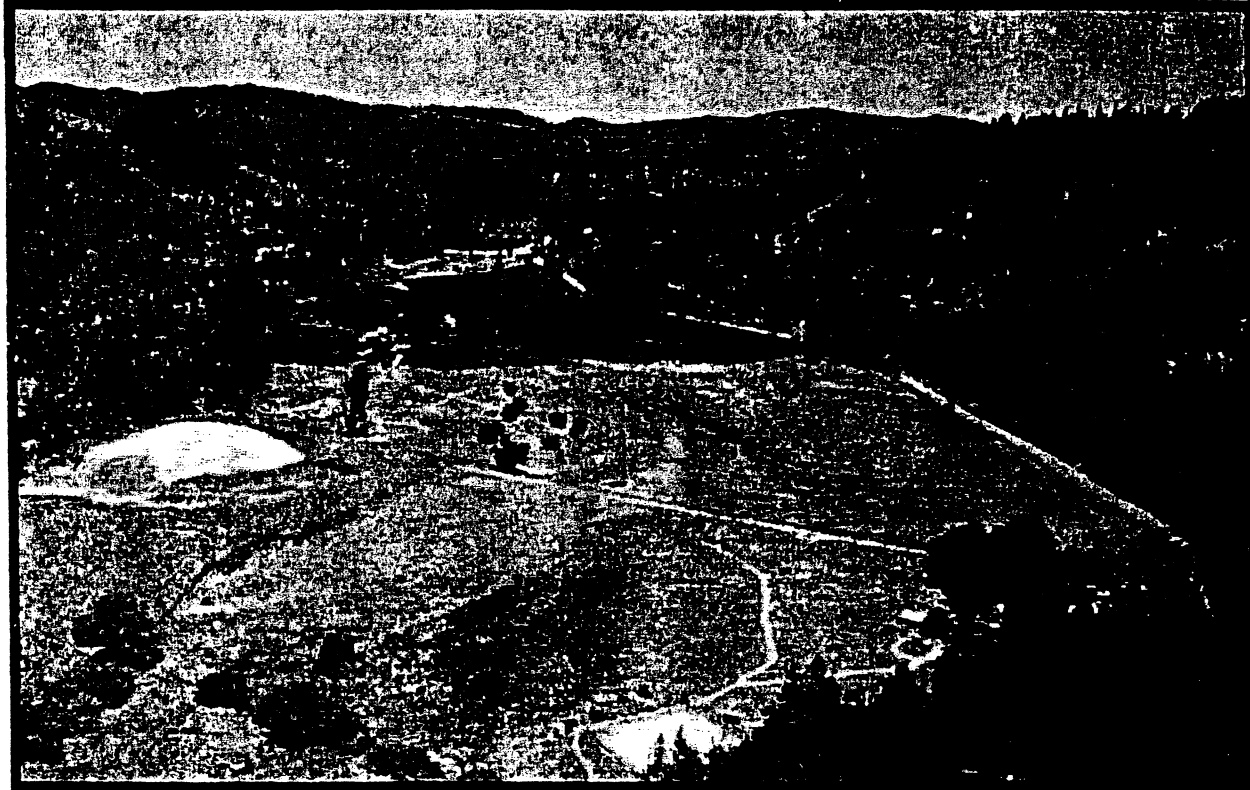
Lowden Ranch Prescribed Fire

Review



Final Report

U.S. Department of the Interior
Bureau of Land Management

Prescribed Fire
Review Team
Lewiston, California
July 22, 1999

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EXECUTIVE SUMMARY

On July 2, 1999, a prescribed fire ignited by personnel from the Redding Field Office of the Bureau of Land Management (BLM) escaped control and was declared a wildland fire. The Lowden Ranch fire grew to about 2,000 acres and destroyed 23 residences before it was contained under management of a California Department of Forestry (CDF) incident management team.

BLM's director of the National Office of Fire and Aviation assembled an interagency team to determine the factors that caused the prescribed burn to escape. This is the review team's final report.

The review team based its findings on interviews with key personnel, residents of the area, and other people who witnessed the fire; on-site observations; and technical analyses of factors including weather, climate and fire behavior.

The review team concluded that a spot fire on the heavily timbered east side of the prescribed burn grew beyond the capabilities of the firefighting personnel at about 1:30 p.m. on July 2, 1999, and became a wildland fire. Further, the review team concluded that the planning and implementation of the prescribed fire were not in compliance with BLM standards and procedures. Specifically, BLM personnel:

- Failed to analyze the operational situations and factors to determine if the burn plan could be implemented. This included inadequately evaluating fire behavior and weather conditions; not lighting an adequate test fire, as prescribed in the burn plan; failure to evaluate smoke impacts; and not considering current and predicted fire behavior.

- Failed to adequately address public safety mitigation factors in the contingency section of the burn plan. Houses were within the contingency boundaries, but protection of them in the event of an escaped fire was not discussed.

- Did not assess current weather and fuel conditions related to the severity of the long-term fire season.

- Provided for adequate contingency resources in case of an escaped fire, but failed to determine if adequate contingency resources were available.

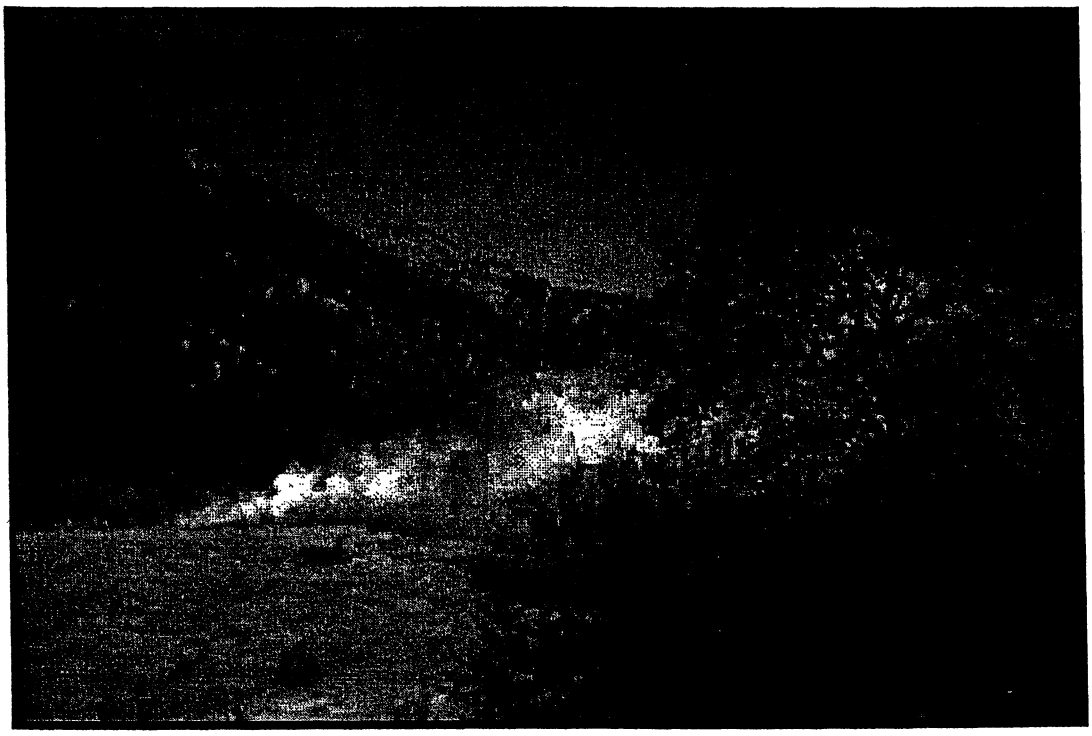
- And, failed to implement the prescribed fire according to the approved burn plan.

