United States Department of the Interior

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In reply refer to:
9214
(UT-936)

Memorandum

To: State Director, New Mexico

From: Review Team Leader

Subject: Review of the escaped Blanco Prescribed Fire

Attached is the final report on the Blanco escaped prescribed fire in the Albuquerque Field Office. The escaped prescribed fire review was conducted on June 10-12, 2003.

The review team found an actively developing Fuels Management program in the Field Office. The program is well coordinated between the resource specialists and fire management and has strong management support. The fuels and fire management staff and management teams are building important partnerships with diverse interest groups and communities within the field office area. There has been a substantial improvement in the program in the Albuquerque Field Office since the 2000 Prescribed Fire Policy and Program Review conducted by the Office of Fire and Aviation.

The review identified causal and contributing factors of the escape relating to the Blanco prescribed fire project. The review identified several areas that need improvement; these are listed in the specific findings and recommendation section of the report. It was not the intent of the review to do an in depth review of the Field Office or statewide fuels management programs.

The team recommends that the Albuquerque Field Office, in conjunction with the State office Fire management Staff, develop an action plan to address the findings and recommendations in the report. This report should be completed and submitted to you as soon as possible following receipt of this finial report.

The review team greatly appreciates the support, assistance and openness of the State Office and Field Office management teams and staff during the review. Any questions regarding the report should be directed to John C. Shive at (435) 259-2113.

Blanco Escaped Prescribed Fire Review
Albuquerque Field Office
June 10-12, 2003

I. Introduction

The Blanco Prescribed fire is within the Ignacio Chavez Fuels Treatment Area. The project area is north of Mesa Chivato and is located approximately 25 miles west of San Isidro on the Cerro Parido Quadrangle. Historic uses and active fire suppression have interrupted the natural fire regime in this fire dependent ecosystem. This has resulted in hazardous fuel accumulations and increased stand densities, which contribute to the decline of wildlife habitat and the potential of catastrophic wildfire. The project area was previously burned in 1993 along with contributions from the Rocky Mountain Elk Foundation and the SIKES act program. The 1993 burn had marginal effects on fuel loading and stand densities. The goal of this project was to employ management ignited prescribed fire in the ponderosa pine to reduce stand densities, ladder fuels, and hazardous fuel loadings that under the right conditions could contribute to high intensity crown fire.

The test fire and primary ignition was in mixed pinyon/juniper (p/j) communities below the rim of the mesa top. Black lining had been completed in April along the upper slopes in the under story of the ponderosa pine. The black lining did not result in the removal of canopy cover in the p/j. The test fire and primary ignition rapidly developed into a crown fire in the p/j, with spotting occurring over the black lines and outside of the planned ignition area and the Maximum Manageable Area (MMA). Spotting distances were estimated at up to ½ to ¾ of a mile. The onsite holding forces were unable to contain the multiple spots outside of the planned perimeter, which appropriately resulted in the declaration of an escaped prescribed fire. The escape was declared contained at 1900 on June 8, 2003.

Following is a chronology of events:

Section 1.01 June 4, 2003

10:15 Weather taken at Ned tank
Dry 72 RH 16 Wind Speed 0-4
Wet 47 DP 24 Direction SW

11:30 Spot Weather Forecast back

12:00 Test Fire
Fire Behavior - Flame length 2-4', occasional torching
Weather
Dry 76 RH Wind Speed 4-6 Gusts 7
Wet 56 DP Direction W

12:45 Ignition stopped

13:00 Spot fire reported on top

All personnel went to work on spot fires
Weather
Dry 77 RH 14 Wind Speed 8-14 Gusts 17
Wet 50 DP 24 Direction W / NW

13:45 Unable to contain Spot fires on top with resources present

14:08 Additional Resources ordered
14:27 State Engine 64 in route ETA 1 ½ hr
14:52 FS Engine 203 in route

