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Testimony

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FIRE MANAGEMENT

Lessons Learned From the Cerro Grande (Los Alamos) Fire and Actions Needed to Reduce Fire Risks

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Madam Chairman and Members of the Committee:

We are here today to discuss two related issues, lessons learned from the recent Cerro Grande fire, and, on a broader note, actions needed to mitigate current hazardous forest conditions in the interior West.

Only a few months ago, the Los Alamos fire, now officially known as the Cerro Grande fire, caused hundreds of families in Los Alamos, New Mexico, to lose their homes and more than 18,000 residents of the state to be evacuated. Over 1,000 fire fighters were required to bring the fire under control. Estimates have placed total damages at about $1 billion. This tragedy was the result of a prescribed fire ignited by officials of the National Park Service. Ironically, the fire was ignited in an effort to reduce some of the vegetative buildup in a forested area of Bandelier National Monument and thus help prevent the very kind of event that occurred. The plan was to burn up to 900 acres; in the end about 48,000 acres were burned.

The policy supporting the use of prescribed or controlled burns as a forest management tool has been in place for some time. According to analyses by federal land management agencies, the use of prescribed burns has been and will continue to be a critical component of forest management if the nation wants to reduce the risk of catastrophic wildfires, particularly in the interior West. The need to reduce these risks has never been more obvious as it as at this time. While the Cerro Grande fire demonstrated this, as events have unfolded, it was only the beginning of what has turned out to be one of the worst wildfire seasons in history with over 4 million acres already burned and dozens of fires still burning in many western states. In reviewing the events surrounding the Cerro Grande fire, we examined how well the policy was implemented and what, if any, lessons can be learned to prevent future tragedies like it.

To address your concerns, you asked us to look back at the events leading up to the prescribed fire and examine how it was managed. You also asked us to identify what fire management policies or practices need to be improved. Since we began our work over 2

months ago, we have reviewed the relevant documentation on the conduct and management of the fire, including the e-mail traffic and field notes of key staff involved in planning and implementing the prescribed burn. In addition, we reviewed the investigative report done for the Secretary of the Interior[1] and the associated Board of Review report[2] and interviewed the officials responsible in various capacities for managing and fighting the fire. We also visited the fire site at Bandelier National Monument to get a first-hand look at what happened and to review the events with local park officials and others.

Madam Chairman, before proceeding with the specifics of what we found on the Cerro Grande fire, I think it is important to set the proper tone and provide some context for the points we will be making. Each year, federal land management agencies carry out hundreds of prescribed burns. The vast majority of these are done without incident. However, when a prescribed fire does get out of control, like the one we are talking about today, it is imperative that the events surrounding the incident be closely reviewed to determine what can be learned to help prevent such occurrences in the future. This kind of analysis has the benefit of hindsight. We did not have the burden of making urgent, on-the-spot decisions in the midst of trying to manage an ongoing fire. With the benefit of this hindsight, we have analyzed the management of the Cerro Grande fire. Accordingly, we are not here to assign blame but to help improve the way federal land management agencies manage future prescribed burns.

In summary, we found the following:

- The Cerro Grande fire exposed policy implementation issues that need to be addressed for managing prescribed fires. Most of the issues involved procedural gaps or a lack of clarity about how policies are to be implemented. These issues affected both the planning and implementation of the burn.

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[1] *Los Alamos Prescribed Fire: Investigative Report*, May 18, 2000

[2] *Los Alamos Prescribed Fire, Independent Review Board Report*, May 26, 2000.

- Some of the issues are specific to Bandelier National Monument and the National Park Service. However, others involve other federal agencies. Those problems that are not site-or agency-specific raise questions about the current readiness of the federal land management agencies to effectively support and administer prescribed burns as a forest management tool.

We have made a number of recommendations aimed at addressing these issues. Both the Department of the Interior and the Department of Agriculture agree with our recommendations.

In addition to addressing the issues surrounding the Cerro Grande wildfire, you asked us to discuss the actions needed to address the current hazardous forest conditions in the western part of the nation. In summary, our past work shows the following:

- The increasing danger of catastrophic wildfires has been caused, in large part, by excessive accumulations of vegetation in the nation's forests, particularly in the western states.

- While efforts to address this problem are now beginning, the Congress needs to ensure that the responsible federal agencies use the available funding on those areas facing the most serious wildfire risks. Currently, it is not clear that this will be done.

Lessons Learned From the Cerro Grande Fire

Before proceeding with a discussion of our specific findings, I would like to show some slides we have prepared on the Cerro Grande fire. The slides map the progress of the fire, help describe how it was managed, and provide a common background and understanding of the flow of events that led to the fire getting out of control. The slides take you from the start of the fire on the evening of May 4, 2000, to its substantial containment on May 19, 2000. (See app. I.)

Clearly, many important lessons are to be learned from the experience at Cerro Grande. We will be highlighting the major ones here today. These lessons, if they are applied in planning and implementing future burns, should result in more effective use of prescribed fires as a tool to accomplish resource and forest health objectives throughout the public lands enterprise.

Planning for the Prescribed Fire

The National Park Service, like other federal land management agencies, requires a specific plan for each prescribed fire. Essentially, the prescribed burn plan documents the objectives of the burn and specifies how it is to be carried out. In addition, the burn plan is to provide for cooperation and coordination with other agencies and, where appropriate, public involvement, and the notification of affected agencies and the public on the day of the burn.

Policy guidance and manuals on how to prepare these plans were jointly developed by the federal land management agencies, and each agency provided supplemental instructions to its staff. Once a plan is prepared, it is to be reviewed and approved by the top operating official at a park—usually a superintendent—before it is made final. However, the National Park Service's guidance does not require or encourage park managers to include other knowledgeable or potentially affected parties outside of the park in the review process.

As a result of the Cerro Grande fire, we identified three important lessons to be learned about the planning process that could improve the management of future prescribed burns. First, prescribed burn plans need to be "peer-reviewed" by independent, knowledgeable individuals. Second, clarification is needed on how to get additional fire-fighting resources--called "contingency resources"--for a fire once it has begun and when to make these additional resources available for prescribed fires. Finally, federal

agencies and nearby jurisdictions need more effective coordination and cooperation before a prescribed burn is started.

Burn Plans Need to Be Peer-Reviewed

The prescribed burn plan for the Cerro Grande fire was developed and written by staff at Bandelier National Monument and, in accordance with Park Service and federal wildfire management policy, approved by the park superintendent. However, while the process used in preparing the plan was consistent with the existing policy guidance, the circumstances surrounding this fire indicate that the current policy should be revised. The revised policy should require that, in risky situations, prescribed burn plans be peer-reviewed by technically competent reviewers outside of the agency. This kind of independent review would provide for an objective analysis of the burn plan and would provide an additional check and balance on what is an inherently dangerous activity.

In the case of the Cerro Grande fire, the superintendent responsible for approving the plan acknowledged that he was not technically competent to analyze the plan's contents. Furthermore, as our analysis and others that have been done since the fire have shown, several aspects of the burn plan could have been improved.

Our analysis shows that when all the surrounding weather, seasonal, and historical data and experience are considered, the timing of the burn can be questioned. Specifically, the fire was set on May 4, the time of year when the wildfire season in the southwestern United States is just beginning. Furthermore, this time of year typically brings high winds, the area was in the midst of a 3-year drought, and it was known that there were high levels of forest fuel buildup in the immediate area. Compounding the risk of starting a prescribed fire in this particular location was the fact that the town of Los Alamos, the Los Alamos National Laboratory, and other populated areas were only a few miles from the burn area. Also, during the 2-week period before the fire was started at Bandelier, four prescribed fires got out of control in that region. While Bandelier officials acknowledge these points, they said that two additional factors need to be

considered to understand the basis of their decision to proceed with the burn. First, their information indicated that the weather and moisture conditions in the area of the burn--at an elevation of 8,000 to 9,000 feet--were more favorable than the publicly available information suggested. And second, the official fire status of the entire southwestern region placed no restrictions on prescribed burning at the time the Cerro Grande fire was started.

In addition to our analysis, the special investigative team and its associated board of review working for the Secretary of the Interior found numerous problems with the fire plan, including the fact that the overall complexity of the burn and the resources needed to keep it under control were underestimated. This occurred in large part because the agencywide instructions developed by the Park Service and used by the Bandelier staff in determining the complexity of the burn were incorrect. As a result, insufficient fire-fighting resources were available on site. The effect of having insufficient resources snowballed until the fire was out of control. Similarly, a post-fire analysis by staff from the Santa Fe National Forest--adjacent to Bandelier--found that the plan for managing the burn was inadequate because it did not provide for enough fire-fighting resources--particularly considering the timing of the burn. In our view, an independent, technically qualified peer review by individuals outside the responsible agency could identify and resolve areas of disagreement before a fire is started. This process would provide an additional check and balance and would help ensure shortcomings are identified and addressed before prescribed burns are initiated.

Policies About the Availability and Use of Contingency Resources Need to Be Clear

Another important lesson involves the availability and use of contingency resources in helping to manage prescribed fires. In this regard, one of the critical elements in determining whether to proceed with a prescribed fire is the availability of sufficient resources to assist in controlling it if and when they are needed. The Park Service's policy, as well as federal interagency fire management policies, indicates that if sufficient

contingency resources are not available at the start of a prescribed fire, it should not proceed.

The Cerro Grande fire demonstrated that there is a great deal of confusion among the federal land management agencies about the availability and use of contingency resources. This confusion led to differing expectations among the Park Service personnel responsible for managing the burn, the Forest Service staff responsible for dispatching contingency resources to Bandelier, and the regional resource coordinating officials in Albuquerque. The Park Service staff believed that once they had confirmed the availability of the contingency resources identified in the prescribed burn plan, the resources would be available if and when they requested them. However, the Forest Service dispatching officer and officials at the regional coordinating center did not agree with the Park Service's view. Instead, they told us their interpretation of the policy was that contingency resources are only to be made available when a prescribed fire becomes a wildfire. As a result of this confusion, valuable time was lost in getting additional resources to the site. It was not until 7 to 9 hours after a Park Service official first requested contingency resources that they began to arrive at the burn site. Even then, the resources arrived only after the Forest Service dispatcher circumvented the regional policy by diverting the resources from another wildfire to Bandelier.

The length of time required to get the contingency resources to the burn site highlights a significant problem. The confusion that existed about the availability and use of contingency resources during the Cerro Grande fire is reflective of all the land management agencies currently operating under the federal interagency policy for managing wildfires. The agencies' relevant policies and procedures contain no standard definition of what contingency resources are, how they are to be identified, or when and how they are to be used. The agencies need to work together to make sure that these policies and procedures are clarified and their implementation standardized. Then, when contingency resources are identified in a prescribed burn plan, they can be provided when needed, regardless of whether the burn is a wildfire or a prescribed burn. If they cannot be provided, the burn should not proceed. If this confusion had been worked out

prior to the Cerro Grande fire, it is possible that the fire would have never gotten out of control.

More Effective Cooperation and Coordination Among Agencies Is Needed

The third and final planning point we want to highlight as an important lesson is the need for more effective coordination and cooperation among the nearby agencies, communities, and other parties that might be affected by a prescribed burn. As I have already mentioned, introducing fire into forests under any conditions, including a prescribed burn is inherently risky. This risk is compounded in a situation like that at Bandelier, with a large fuel buildup in the park, as well as on the adjacent Santa Fe National Forest, and the Los Alamos National Laboratory, and thousands of people living in Los Alamos and other communities just a few miles from the burn site.

Under such circumstances, it is critical that a prescribed burn be closely coordinated with officials from the jurisdictions that could potentially be affected by it. While the park officials at Bandelier notified representatives from potentially affected jurisdictions about their plan to conduct the prescribed burn, these notification efforts were apparently not enough in light of the concerns that have been raised since the fire occurred. Specifically, since the fire, representatives from a number of affected agencies and communities, including Los Alamos National Laboratory and the Santa Fe National Forest, have questioned the Park Service's decision to conduct the burn. Essentially, their concerns were based on the dry conditions that existed in that part of the country at the time of the burn and the heavy buildup of fuel in the area. In fact, Forest Service officials at the national forest bordering the park decided to stop all burning in the forest on the same day--May 4th--that the prescribed burn was started in Bandelier. However, the concerns expressed by these officials, including the Forest Service's decision to cease prescribed burns, were not communicated to Bandelier officials before they started the prescribed burn.

Furthermore, officials from the park, Los Alamos National Laboratory, and the Forest Service knew that the most likely wildfire threat to the town of Los Alamos and the Laboratory was from the area of the prescribed burn. Yet the agencies did not work together to mitigate this threat before starting the fire. Instead, the Park Service attempted to reduce forest fuels within its boundaries and did not work with other agencies to identify, for example, possible fire breaks that could have been put in place before the fire started. Several experts we interviewed informed us that more could and should have been done to mitigate the threat to local communities and the Laboratory if there had been better cooperation and planning across jurisdictional boundaries.

Having these circumstances come to light only after the fact is unfortunate and underscores the need for more substantive coordination and cooperation before prescribed burns are started. Improved coordination and cooperation need to occur in a way that puts public safety first, overcomes agency or other jurisdictional boundaries, and achieves buy-in by the affected parties. All of this needs to be done before a burn proceeds.

Implementation of the Prescribed Fire

In addition to lessons learned in planning for the fire, we identified a number of important lessons to be learned from the implementation of the prescribed burn. First, before an agency ignites a fire it should be assured that all the necessary preparatory steps have been completed. Second, public safety should take precedence over resource protection considerations in deciding on which fire-fighting tactics should be used. And third, guidance is needed for determining the amount of resources that should be used in managing prescribed burns.

Better Assurance Is Needed That All Key Factors Are Considered Before Initiating a Prescribed Burn

Before proceeding with a prescribed burn, current interagency and Park Service policies and procedures call for the fire manager to determine whether all of the necessary preparatory steps have been completed. This determination is commonly referred to as

the “go/no-go” decision. If the on-site fire manager determines that any important factor is not consistent with the plan, the burn is not to proceed.

Existing policy and procedural guidance available to Park Service managers and the land managers in other federal agencies provide some guidance on this decision-making process. This guidance includes the suggested use of a go/no-go checklist to help ensure that all of the key factors are addressed before starting the burn. However, current policy and procedures do not require the use of this checklist. In addition, agencies are not required to document that all of the relevant factors have been properly considered.

The fire managers at Bandelier did not use the suggested go/no-go checklist to document their decision because they were not required to do so. They told us, however, that they reviewed all of the factors on the checklist prior to igniting the burn but did not document their decision to proceed. Without such documentation, there is no record of which factors were considered in the go/no-go analysis, whether each factor was actually reviewed, and whether all of the conditions that existed on site were consistent with the burn plan and applicable policy.

In our opinion, the events at Cerro Grande demonstrate a need to change current policy so that a documented and reviewed record of go/no-go decisions is required for every prescribed burn. Requiring the use of a checklist can serve this purpose as well as provide structure and discipline to the decision-making process.

Policy Needs to Make Clear That Public Safety Has Priority Over Natural Resource Protection

Perhaps the most important lesson learned from this fire involves the choices that were made about the tactics used to suppress the fire once it was declared a wildfire and was still within the boundaries of Bandelier National Monument. According to current interagency fire management policy, once a prescribed fire gets out of control and becomes a wildfire, the fire-fighting strategy can change. Under this policy, the revised

strategy can range anywhere from continuing to manage the fire to achieve forest thinning or other natural resource benefits to complete suppression. The change in strategy may trigger changes in the fire-fighting tactics that are employed. At Cerro Grande, some of the tactics that were employed have been questioned.