EXECUTIVE SUMMARY

The findings of the review team are documented through the Lowden Ranch Prescribed Fire Burn Plan, personal statements, weather observation forms, and calculations provided by fire behavior analysts.

The review team concluded that BLM's national fire policy and the agency's prescribed fire standards and procedures are sound. Review team members acknowledge that when the standards and procedures are compromised, the potential for a wildland fire disaster increases markedly.

A board of inquiry will be convened by the acting director of BLM this summer to review the team's findings and address the issue of accountability. Finally, recommendations will be formulated by the review team and transmitted to BLM's acting director. He will consider implementing the recommendations on a national basis.



The Lowden Ranch prescribed fire.

INTRODUCTION

The Bureau of Land Management (BLM) has policies and standards for conducting prescribed fires. When they are followed, the risks associated with prescribed fire are mitigated. When the policies and standards are not completely followed, problems can and often do occur. In the case of the Lowden Ranch prescribed fire, policies were not strictly adhered to and standards not always met. The results for the community of Lewiston were disastrous.

On July 2, 1999, a planned 100-acre prescribed fire near Lewiston, California, jumped control lines and raced up a heavily forested hillside. Before it was controlled almost a week later, the Lowden Ranch Fire burned more than 2,000 acres and destroyed 23 residences.

Two alternatives other than prescribed fire were evaluated: herbicide treatment and "no action." They were rejected in favor of prescribed fire as the treatment method.

As the severity of the fire became known that afternoon, the acting BLM California State Director authorized an interagency support team to assess the situation and provide assistance to the local field office, as well as help with the investigation. It consisted of representatives of BLM, U.S. Forest Service, National Park Service, and California Department of Forestry (CDF). That evening, BLM's director of the National Office of Fire and Aviation formed a national review team made up of interagency employees. Both teams merged under the leadership of the national team.

Purpose and Objectives

This report reviews the events and circumstances that caused a relatively small prescribed fire to transform into a destructive wildland fire. It contains the team's findings and assesses accountability. It reviews BLM's national prescribed fire policy in the context of events that took place on the Lowden Ranch prescribed fire. The report represents the experience, knowledge and best judgment of the team members and others in the fire community who provided information.

Specifically, the team was asked to:

- Determine if BLM's national prescribed fire policy is sound.
- Determine if BLM's prescribed fire standards and procedures are adequate.
- Determine if the burn plan was satisfactory.
- Determine if the prescribed fire was conducted in accordance with the plan.
- Assess accountability.

INTRODUCTION

Process

The review team completed its assignment by using several processes:

- The team identified, collected and analyzed the factual data associated with the escape of the prescribed burn.
- Technical analyses of weather, climate and fire behavior factors were completed by team members.
- Team members conducted interviews with key personnel involved with the planning and implementation phase of the Lowden Ranch prescribed burn project. They also sought and interviewed local people who witnessed the prescribed fire.
- The team documented the data it gathered.

The primary intent of the review is to determine the facts regarding the escape of this prescribed burn. A draft report, issued on July 22, 1999, focused only on findings that would be presented to BLM management. This final report incorporates minor editorial revisions. Recommendations resulting from these findings will be developed and submitted to the BLM acting national director. Some actions, such as a state-by-state review of compliance with standards and procedures, have already begun.

Scope

The report covers only the series of events before and during the prescribed fire that contributed to its escape. It does not address the events that occurred once the prescribed fire was declared a wildland fire.

Prescribed Fire Program

To fully understand this report, it is critical to have at least a basic knowledge of wildland and prescribed fire policy. Stated simply, prescribed fires are ignited to meet specific management objectives. It is a well-established practice in both the public and private sectors. Farmers have long burned fields to eliminate unwanted vegetation and improve soil quality. Prescribed fire is also an ancient practice. Native Americans used prescribed fire, for example, to regenerate vegetation and for other purposes. Through the years, the practice has changed, as fire technology, research and application have improved.

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Among the changes was greater use of prescribed fire to help restore natural systems and reduce the risk of calamitous wildfires. When an area is burned under the right conditions or "prescription," important benefits can result. Accumulations of fuel can be reduced. Wildlife habitat can be improved. Soil fertility can increase. Insect and plant disease susceptibility can be lessened. Overall biological diversity can be improved. The list of advantages is lengthy.

BLM's prescribed fire policy has worked well. The vast majority of prescribed fires accomplish their purposes with little or no collateral damage. In 1999, BLM targeted 314,258 acres for prescribed burning, including 42,132 acres in California. One of the prescribed burns, Lowden Ranch, was planned for a 100-acre site near Lewiston that had been overtaken by a noxious weed, yellow starthistle. By burning the area, BLM hoped to eliminate the thistle, remove build-up of hazardous fuel, plus restore the health of the grassland, oak woodland and riparian ecosystem. Prescribed fire is recognized by fire ecologists as an effective means of controlling yellow starthistle by decreasing its seed supply. It was deemed the most effective way to control the weed at the Lowden Ranch site.

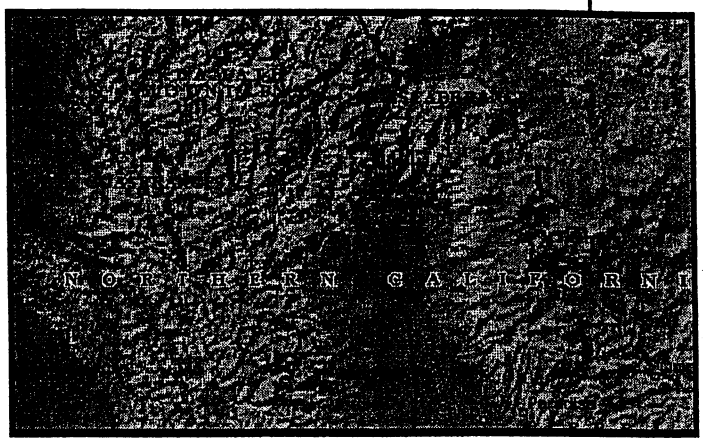
The Federal Wildland Fire Management Policy provides a common approach to wildland and prescribed fire management for all federal wildland fire agencies. This policy reflects a commitment to public land resource management through the use of prescribed and natural fire, where appropriate and carefully planned, to improve the land's health or reduce hazardous build-up of fuels.

As stated previously, the Lowden Ranch prescribed fire allows the review team and fire management community to examine again the prescribed fire policy and our national guidance. BLM will quickly take the appropriate action for any recommendations made that would help avoid this kind of tragedy in the future.

For those who lost their homes and possessions, or have in any way had their lives altered by this fire, it is the very least BLM can do.

OVERVIEW

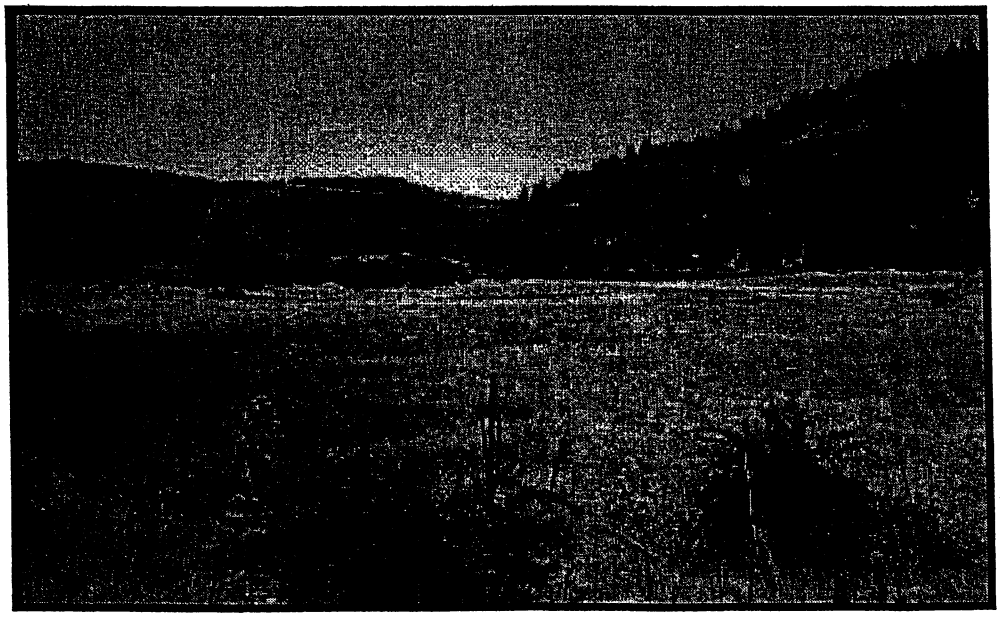
Background of the Lowden Ranch Prescribed Fire



The Lowden Ranch prescribed fire was ignited in northern California.

