

**FIRE SHELTER DEPLOYMENT
INVESTIGATION REPORT**

Clover Fire

July 14, 1988

Submitted by:

**Howard Dimont
Chief Ranger, Mesa Verde National Park**

**Steve Holder
Unit Manager, Jewel Cave National Monument**

**Jim Reilly
Ranger Activities Specialist,
Rocky Mountain Regional Office**

CONTENTS

Summary of Deployment Incident

Description of Fuels, Weather, Topography, and Fire Behavior

Narrative of Deployment Incident

Narrative of Investigation

Interviews of:

Dan Sholly, Chief Ranger
Curt Wainwright, Pilot
Dick Bahr, Helitack Supervisor
John Dunfee, Helitack Crew
Christin Cowan, Helitack Crew
Jane Lopez, Helitack Crew

Diagram of Deployment Site

Photographs of Deployment Site

Dispatch Log

Topographic Map of Deployment Site

Predicted Fire Potential

Rocky Mountain Region's Policy on Investigating Fire Shelter Deployments

SUMMARY

On July 14, 1988 at about 1730, Dan Sholly, John Dunfee, and Christin Cowan were involved in a fire shelter deployment incident in Yellowstone National Park. The incident occurred while they were attempting to protect the Calfee Creek Cabin from the Clover Fire. They became overrun and had to deploy their shelters. They had only two shelters between the three of them and had to double-up. No one was injured in the incident.

DESCRIPTION OF FUELS, WEATHER,
TOPOGRAPHY, AND FIRE BEHAVIOR

Fuels: The canopy is quite ragged consisting of predominately over mature lodgepole pine with englemann spruce, sub-alpine fir, and white bark pine in pole sized classes. The lodgepole is old growth in successional stages. This area is similar to fire behavior fuel model 10 under normal wind conditions and fire behavior fuel model 12 under high wind conditions.

Fire Behavior: The fire was actively burning, crowning, and torching. It was flanking down river and running up the slopes. The fire was estimated to have spread from 300 acres to 4700 acres between 1400 and 1600 on July 14.

Weather: Weather readings were taken at time of deployment by Dick Bahr near the deployment site and were as follows:

1) At 1630 dry bulb was 74, wet bulb was 52, relative humidity was 35 percent, wind was 4 to 8 miles per hour out of the west/southwest. This reading was taken from a ridgetop about 3/4 mile due west of the cabin and about 2000 feet above the cabin.

2) At 1740 dry bulb was 82, wet bulb was 53, relative humidity was 14 percent, wind was 4 to 8 miles per hour out of the southwest and gusting to 15 miles per hour. This reading was taken 1 mile north of the cabin.

3) At 1830 dry bulb was 70, wet bulb was 50, relative humidity was 26 percent, wind was 4 to 8 miles per hour out of the southwest. This reading was taken from a ridgetop 3/4 mile northwest of the cabin and about 2000 feet above the cabin.

The fire area was in the midst of a drought with high to extreme fire potential predicted throughout the region (see predicted fire potential).

Topography: The deployment site was located in a large meadow just north of the Calfee Creek Cabin. The site was just west of the Lamar River in the Lamar River Canyon (see diagram and topographical map). The Lamar River Canyon has a general north south orientation at the site with elevations ranging from about 6500 feet along the river bottom to about 9000 feet along the ridgetops.

NARRATIVE OF INCIDENT

(The following narrative is based upon interviews of those involved in the deployment incident. It is our best guess at what occurred. Where we found major discrepancies in facts regarding an issue, the issue was omitted from the narrative. The main case-in-point would be whether or not Sholly knew his crew was ill-equipped and, if so, when he knew it. We are leaving it up to the reviewers to decide this issue based upon information found in the interviews.)

At about 1400 on July 14, 1988, Sholly and Bahr took off by helicopter for Grant Village, but were re-routed to the Clover Fire. A backcountry ranger near the Clover Fire requested their assistance evacuating outfitters who were being threatened.

After assisting the outfitters, they noticed the fire was threatening the Calfee Creek Cabin and decided to try to protect it. The fire was about a mile above the cabin at the time. They notified a helitack crew (Lopez, Cowan, and Dunfee) working in the area that their assistance would be needed and made arrangements to pick them up.

Before picking up the helitack crew, they dropped off Bahr on a ridgetop overlooking the cabin to act as a spotter. Once they had the crew on board they attempted to land at the cabin, but were too heavy. They dropped off Lopez on another ridgetop and landed near the cabin site. The fire was about 1/8 mile away when they landed.

Sholly called for a retardant drop and he, Dunfee, and Cowan began to work on protecting the cabin. They interrupted their work briefly to locate a safe area in the meadow near the cabin and stored their gear. They went back to work burning out around the cabin and removing fuels from it. While working, the fire jumped the river.

The retardant plane arrived but, due to topography and smoke, was unable to get in. Just prior to the plane's arrival, Sholly ordered the helicopter to leave telling the pilot that he and the crew would remain.

They continued working on the cabin when a ground fire in the area got up into the trees and started a crown fire. They left the cabin, went to the safe area in the meadow, and pulled out their shelters (see diagram). They had only two shelters for the three of them and decided that Cowan would double-up with Sholly.

The fire made a run up the eastside of the meadow and they deployed their shelters. After the run they got out of their shelters and were out for only a few minutes when the fire made a run up the westside of the meadow followed shortly by the main wall of flame. They got back in their shelters and remained there for about 40 minutes. After the fire passed, they got out of their shelters. Nobody was injured in the incident.