In particular, after the fire was declared a wildfire on the afternoon of May 5, the Bandelier officials used a fire suppression tactic that required the introduction of more fire into the western section of the burn area. According to Park Service policy, agency officials must decide on the tactics that minimize costs and resource damage. According to the on-site Park Service officials, the introduction of this additional fire was done in order to establish wider, more effective fire breaks called blacklines in the western section of the burn area. The alternative was to create these fire breaks by using mechanical means such as chainsaws and bulldozers. However, this alternative was not chosen because it would have been inconsistent with Park Service policy calling for resource damage to be minimized.

During the fire, none of the on-site fire-fighting officials expressed concerns about introducing fire along the western side of the burn area. However, after the fire, the on-site Park Service official who was in charge recognized that this was a tactical error and said that if he had better information on the wind for May 7, the day the fire began to move towards Los Alamos, he would not have introduced fire into the western portion of the burn area. According to some on-site firefighters, the suppression tactics used by the Park Service fire managers appeared to be more directed at accomplishing the original objectives of the prescribed burn than in suppressing the fire. On-site Park Service officials did not agree with this assessment. They told us that once the burn was declared a wildfire, fire suppression and fire fighter safety were their overriding objectives in deciding which tactics to use.

As events unfolded, the introduction of fire in the western portion of the burn area led directly to the fire's getting out of control on May 7. With fire in the western portion of the burn area on May 7, and estimated wind gusts from people on site of 20 to 50 miles

per hour, the fire intensified and began moving towards the Los Alamos and White Rock communities. In light of the conflicting views and assessments, this experience provides a valuable lesson. The existing Park Service policy requiring fire mangers to protect resources while trying to suppress a wildfire should be revised in instances like Cerro Grande. In these cases, where the threat of a prescribed fire's getting out of control poses direct and serious public safety risks, there should be no question that fire suppression should be the top priority.

Guidance Is Needed for Determining the Resources Necessary for Managing Prescribed Burns

The last major lesson that we would like to highlight involves the amount and experience of fire-fighting resources needed to implement prescribed burns. The lack of experience and inadequate fire-fighting resources were common themes that began during the planning stage of the burn and carried through to the implementation stage.

The Secretary of the Interior's investigative report raised questions about whether a more experienced team with more fire-fighting resources should have been used in light of the fire conditions and the proximity to nearby communities. This situation became more critical on May 5, the second day of the fire, when Park Service staff determined that additional resources were needed in order to keep the fire under control. As we mentioned earlier, when these additional resources were requested, it took 7 to 9 hours to get them to the site. Without this delay, the fire might never have gone out of control. Furthermore, on May 7, the day the fire began to spread toward Los Alamos and White Rock, most of the fire-fighting resources on site were being deployed on the eastern portion of the burn area because of containment concerns there. At the same time, fire had already been introduced into the western portion of the burn area without sufficient resources to monitor and control the fire in that area. As I have already pointed out, this situation resulted in the fire's burning out of control.

Currently, there is very little guidance available on the amount or experience of, fire-fighting resources needed to manage prescribed burns. While the current policy and procedures provide guidance on how to determine resource needs for managing wildfires, they provide no guidance for determining resource needs for managing prescribed fires. We discussed this issue with officials in both the Park Service and the Forest Service. They told us that making these kind of resource determinations for prescribed fires is "more art than science" and that the quality of these determinations is based more on experienced judgment than anything else. However, the experience at Cerro Grande suggests that just relying on the experience and judgment of individuals is not enough. While a cookbook approach to determining staffing needs for prescribed fires may not be prudent, a more structured, systematic approach can and should be adopted to assist fire managers in making resource decisions.

To address the lessons of Cerro Grande, we have recommended that the current interagency policy for federal wildfire management and its implementing procedures, as well as those of the respective agencies that are signatories to it, be revised to

- require that, in risky situations like Cerro Grande, prescribed burn plans be peer-reviewed by qualified individuals outside the agency responsible for managing the burn;

- better define what is meant by the term "contingency resources," including clarifying the circumstances under which these resources can be used, the process for getting them, and the appropriate response time;

- require that federal agencies better coordinate and cooperate in developing prescribed burn plans so that public and fire fighter safety is the top priority, without regard to agencies' administrative or jurisdictional boundaries;

- require that a decision to proceed with the ignition of a prescribed burn is fully justified by requiring the responsible officials to complete the analysis called

for in the go/no-go checklist and requiring that the supporting analysis be documented and reviewed;

- make clear that, once a prescribed fire becomes a wildfire, the goal should be to suppress the fire as quickly as possible without compromising fire fighter or public safety, even if suppression requires the use of mechanical means; and

- provide guidance to assist in making decisions about the amount and experience of personnel needed to properly manage and control prescribed fires.

Both the Departments of the Interior and of Agriculture generally agreed with the facts, conclusions and recommendations of this statement.

Actions Needed to Mitigate Current Hazardous Forest Conditions

Our review of the circumstances surrounding the Cerro Grande fire underscore other recent findings about the difficulties faced by the Park Service, Forest Service, and other federal land management agencies in coping with the increasingly grave risk of uncontrollable, catastrophic wildfires threatening communities and natural resources in the dry interior regions of the western United States. In particular, as we noted last year, past forest management practices, including the decades-old policy of putting out wildfires, has disrupted the historical occurrence of frequent, low-intensity fires. The

routine occurrence of these low-intensity fires have periodically removed flammable undergrowth without significantly damaging larger trees.[3] Because this normal cycle of fire has been disrupted, vegetation has accumulated in many forested lands, creating high fire fuel levels for catastrophic wildfires. These conditions have, in turn, transformed much of the western part of the nation into a virtual tinderbox.

Without actions to reduce these accumulated fuels, the current trend of more frequent and more intense wildfires can be expected to continue and perhaps get even worse. These fires not only compromise forests' abilities to provide timber, outdoor recreation, clean water and other resources, but also pose increasingly grave risks to human health, safety, property, and infrastructure, especially along the boundaries of forests where population has grown significantly in recent years – the so-called "wildland/urban interface."

As our past work has shown, effectively addressing the problem will require changes in land management priorities at all levels. Accordingly, on the basis of evidence that 39 million acres of national forest lands are at high risk of such catastrophic wildfire, we recommended that the Forest Service develop a coherent strategy to address this problem. Earlier this year, the Service produced a strategy that (1) established forest fuel reduction priorities for areas where communities, species, watersheds, and ecosystems are at risk of such fires, and (2) proposed undertaking vastly increased fuel reduction efforts in these areas using both mechanical methods (including some timber harvests) and controlled burning where feasible to reduce fuels. According to the Forest Service, evidence from fires in Colorado this year supports our prior finding that, when major fires reach large areas where fuels have been reduced a fire's intensity and rate of spread slow sufficiently so that they can be put out. Thus, we believe the Forest Service strategy is a good start and that a similar strategy for Department of the Interior lands, may help to establish a coherent approach across nearly all federal lands. Interior officials have told us that such a plan is under development.

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[3] *Western National Forests: A Cohesive Strategy Is Needed to Address Catastrophic Wildfire Threats (GAO/RCED-99-65, Apr. 2, 1999)*

Currently, the Congress is considering an additional $240 million in funding for fuel reduction activities on Forest Service and Department of the Interior lands for fiscal year 2001. This is consistent with the finding in our report last year that reducing fuels will be costly and require substantial increases in current funding levels. On the other hand, such an approach could pay for itself in reduced fire fighting costs as well as property loss and reduced resource impacts. However, we are concerned that there be adequate accountability to ensure that these funds are spent on the highest priority areas. For instance, although the Forest Service's new strategy identifies, as we recommended, priority categories of lands for fuel reductions, the agency has no firm schedule for identifying the specific areas that fit in these categories. Thus, it is important for the Congress to ensure that the agencies (1) identify which lands meet these priority criteria and (2) that the additional funding will be spent only on these lands. Additionally, as both the Los Alamos and other recent fires demonstrate, much of the risk to communities --as well as to federal forests--can be reduced by fuel reduction efforts on adjacent lands.

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This concludes my statement. I would be happy to answer questions that you or other Members of the Committee may have.

Contact and Acknowledgements

For further information on this testimony, please contact Barry T. Hill at (202) 512-3841. Individuals making key contributions to this testimony included Lew Adams, Amy Sue Bunting, Linda Chu, Alan Dominicci, Cliff Fowler, Chester Joy, Frank Kovalak, Bob Lilly, and Paul Staley.

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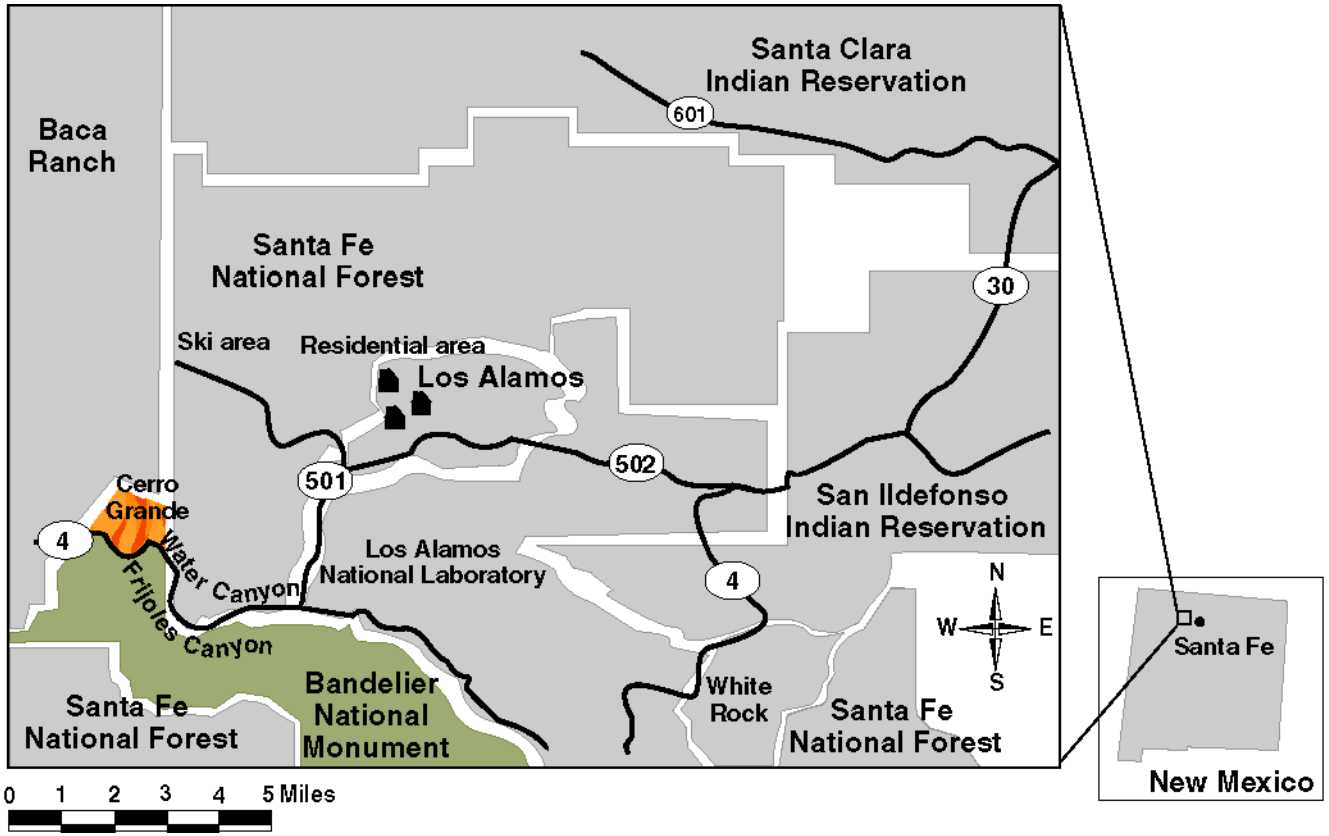
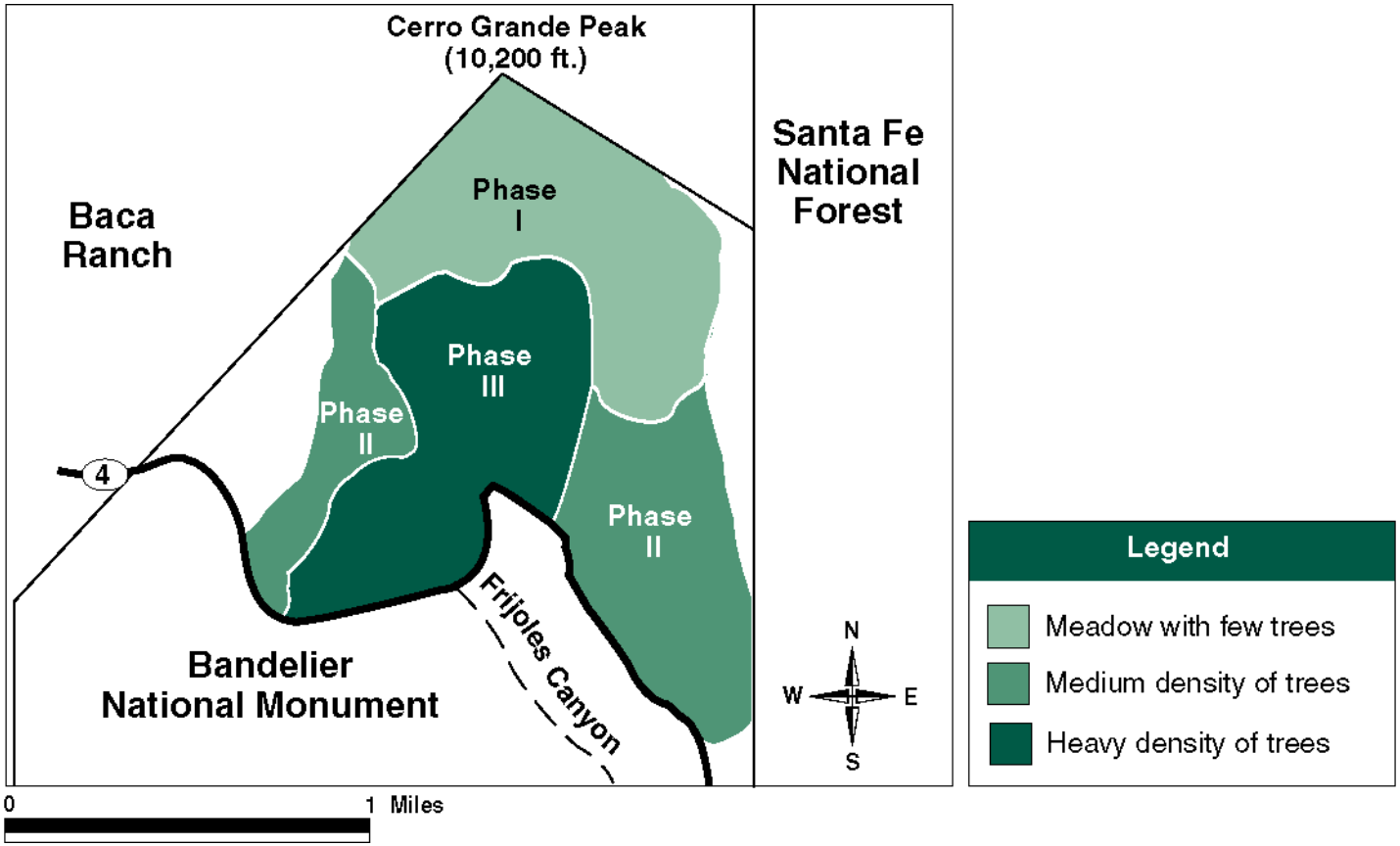
Cerro Grande (Los Alamos) Fire