Northern California experienced normal precipitation during the winter, followed by a dry spring. Eleven of the first 22 days in May had an above-normal occurrence of dry, north wind events, called foehn winds. The winds continued through June with below-normal precipitation. On May 22, 1999, three prescribed fires on national forests in northern California escaped. An analysis of the Weaverville, California, remote automated weather station (RAWS) indicated that fire danger predictors were near or exceeded historical measurements for the July 1 period.

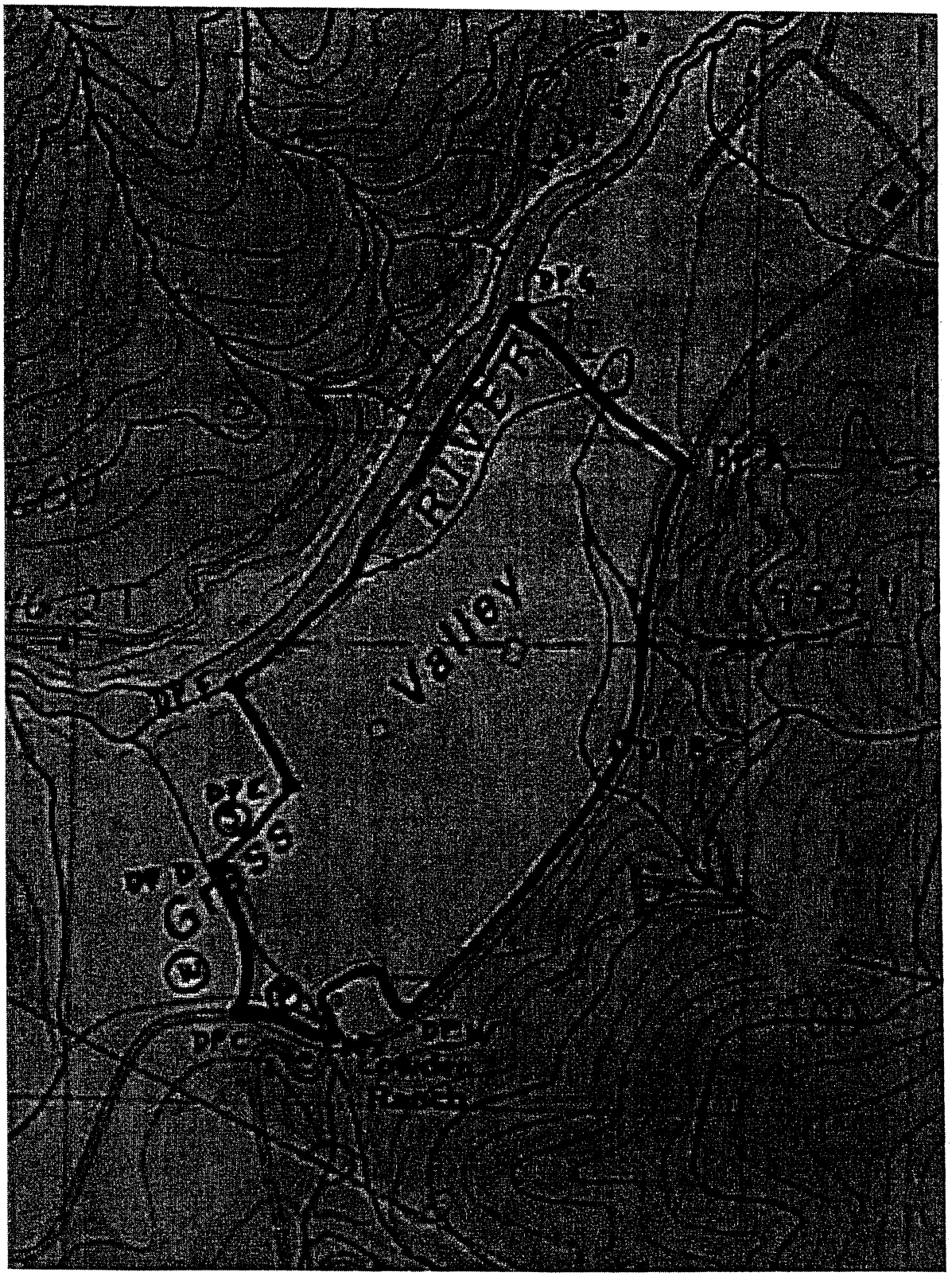
The Lowden Ranch is located about 45 miles northwest of Redding, California (see Project Briefing Map). The project site is bordered by the Trinity River on the west and the Old Lewiston Road on the east. An archeological site is present in the southeast corner of the area. One of the purposes of the prescribed fire was to eliminate yellow starthistle, a rapidly spreading weed that was crowding out desirable plants in the area.



Lowden Ranch prescribed fire site.

Prescribed fire has been effective in controlling yellow starthistle. In a three-year series of prescribed burns on a site in northern California, the plant's seed count was reduced by 99 percent.

OVERVIEW



Project Briefing Map.

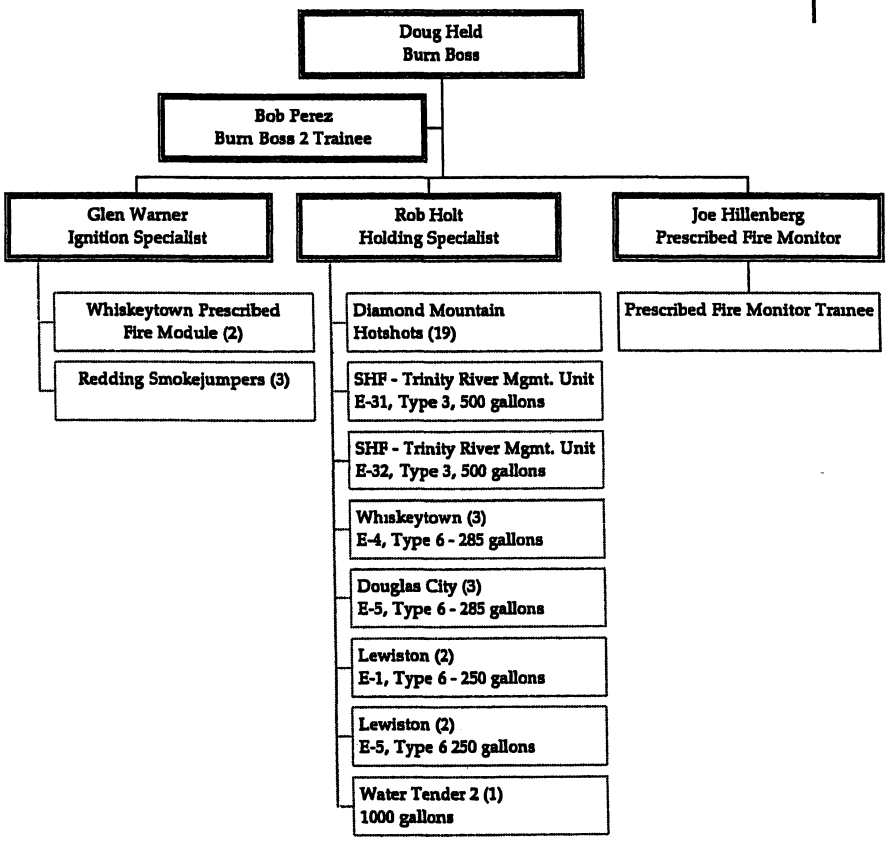
OVERVIEW

The Lowden Ranch prescribed fire burn plan was approved on May 3, 1999, and BLM specialists hoped to implement the project on June 24, 1999. BLM postponed the burn because the project resources were committed to other fires in the area. It was scheduled again for June 29, 1999, but BLM again called off the prescribed fire because of unfavorable weather.