15:00 Declared RX an escaped fire

15:46 SEATS ordered to stop eastward spread
16:15 Air Attack ordered
16:58 Air Attack over Blanco Fire, T411 ETA 20 min.
17:10 Type 1 Crew ordered
17:29 BIA Engine 37 Tied in with Blanco IC
17:39 Ordered the rest of ABQ and Grants BLM Fuels Crew
18:40 Air Attack guiding in Mt Taylor HS
19:54 Mt Taylor HS on the fire
20:17 Air Attack departing fire

June 5, 2003

06:10 No additional resources needed.
Will hold fire to BLM Rd 1101 and contain on SE side

07:22 All lines holding
Keep fire at BLM road 1101, NW corner will be objective for today.
Est, 400-500 acres in size.

12:08 Holding on to all resources

June 7, 2003

An Escaped Prescribed Fire Review team was ordered to report to the Albuquerque Field Office by 08:00 on June 10, 2003. The team consisted of the following personnel:

John C. Shive, Fuels Management Specialist, BLM Utah State Office
John R. Christensen, Field Office Manager BLM, Kingman Field Office
Joe N. Freeland, District Fire Management Officer, BLM Elko Field Office

The team received an entry briefing from Edwin Singleton, Albuquerque Field Office Manager and Bob Lee, State Fire Management Officer, New Mexico State Office.

The State FMO presented and reviewed the delegation of authority for conducting the review from the New Mexico State Director.

The Delegation of authority directed the team to follow the objectives outlined in the Escaped Prescribed Fire Guidance, Chapter 8, and determine:

- If the prescribed fire plan was adequate;
- If the prescription, actions, and procedures set forth in the plan were followed;
- The level of awareness and understanding of the personnel involved, with regard to procedures and guidance;
- If overall policy, guidance, and procedures relating to prescribed fire operations were adequate and being followed;
- The extent of prescribed fire training and experience levels of the personnel involved in the planning and operational phases; and
- Recommended actions to prevent similar future occurrence.

The team was also directed to hold a closeout for the fire staff and the State Director at the State office in Santa Fe, with a factual report and recommendations submitted to the State Director by June 24, 2003.

The team visited the burn site with the Field Office Manager, Burn Boss, Holding Boss and New Mexico State Office Fire Operations Specialist on June 10, 2003. Documentation, project files, spot weather forecasts and all other data related to the escape and the prescribed burn were reviewed on June 11, 2003. Personnel interviews were also conducted with the following personnel:

Field Office Manager
Burn Boss
Holding Boss
State Fuels Specialist
Predictive Services, Southwest Coordination Center
State Fire Operations Specialist
Center Manager, Albuquerque Zone Dispatch Center

II. General Findings

The review team found an actively developing Fuels Management program. The program is well coordinated between the resource specialists and fire management and has strong management support. The fuels and fire management staff and management teams are building important partnerships with diverse interest groups and communities within the field office area. There has been a substantial improvement in the program in the Albuquerque Field Office since the 2000 Prescribed Fire Policy and Program Review conducted by the Office of Fire and Aviation.

The Albuquerque Field Office Manager is actively involved in the Fuels and Fire Management Programs. The Field Office Manager has a good understanding of the program his roles, responsibilities, and delegations. The Natural Resource Staff and the Fire and Fuel Management Staff are working well together to meet both Fuels and Resource Management objectives as projects are developed and implemented.

The burn boss and holding specialist are both committed to personnel safety and display a high degree of commitment to the program and the success of the project. They have been actively working to develop landscape-level projects within the field office.

Landscape-level burning requires a delicate balance between sufficient detail to adapt to changing situations over time, while still allowing sufficient flexibility for the burn boss and line officer to manage the project effectively to meet the resource objectives within the prescription parameters.

The Blanco Prescribed Fire Plan is technically adequate, however there are several areas that need further refinement and additional information for clarity, to enhance its usefulness, and to meet BLM standards. The burn boss demonstrated technical skill and decisiveness after the escape resulting in minimum damage from the event. The field office should be commended for its work as a team following the escape.

