

# “The Dude Fire”

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Payson Helitack 1968

Payson Hotshot Foreman 1971

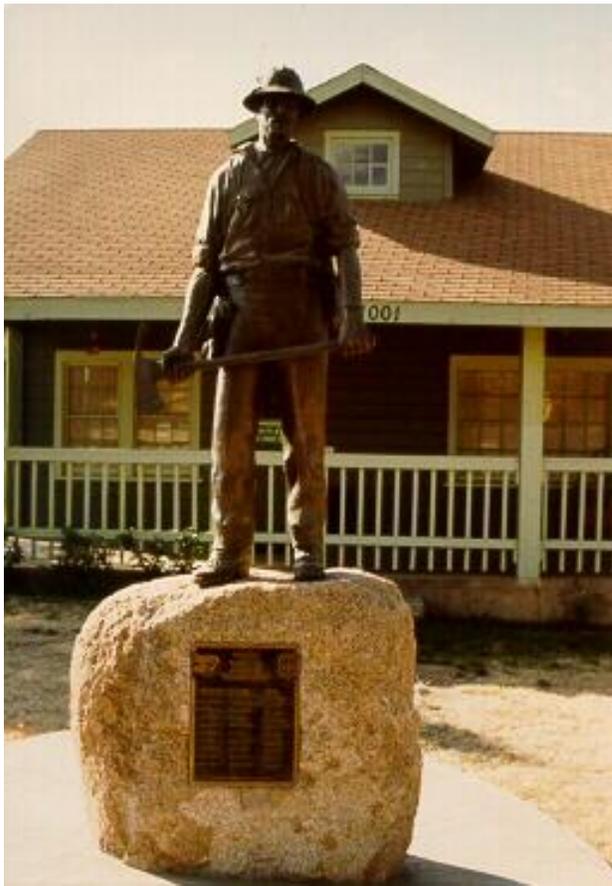
Assistant U.S. Attorney 1974 – present

Prepared for the 2009 Dude Fire Staff Ride

Tenth Wildland Fire Safety Summit

International Association of Wildland Fire

and the NWCG Safety and Health Working Team



“Dedicated to Firefighters who made the ultimate sacrifice to protect our magnificent Mogollon Rim Country”

## 1. Arrival

At about 0200 hours on June 26, 1990 the Perryville wildland firefighting crew arrived at the Bonita Creek subdivision near a forest fire named the Dude Fire. Their rigs were covered with red and grey dust. They piled out of their rigs, headlamps lit, enjoying the cool darkness of the forest. It was a relief to get out of the rigs. They had seen the fire's plume on the way up from Phoenix and had a mix of anxiety, curiosity and excitement among them, some reading, others listening to music, watching the scenery or napping. One of the rigs had overheated during the climb out of the desert into the pines, but they made it to Payson where the glow of the fire was visible in the distance. They were shuttled around from the Ranger Station, to dinner, to a spike camp to bed down, but were then diverted to Bonita Creek to start work. They began to unload in the subdivision but were told to go back down to the Control Road as the fire was too active for that time of night and everyone was re-grouping down there. They were nonetheless happy to be there. Home was the Perryville Prison for these inmate-firefighters.

The Crew Rep assigned to this inmate crew was Dave LaTour from Tucson, a qualified Strike Team Leader and Task Force Leader who was in training for Division Supervisor. LaTour had Yellowstone, Oregon and other large fire experience. LaTour had worked with the Perryville Crew on other fires. Crew Reps serve as leaders of the crew and as liaison to the Incident Command staff. LaTour, a regular Rural Metro firefighter, had driven up to the Payson Ranger Station that night from Tucson with S.J. "Jeff" Piechura. They had met the Perryville Crew there too. They found Cliff Pearlberg, the Arizona State Agency Rep on the fire, who said they needed an engine strike team leader and a crew rep for Perryville. Because LaTour had greater experience as a prison crew rep and Piechura had greater experience with engines, LaTour was assigned to the Perryville Crew and Piechura to lead an Engine Strike Team, which headed out toward Bonita Creek with some engines.

Larry Terra was the senior Corrections Officer assigned to the Perryville Crew and also served the role of a crew foreman. At Bonita Creek LaTour asked Terra to assemble the crew for the safety meeting. They were reminded to park the vehicles heading out in case they had to escape. LaTour told the crew to take their fire shelters out of their packs and put them on their hip. They discussed use of the roads as escape routes to their vehicles. They hadn't identified any other safety zones yet, but could deploy shelters "in the black" if they were threatened.

Lightning had started the Dude Fire about noon the day before the Perryville Crew arrived. Fire and Aviation Staff at the Tonto National Forest office in Phoenix saw the lightning strike displayed on their computer nearly instantaneously. Wayne Stutzman, a resident at the old Cowan Ranch about 2 1/4

miles Southwest of the origin of the Dude Fire, heard one clap of thunder at 1155, and two claps, closer, at 1225. By 1230 ashes were falling on his deck. He and his wife discussed the possibility of evacuation, but that would come later. They reported the fire to the Whispering Pines Fire Department because the line to the Forest Service was busy. Stutzsman was familiar with the terrain as he had hunted Elk in the area. He and Al Kendall, his neighbor, grabbed some tools and drove up Dude Creek to the Highline National Recreation Trail. They parked at the Trail and hiked into the fire. The Tonto Air Attack plane saw the fire while taxiing on the Payson Airport runway at about 1300. Initial attack was ordered. Payson Helitack was quickly on the fire. Helitack teams are designed to quickly suppress small fires before they have a chance to become large incidents. The fire was officially recorded at 1315 on June 25, 1990.