A third attempt was scheduled for July 2, 1999. On July 1, 1999, a spot weather forecast was obtained that indicated conditions might allow a burn in the morning hours, although increasing winds were forecasted for the afternoon.

July 2, 1999

On the morning of July 2, 1999, the burn boss was busy trying to fill critical positions and resources that were needed for the fire but were not available. Engines from the Forest Service and California Department of Forestry (CDF) that were expected to work on the burn were unavailable. An additional Forest Service engine and local volunteer fire department engines were substituted. The two planned California Department of Corrections (CDC) hand crews were unavailable and the Diamond Mountain Hotshots were substituted. Three smokejumpers were ordered to help with ignition. The Diamond Mountain Hotshot foreman was assigned as the holding specialist, and the Whiskeytown Prescribed Fire Use Module leader was assigned as ignition specialist. Prior to the briefing, the burn boss met with the holding and ignition specialists to discuss the ignition sequence and holding strategies and tactics.



Lowden Ranch prescribed fire organizational chart for July 2, 1999.

Briefing

At 9:30 a.m., the briefing was held at the Old Lowden Ranch cabin. All resources were present at the briefing, with the exception of Engine 32 (E-32). The prescribed fire briefing checklist was used in conducting the briefing. Organization, escape routes, safety zones, personal protective equipment (PPE) requirements, communication frequencies and resource assignments were discussed.

Implementation

At about 10 a.m., personnel began preparation for starting the burn. A National Park Service (NPS) engine (E-4), and Lewiston water tender put a hose lay on the north end of the burn between the Old Lewiston Road and the Trinity River. They then positioned themselves at the structure adjacent to the project on the north end. A Lewiston engine and the Diamond Mountain Hotshots were also in this area constructing and improving hand line. The Douglas City engine (E-5) and crew was placed across the Trinity River to serve as a lookout and to pick up any spot fires. A Shasta-Trinity National Forest (SHF) engine (E-31) was on the Lewiston Road at the northeast corner of the burn. Another Lewiston engine was on the Lewiston Road near the old Lowden Ranch.

At about 10:50 a.m., fire behavior monitors took a weather observation. The Go/No Go checklist was completed and the CDF Command Center was notified of intent to begin ignition. A small test fire was conducted at the northeast corner of the area to evaluate flame length, rate of spread, and fuel consumption. After observing the test fire, the decision was made to continue.

The Redding smokejumpers ignited the area along the north line between the road and river. Meanwhile, the Whiskeytown Fire Use Module burned along the road from Drop Point A (northeast corner) to Drop Point B.

Smokejumpers ignited the northern portion of the site.

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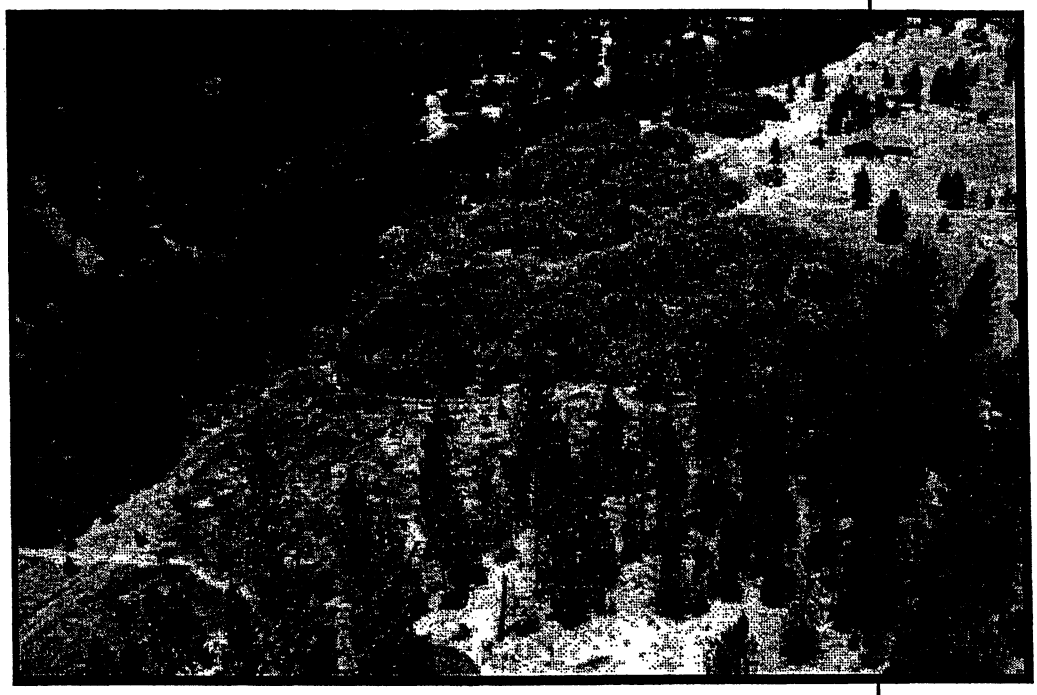
At 11 a.m., another SHF engine (E-32) arrived at the scene and provided back-up to E-31 along Lewiston Road.

At 11:15 a.m., the burn boss was concerned with the fire getting into a group of conifers along Lewiston Road, midway between Drop Point A and B. A squad of Diamond Mountain Hotshots scratched a line around the conifers. The area was also pretreated with foam to prevent the fire from getting into the trees. The ignition personnel proceeded to fire from the line and completed it within about 20 minutes.

At 11:45 a.m., the burn boss trainee advised the burn boss that good progress was being made on firing the north line. The trainee also asked if the ignition crew should continue to fire down to the river. The burn boss responded affirmatively.

At about 12 p.m., the burn boss trainee notified the burn boss of a slop-over across the line in Drop Point G (northwest corner). The fire was burning in light grass and riparian vegetation. The firing operations were stopped. E-32 and Water Tender 2 were sent from the Lewiston Road to support Whiskeytown E-4, the Lewiston engine, and the Diamond Mountain Hotshots to contain the slop-over. The Douglas City engine (E-5) was ordered to leave its location across the river and return to the project area to assist in holding operations.