NARRATIVE OF INVESTIGATION

On Friday, July 15, Yellowstone's Fire Management Officer, Terry Danforth, called and reported a fire shelter deployment incident. He urged me to come to the park and investigate it as soon as possible while the facts were still fresh. He said the National Wildland Fire Coordinating Group requests that all such incidents be investigated.

He briefed me on the incident, saying that Dan Sholly, Yellowstone's Chief Ranger, had taken a couple of helitack people in to save a cabin from fire and had become overrun. He said one of the helitack people did not have a shelter and had to share Sholly's.

He said he had already passed this information to Steve Botti at BIFC.

After briefing John Chapman, Regional Chief of Resource Management and Visitor Protection, and Jack Neckels, Deputy Regional Director, and obtaining their approval I put together a review panel to investigate the incident.

The review panel consisted of Steve Holder, Howard Dimont and myself. We went to Yellowstone and arrived in Mammoth at around 9:00 p.m. We met with Dan Sholly and discussed our plans for the next day.

The next day Sholly made arrangements to fly us into the site of the deployment. While driving to the helispot Sholly mentioned that the panel we put together did not have enough stature to conduct a review and that he would have liked Rick Gale as a member of the panel. As that was a fair criticism, I told Sholly we would act as a fact finding group only and that a review could be conducted later.

At the scene of the deployment we discussed what happened and diagrammed and photographed the area. After photographing the shelters in place we seized them and identified them as Anchor Industries Fire Shelters manufactured in December, 1985. The shelters appeared to be in good condition (the shelters were later taken to the Rocky Mountain Regional Office for storage).

While at the scene Sholly pointed out some of the actions he had taken to protect the cabin and we observed that the cabin had not been damaged by the fire.

Sholly had the two helitack people, who were with him at the time of deployment, flown to our location to be interviewed. They arrived and we conducted 15 minute individual interviews with each (see interviews of John Dunfee and Christin Cowan). We were cut short because they were needed elsewhere, but we told them we would interview them later when they returned to Mammoth.

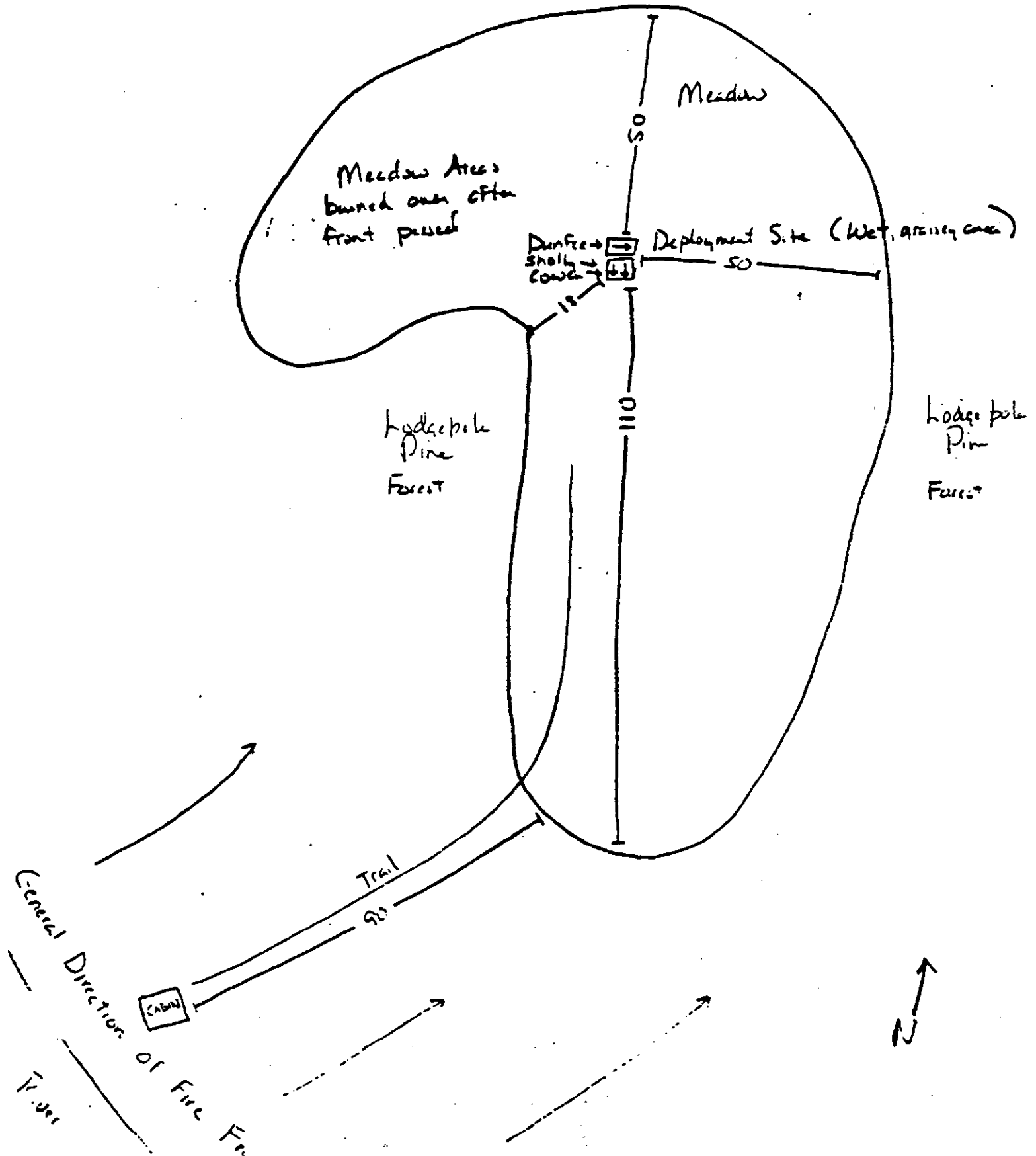
The following morning we interviewed Dick Bahr, who had functioned as a spotter during the fire shelter deployment, and Curt Wainwright, the pilot who had flown the crew into the cabin.