A Chronology of Events

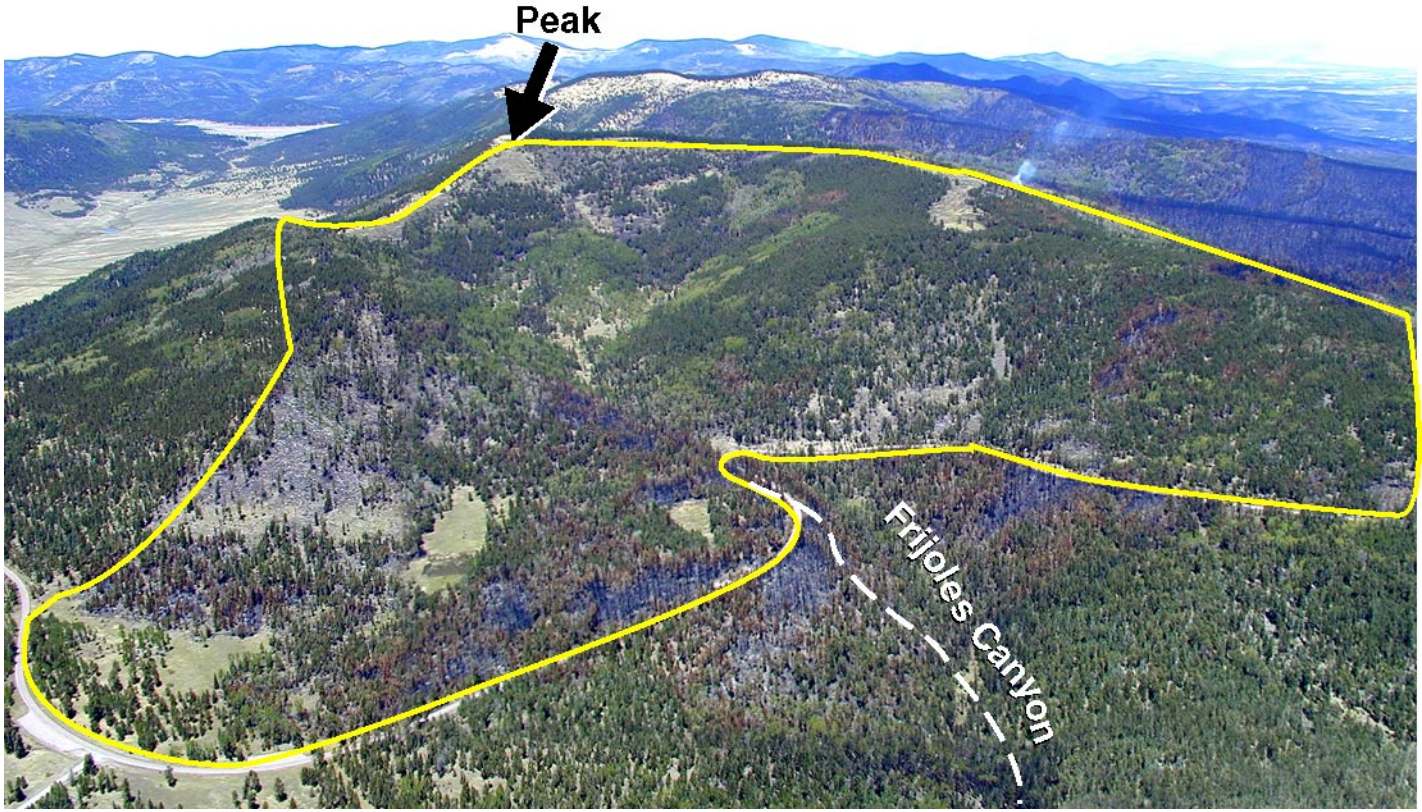
General Area Map



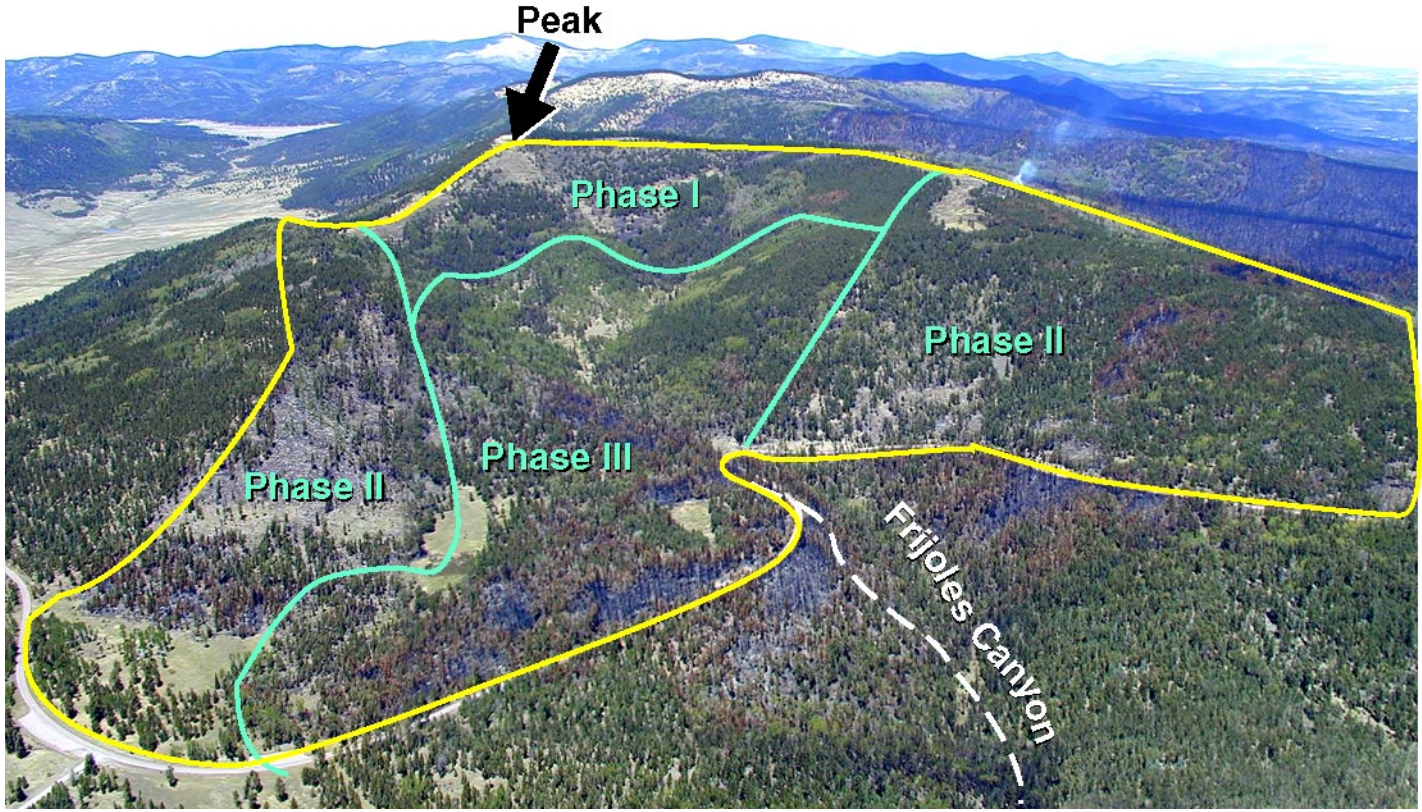
Prescribed Burn Area



Aerial View of Prescribed Cerro Grande Burn Area

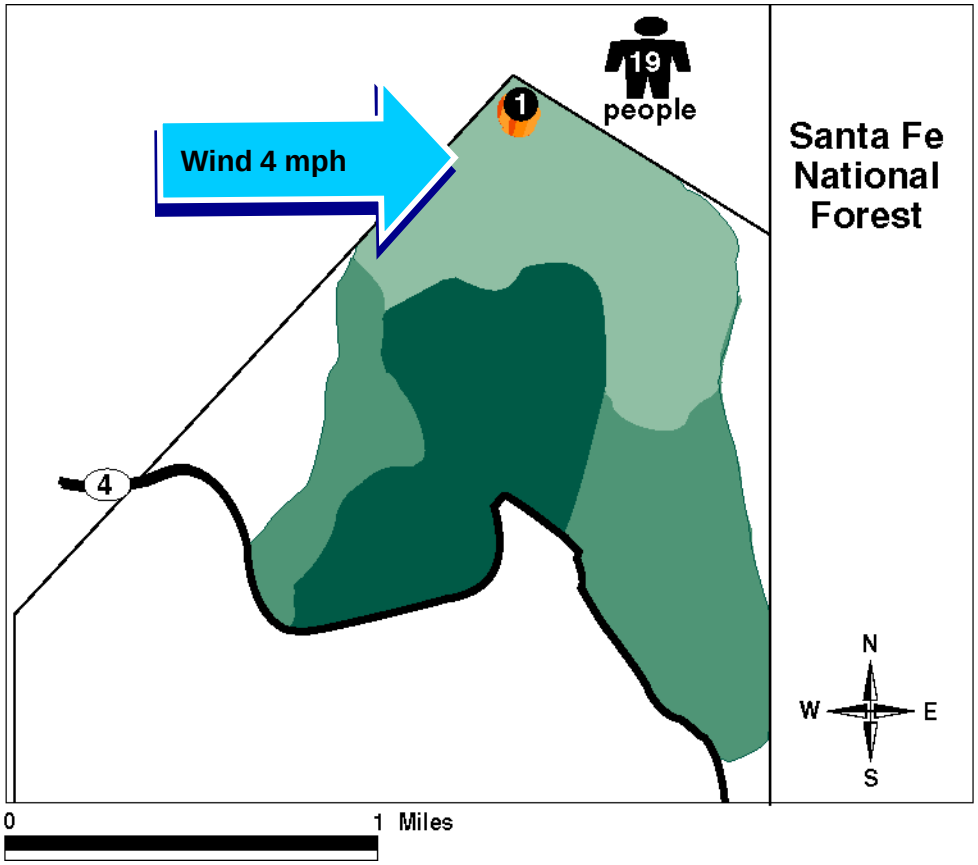


Proposed phases of prescribed Cerro Grande burn



Phase I Vegetation Northeast Side of Peak

Ignited Test Fire for Prescribed Burn



Thursday, May 4, 2000

7:20 p.m.

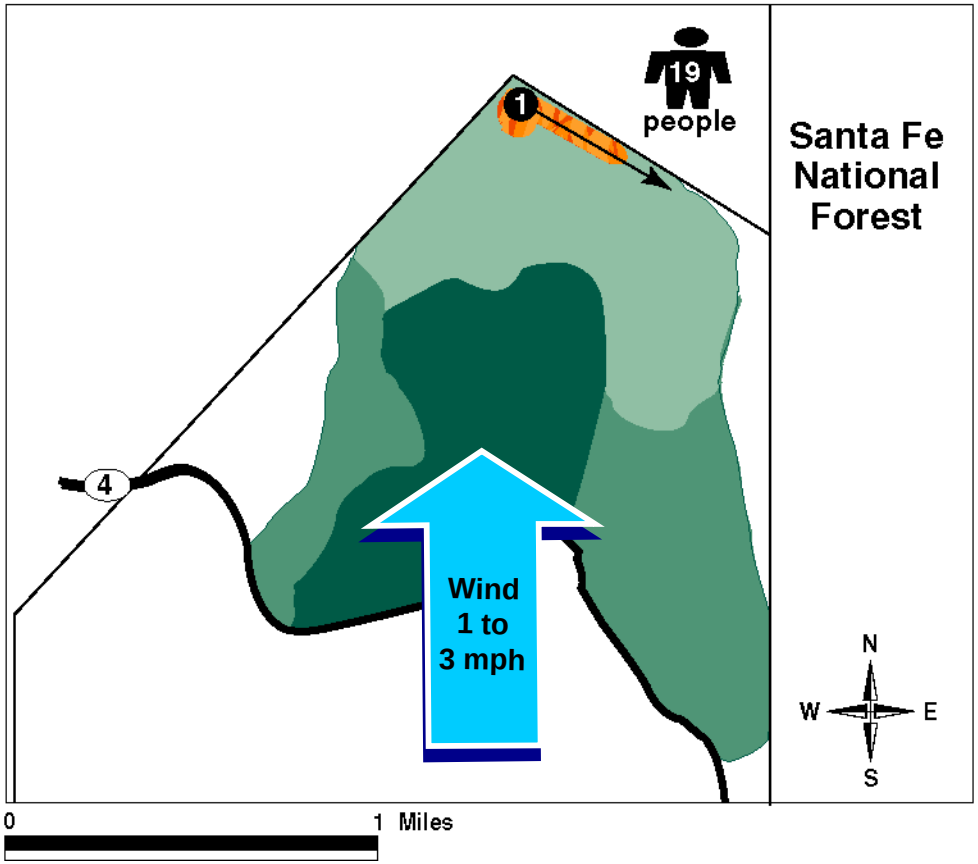
Total resources:

- 10 BIA crew members
- 9 NPS staff

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area

Test Fire Completed; Burn Started on Northeast Side to Establish Black Line



Thursday, May 4, 2000

8:00 p.m.

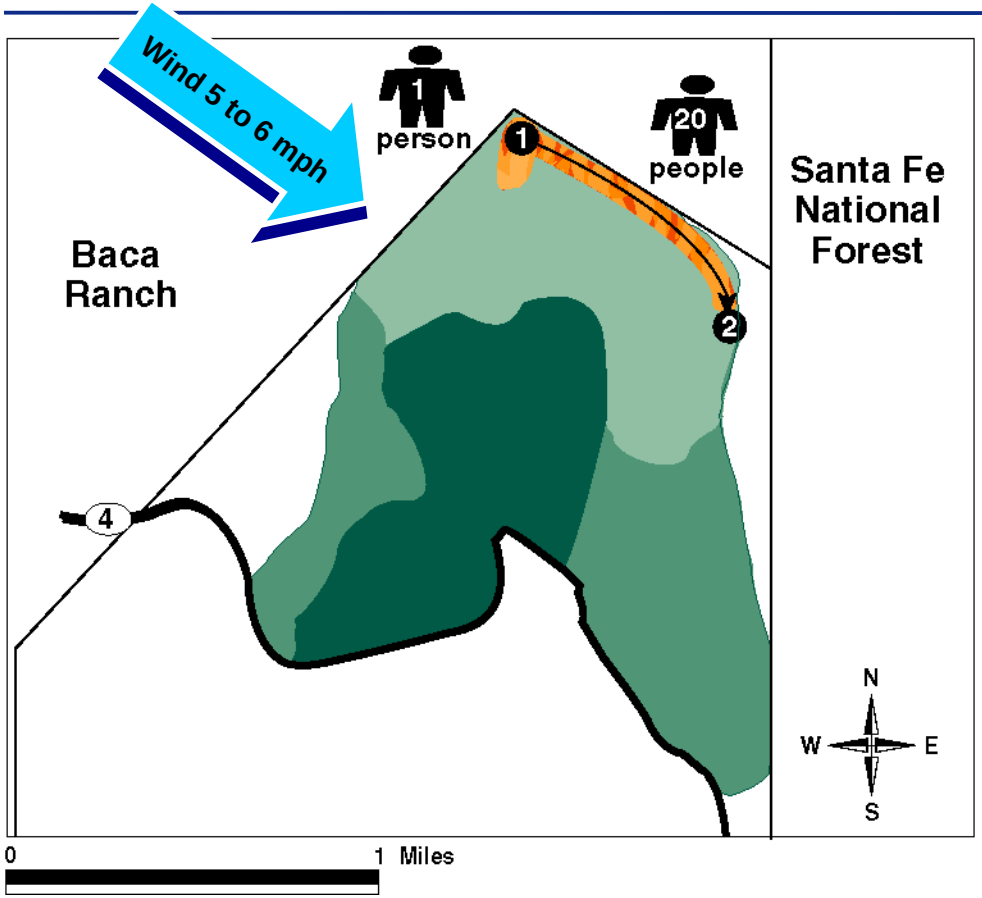
Total resources:

- 10 BIA crew members
- 9 NPS staff

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area

Black Lining Stopped on Northeast Side; Fire Growing Towards Baca Ranch



Thursday, May 4, 2000

about 10:00 p.m.