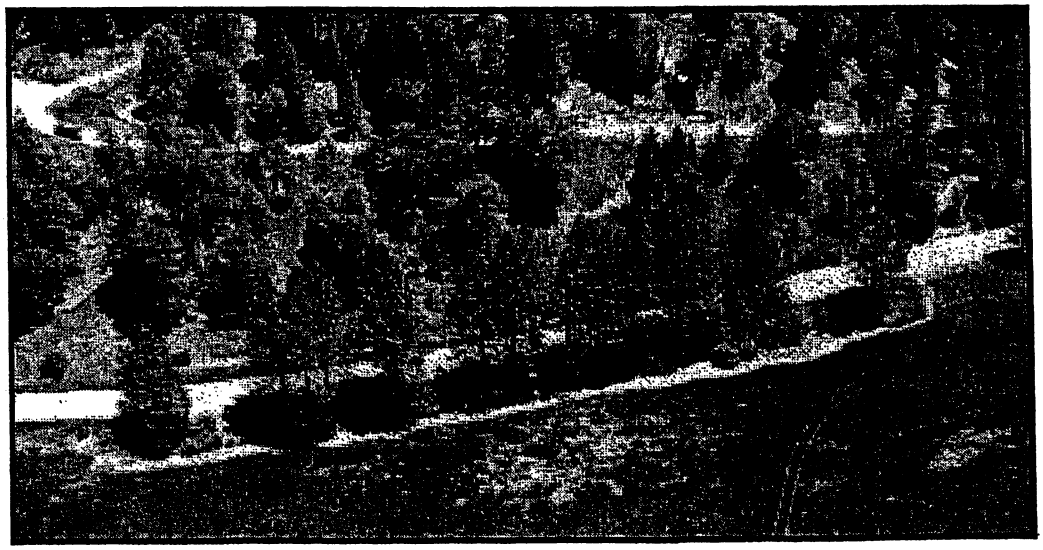
A slop-over at Drop Point G (northwest corner).

At about 12:20 p.m., the slop-over was contained. Some private property was involved. The burn boss ordered 100 percent mop-up on the slop-over, and firing resumed. The smokejumpers completed firing to the river and began firing along the meadow to allow the fire to back into the riparian vegetation. Simultaneously, the Whiskeytown Fire Use Module continued firing along Lewiston Road, about halfway between Drop Point A (northeast corner) and Drop Point B (archaeological site).

OVERVIEW

Smoke from the fire blew across the road.

At 1 p.m., the Whiskeytown Fire Use Module reached Drop Point B (archaeological site) and began putting resources in place to protect the site. The burn boss was at this location and was notified by the pilot car operator that a flare-up was occurring up the road between the archaeological site and the far northeast corner of the burn. The fire had crossed the hand line meant to protect the conifers along Old Lewiston road. This spot fire ignited a wildrose bush that was covered with needle drape, causing a spot fire across Old Lewiston Road. The burn boss immediately ordered E-31 and the Whiskeytown Fire Use Module to respond. They contained the flare-up and the small spot fire across Lewiston Road. Personnel patrolled the hillside for any additional spots. Engine 31 and the Whiskeytown Fire Use Module returned to continue ignition around the archaeological site. At that time, the Lewiston and Douglas City engines were ordered to assist in the holding efforts at the archaeological site.



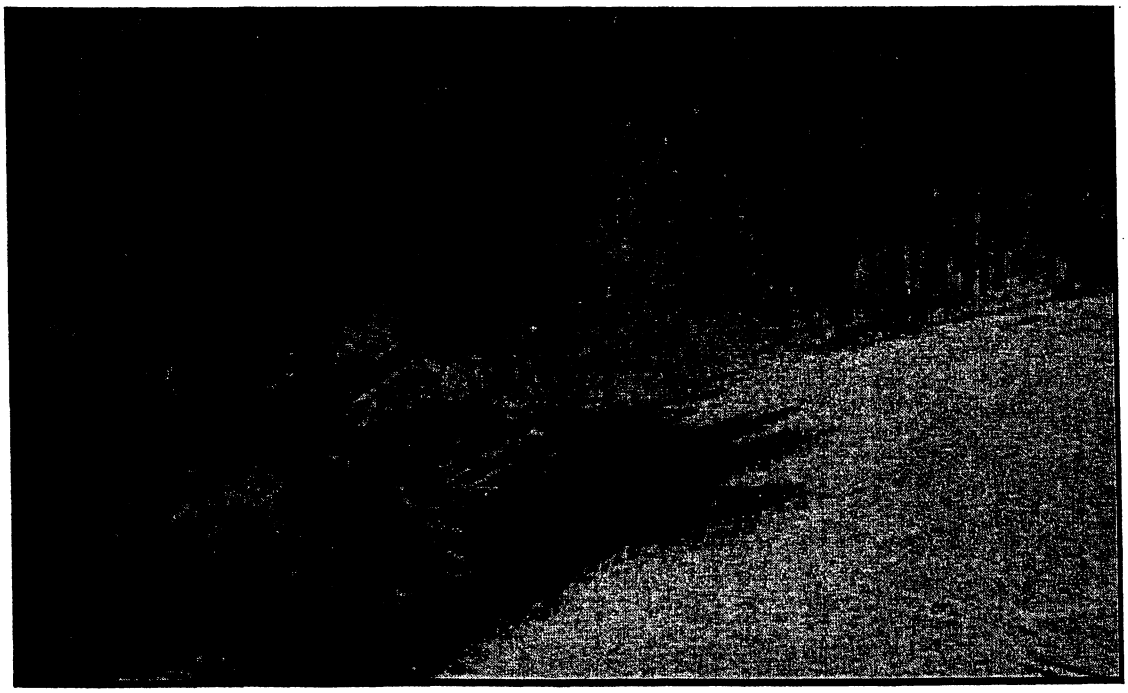
A spot fire jumped the hand line and ignited wildrose bushes.

OVERVIEW

At 1:15 p.m., the fire behavior monitor contacted the burn boss to report a spot fire burning on the hillside in the vicinity of the earlier spot. All firing was stopped, and the burn boss, E-31, and a member from the module responded. The spot fire was about 100 feet above the Old Lewiston Road and below an old logging road that ran parallel to the hillside. There was a locked gate on the old logging road that forced Engine 31 to lay hose up from the Old Lewiston Road.

At 1:20 p.m., the fire was contained with hand line and the use of water. E-31 left to get more water, and the Diamond Mountain Hotshots arrived from their position on the north line. The hotshot crew superintendent contacted the burn boss on the radio, requesting a meeting to regroup and discuss future operations, strategies and tactics. As the burn boss walked down to meet with the superintendent, a third spot fire occurred. This spot fire spread quickly up slope and exceeded the capability of the personnel on site to contain it.

At 1:30 p.m., the burn boss contacted the burn boss trainee, briefed him, and instructed him to notify the CDF command center that the fire had escaped and was a wildland fire.



The Lowden Ranch prescribed fire was declared a wildland fire.

FINDINGS

The Lowden Ranch prescribed fire review team conducted its analysis using established wildland fire management guidance, including the Federal Wildland Fire Management Policy, Interior Manual 620 DM 1, BLM Manual H-9214-1, Prescribed Fire Management Handbook, and BLM's Standards for Fire Operations handbook.

The BLM's Standards for Fire Operations handbook establishes national operating standards relating to wildland fire policy, safety procedures, fire suppression, prescribed fire and other fire management issues. This handbook, adopted in 1996 and updated annually, describes standards and performance requirements to ensure all BLM fire managers and agency administrators promote safe, effective, and efficient operations.

The team focused its review and findings based on BLM policy and guidance, while re-evaluating the soundness and adequacy of this guidance in terms of the Lowden Ranch prescribed fire project. The review team reaffirms the intent and implementation of the policy: BLM fire operation standards are sound and adequate.

Performance

The following section describes the team's review and findings on the performance of three key positions relating to the planning and implementation of the Lowden Ranch prescribed fire. These positions include the agency administrator (Redding Field Office Manager), the northern California fire management officer (manager responsible for fire management oversight in the Redding area) and the prescribed fire burn boss.