III. Specific Findings and Recommendations

1) **Was the prescribed fire plan adequate?**

   a) **Finding:** The majority of burn plan met minimum BLM National Standards. There was a lack of clear understanding in the procedures for selection of fire behavior models, and prescription development.

      The burn plan was specifically developed to complete an under story burn in a Ponderosa pine community. The discussion in the Fuels Management Summary, Complexity Analysis and the Fuels Description narrative was to burn ponderosa pine primarily for rejuvenation and stand health. However, a significant part of the project was to reduce pinyon and juniper concentrations within and adjacent to the ponderosa stands and should have been considered to be the primary carrier in the block being burned. Therefore, the choice of the NFFL fuel model 8 did not accurately predict the potential fire behavior for the site under prolonged drought, very dry conditions, and high winds. In addition, the fuel model did not take into account the amount of dead and dying fuel. The selected fuel model and associated fire behavior caused an underestimation in necessary holding forces on a high wind day in extremely dry conditions. Much of the black lining in this block and ignition in an adjacent block, which was completed in April, was consistent with the fuel model 8 and did a good job of making an under story black line but resulted in little or no reduction in the pinyon/juniper canopy/crowns and probably resulted in increased drying of those canopies.

      The fuel model selected illustrated a ground fire with predictable rates of spread and flame lengths that could be easily confined with the forces required in the

burn plan. Conditions on site in June allowed for development of a rapid crown fire with the slopes, weather conditions and fuel moistures. The actual fire behavior on June 4, 2003 was torching and spotting with isolated wind driven crown runs. Actual rates of spread, spotting distance, and crown runs were beyond the capability of the ground personnel on site to confine utilizing direct attack with hand crews.

b) **Recommendation:** It is highly recommended, that to meet an objective of reducing pinyon/juniper, that the Field Office use a combination of fuel model 4 and 6 when the burn unit contains a majority of mixed pinyon/juniper. When doing low intensity under story burns in ponderosa pine stands it is appropriate to use fuel model 8 or 9 based on the objective for the site. It is also important to use monitoring to continue to develop a local prescription that will accomplish the desired treatment objectives in the pinyon/juniper woodlands.

c) **Finding:** The Ignacio Chavez fuels treatment project is a landscape scale treatment plan. The plan calls for several types of treatments within the project boundary to be implemented over several years. The Blanco prescribed burn unit boundary was established with a restricted MMA that followed a natural topography break, not a fuel break where the prescribed fire would naturally lay down. This design limited the burn bosses ability to use natural fire behavior to contain the fire. The reason the MMA was not expanded out to road 1103 was that an archeological clearance had not been completed in the adjacent area. This requirement was probably made because it was identified as a mechanical treatment rather than a prescribed fire treatment. There does not appear to be any internal or external concern with fire spread on the top of the mesa, making it unreasonable to limit the burn boss in this manner.

d) Recommendation: Expand MMAs where consistent with management objectives. In this case the MMA could be adjusted to encompass the entire landscape level plan with little to no impact to the resource values identified in the E.A. The design of MMAs should be based on natural barriers to fire spread. In this case, the need to declare an escape would have been eliminated if this process had been utilized.

e) **Finding:** The burn plan did not incorporate several requirements and mitigation measures that were identified in the environmental assessment, such as: retention of snags and remaining down and dead logs, leaving the described pinion and juniper trees/ acre, and retaining trees with nesting cavities.

f) Recommendation: Burn plans need to specifically incorporate requirements and mitigation measures from the Environmental Assessment. For instance how they will meet the snag requirement, leaving the described pinion and juniper trees/ acre, and retaining trees with nesting cavities. The Communications plan needs to add contacts that were identified in the EA, such as the Native Americans.

g) **Finding:** The Go/No Go Check list was checked indicating that long-term drought was not a factor and the plan was not updated to consider the effects of the drought conditions on the unit and the expected fire behavior.

h) **Recommendation**: FMOs and Burn Bosses need to ensure that all existing burn plans are reviewed and updated to consider the effects of drought on the fuels and fire behavior in the burn unit prior to ignition. Each element of the Go/No Go checklist needs to be given thoughtful consideration based on current and predicted conditions at the site, prior to checking the yes or no boxes.