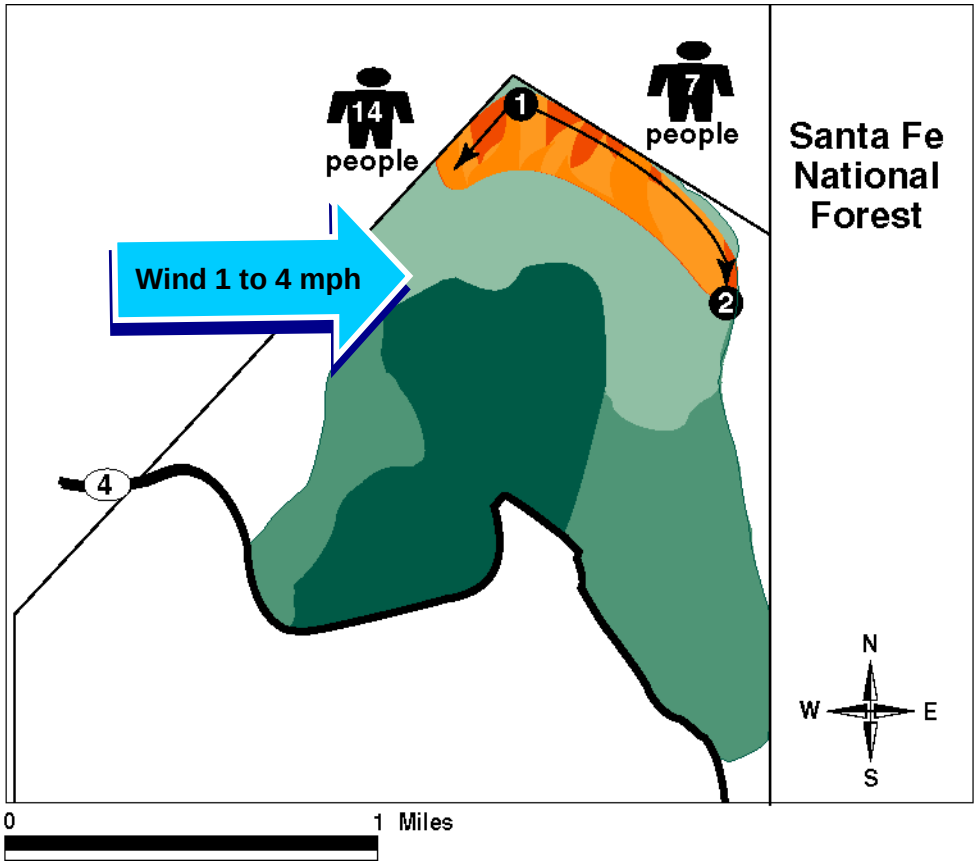
Total resources:

- 10 BIA crew members
- 11 NPS staff

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area

Black Lining Started on Northwest Side



Thursday, May 4, 2000

about 11:15 p.m.

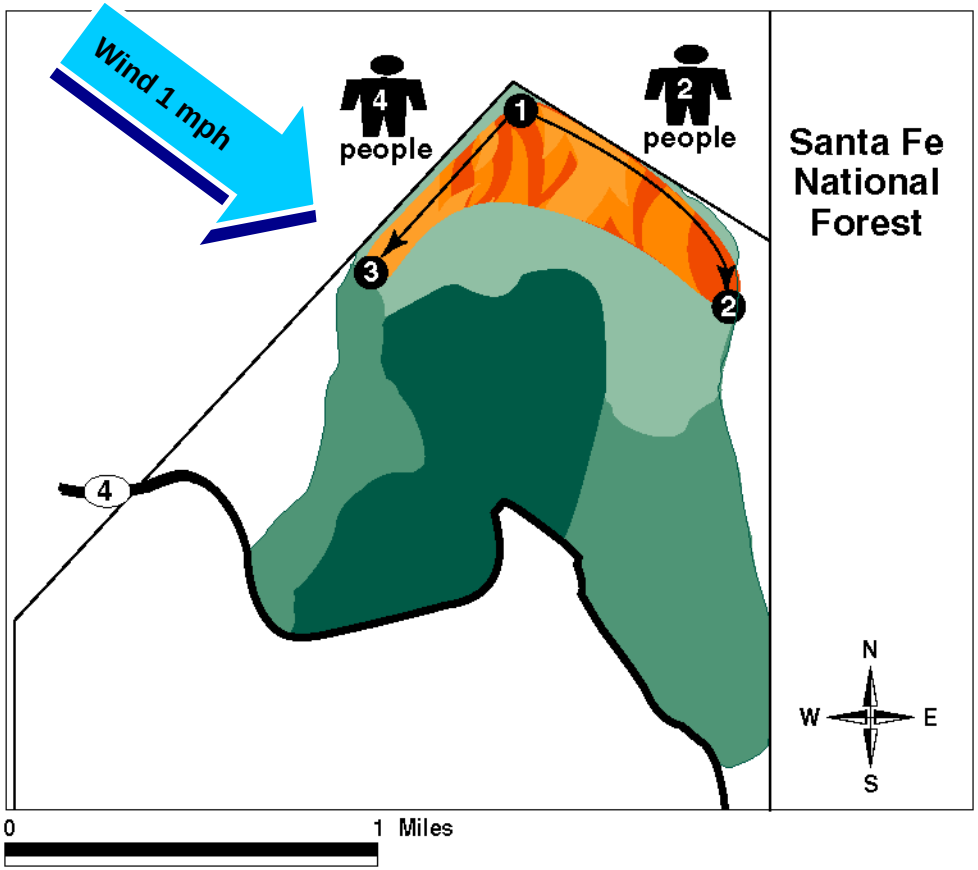
Total resources:

- Moved 13 firefighters to northwest side of peak
- 21 total firefighters

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area

Black Lining Stopped on Northwest Side; Most Crew Released Due to Fatigue

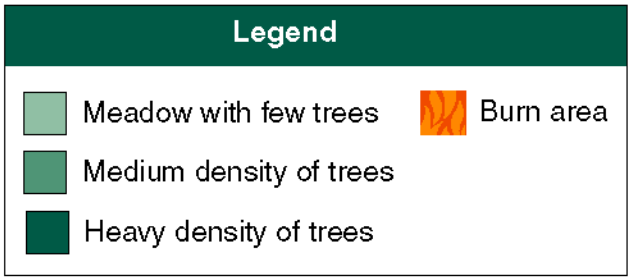


Friday, May 5, 2000

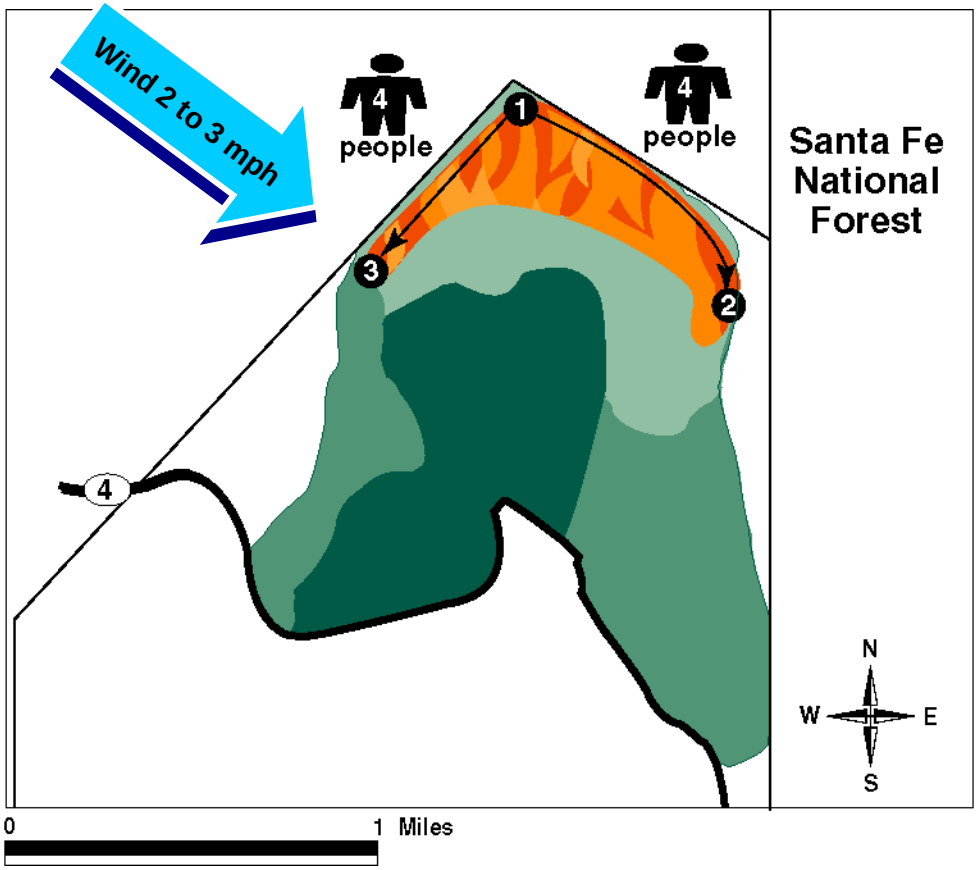
2:00 a.m.

Total resources:

- 6 NPS staff remain



Fire Expands Down Northeast Side; Agreement Reached on More Resources



Friday, May 5, 2000

7:30 a.m.

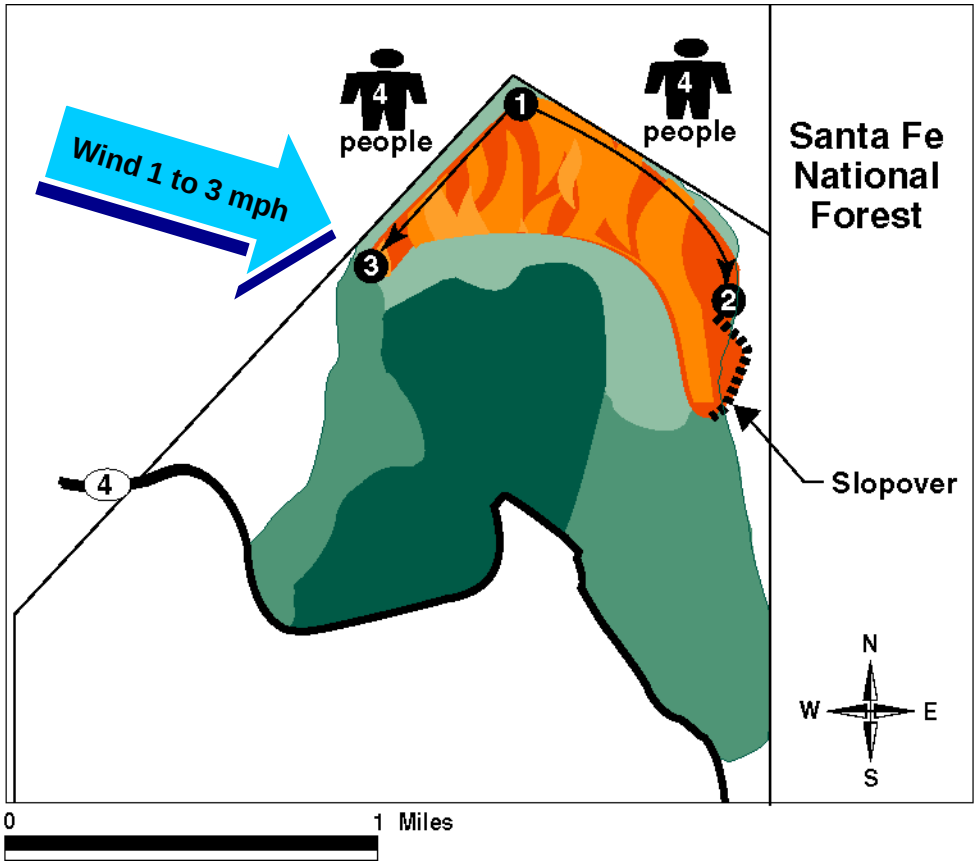
Total resources:

- 8 NPS staff
- Fire engine on road

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area

Burn Boss Changes; Slopover Occurs



Friday, May 5, 2000

about 10:00 a.m.

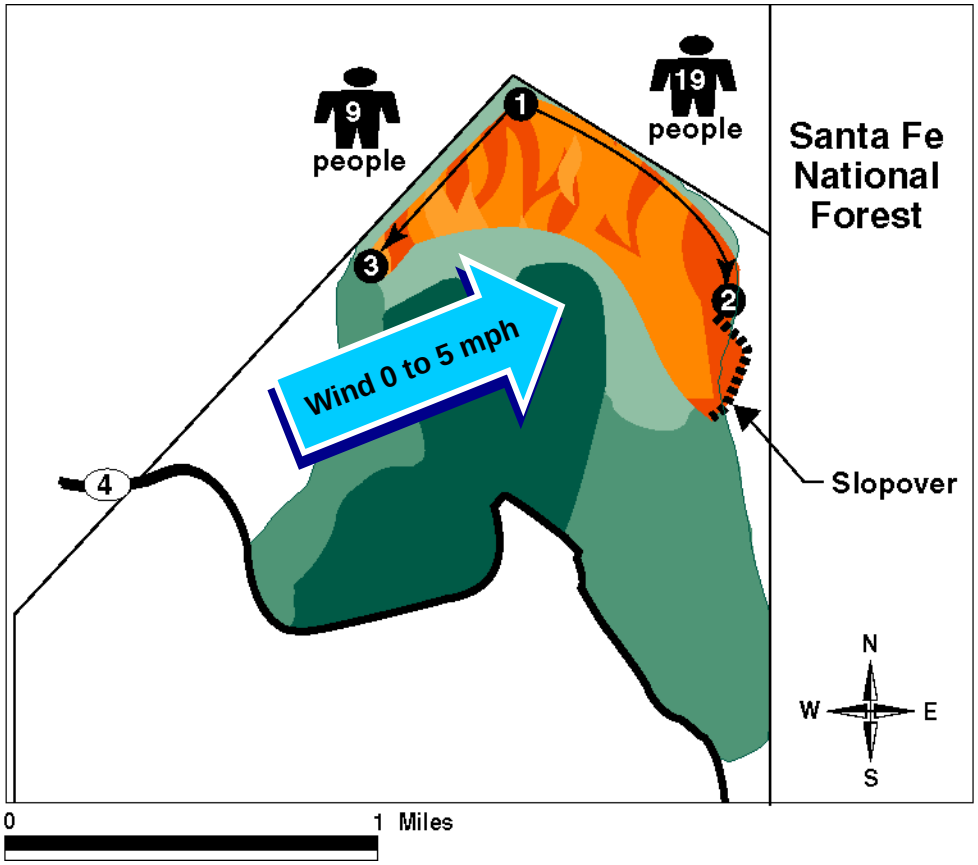
Total resources:

- 8 NPS staff
- Fire engine on road

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area

Additional Resources Arrive



Friday, May 5, 2000

10:30 a.m. to 1:00 p.m.