Four integral positions are in this prescribed burn organization: burn boss, ignition specialist, holding specialist and fire behavior monitor(s). They each play a key role and share responsibility in the safe, effective implementation of a prescribed burn. However, the burn boss makes the final decision. The actions of the ignition, holding and monitoring specialists on the Lowden Ranch prescribed burn were not included in the performance evaluation because: 1) they were assigned to their positions when they arrived at the project; 2) they did not receive an adequate briefing upon arriving; and 3) they did not have an opportunity to review the prescribed burn plan prior to the project.

FINDINGS

Agency Administrator

The Standards for Fire Operations (Chapter 2) requires the agency administrator (AA) to ensure fire management officers are qualified by training and experience for the positions they hold. The AA also ensures that a written, approved burn plan exists for every prescribed fire project, and that all escaped prescribed fires are reviewed. Additionally, it is the AA's responsibility to maintain awareness of daily fire activity, burning conditions and weather forecasts.

Findings:

> The review team found that the AA accomplished, or met, all of these requirements. However, the AA failed to recognize that an unqualified person prepared the burn plan, and that the plan did not have appropriate technical review.

Fire Management Officer

The BLM's Standards for Fire Operations (Chapter 2) requires the fire management officer (FMO) to: 1) ensure that a written, approved burn plan exists for each prescribed burn; 2) ensure that a job hazard analysis (JHA) is completed and mitigation measures are taken to reduce risk; 3) ensure that personnel assigned to fire projects meet physical requirements, and are trained and fully qualified; and 4) monitor fire season severity predictions, fire behavior and activity levels, and take action to ensure safe, efficient and effective operations.

Findings:

> The FMO met all these requirements. However, he failed to recognize that an unqualified person prepared the burn plan. The FMO also failed to provide the appropriate level of technical review prior to approval of the plan.

Note: A national interagency concern on how fire management officers adequately track and disseminate long-term fire danger information through new technology was identified.

Prescribed Fire Burn Boss

The burn boss was evaluated based on an additional tool called the Prescribed Fire Burn Boss Task Book. The task book was developed by the National Wildfire Coordinating Group, which includes representatives from all federal wildland firefighting agencies and representatives of the National Association of State Foresters, tribes and the U.S. Fire Administration.

The burn boss is required to ensure everyone involved in, or possibly affected by, a prescribed burn is notified in advance. Those to be notified include fire dispatchers and staff, cooperators and land owners.

Findings:

Land owners adjacent to, and in the vicinity of, the burn were not notified of the Lowden Ranch prescribed fire. The news media was not notified 72 hours in advance of the prescribed burn as specified in the burn plan. This was particularly important since the burn was conducted at the start of the Fourth of July holiday weekend.

The burn boss failed to meet several requirements concerning the implementation of the prescribed burn. Prior to the actual ignition, the burn boss did not implement the burn plan in compliance with agency procedures, policies and regulations. He did not implement the prescribed fire according to the plan. Specifically, he failed to determine and evaluate fire line placement; he did not identify critical fuel characteristics that affect fire behavior; nor did he verify burn plan components, such as staffing and equipment resources, prescription parameters, contingency planning, and mitigation techniques for air quality.

Once on site, the burn boss failed to adequately brief subordinates on operational procedures, objectives, hazards and safety issues. He did not evaluate fire behavior and weather conditions before making the "go/no go" decision. He failed to obtain adequate holding resources to ensure the objectives were met. Finally, the burn boss did not adequately evaluate the results of the test fire, such as smoke impacts and current-versus-predicted fire behavior, and take actions to safely and effectively implement the burn plan.

FINDINGS

Planning

Analysis of Planning and NEPA Documentation

Planning and Prescribed Fire

BLM's Resource Management Plans (RMPs) provide general guidance and direction for land management activities in a field office. All management activities, including prescribed burning, must comply with the requirements of the RMP and the National Environmental Policy Act (NEPA). For site-specific management activities, including prescribed burning, BLM assures NEPA compliance by preparing an Environmental Assessment (EA) prior to implementation. Once an EA is approved, an operations plan, such as the Lowden Ranch Prescribed Fire Burn Plan, is prepared. The burn plan addresses 23 required elements needed to conduct the prescribed fire in a safe and effective manner.

Redding Field Office Resource Management Plan

In the case of the Lowden Ranch prescribed fire, it was allowed under the broad authority of the Redding Field Office RMP, published in June 1993. The Redding Field Office RMP includes guidance on air quality, vegetation management and fire management that was relevant to the Lowden Ranch prescribed fire.

The Redding Field Office RMP is "tiered" to a document that specifically addresses vegetation management on BLM land in California. That document is called the California Vegetation Management Environmental Impact Statement (EIS). Because it is linked to the EIS, the Redding RMP does not repeat the analysis of prescribed burning effects contained in the EIS. The RMP also defers site-specific analysis to individual projects.

Lowden Ranch Prescribed Fire Project Environmental Assessment

The Lowden Ranch Prescribed Fire EA was prepared by Doug Held, Redding Field Office fire management officer, in February 1999. It was completed as an interdisciplinary effort and was initialed by six staff members. The document was approved by the Redding Field Office manager and environmental coordinator.

The formal "Decision Record and Finding of No Significant Impacts" (FONSI) was approved by the field manager on May 3, 1999.

The EA identifies three reasons for the "Proposed Action": "A prescribed burn conducted in the spring would greatly enhance the health and vigor of the vegetation component, reduce decadent fuel loads and reduce the encroachment of noxious weeds, in particular, yellow starthistle ..." The EA also notes that the property is "currently in poor health ..."

Two alternatives other than prescribed fire were evaluated, herbicide treatment and "no action." The EA indicates that neither alternative would meet the threefold need for the Proposed Action.

Effects on vegetation, wildlife, soils, cultural and historical values, recreation, air quality, and foreseeable development were evaluated in the EA. The FONSI concluded, "... there would be no significant impact to threatened or endangered plants or animals, areas of critical environmental concern, cultural or historical resources, flood plains and wetlands, wilderness values, water resources, wild and scenic rivers, or Native American religious concerns."

FINDINGS

Findings:

The EA states that the property is currently in poor health. However, it contains no analysis regarding existing conditions on the site that led to a decision to conduct a prescribed burn. No discussion exists about the extent and severity of the noxious weed infestation, the health and vigor of the vegetation, and extent of decadent vegetation on the site.