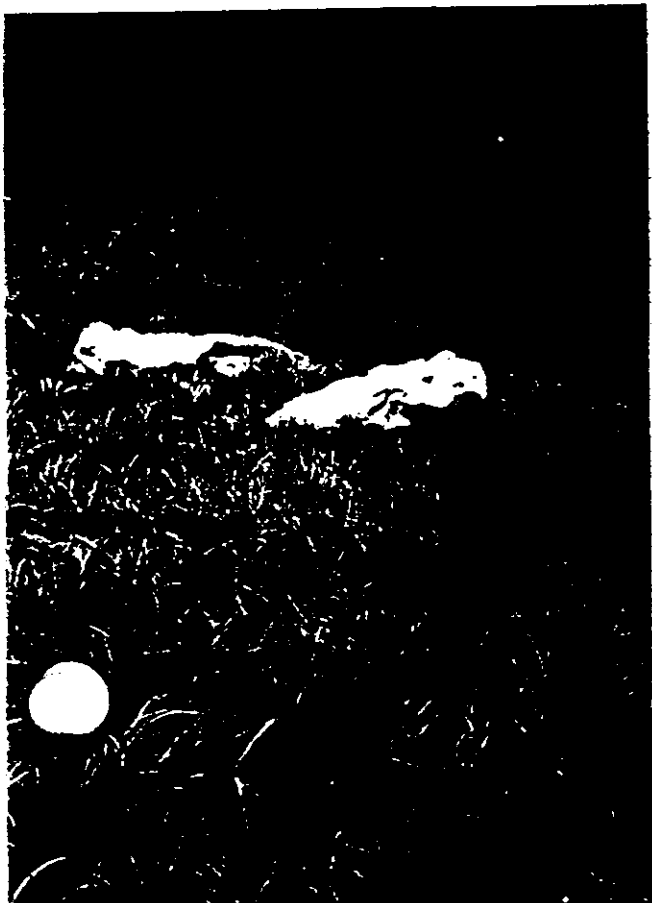
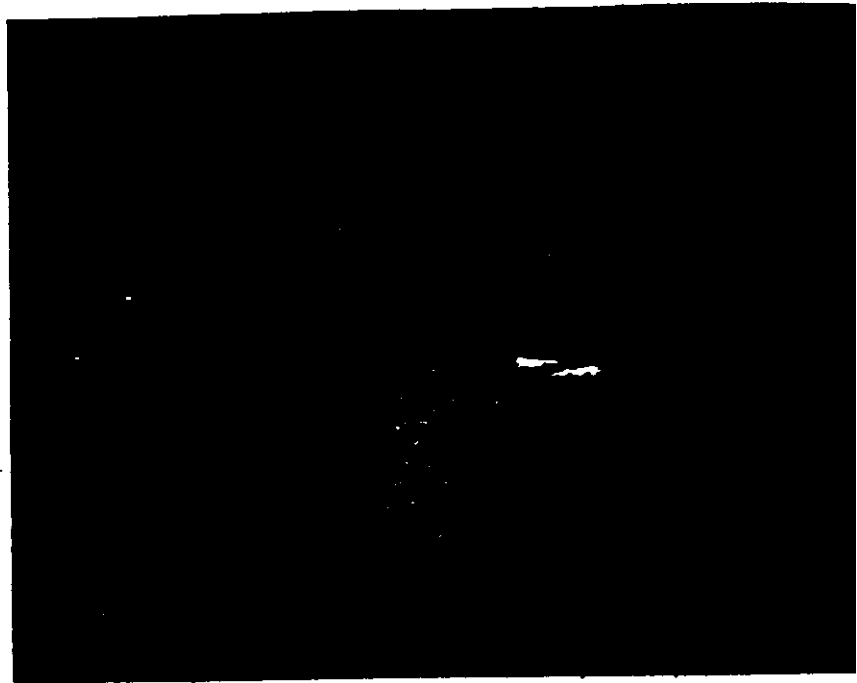
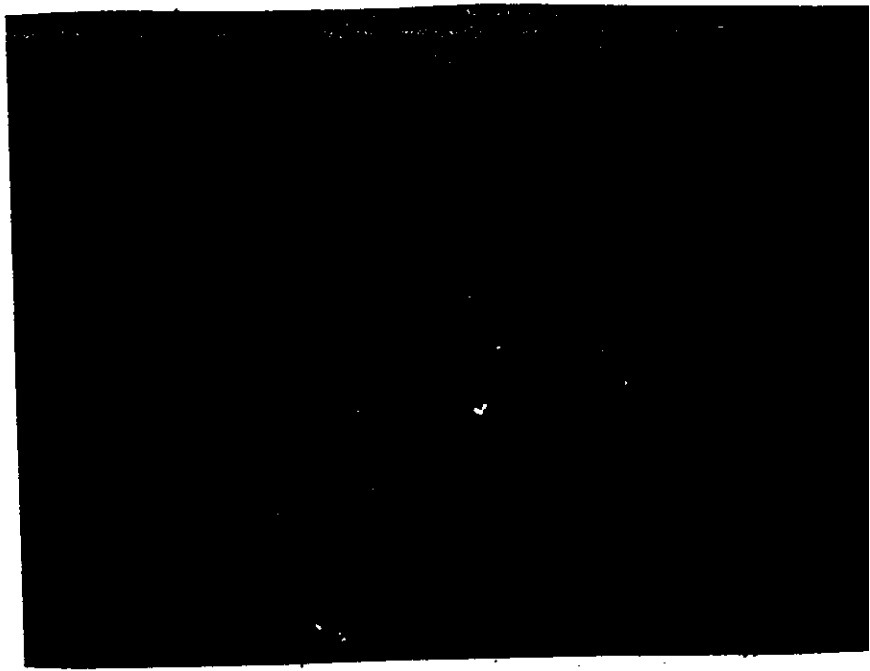
That afternoon we interviewed Dan Sholly and made attempts to locate Jane Lopez for an interview. We learned that she had left the Park to visit family.