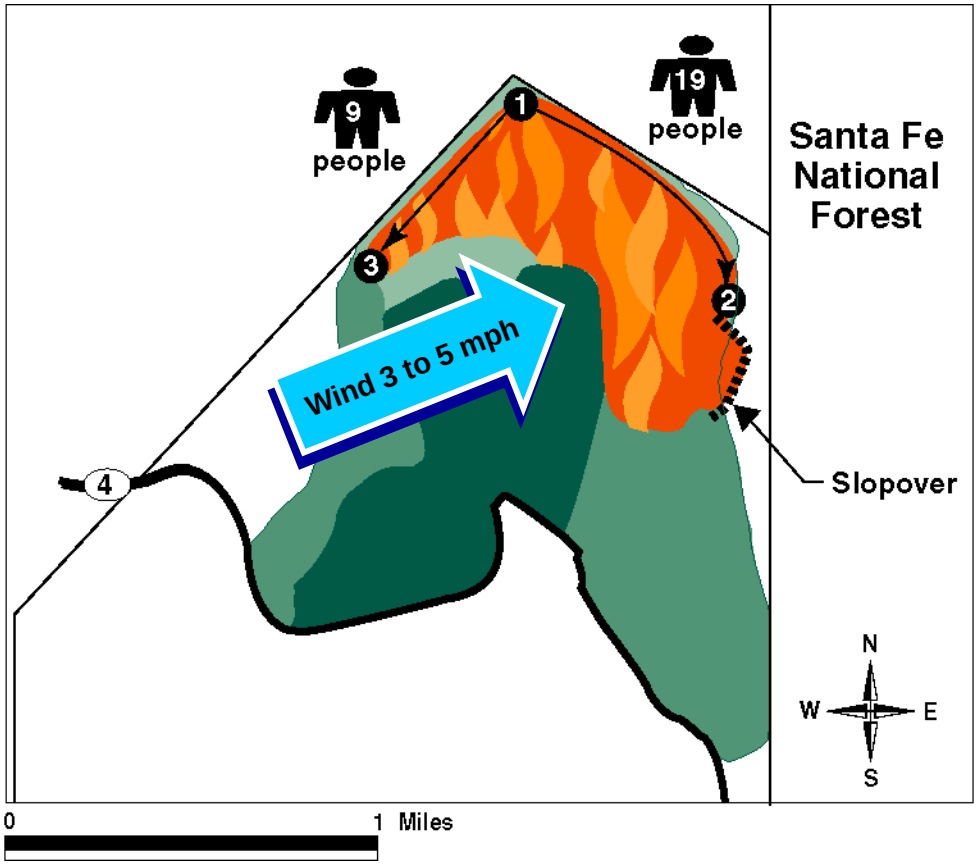
Total resources:

- Helicopter - 10:30 a.m.
- Hot shot crew - 12:30 p.m.
- 28 firefighters on-site

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area

Fire Declared a Wildland Fire



Friday, May 5, 2000

1:00 p.m.

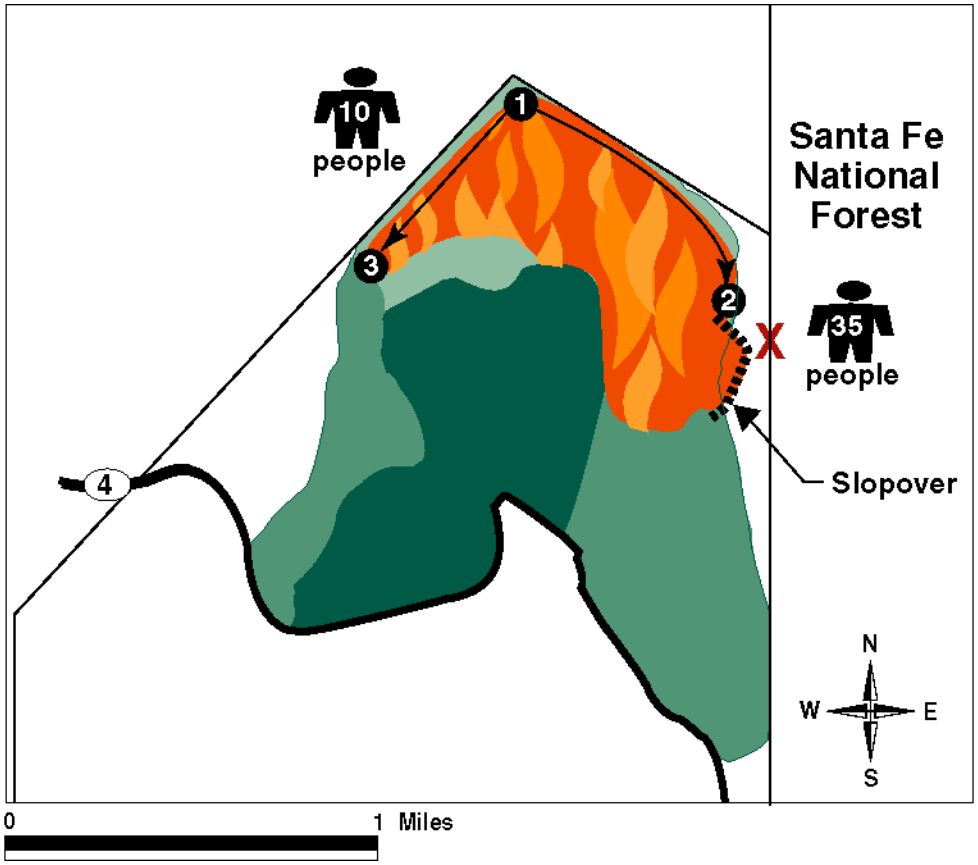
Total resources:

- 28 firefighters
- Air tanker ordered
- Additional crews ordered

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area

Resources Are Added; Slopover Is Contained



Friday, May 5, 2000

4:30 p.m. to 9:15 p.m.

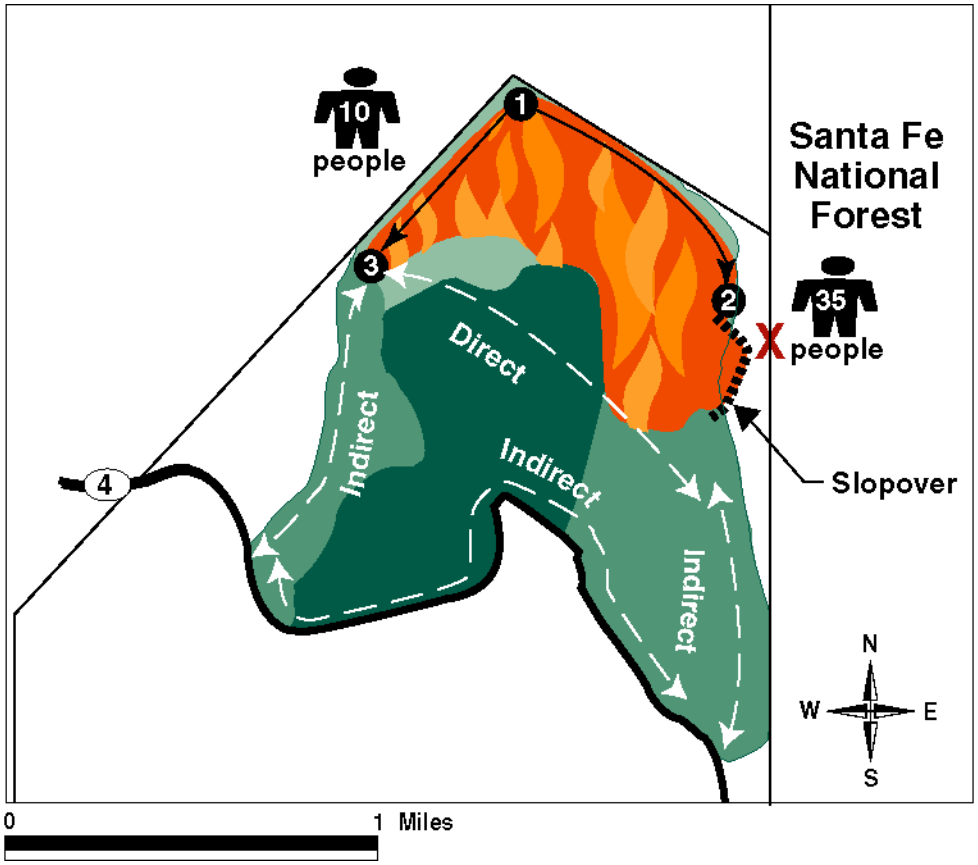
Total resources:

- 45 firefighters
- 2 air tankers
- 2 fire engines

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area
- X Spot fires

Options Discussed to Suppress Wildland Fire *(indirect option selected)*



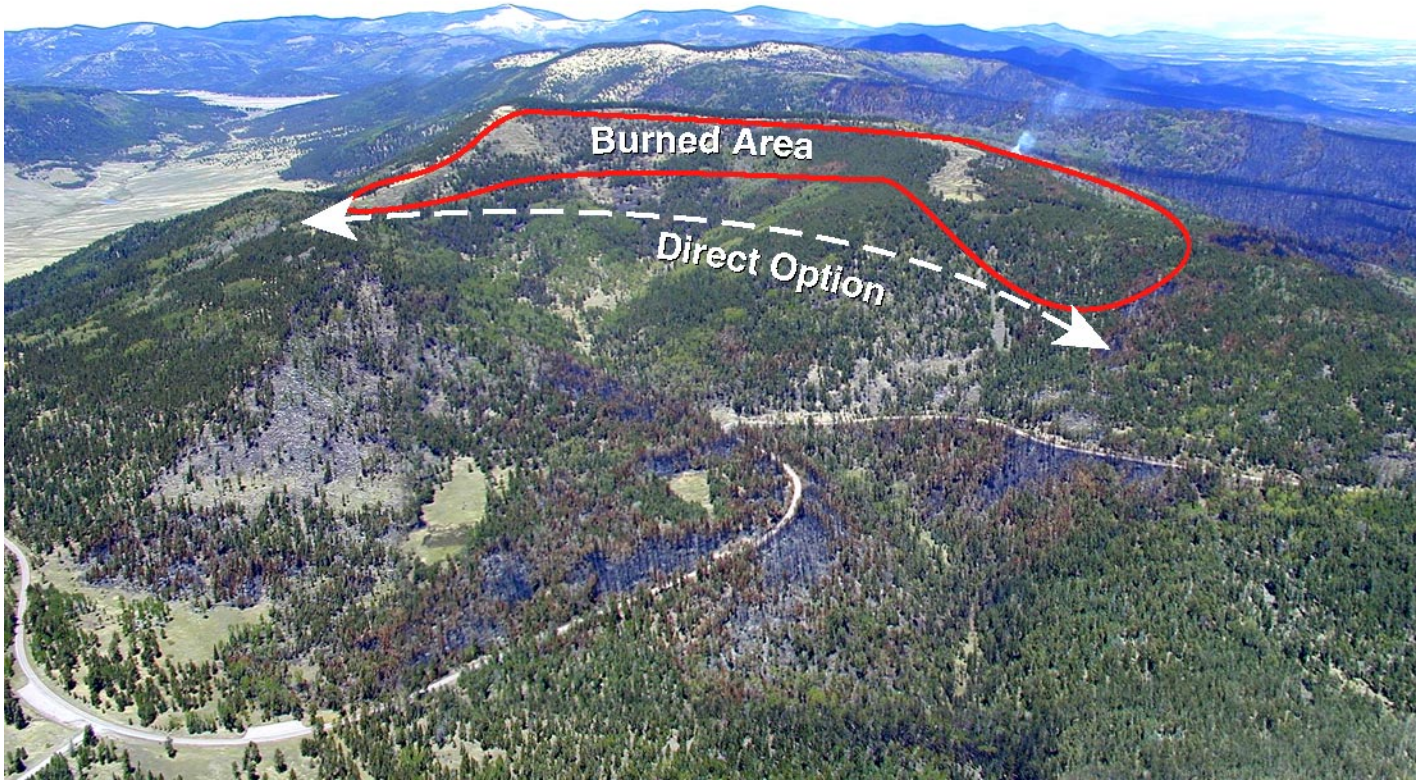
Friday, May 5, 2000

4:30 p.m. to 9:15 p.m.

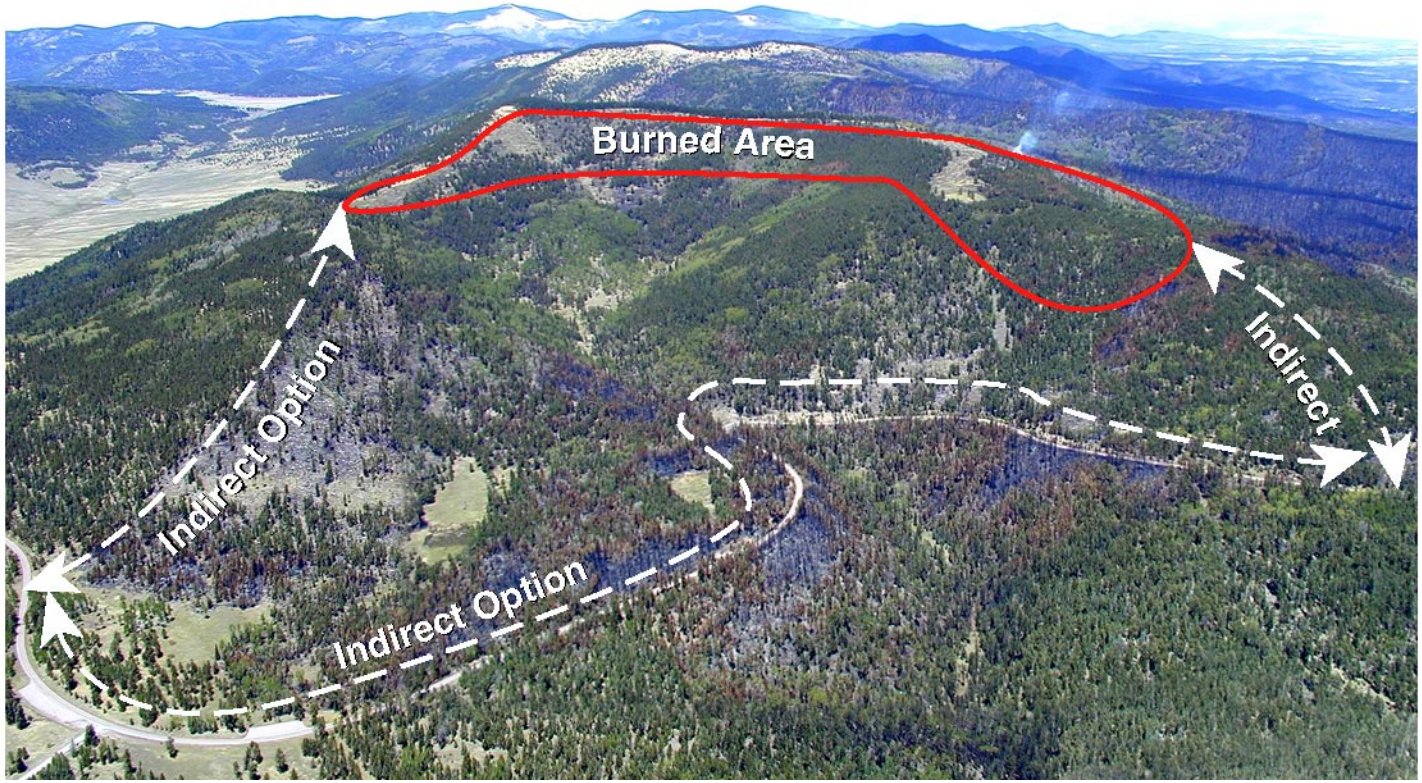
Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area
- X Spot fires

