

— DRAFT —

INCIDENT SUMMARY

SILVERTIP RANCH SHELTER DEPLOYMENT INCIDENT

STORM CREEK FIRE--GALLATIN NATIONAL FOREST

SEPTEMBER 3, 1988

On the above date forty-eight fire fighters and Silvertip Ranch personnel deployed fire shelters at the Silvertip Ranch near Cooke City, Montana. The incident was precipitated by a fire storm that involved the surrounding area creating large burning embers up to the size of a tennis ball, winds of approximately sixty miles per hour and heavy smoke conditions.

The deployment was for the purpose of preventing burns from the burning embers that were falling, and to alleviate the effects of the heavy smoke.

The fire shelters were effective in accomplishing the deployment objectives as no burn or respiratory injuries were reported and the personnel were able to resume work following the incident.

The attached interviews and team analysis of the incident have resulted in the following recommendations:

- Six of the shelters had tears along the seams exceeding six inches and this was a concern to the involved personnel. A cyclic means of inspecting shelters on a rotating basis may need to be considered.
- Shelter deployment training needs to include emphasis that the shelters remain effective with the small holes and tears that will be present.
- Shelter deployment training should emphasize the technique of deployment in high wind conditions.
- An outline that defines the "must know" information and a suggested format for shelter deployment analysis teams should be developed. This would assure that reports will serve the widest range of development and training needs.
- The title of "Fire Shelter Deployment Investigation Team" should not be utilized as it carries a negative and threatening connotation. We suggest "Fire Shelter Deployment Analysis Team" as a more positive title.
- The team strongly recommends that all fire service organizations develop a fire shelter deployment refresher training program. New information is being developed that must reach the "veterans" of our respective organizations.

## STORM CREEK FIRE--FIRE SHELTER DEPLOYMENT REVIEW

On September 3, 1988, fire shelters were deployed by 48 personnel on the Storm Creek Fire. The deployment was reported as required by the NWCG. The following day a review team was established by Rick Gale, National Park Service Area Commander, Greater Yellowstone Area Command, to review the circumstances of the deployment. The team consisted of:

STEVEN L. HOLDER, Team Leader  
Jewel Cave National Monument  
RR 1, Box 60AA  
Custer, SD 57730  
(605) 673-2288  
Fire Qualifications:  
IC - Multi-Resource  
Strike Team Leader--Crew  
Crew Liaison Specialist  
Engine Supervisor

HOWARD L. DIMONT  
Mesa Verde National Park  
Mesa Verde, CO 81330  
(303) 529-4461  
Fire Qualifications:  
IC Multi-Leader  
Safety Officer

DAVID F. ALDRICH  
Idaho Panhandle National Forest  
1201 Ironwood Drive  
Coeur d'Alene, ID 83835  
(208) 765-7238  
Fire Qualifications:  
Fire Behavior Analyst  
Training Officer  
Agency Crew Coordinator

The objectives of the review team are to:

1. Document the conditions and actions that led to the shelter deployment.
2. Document the details of the actual deployment.
3. Identify problems or deficiencies in shelters, shelter use training, or deployment procedures.

Dimont and Aldrich met in West Yellowstone the night of September 4 and drove to the Storm Creek ICP where they met Holder on September 5. After a briefing by Incident Commander Dave Liebersbach the team attended the fire team planning session for the September 5 day shift. The review team explained their objectives and discussed them with Liebersbach and other overhead team members.

The fire team provided maps, shift plans, unit logs, radio logs and other documentation pertinent to the review team objectives. The team then began interviewing personnel at the incident base. Interviews continued the following day at the incident base and helibase. The team was then flown to the Silver Tip Ranch to see the location of the shelter deployment and to interview the personnel involved in the deployment. The team returned to Cooke City for the night and went to Mammoth the next day to complete the report.

Interviews were conducted with the following persons:

Don Wahl - Safety Chief

Chuck Otto - Safety Officer

Larry Sears - Group Supervisor (Silver Tip Ranch)

Roger Sadler - Helicopter Pilot (Evergreen Bell 205)

Roy Hall - Helibase Manager

Rob Collins - Air Attack Supervisor

Tom Goheen - Deputy Operations Section Chief in charge of groups

John See - Fire Behavior Analyst

Kevin Baker - Fire Weather Meteorologist

George Jackson - Smokejumper-fireline explosive blaster

Personnel who were at the ranch when shelters were deployed:

Northern New Mexico BIA Engine Strike Team

Crow #84 Crew

Fort Peck #55 Crew

Employees and persons associated with the Silver Tip Ranch

Due to time constraints all groups were interviewed together. They were invited to meet with members of the review team individually or in groups after the mass interview if they had things to discuss confidentially. Several did choose to meet privately with the team.

The team did take pictures at the incident scene. Additional pictures were obtained from individuals at the incident. These photographs show conditions during the fire storm and persons actually deploying their shelters. The photographic documentation is included in the final report.

## FIRE BEHAVIOR

The Greater Yellowstone Area has experienced fire danger and fire behavior conditions not experienced in the recorded history of the area. To date this fire season, about one million acres have burned or are included within the boundaries of the fires still burning. During the last three-month period more than 30 fires have started, some have been suppressed and many have burned together resulting in several very large fires.

Fire Danger Rating System variables are exceeding previous highest values. Drought conditions of the last several years and the extended period without significant rain this season have resulted in low soil moisture content and correspondingly low moisture contents of living vegetation (forest fuels). Dead fuels have been dried severely by the extended hot, dry conditions. Warm night-time temperatures and poor night-time relative humidity recovery have aggravated the low fuel moisture conditions.