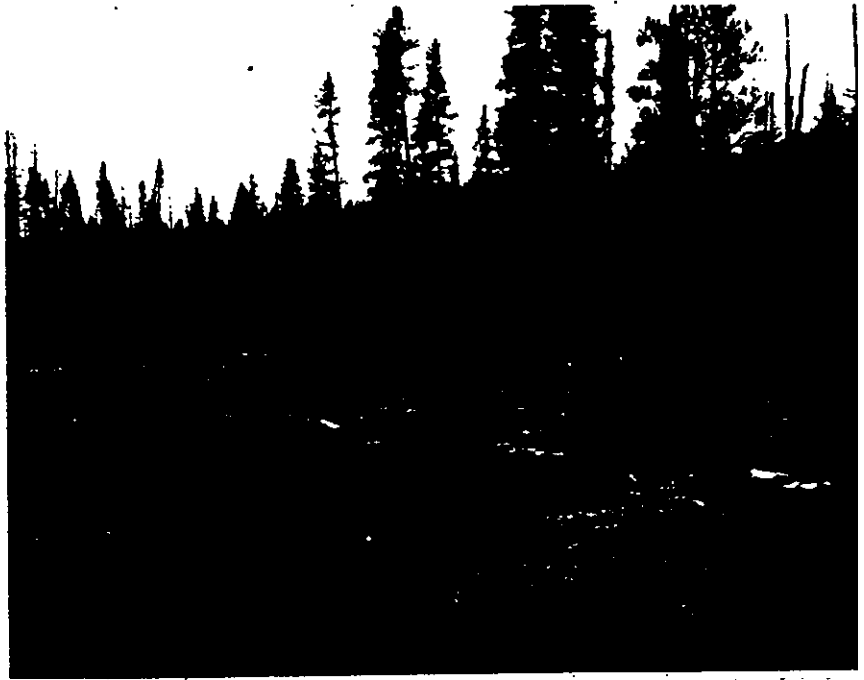
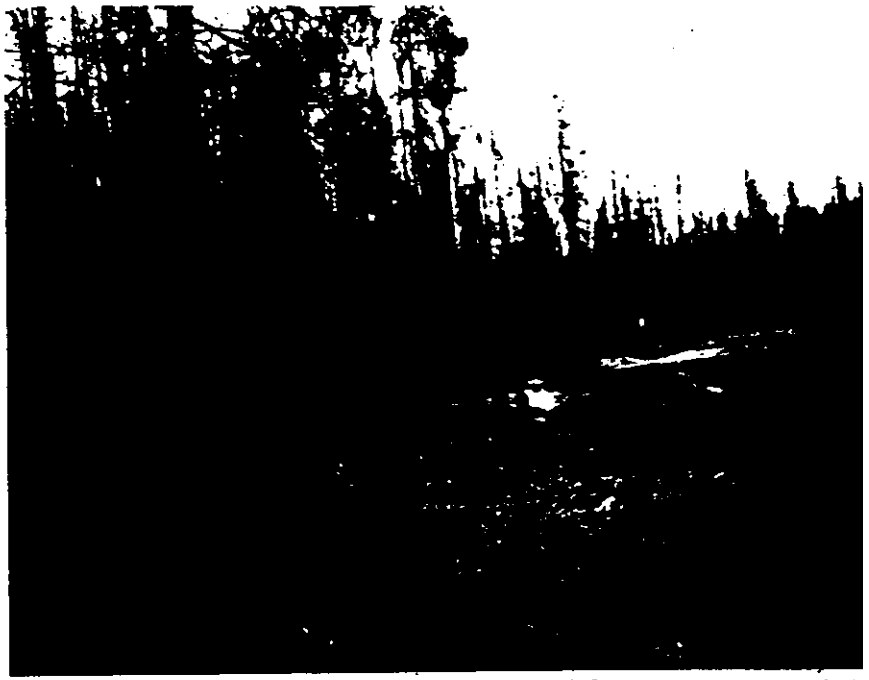
That night we did our follow-up interviews with Cowan and Dunfee and left the park the following morning at 4:30 a.m. (see attached interviews).