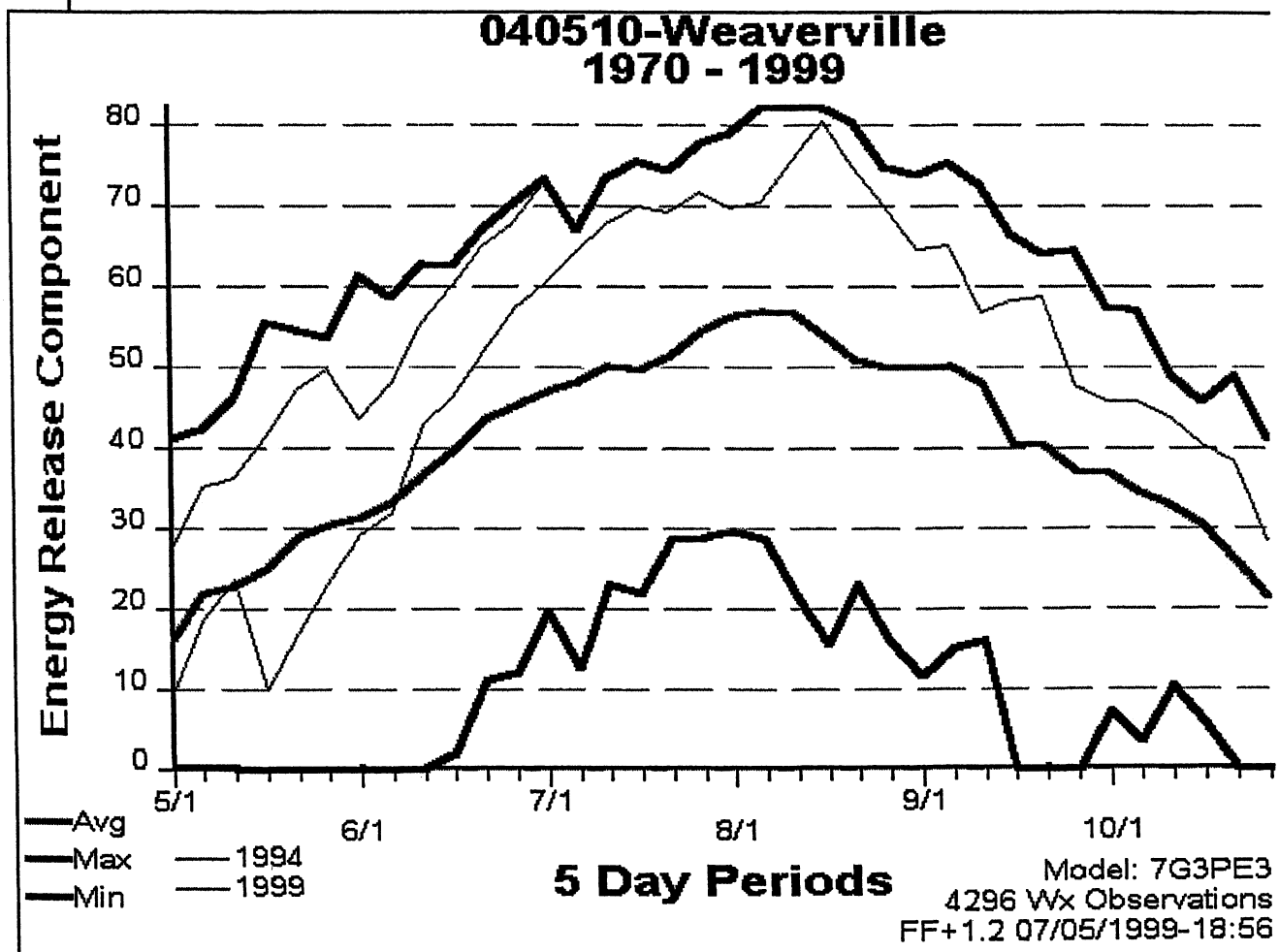
The EA states the burn would be undertaken in "late May or early June to coincide with seed development of yellow starthistle." The EA states that the burn is in conformance with the existing RMP. The EA does not address the need for multiple-year prescribed burning projects to reduce the thistle encroachment.

In addition, the EA contains no analysis of the potential social, economic or health impacts.

The agencies consulted about the prescribed fire were California Department of Forestry, California Department of Water Resources, California Department of Fish and Game, North Coast Unified Air Quality Management District, and local Native American tribes. The EA does not say whether a public review opportunity was provided.

Fire Behavior: Long Term Risk Assessment

Using data from a remote weather station near Weaverville, California, the review team sought to determine how the current fire season compared with others in the 29 years that such records have been kept. Indices used as part of the National Fire Danger Rating System were employed in the analysis. The result showed that most of the indices were near or exceeded historical maximums for early July. In simple terms, it was hot, dry and windy in northern California in early July. The Lowden Ranch prescribed burn was started under extreme fire danger conditions.



FINDINGS

Both short-term and long-term fire weather conditions resulted in an extremely volatile burn day on July 2, 1999, where spotting and fast-moving fires were likely.

As evidence of the dangerous fire conditions, on May 22, 1999, at least three prescribed burns in Northern California demonstrated fire behavior outside of expected ranges of intensity, resulting in escaped fires. The pattern of dry, windy conditions began in May and continued through June, with precipitation in the area below normal from March 1, 1999, to July 1, 1999.

Prescribed Burn Plan Review

The Lowden Ranch Prescribed Fire Burn Plan addressed all the elements required by the Prescribed Fire Management Handbook, H-9214-1. Critical elements of the burn plan that were inadequate include the risk assessment, complexity rating, contingency planning, and fire behavior calculations. Several other parts of the burn plan were incomplete.

Findings:

Burn Plan Preparation and Review. The review team could not determine who actually prepared the Lowden Ranch burn plan. The plan shows the burn boss trainee as the person responsible for preparing it. The burn boss trainee is not qualified to prepare the plan, nor did he sign it. In reviewing two previous burn plans for prescribed burn projects executed this year by the Redding Field Office, both were documented as completed by the burn boss trainee and technically reviewed by the burn boss. The burn boss trainee did not sign any of the three burn plans, although his name is printed or typed onto the "Prepared by:" signature line. It appears that the Lowden Ranch Prescribed Fire Burn Plan was mostly comprised of portions of previous burn plans. In all three cases, the burn plans did not receive an appropriate technical review. The approving officials failed to recognize a trainee prepared the plan and the plan did not have adequate technical review, although all the proper signatures are on the plan.

Plan Objectives. The prescribed fire objectives in the Lowden Ranch Prescribed Fire Plan are not consistent with the fuel or vegetative description of the site. In reviewing two previous burn plans completed and executed this year by the Redding Field Office, the prescription parameters were not consistent with the fuel or vegetative description from the NEPA documentation. The review team believes that portions of this burn plan were prepared using criteria from other prescribed burn plans, which resulted in conflicts with land management objectives, site descriptions and incorrect fire behavior outputs for given prescriptive criteria. For example, the description of on-site and adjacent fuels on the Lowden Ranch site underestimated the potential for spotting and escape, especially in pine/blackberry fuels.

Prescription. A fire prescription contains key weather, fuel and fire behavior parameters needed to achieve desired results. The Lowden Ranch prescription does not appear to match the land management objectives, the fire management objectives nor the high-end fire behavior calculations listed in the prescribed burn plan.

Air Quality. Prescribed fire projects must comply with county, state and federal air quality regulations. Although all the required permits were included in the plan, there were three conflicting statements concerning acceptable wind direction listed in the following areas: the smoke management projection map, and the acceptable prescribed range for wind direction under "Weather and Fuel Parameters" (Sec. VI) and prescribed Transport Wind Direction (Sec VII-B).

Contingency Plan. A contingency plan was prepared as required, but provisions for mitigation of threats to public safety were not included.

Organization. Prescribed fire plans must identify the type of support and holding forces needed to carry out the project. The organization listed in the plan was adequate for the prescription and project, however, it did not list fire monitors or traffic controllers.

Notification. Although the Lowden Ranch prescribed fire plan includes the pre-burn and burn contacts, adjacent landowners were not listed to be contacted prior to ignition.

Safety Briefing. A safety briefing is required prior to ignition. The prescribed fire crew-briefing checklist was included in the plan; however, it was incomplete.

Cost. Cost was not addressed in the Lowden Ranch burn plan.

Implementation of Prescribed Burn Plan

Short-Term Fire Behavior

Fire and weather can be a volatile mix. Many factors need to be considered in analyzing short-term fire behavior. Review team members identified a number of factors that help account for the rapid growth of the Lowden Ranch prescribed fire.

Findings:

The project was not within the parameters outlined in the Lowden Ranch Prescribed Fire Plan. Wind speed and one-hour fuel moistures exceeded the prescription before the test fire was ignited, and remained out of prescription until after the fire escaped.

The description of fuels in the Lowden Ranch Prescribed Burn Plan (Section I.B.3, Management Summary and Risk Assessment) was inaccurate and failed to recognize a more complex fuel condition immediately outside the burn unit. In the plan, fuels adjacent to the burn unit were described as grass, when they more accurately should have been classified as timber (according to the Fire Behavior Prediction System, timber fuel model 9) on the east side of the project area. Also, the fuel model for the burn area was not correctly identified.