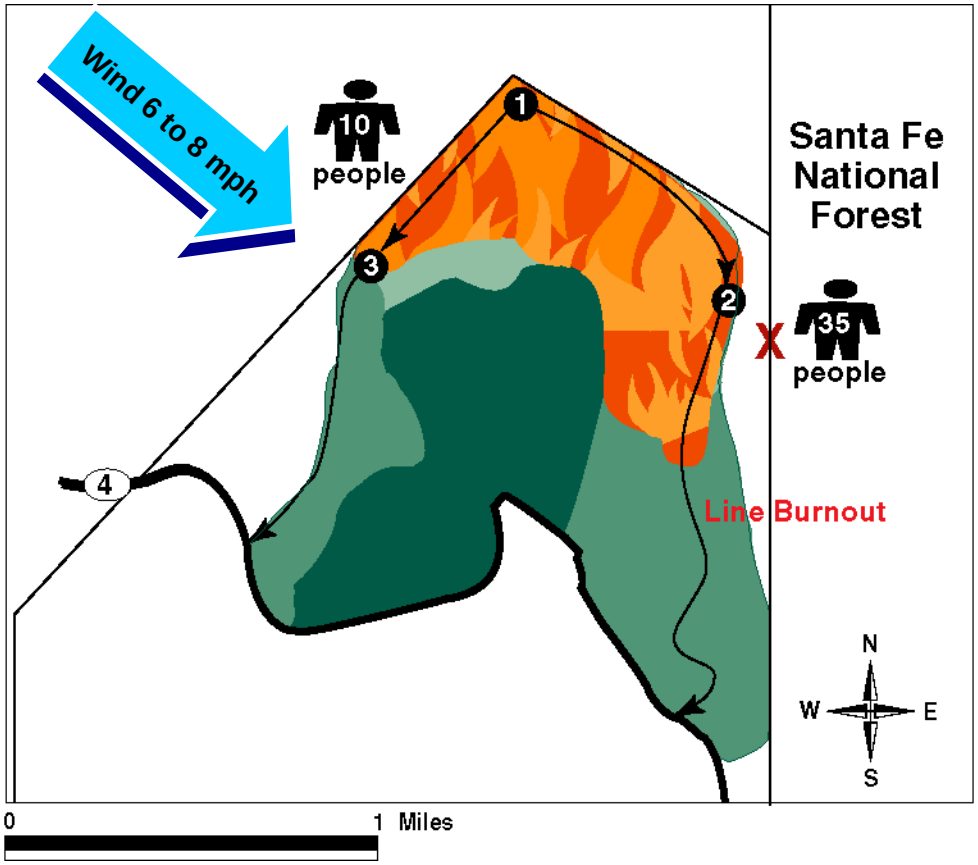
Aerial View of Direct Option for Suppression of Fire



Aerial View of Indirect Option for Suppression of Fire



Firefighters Begin Blacklining East Side



Friday, May 5, 2000

11:00 p.m.

Total resources:

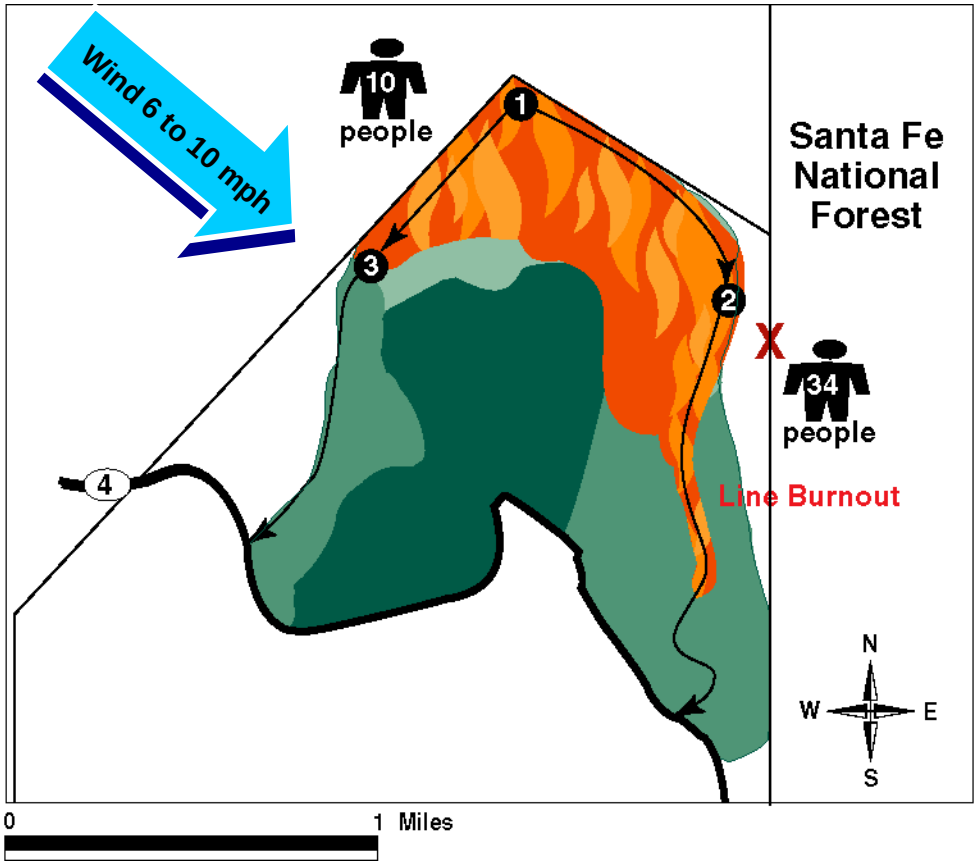
- 45 firefighters
- 2 fire engines
- 1 water tanker truck

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area
- X Spot fires

Transition From Phase I to Phase II Vegetation for Blacklining East Side

More Firefighters Ordered; Crews Improve Line on East Side



Saturday, May 6, 2000

about 9:15 a.m.

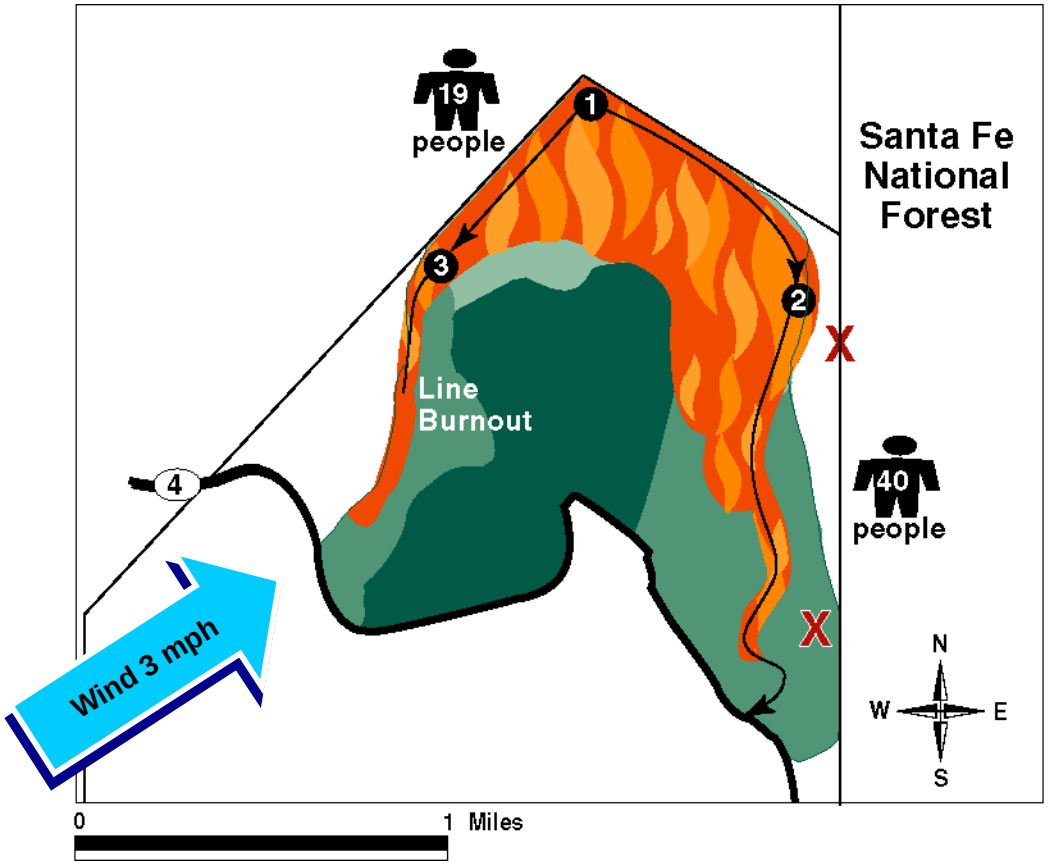
Total resources:

- 44 firefighters
- 3 fire engines

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area
- X Spot fires

New Crew Black Lines West Side



Saturday, May 6, 2000

Evening

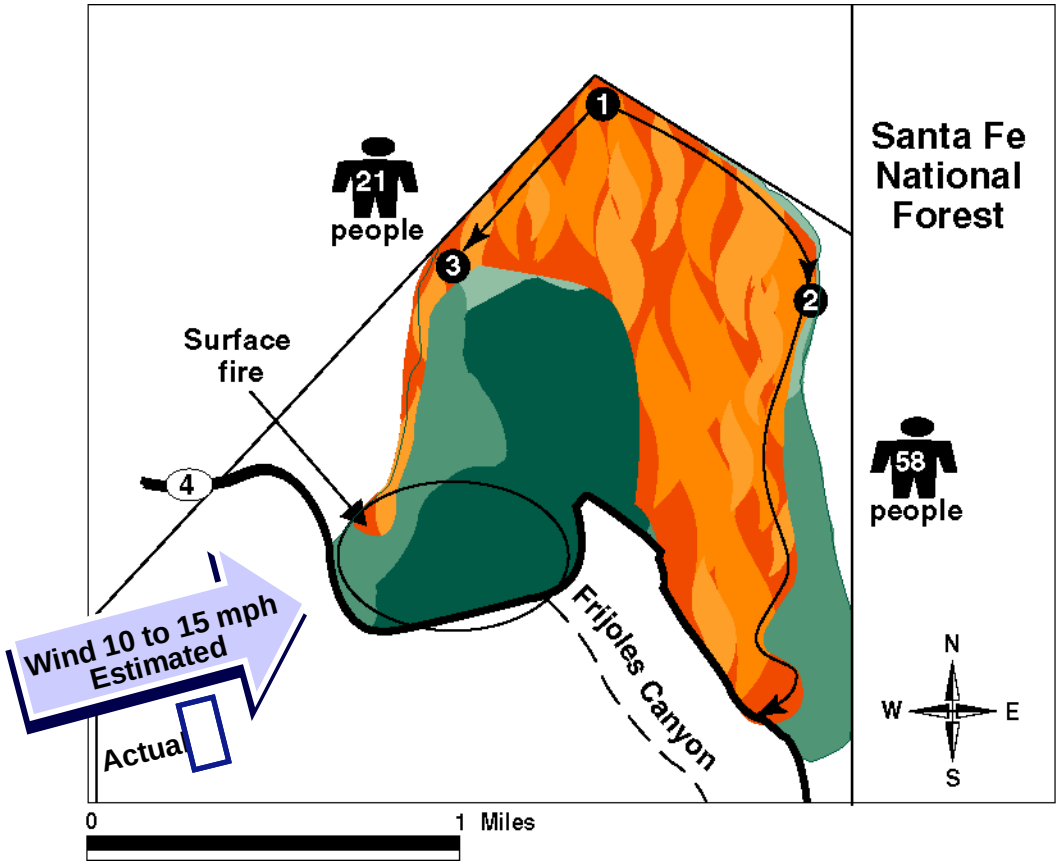
Total Resources:

- 59 firefighters
- 4 fire engines
- 1 water tanker truck

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area
- X Spot fires

Surface Fire Observed in Southwest Corner



Sunday, May 7, 2000

9:00 a.m.

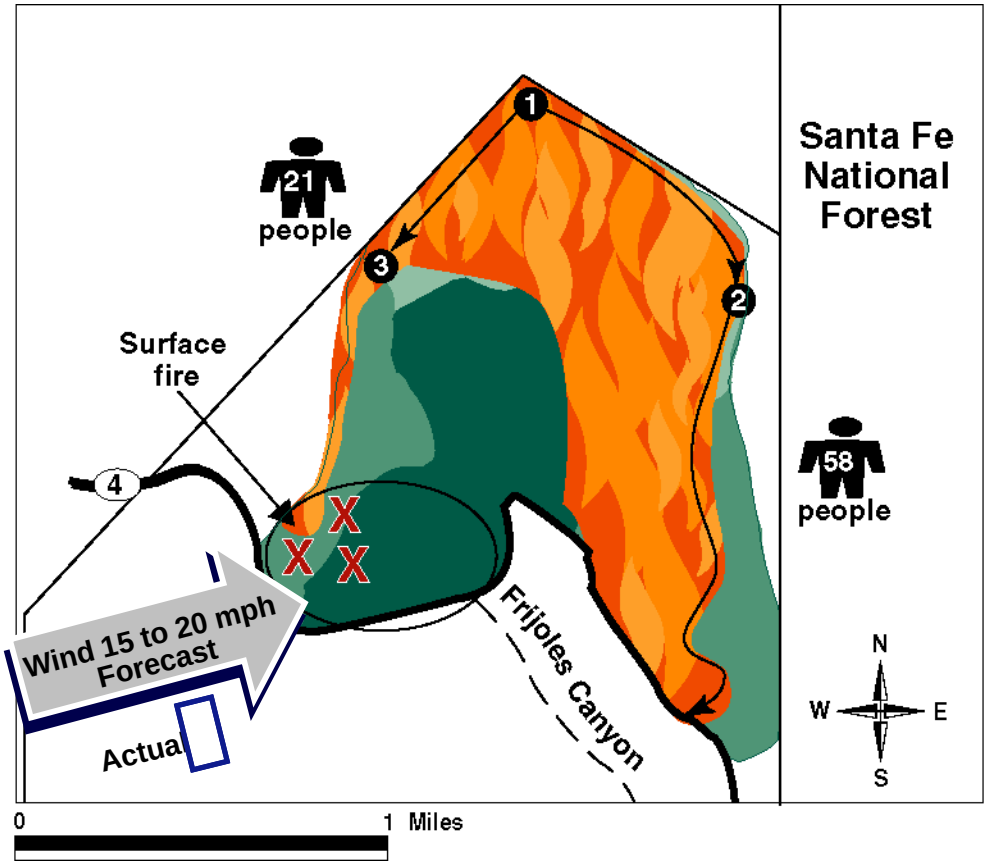
Total Resources:

- 79 firefighters
- 3 fire engines
- 1 water tanker truck

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area

Trees Observed Torching in Southwest Corner



Sunday, May 7, 2000

10:00 a.m. to 11:00 a.m.