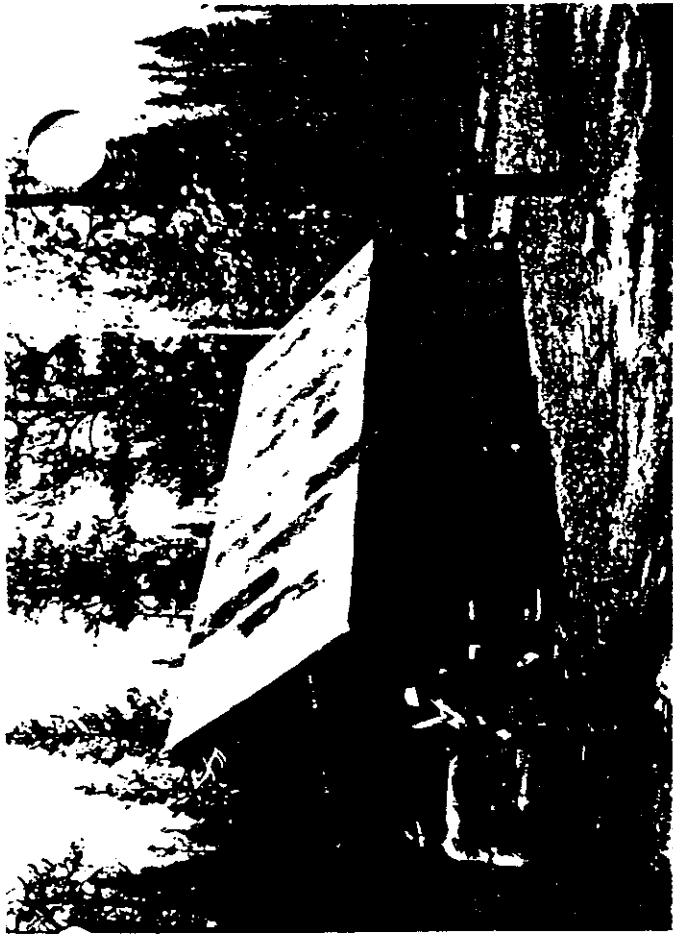
Diagram of Meadows
where deployment took
place

All measurements made
by pacing
1 pace \approx 3'









1430 #123 to ocean pass → so. gov. →
Jensen

1439 512 reports Falls fire UTM's @ 515.7E x
488.76N. Fire is limited to
north side of Falls River on ground
1:1 Small spruce no crowning

1451 All off Mount → Lamar
1455 Tim Cole will have a practice fire
in the Roosevelt parking beginning
now...

1500 #1 So. of Tower.

1510 222 Jones reports crown fire on East
side of river on Lamar Ridge

1509 #1 crown fire @ Collee Cr / Lamar River

1517 #1 landing - 3M1

1518 #1 on ground 3M1

1527 26 @ 5.3 mi NW of Gardiner landing
Gardiner area fire

1540 #1 ~~at~~ from lower fire

1555 #1 ~~at~~ on ground

1600 20 @ ~~at~~ → Fan

1600 #123 searching on open plateau - will
land & start dam for 1.5 hrs

1603 #1 ~~at~~ → north

1609 26 @ ~~at~~

1611 #1 Collee Cr area

1613 #1 landing on ridge due W. of Lamar -

127 will be lookout - Lopez or Pfeiffer
will go to Lamar to manifest still loads

H1 ... → N. in of cold cr. cabin (342)

10 ... → Showdown

017 #1 landing base of from willow cr.

028 #1 ... → Calfee cr. drainage

027 122 IS @ 568, 3 x 4957, 8 directly w. of
Calfee cr. Cabin @ 9200' in open meadow
Just south of Flint cr.

plans are to drop 103 + 2 @ Calfee

& send one to Laman

36 landing Calfee

4) 26Q

43 #1 ~~land~~ on Calfee cr.

38 103 ordered drop on Calfee Cabin

ordered from wys → 30 min ETA

46 Air tanker ~~at~~ 10 min

48 H123 ~~50~~ → green plate

51 ETA TANKER → 1715

56 122 advises they will burn out
around cabin.

702 ~~TANKER~~ ^{ETA} 1715

731 T47 1mi so of Laman → Narrows fire

734 516 Visee on Narrows fire

737 516 will try to move visitors off Narrows fire

742 T47 own Narrows fire

748 26Q TO FROST LK • RETURN TO CLOVER

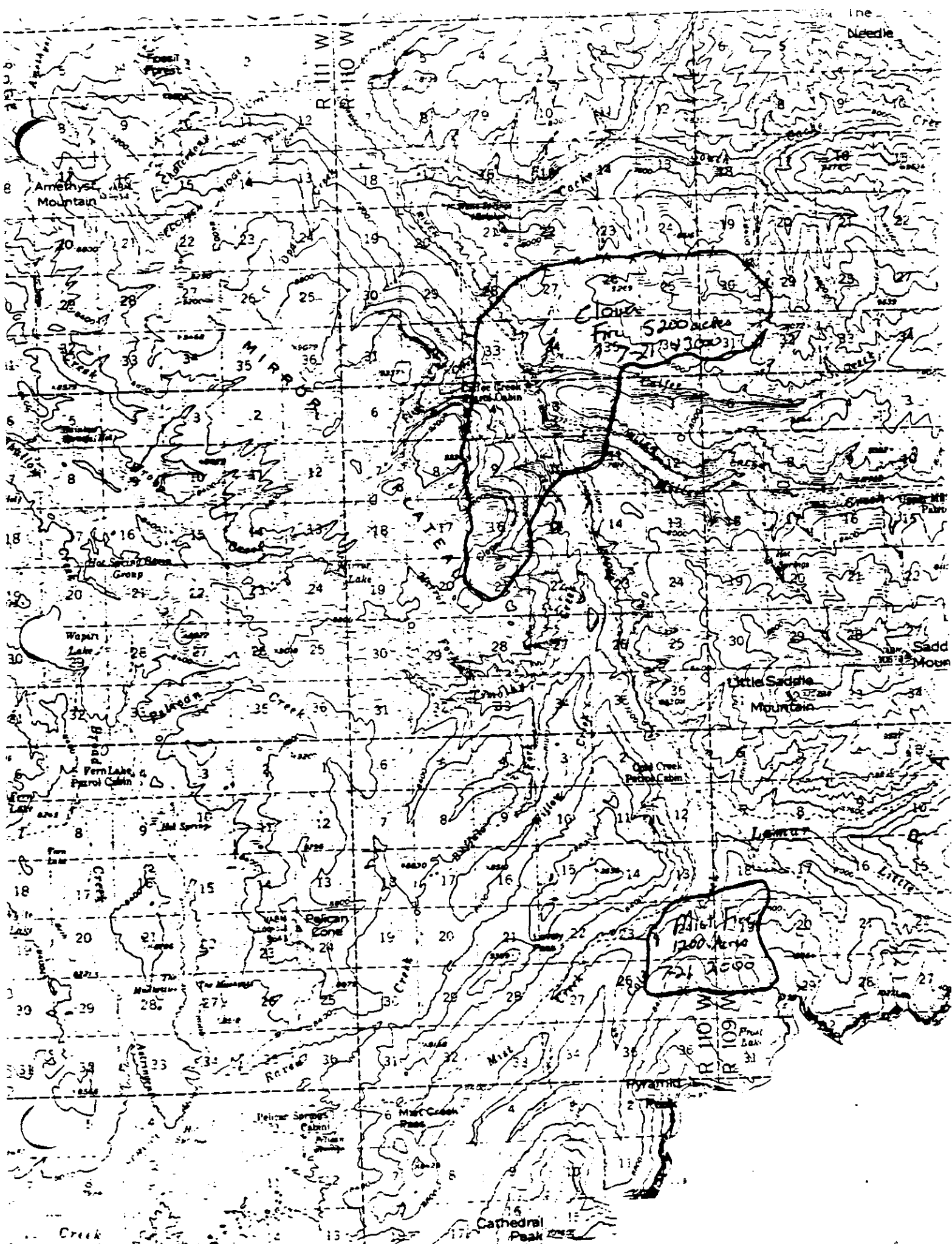
747 H1 just w. of Calfee Cabin → recon.