2) Determine if the prescription, actions and procedures in theprescribed fire were followed.

a) **Finding:** *Prescription* – the prescription should be developed based on the fuels which would carry the fire during ignition. The prescription represented fire behavior and intensities experienced during the April burn in the same area. The extended drought conditions, reduced live fuel moistures and bug kill in the pinyon resulted in higher intensity, rate of spread, flame length, and spotting distances, which were not accurately predicted by fuel model 8 or 9. Neither fuel model 8 or 9 allows input of measured live fuel moisture in the Behave Model.

b) **Recommendation**: See Issue 1 first recommendation.

c) **Finding:** *Actions and Procedures* - The actions and procedures established in the burn plan were followed. The fuel model selected to predict fire behavior resulted in an under estimation of potential fire behavior, intensity, and spotting distances. If fuel model 4 and/or 6 had been used in developing the plan there would have been more keys/indicators, which would have allowed the burn boss to develop sufficient holding/black lines and would have indicated a need for additional holding forces on site. The test fire should have been allowed to develop sufficiently to indicate actual behavior that could be expected and spot weather readings should have been taken at the test fire location instead of the rim above the test fire. Primary ignition should not have proceeded until all results of the test fire were analyzed to determine what actual fire behavior the primary ignition would generate given the actual on site conditions.

d) **Recommendation**: The test fire should be allowed to develop sufficiently to indicate actual fire behavior that will develop during primary ignition operations. Spot weather readings should be taken at the test fire location. Primary ignition should not proceed until all results of the test fire are analyzed to determine what actual fire behavior the primary ignition would generate given the actual on site conditions. Test fires should be in a location that can be easily extinguished and closely resembles the burn unit (see 9214, Chapter 3 page 21).

e) **Finding:** A spot weather request was submitted. The spot weather forecast was accurate. The forecast called for southwest winds 2-4 mph at ignition changing to west-northwest 10-15 mph with peak gusts to 25 mph during the afternoon. Gusty and erratic winds near dry showers. The relative humidity was 8-10%. Max.

Temperature 83-84. These projections were within the Acceptable prescription range. Historical data from the Cuba RAWS station confirmed that these type winds are normal for this time of year.

f) **Recommendation:** The use of the spot weather forecast is important and should be used in combination with other tools available. The State should develop a live fuel monitoring program similar to those established in Nevada and Utah. The State should encourage the use of the resources available through the Predictive Services Unit in the Southwest Coordination center. (i.e.: historical weather parameters and reports, long and short range severity assessments, and weekly/monthly weather predictions as well as drought severity products.). The use of existing fire danger pocket cards would also indicate when prescribed fires are being conducted under extreme conditions. The existing pocket card for the Albuquerque Field Office should be updated to include burning index and more representative fuel models.

3) Determine the level of awareness and understanding of the personnel involved, with regard to procedures and guidance.

a) **Finding:** The personnel involved in project implementation were generally familiar with Bureau procedures, policy, and guidance. Two elements of the plan needed additional information and development to meet the minimum standards as outlined in Chapter 3 of the 9214. These sections were the Escaped Prescribed Fire Plan and the Complexity analysis.

b) **Recommendation:** Clearly define points at which the Burn Boss would be required to declare an escape in the Escaped Fire Plan. Minimum parameters for declaring an escape as specified in Chapter 8 of the 9214 are: 1- Fire outside of the of MMA, 2- Fire that cannot be contained with the holding forces identified in plan, 3- timeframes for containing/controlling slop overs, 4- fire encroaching on areas of critical concern.

c) **Finding:** This prescribed fire was rated as a Low Complexity (Type) burn. This was due in large part to the fact that Fuel models 8 and 9 were used rather than 4 and/or 6 particularly in the potential for escape and anticipated fire behavior. Many of the elements in the Complexity Analysis work sheet were marked as N/A with no rationale given.

d) **Recommendation:** Perform the complexity analysis in accordance with the NWCG direction and the 9214 guidance. Do a more complete job of documentation of rational on the worksheet; there should never be a N/A, each element is applicable and needs a response and rationale developed for the selection made. The complexity analysis should be completed with the interdisciplinary team to ensure all values and risks are adequately discussed and analyzed.