Fire Behavior Analysts and other fire behavior specialists have been tracking fire behavior for the general area and individual incidents using the state-of-the-art fire behavior prediction system developed by Rothermel et al. John See, Fire Behavior Analyst, is a member of the Dave Liebersbach Type I Incident Management Team assigned to the Storm Creek Fire. He is supported by Kevin Baker, National Weather Service Fire Meteorologist, at the incident base. A copy of FIRE BEHAVIOR EVALUATION (for the) GREATER YELLOWSTONE FIRE COMPLEX, September 4, 1988, is included in the appendix. Even though it was dated September 4, the information is applicable for the previous day.

The situation report issued at 0900 hours September 3, 1988, reported the fire as 50,000 acres and said it was burning actively in the Lost and Frenchy Creek drainages, that it had spotted into Pebble Creek and that the Silver Tip Ranch and Slough Creek Guard Station were threatened. The towns of Silver Gate and Cooke City were also in jeopardy. The Fire Weather Forecast and Fire Behavior Forecast are included in the Daily Shift Plan for September 3 (see appendix). The essence of the fire behavior forecast was that fire behavior would be extreme in the afternoon after the inversion "cleared out of the area."

John See described the input he had for predicting fire behavior. The weather was provided by an on-site meteorologist and was excellent. Slope information was obtained from a topographic map. Fuel model information was inferred from USGS Quad maps and "verified" as possible by personal contacts. The fire was so large and had so many areas needing fire projections that it was impossible to get site-specific information for site-specific fire behavior predictions with personnel available. The forecasts were more general and were intended to depict worst-

case conditions. Kevin Baker used the weather data available from the National Weather Service as the basis for his forecasts. On-site information from RAWS or weather observers was not available at the time.

The fire behavior associated with the protection of the Silver Tip Ranch and the fire shelter deployment on September 3 were reconstructed from information obtained by interviews of persons who were at the scene. Precise information such as times, fire perimeter location, wind speeds, flamelengths, etc., could not be obtained but the sequence and qualitative information were obtained.

### **Physical Setting**

The Silver Tip Ranch is located in the Slough Creek drainage. Above the Ranch the valley is broad and the creek meanders along on a low gradient. Several large drainages come in from the sides. Just above the Ranch site the valley constricts and the creek gradient steepens. The Ranch is located at the head of another broad valley. Tucker Creek comes into Slough Creek from the west side just above the Ranch. The west side of the creek is steep and has heavy coniferous cover. The timber stands were old-growth spruce and fir with stands of decadent Lodgepole pine interspersed. The Ranch itself is on a 150-acre in-holding. It has a meadow of approximately 20 acres at the north end where the lodge and associated buildings are located. On the east side of the valley the stands were closed canopy lodgepole pine with some poorly stocked stands on the ridges and southwest aspects of finger ridges. The slopes are more gentle than on the other side of the creek. The meadow is covered with grasses but was heavily grazed so remaining grass was very short and there was a lot of exposed soil.

### **Fire Perimeter**

Infra-red imagery 0100 on September 3 showed the fire to be on both sides of Slough Creek at a point about 1/2 mile above the ranch. The perimeter extended almost due west to the ridgetop, crossing Tucker Creek just over a mile up the creek. On the east side the fire followed the contour just above the bench around in to Cutoff Creek.

### **Fire Behavior**

The fire had been active on the previous afternoon and evening. On the morning of September 3 the area was under an inversion and fire activity was slow. A helicopter pilot described it as "punkv." At about 1430 hours the inversion began to break and the fire became more active. A helicopter pilot reported a temperature of 31 degrees Centigrade at the Silver Tip Ranch at 1430 hours compared to 21 degrees at the same time at the Elk Helispot just downstream at 100 feet lower elevation. There was no line of fire or large area burning but the heavy fuels were

burning and showing flames. A light breeze was blowing down canyon and the fire was backing downslope. Activity picked up slowly and by 1600 hours the fire was spreading hot and fast down Slough Creek. About 1620, when winds in the area of Silvertip Ranch became up canyon (into the fire front) the planned backfire was ignited. The backfire lighted very easily with fusees and gained intensity quickly. The initial set went to the crowns in a short time. The backfire was completed by 1700 hours. The fire intensity built rapidly. Very quickly fires were burning actively on all sides of the 20-acre clearing and a fire storm was developing. Observers reported that approximately 75% of the fire intensity was coming from the west side of the creek at that time. Winds were rotating about the meadow in a counter-clockwise direction. A helicopter doing bucket support reported that his airspeed indicated 60 mph as he hovered over the fire. He reported burning limbs several inches long hitting the bubble and strong turbulence. A smoke column built to an estimated 20,000 feet over topography. At the meadow personnel reported very strong winds carrying burning embers the size of a tennis ball. Estimates of 60 mph winds were reported by two persons who were in the meadow during the fire storm. Nobody noted the time but the strong winds persisted for a couple of hours.

People in a position to view the fire storm from a distance told us that the area involved and affected by the fire storm was relatively small. The winds were calm and the sky was blue just a few miles from the Silver Tip Ranch. Further, there were no observed events that contributed to the sudden increase in fire activity. It appeared to be a local phenomenon. Observers in the area after the fire noted a very clean burn. There were a number of trees broken off and windthrown--all were oriented perpendicular to the meadow. The snags and logs continued to burn hot after the fire storm.