Jumpers: Carstart 7 will be jumping

Narrows fire - will contact us in 1/2 hr.

- 1804 272 Robinson rept's done visible from
Lamar R.S. - in valley bottom 100' flame length
- 1807 260 miles cr.
- 1807 HI on ground Lamar to refund
- 1813 147 on grd. @ 1805
- 96 will advise when Mink Cr fire
- 1820 HI off Lamar → Calfee Cabin
- 1830 147 off ways → narrows ETA 15min
- 1834 260 landing Gardner
- 1858 HI from Cloud Ave
- 1914 HI on ground Lamar
- 1945 HI off Lamar → Clover fire
- 1946 No More open fires in Yellowstone Park.
- 2000 HI on ground Calfee Cabin
- 2011 HI off Calfee → Recan
- 2020 HI landing 304
- 2042 HI off Calfee → Mann Gully/Cowan
~~HI~~ Dumper/Helms @ Calfee for the
Nite
- 2047 HI landing 1000
- 2048 Recan Clark will be at F.R. 1000
at West fork ex 7313
- 2054 HI off Lamar → Mann
- 212 HI over Tower → Recan
- 2222 HI high EC.

Fuel Truck miles 62



SEVERITY POTENTIAL, JULY 9, TO AUGUST 5, 1988

U.S. Drought Index (PDI) shows drought of some form in 81% of the climatic divisions within the US. Conditions are significantly ahead of last year at this time. Areas in the northwest that usually recover from minor drought with June rains did not receive the normal precipitation for June. Live fuels in many areas are showing stress and some mortality due to the drought. This is having a significant effect on fire activity and fire behavior.

NORTHERN - Potential: medium to extreme. Precipitation and temperatures over the the area from the continental divide west have been near normal keeping fire potential moderate. The eastern part of the area has seen record breaking high temperatures with little or no precipitation. PDI reflects extreme drought conditions throughout the eastern part of the region. Thousand hour timelag fuels (THTLF) range as low as 9% in the east to 18% in the west. Long range forecasts do not show any relief. Medium to extreme fire activity can be expected.

ROCKY MOUNTAIN - Potential: low to extreme. Temperatures have ranged above normal. Precipitation has been normal, however the shortness of duration, high winds and above normal temperatures have negated it's effect. PDI indicates drought conditions in western Colorado, Wyoming and western S. Dakota. THTLF range from 6 to 13% throughout the area. Long range forecast indicates above normal temperatures equal chances of normal precipitation. Activity should decrease in the southern half of the area due to monsoonal activity with medium to high fire activity in the north.

SOUTHWEST - Potential: low to medium. Monsoonal activity has provided relief the eastern half of the area, however some areas in the west remain dry. THTLF range from 13 to 18%. Fire dangers still remain high in brush at lower elevations in the west, but expect monsoonal activity to provide needed precipitation by mid-month. Long range forecast indicates normal temperatures, and a high probability of significant precipitation. Expect some fire activity to continue in the west at low elevations.

GREAT BASIN - Potential: high. Precipitation in the latter part of June provided some temporary relief, however quantities were not significant enough to raise fuel moistures. Temperatures range from normal to above normal. PDI indicates drought conditions in western Nevada, western Wyoming, and southeast Idaho. THTLF range from 10 to 15%. Long range forecast calls for equal chances of normal temperatures and precipitation. Expect medium to high fire activity.

CALIFORNIA - Potential: high to extreme. Temperatures and precipitation have been near normal. PDI indicates 90% of the state is within severe or extreme drought. Fire occurrence as well as acreages are running 130% of the five year average. Long range forecasts indicate near normal temperatures with little to no precipitation. Medium to extreme fire activity can be expected. Hawaii fire dangers are running high to extreme due to below normal precipitation. This has necessitated the closing of one half of the Hawaii Volcano NP. Long range forecast indicates little change from present situation.