The burn plan did not identify any potential holding problems. The plan failed to account for the steep slopes

east of the project boundary and that spot fires occurring on those slopes in hot, dry conditions would result in rapid upslope runs.

Another shortcoming in the burn plan relating to short-term fire behavior is smoke management. The projection of smoke in the plan was inaccurate. The actual direction of smoke travel during the project was what would be expected during normal daytime, upslope, up-valley wind conditions.

Although a spot weather forecast was requested and issued on the afternoon of July 1, 1999, no follow up information was requested on the morning of the burn. The spot forecast accurately predicted the weather that occurred on July 2, 1999.

Lack of weather monitoring prior to implementation of the burn resulted in missing key indicators of extreme fire behavior conditions. Three days preceeding ignition, relative humidity recovery was poor, further drying out fuels. Two fire behavior monitors assigned to the project were not briefed on maximum wind speed limits and other critical parameters.

Compliance

When the Lowden Ranch prescribed burn was ignited the morning of July 2, 1999, several aspects of the prescribed burn implementation failed to meet requirements outlined in policy and guidance.

Findings:

Go/No Go Decision Matrix. Prescriptive specifications were not met in the go/no go decision matrix (completed by the burn boss prior to ignition on the day of the burn). For example, actual on-site wind speeds were 6-7 miles per hour (mph) from field observations at 10:30 a.m. (prior to ignition), while the burn plan prescription called for 2-5 mph winds. Additionally, on-site one-hour fuel moistures at 10:30 a.m. were lower than prescribed in the plan.

FINDINGS

The burn boss did not recognize that the spot weather forecast would put the project out of prescription in the afternoon. The unfavorable afternoon spot weather forecast for July 2, 1999, predicted wind gusts of 11-14 mph.

All of the required equipment was not on scene. Four type III engines were required by the burn plan, but only one was on site.

The project briefing was conducted, but was inadequate. It was rushed and incomplete. Additionally, Engine 32 was not present and its crew was not briefed upon arrival at the site, 20 minutes after ignition.

A JHA was included in the burn plan but not reviewed by anyone except the burn boss.

Contingency resources were not specifically assigned to the project. An inadequate number of contingency resources was assigned based on the weather, fire behavior (e.g. rate of spread), and spotting that could occur. There was also some uncertainty as to the availability of these resources.

Lowden Ranch Prescribed Burn Plan Technical Review. Burn site preparation requirements were not met. The prescribed fire was not conducted during the planned implementation period of late May or June. Line construction width specifications of 3-5 feet were not met in portions of the prescribed burn project as stipulated in the burn plan.

California state burning permit requirements were not met as the burning permit was invalid after July 1, 1999. Not all the resources listed in the burn plan were on site as required by the permit.

Scheduling and notification requirements were not met. Pre-burn news media (local radio and newspaper) contacts were made on June 3, 1999. The burn plan stipulated a pre-notification schedule of 72 hours prior to ignition. Private land owner notification adjacent to the prescribed burn site was incomplete.

FINDINGS

The prescribed fire crew briefing checklist identified in the burn plan was incomplete. Critical information on the checklist was absent and should have been communicated during the briefing.

The burn boss did not perform adequately as a trainer with the burn boss trainee. The burn boss failed to participate completely in the incident action plan briefing prior to ignition. The burn boss and trainee were in different locations during burning operations and failed to jointly coordinate the implementation of the burn.

The holding specialist and hot shot superintendent expressed their concerns about implementing the burn under current and expected fire behavior conditions to the burn boss prior to ignition. During interviews the ignition specialist, fire monitors, and most burn personnel expressed concerns about implementing the burn, such as the upcoming holiday weekend and the associated impacts the fire could have, time of day (afternoon), and high wind speeds. They should have expressed their concerns to the burn boss prior to ignition.

Deteriorating fire weather conditions were not recognized as an issue nor were they appropriately acted upon. Ignition proceeded after continued spotting.

The necessary site preparation work to meet the ignition time table and escape contingencies, as identified in the burn plan, was not completed. For example, hose lays, hand-line construction and improvement all should have been completed prior to ignition. A closed, locked gate denied engine access for spot fire control.

The contingency plan did not take into consideration the up-wind, up-slope fuel beds outside and adjacent to the planned area.

FINDINGS

Safety

Firefighter and public safety is the first priority, as stated in the Federal Wildland Fire Policy, including personnel working on prescribed fires. This commitment must be reflected in all fire management plans and implementation.

Prior to Ignition

Some individuals thought the burn should not be started that day, but did not voice their concerns. At one point, the holding specialist and the Hot Shot superintendent questioned the burn boss about whether or not to ignite the project.

Personnel Briefing

A relatively short briefing was conducted covering escape routes, safety zones, PPE requirements, communication frequencies, and resource assignments.

Findings:

> The prescribed fire crew briefing checklist was not complete. A completed copy should have been shared with all burn personnel at the briefing. The JHA was completed and attached to the prescribed fire plan, but it was not thoroughly reviewed with burn personnel prior to ignition.

Training

All federal personnel at the prescribed burn were trained and qualified for their assignments. Rural/volunteer fire department personnel must meet National Wildfire Coordination Group (NWCG) for prescribed fire operations.

Findings:

> The local fire department personnel at the site did not meet NWCG standards.

Public Safety

Safety measures, including traffic control and a pilot car, were used during the burn project.

Findings:

> Public safety was not adequately addressed in the planning or implementation phases of the burn. Land owners near the project were not properly notified. Public evacuation plans and safety routes were not established. Residences were included within the boundaries of the contingency plan area without identifying adequate protection measures. Public viewing areas were not identified.

Personal Protective Equipment (PPE)

All burn personnel had the PPE required by their agency. The federal firefighters had the PPE necessary for wildland fire suppression.

SUMMARY

The review team was charged with five tasks, as listed on page eight of this report. Addressing those tasks is the best way to summarize the work of the team.

Determine if BLM's national prescribed fire policy and guidance is sound.
The team strongly believes that the overall national prescribed fire policy and guidance is sound. Prescribed fire should remain available as a tool for resource management.

Determine if BLM's prescribed fire standards and procedures are adequate.
National technical representatives from each wildland fire agency reviewed the prescribed fire standards and procedures. The technical representatives found the procedures and standards are adequate.

Determine if the burn plan was satisfactory.
All of the required elements of a burn plan were included. However, several elements were either incomplete or inadequate.

Determine if the prescribed fire was conducted in accordance with the plan.
The team found that the Lowden Ranch prescribed fire was not conducted in accordance with the plan. This was a critical factor in the fire's escape.

Assess accountability.
The team concluded that the agency administrator and northern California fire management officer generally met the requirements of their positions and adequately followed procedures. However, both failed to provide adequate oversight and ensure proper technical review of the burn plan. The prescribed burn boss, though qualified for his position, failed to meet key requirements regarding the burn, both before ignition and during implementation.

Team members unanimously believe that prescribed fire is still a useful tool and should remain available to managers. However, when policies, standards and procedures are not met or are ignored, a disaster is in the making.

SUMMARY

What Comes Next

Completion of the review team's report is an important step in the overall investigation, but is not the end of the process. At least three more steps remain.

First, within BLM, corrective and preventive actions continue as a result of the Lowden Ranch Fire. For example, BLM in California has suspended prescribed burning operations until re-certification is completed of individual field offices' prescribed fire program. BLM's national office has requested that each BLM state review its prescribed fire program for compliance with standards.

Next, a formal board of inquiry will convene in late summer to review the findings of the review team and address the issue of personal accountability.

Finally, recommendations will be formulated by the review team and transmitted to BLM's acting national director. He will consider effecting the recommendations on a national basis for the agency.

Lowden Ranch Prescribed Fire Review

Appendix