4) **Determine if policy, guidance, and procedures relating to prescribed fire operations were adequate and being followed.**

a) **Finding:** The Dispatch center was given a copy of the burn plan but did not receive a copy of the project map, and did not do the notifications as identified in the burn plan. The Burn plan identified that the "Albuquerque Zone Coordination Center" would make the contacts with "agencies and surrounding zones". The list on page 18 would be the responsibility of the Burn Boss. As a result of our interviews the team was informed that this role and responsibility should be made clearer and that the Burn Boss may not be the best person to make all the contacts. Burn bosses were not coordinating with the Center to ensure all necessary contacts are being made.

b) **Recommendation:** Burn bosses should coordinate with the Zone Coordination Center to ensure that: all required contacts are made, that there is a current copy of the plan and maps of the project in dispatch on the day of the burn. Burn bosses should also confirm with dispatch that all required contacts have been made if that is a requirement of the burn plan.

c) **Finding:** At the time when additional resources were ordered, all of the available BLM Fire personnel were either on the prescribed burn or out of the office. This required dispatch to take extra time to locate requested BLM resources to respond to the request.

d) **Recommendation:** Designate an Albuquerque Field Office employee to be the "Duty Officer" point of contact at the Office to help with communications and crew deployment.

5) Evaluate the extent of prescribed fire training and experience levels of the personnel involved in planning and operational phases.

a) **Finding:** All employees were appropriately qualified for their positions on the burn.

b) **Finding:** The State Office is lacking a higher level of prescribed fire experience and qualifications which limits their ability to provide oversight, review, training and support to prescribed fire and fuels management operations.

c) **Recommendation:** The State should continue to develop the experience level and qualifications of the State office fuels management staff to ensure that the appropriate level of oversight review training and support is provided to the Field Offices. In addition the State fuels specialist should set up regular coordination/information sessions to discuss and coordinate on fuels management issues, training, successes and challenges. Most States have quarterly meetings with the program leads. The Albuquerque Field Office should also work to get the fuels staff more experience with landscape treatments and in different fuel models and in other States and/or Field Offices within the State.

d) **Finding:** Technical review procedures are mostly in accordance with the minimum standard indicated in Ch. 3 of the 9214. Most of the reviews are either

conducted in the field office or sent to another field office for review. The state office reviews at least one plan per year in each field office. It appeared that though this process is in place, that the technical review may not have been as detailed as it should have been and that it was not conducted by someone who was not associated with the planning and development of the project.

e) **Recommendation:** The FMO should still do a preliminary review of the plan then forward to an objective technical reviewer who will be honestly critical and is familiar with the area, and doesn't have a stake in the accomplishment. (see guidance in 9214 related to technical reviews in Chapters 1,3 & 5.)

III. Conclusion

All burn plans should be developed individually for the specific site and fuel models that would be the primary carrier within the Burn Unit.

The effects of Long Term Drought on fuel conditions always needs to be considered both during plan development and implementation. Particularly when implementing an existing plan which has been used effectively in the past under normal conditions.

Maximum Manageable Areas should always be based on natural barriers to fire spread. In this case, the need to declare an escape would have been eliminated if this process had been utilized.

Field Office Managers should ensure that mitigating measures and objectives identified in the EA are carried forward into the Prescribed Fire Plan.

The team recommends that the Albuquerque Field Office, in conjunction with the State office Fire management Staff, develop an action plan to address the findings and recommendations in the report. The action plan should be forwarded to the New Mexico State Director with a copy to the State Fire Management Officer as soon as possible after receipt of this finial review report.

The review team greatly appreciates the support and assistance of the State Office and Field Office management teams and staff.