OUTERWEST - Potential: medium to high. PDI shows some improvement in the western third of the area, however moderate to extreme drought conditions are still present from the Cascades eastward. Long range forecasts indicate below normal temperatures with equal chances of normal precipitation. Expect medium to high fire activity.

SOUTHEAST - Potential: medium to extreme. Precipitation has been scattered throughout the area, however it has not been widespread or significant in amounts to relieve drought conditions that exist. The area is experiencing unusual summer activity. Many trees in the southern Appalachians are showing signs of severe stress with some mortality. All long range indications are for the drought to continue and spread with no relief forecasted. Expect medium to high fire activity.

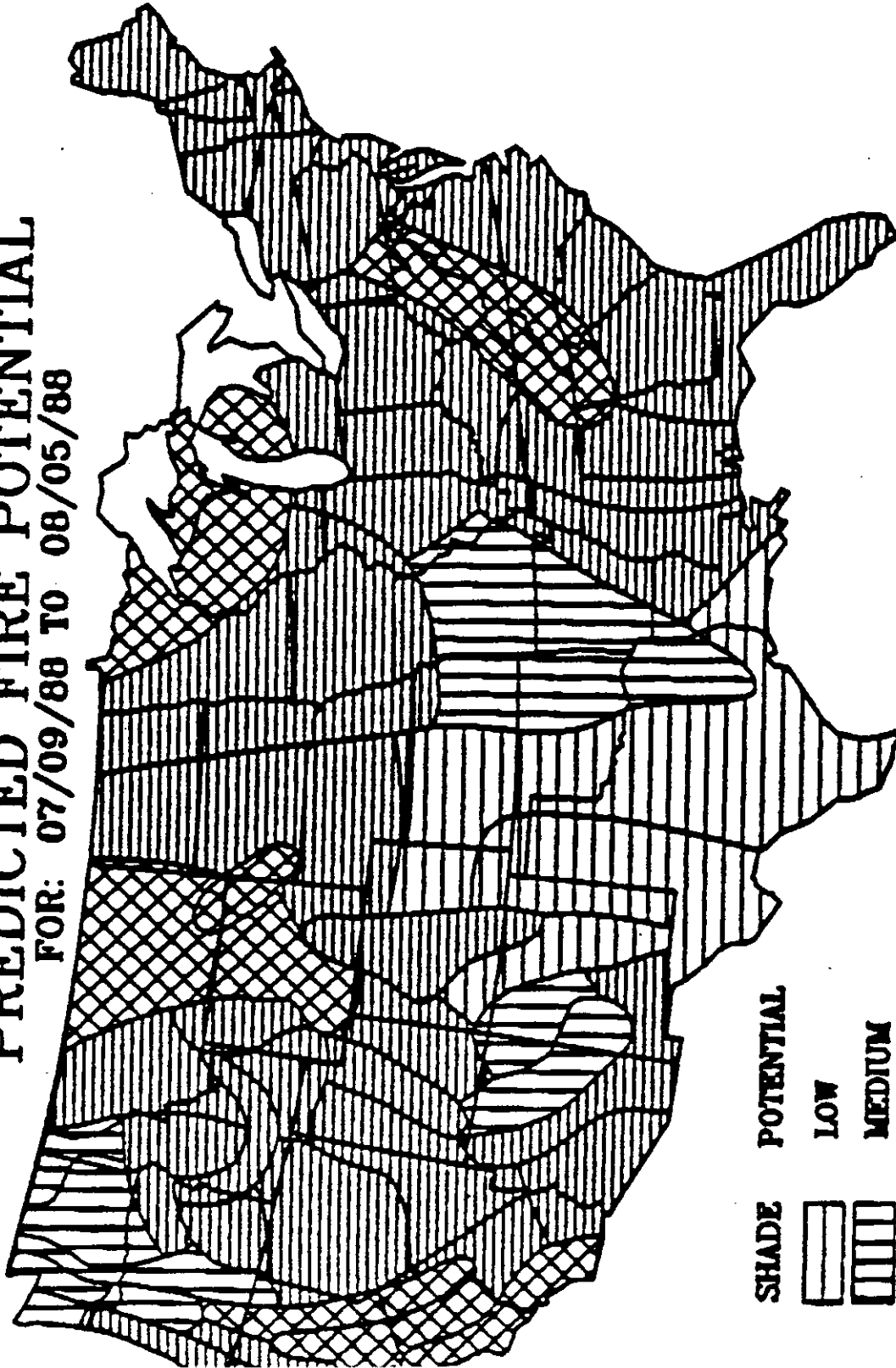
NORTHEAST - Potential: medium to extreme. Precipitation has been below normal with temperatures above normal. PDI indicated severe to extreme drought conditions in the west, northeast, and central parts of the area. Water ditches in the Upper Peninsula of Michigan are at the lowest level on record and some have dried up and all areas are experiencing unusual fire activity. Long range forecasts indicate above normal temperatures and below normal precipitation. Expect fire activity to continue at medium to high levels.

ALASKA - Potential: medium to high. Precipitation amounts in the northeastern section of the interior continue to be below normal with warm temperatures. Fire activity in the interior has created smoke problems and is hampering detection of new starts. Long range forecasts indicate a continuance of warm dry conditions with occasional thunderstorms. Medium to high activity can be expected.