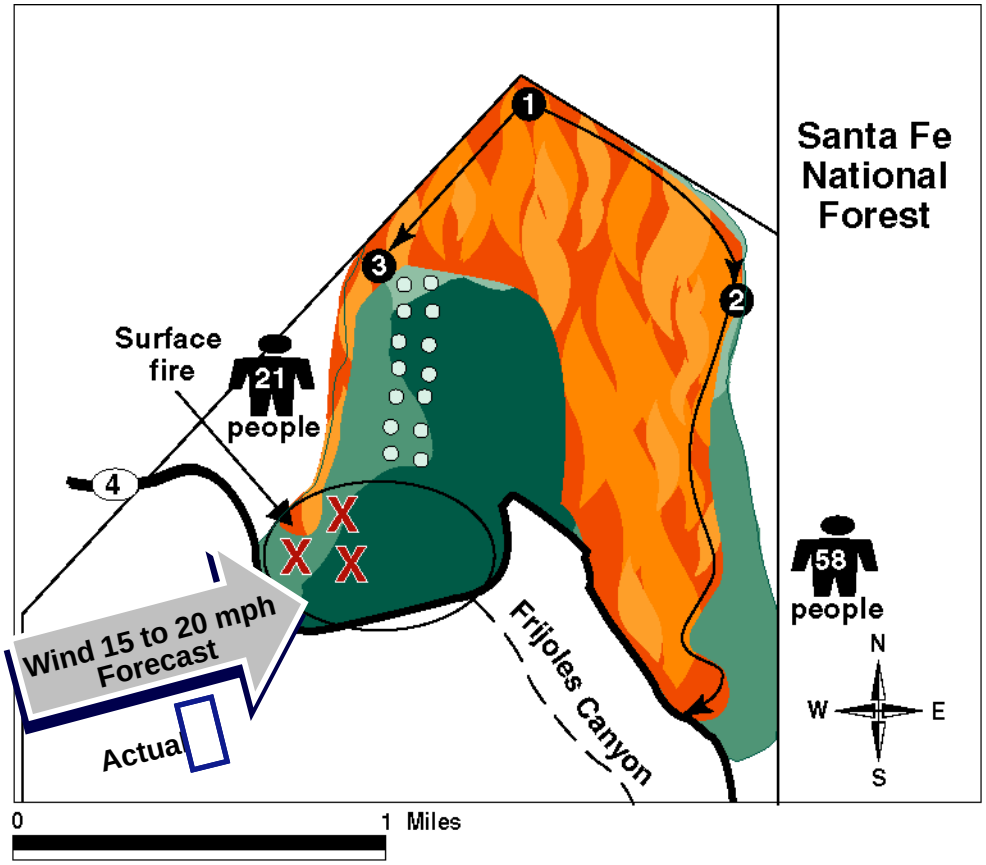
Total Resources:

- 79 firefighters
- 3 fire engines
- 1 water tanker truck

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area
- X Spot fires

Aerial Ignition on West Side of Burn Area



Sunday, May 7, 2000

about 11 a.m. to 11:30 a.m.

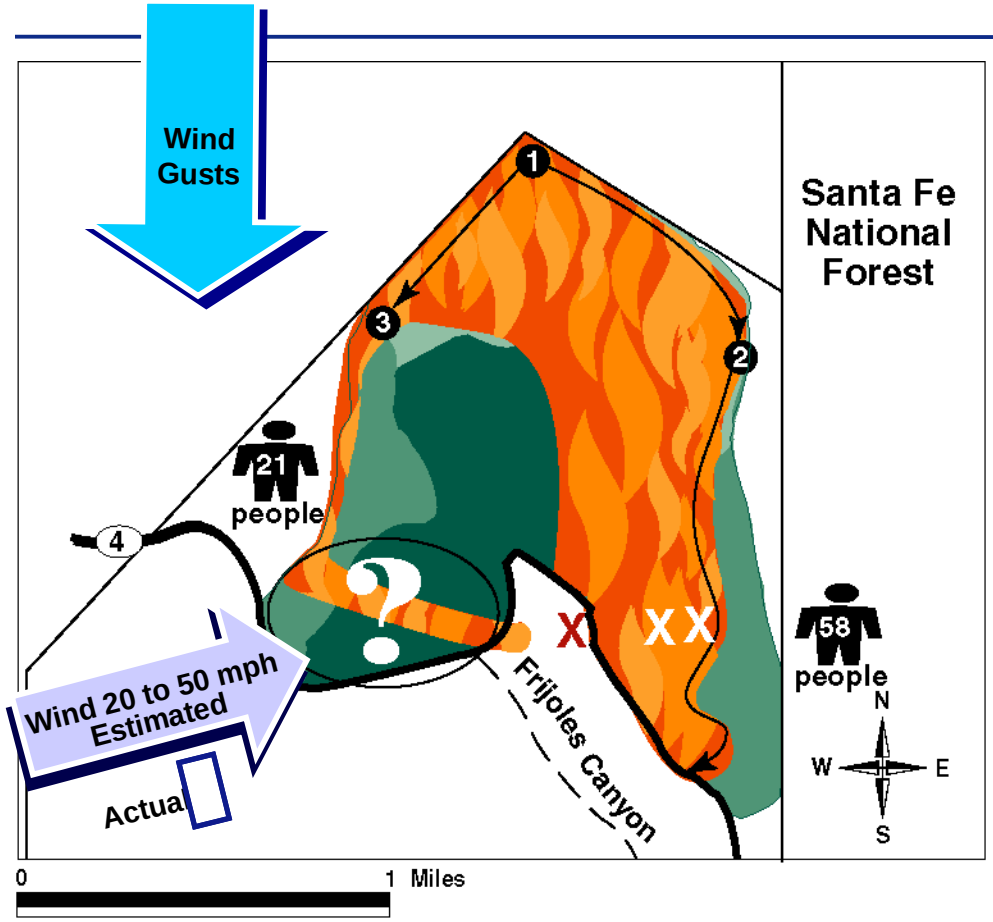
Total Resources:

- 79 firefighters
- 1 helicopter
- 3 fire engines
- 1 water tanker truck

Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area
- X Spot fires

Fire Crosses Into Frijoles Canyon



Sunday, May 7, 2000

12:00 p.m.

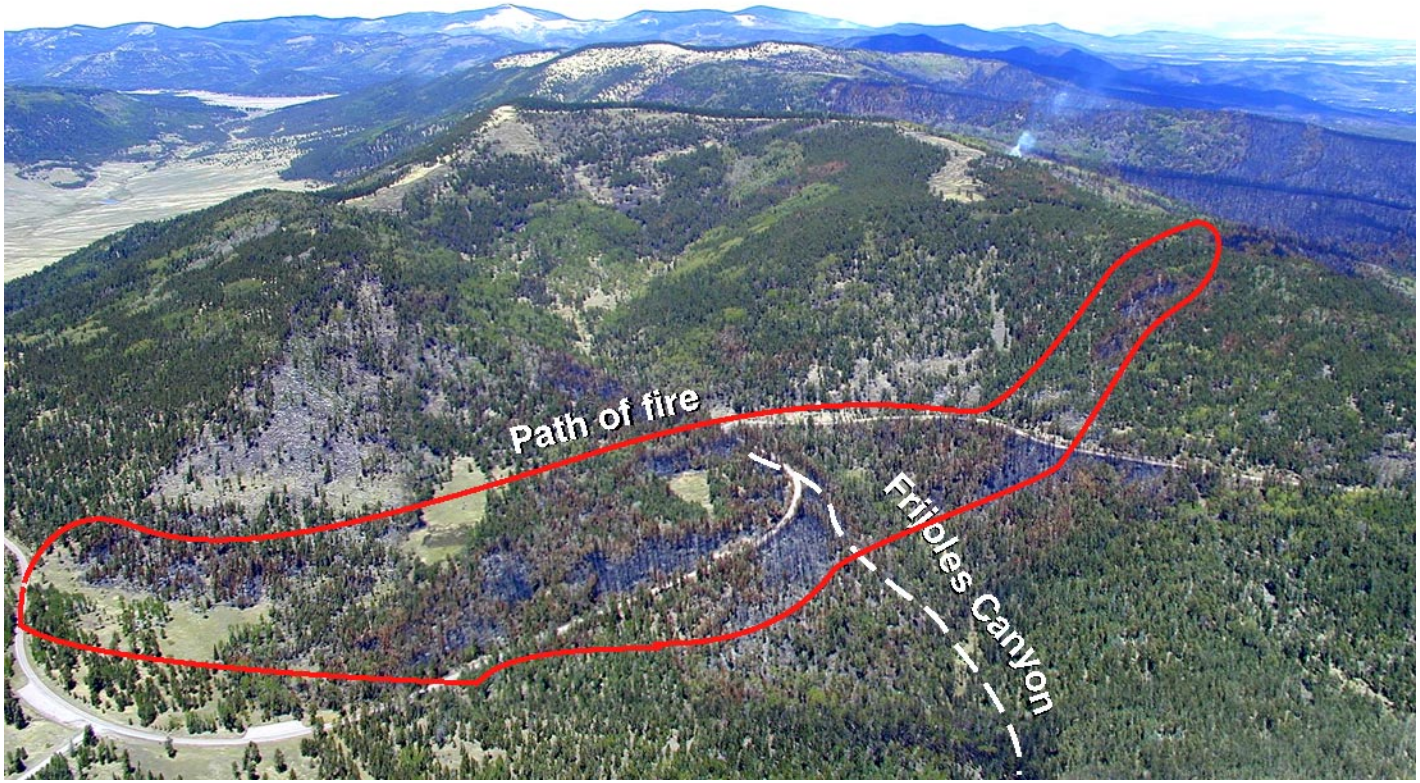
Total Resources:

- 79 firefighters
- 3 fire engines
- 1 water tanker truck

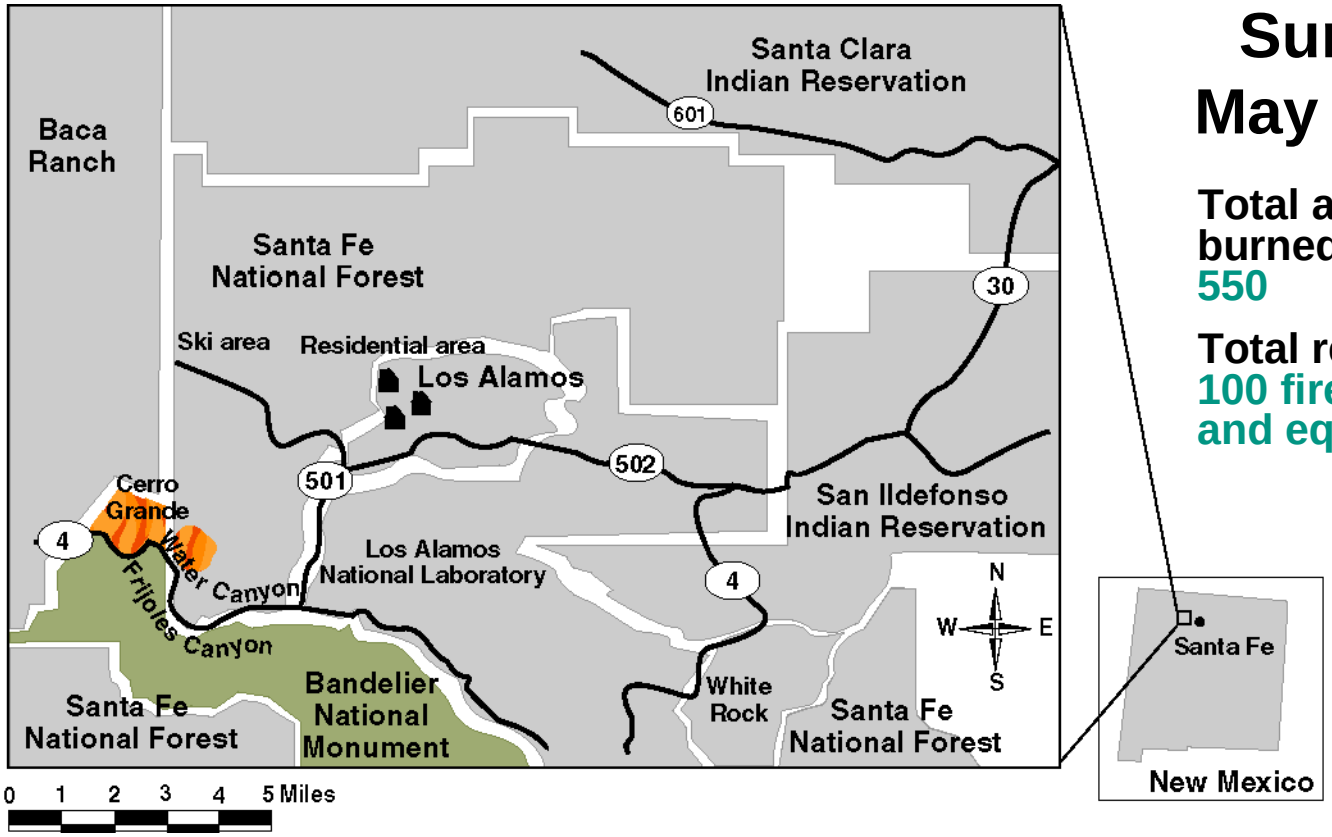
Legend

- Meadow with few trees
- Medium density of trees
- Heavy density of trees
- Burn area
- X Spot fires