Prepared: July 7, 1988 by T. Rios - NIPCC INTELLIGENCE SECTION

PREDICTED FIRE POTENTIAL

FOR: 07/09/88 TO 08/05/88



SHADE POTENTIAL



LOW



MEDIUM



HIGH



EXTREME

DROUGHT CONDITIONS ARE AFFECTING 81% OF THE CLIMATIC DIVISIONS IN THE US. THE DROUGHT IS CAUSING MOST OF THE US TO HAVE HIGH TO EXT. CONDITIONS AT THE SAME TIME. NIFCC INTEL. BOISE, ID. T.RIOS

Olson AD ^{see} check on list

Huff DH Lynch 10/29/87

Chapman W

Y14 (RMR-MR)

OCT 29 1987 ^{Powell} P

Memorandum

To: Superintendents, Rocky Mountain Region

From: Associate Regional Director, Park Operations,
Rocky Mountain Region

Subject: Reporting Fire Related Major Injuries and Life Threatening
"Near-Miss" Incidents

Enclosed for your information is a copy of a memorandum sent out by the U. S. Forest Service relating to reporting serious safety incidents that occur during wildland fire activity. The past 4 years have been very active fire seasons. Time and again wildland managers have had to mobilize for campaign size suppression efforts. During these fires we have had a significant number of injuries and also a disconcerting number of "near-miss" incidents.

The entire fire community is working to reduce the number of fire related incidents. To identify problem areas that can be corrected there is a definite need to investigate and review each occurrence. Each park has a program for following up on accidents but this program has not been feeding into the fire information base.

The National Park Service has agreed to make our fire safety incident information available to the interagency fire safety program.

We are asking that when there is a fatality, major injury or a life threatening "near-miss" on a fire in your park, that you will take the responsibility for seeing that the following action is taken:

1. Meet with your Incident Commander to determine if there was an incident that requires follow up. If there was an incident, assign a member of your staff to investigate the incident. This investigator should work with the fire team but report to the superintendent.
2. Report the incident as soon as possible by phone to your regional fire coordinator. Region will contact our national fire office and our national office will contact NIFCC.
3. A brief review of the incident should be available to your regional fire coordinator within 3 days. Region will take the lead in forwarding your brief by electronic mail so we can make the 3-day deadline.
4. If the incident is complex enough that you need an outside investigative team, you should request assistance from your regional coordinator.

hopefully we will not have any major fire-related incidents, but if we do we can not afford to not seek out the cause of the incident. Fire is a dangerous activity but with proper management we can eliminate a great deal of the risk for our fire personnel.

Please see that your fire staff receives a copy of this memorandum and that they make it a part of their operating plan.

[Sgd] Homer L. Rouse

Enclosure

bcc:
RMR-MP, Safety Manager

JAOlson:ck:10/23/87:2640:fireinjuries



United States
Department of
Agriculture

Forest
Service

WO

AASFM
9/28
<input checked="" type="checkbox"/> Director
<input checked="" type="checkbox"/> Management
<input checked="" type="checkbox"/> Mgt. Spec.
States/Coop
Air Quality
<input checked="" type="checkbox"/> Pest Coord.
Aviation Off.
Transp. Off.
S. Zone
PH Zone
Rec. Clerk

Reply to: ✓ 5100/6730 cc:

Date: AUG 24 1987

Subject: Reporting Fatalities, Major Fire Related Injuries and Life Threatening "Near-Miss" Incidents.

To: NWCG Members

Last December, the National Wildfire Coordinating Group (NWCG) formally approved the establishment of a Fireline Safety Committee. Their mission includes the development of a standardized, consistent approach to the collection, analysis, and distribution of information relating to fatalities, major fire-related injuries, and life-threatening "near miss" incidents occurring in forest/wildland fire operations.

The NWCG, at its June meeting, formally endorsed the Fireline Safety Committee's recommendations regarding a structured process for reporting and sharing critical fireline accident/incident information.

The procedure is as follows:

1. DEFINITIONS

Major Fire Related Injury: Any personal injury occurring on forest/wildland operations that requires hospitalization for more than 48 hours.

Life Threatening "Near-Miss" Incidents: An incident in which the circumstances indicate serious potential for the loss of life such as a shelter deployment or other burnover situation.

2. REPORTING

Federal Agencies and States are requested to provide:

Initial accident report (short alert) to NIFCC as soon as possible. The report will provide immediate information such as number of victims involved, extent of injuries, general activity involved at the time of injury, etc.

A copy of the accident brief within 3 days, if available, to Forest Service Fire and Aviation Management (F&AM) Washington Office (WO). The purpose of the accident brief is one of notification with enough factual information to determine if immediate action is needed to prevent additional accidents.



NWCC Members

A copy of the Accident Investigation Report to Forest Service F&AM-WO upon completion.

3. DISSEMINATION

NIFCC will disseminate initial reports via daily Fire Management Reporting System within 24 hours of receipt.

Forest Service, F&AM, will disseminate accident brief to Federal agencies and States within 5 days of receipt.

After receipt of an investigation report, the State of Florida will extract the following information and prepare a safety-gram for distribution: Accident brief; narrative; findings; sequence of events; cause/probable cause; and actions taken.

Forest Service, F&AM-WO, will distribute the prepared information to the Federal agencies and States.

4. TREND DATA

By the Safety and Health Manager will extract the following information from the investigation reports: Fire name; location; date; organization; fuel type; weather; topography; cause/probable cause; and "watch out" situations. This information will be periodically reviewed by the Safety Committee to identify accident trends and corrective actions needed.

5. DATA STORAGE

Accident investigation reports will be stored in FIREBASE.

We are committed to sharing, as freely and openly as possible, critical information that could help to save firefighter lives. Please adhere to these procedures in reporting major fireline accident/incident information.

Please share this information with your local cooperators.



L.A. AMICARELLA, Director
Fire and Aviation Management