Aerial View of May 7 Fire Run



Progression of Fire

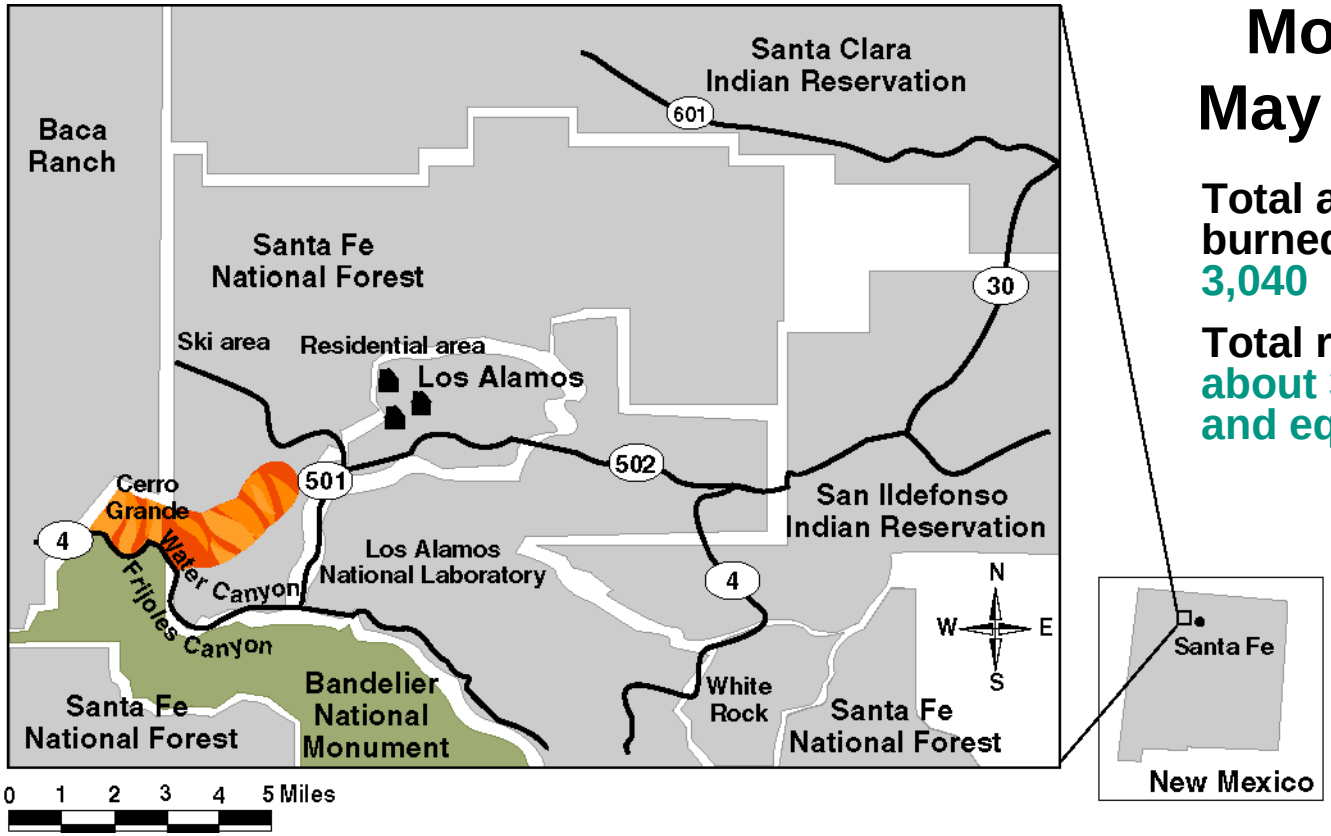


Sunday, May 7, 2000

Total acres burned to date:
550

Total resources:
100 firefighters and equipment

Progression of Fire

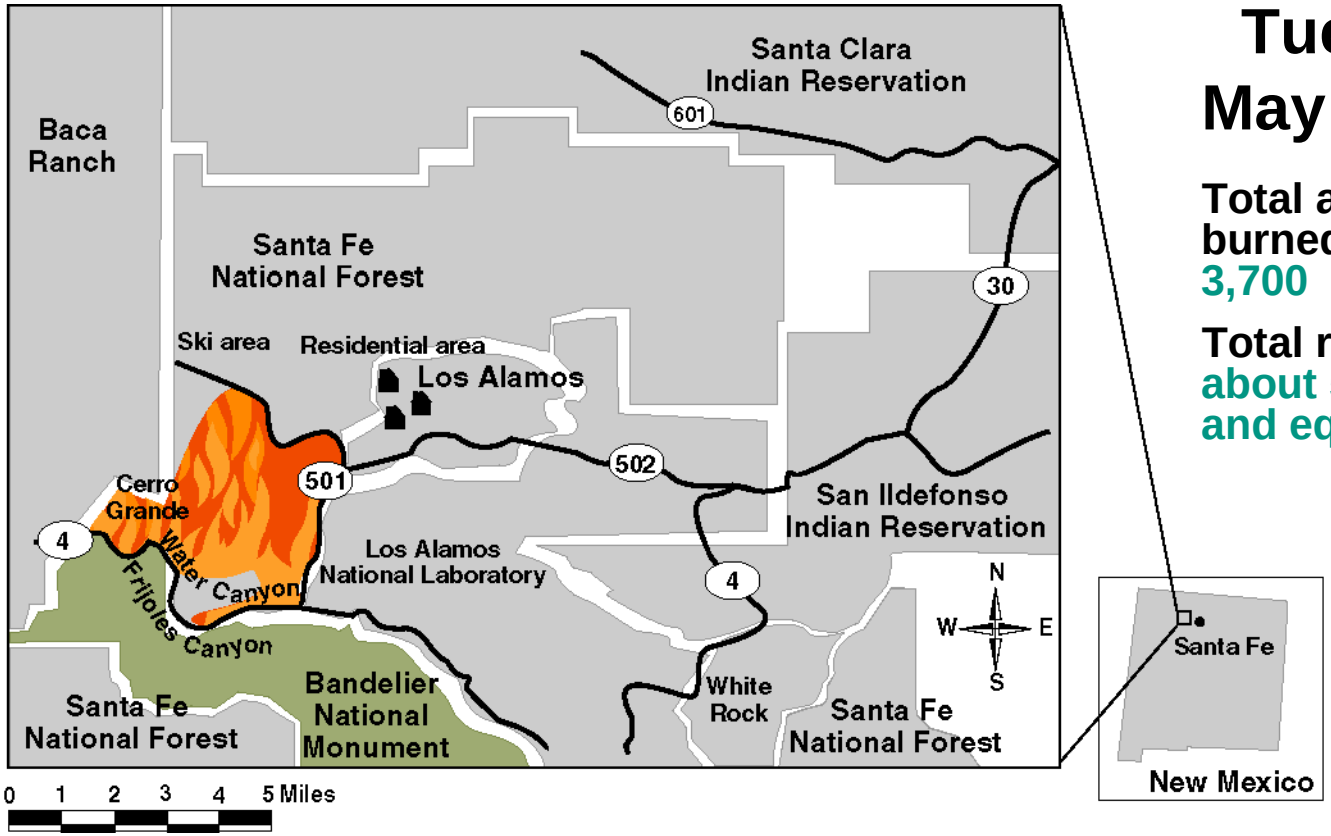


Monday
May 8, 2000

Total acres burned to date:
3,040

Total resources:
about 330 firefighters and equipment

Progression of Fire

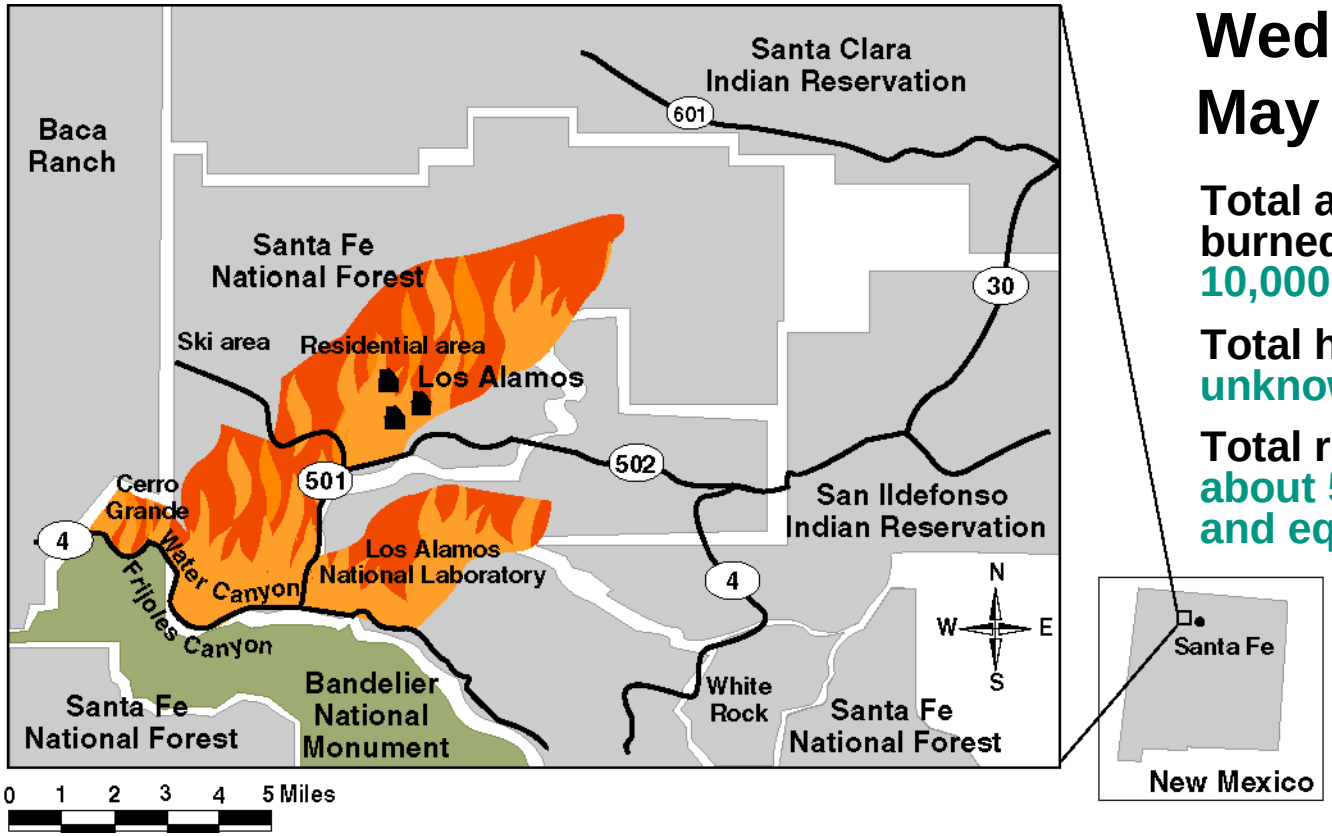


Tuesday, May 9, 2000

Total acres burned to date:
3,700

Total resources:
about 500 firefighters and equipment

Progression of Fire



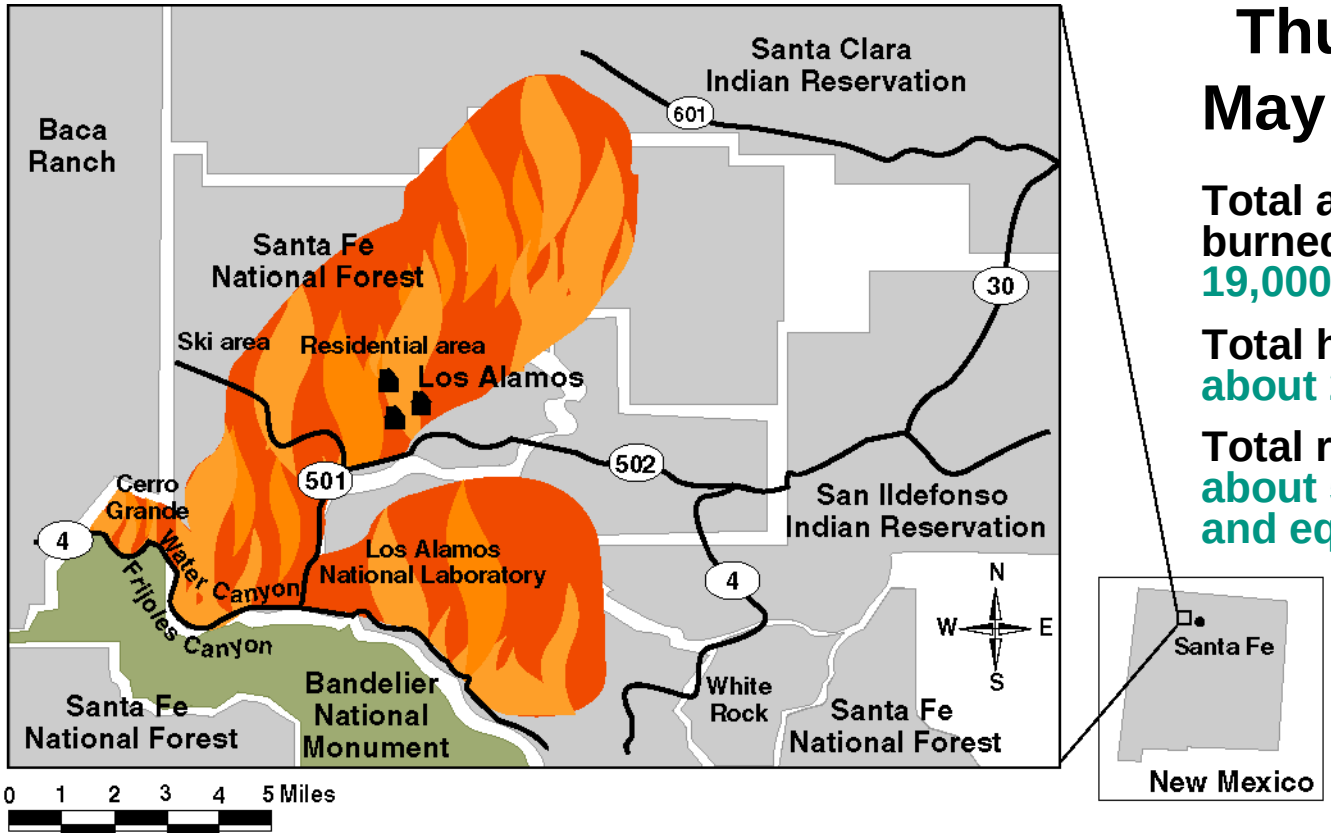
Wednesday, May 10, 2000

Total acres burned to date:
10,000

Total homes burned:
unknown

Total resources:
about 500 firefighters and equipment

Progression of Fire



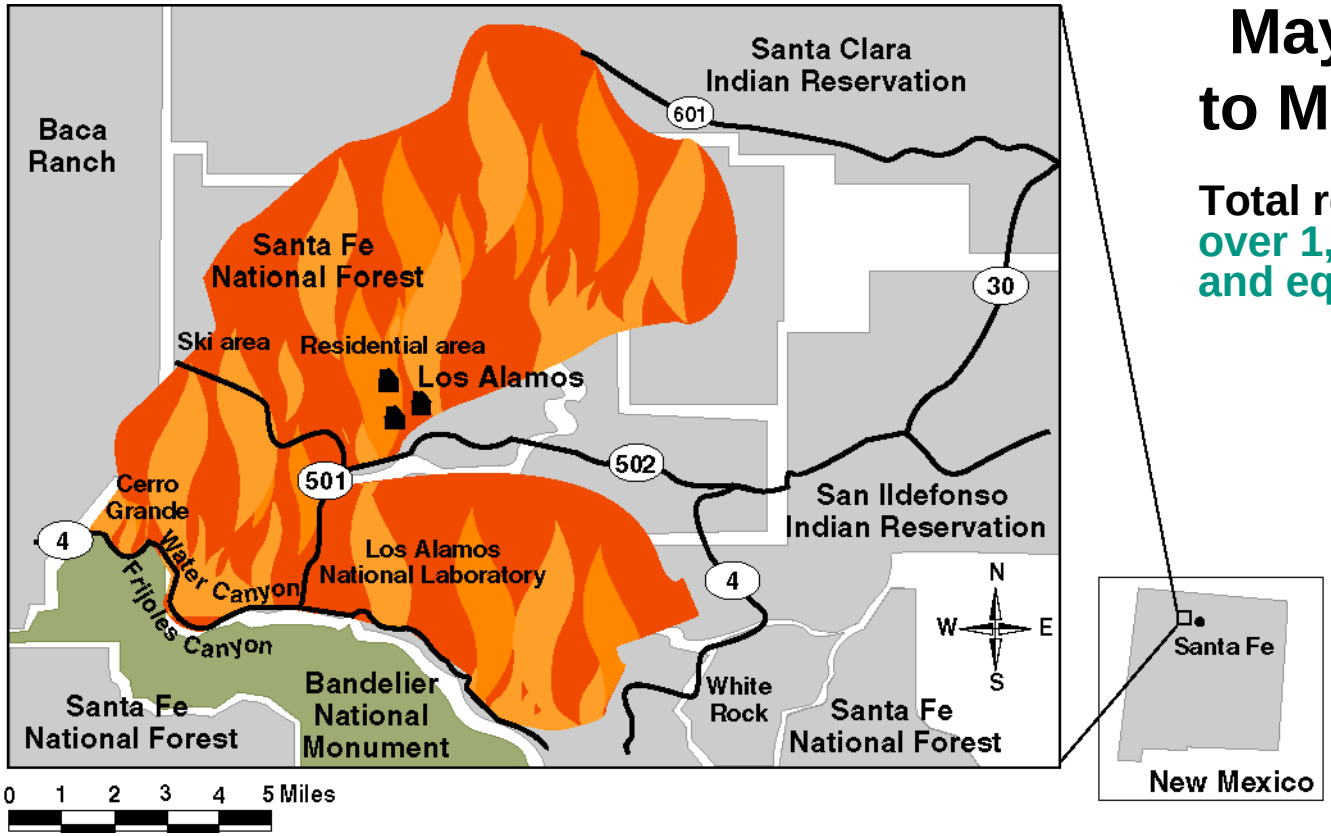
Thursday, May 11, 2000

Total acres burned to date:
19,000

Total homes burned:
about 280

Total resources:
about 570 firefighters and equipment

Progression of Fire



May 12, 2000 to May 19, 2000

Total resources:
over 1,000 firefighters and equipment

Summary of Damage

- Almost 48,000 acres burned
- About 280 homes destroyed or damaged and 40 laboratory structures destroyed
- Over 400 families displaced
- About $1 billion in estimated fire damage

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