The first air tanker was over the fire at 1400. When Stutzsman and Kendall reached the fire, the helicopter and tanker were there. They cut line around the fire for about two hours. Then they hiked back to Dude Creek to get a drink and rest. They met Jeff Prevey, Pleasant Valley Hotshots near Dude Creek. The first ground crews began arriving on foot as they had parked their Hotshot Buggies down below, near the Old Civilian Conservation Corps Camp, where the creek crosses the road, a long way from the fire. Stutzsman and Kendall suggested they drive the trucks on up to the Highline Trail, to deliver the firefighters who were walking in. Their advice was ignored and they were told to leave the area.

During the Depression, workers at the CCC Camp raised Brook Trout at the now-abandoned Piper Spring fish hatchery just west of the fire, installed check dams in the creeks, built recreation trails and stocked Brook Trout in Dude Creek and other streams. There was still a good population of Brook Trout in Dude Creek in 1990, long after the CCC Camp was abandoned. After the Dude Fire the creek was scoured by floods. Threatened Gila Trout were reintroduced to replace the Brook Trout.

The Mogollon Rim was named for Don Juan Ignacio Flores Mogollon, who was the Governor of the Province of New Mexico from 1712 - 1715. The Rim is the Southern end of the Colorado Plateau geologic province. The Rim divides the Colorado Plateau to the North, which includes the Grand Canyon, and marks an end to the Basin and Range geologic province, which includes the Sonoran Desert to the South. The world famous red rocks of Sedona are part of the Rim, dubbed one of the most beautiful places in the world. Human occupation of the Colorado Plateau has been traced back at least 12,000 years. It was home to the Anasazi or "Ancient People" whose civilization collapsed about 800 years ago, followed by the Mogollon People, and the Apache, who still live there. Father Kino approached the Apache homelands from the south in 1697 but he could not penetrate them and turned back. The Government's policies of exile or extermination during the Indian Wars

culminated in defeat of the Apache in 1875 by General George Crook, whose famous trail from Camp Verde into Apache territory passes through the Dude Fire. The last cavalry battle with the Apache in Arizona involved Captain Chafee's cavalry in the Battle of Big Dry Wash on July 17, 1882, just East of the Dude Fire, on top of the Rim at General Spring along the General Crook Trail. These were White Mountain Apache lead by Na-tio-tish. This would become the westernmost holding point for the Dude Fire in this rugged landscape which remains un-surveyed, as lands "not fit for human use or habitation" according to survey notes from the 1800's. Among the few parcels which could be made livable was the site of writer Zane Grey's hunting lodge, which would be destroyed by the Dude Fire in short order.

Fire behavior from the time of ignition included torching, spotting, and runs through the crowns of the Ponderosa Pines and the Firs. Payson, a ranching and lumber town in the past, but now largely a tourist and retirement community, sits within the largest contiguous Ponderosa Pine forest in North America, and the Dude Fire was on the march through it. When observed from the air at 1330 the fire was estimated at 5 acres, located just below the Rim. The Rim forms an escarpment which runs East and West, dividing Arizona North and South, and extending Eastward clear into New Mexico. Within an hour the fire had grown to 50 acres. Fire reached the top of the Rim at about 1500, when a Type II Incident Management Team was ordered. By 1600 the fire had grown to 300 acres with a spot fire about 1 mile East of the main fire.

The Mogollon Rim is several thousand feet high, where lower desert, pinion-juniper, and oak woodland transitions with higher pine-fir country. When the topographic effect combines with the climate differences, especially monsoon moisture streaming up from Mexico, this escarpment produces unusually frequent lightning strikes, an annual density of 2 to 8 strikes per square kilometer. "Hazardous Weather Climatology For Arizona" Shoemaker, C., Davis, J.T., NOAA Technical Memorandum NWS WR-282 (February, 2008).

The top of the Rim is capped with reddish Coconino sandstone formations, formerly dry sand dunes in which trackways of *Chilichnus*, also known as *Laoporis noblei*, a mammal-like reptile the size of a small dog, and *Octopodichnus* a large didactyle spider, crisscrossed the dunes 270 million years ago, well before dinosaurs roamed the area.

The author's Bray Creek Ranch Trackway: *Chilichnus* = *Laoporis noblei*. Mammal-like reptile tracks made 270 million years ago, before dinosaurs, in sand dunes which became Coconino Sandstone. Tiny track resembling deer or javalina about an inch above the 11 centimeter mark on right side of photo is a large didactyle spider track, *Octopodichnus*, on edge of sand crescent left by *Chilichnus*.



Several thousand feet below that strata, grey limestone beds riddled with fossil marine life crop up, mixed with layers yielding geodes and Arizona diamonds which can be picked off the surface, some good enough for making costume jewelry. The Anasazi and Mogollon people traded these diamonds with other native peoples in the Southwest, for sea shell jewelry and other items. The nearest fire tower to the Dude Fire was Diamond Point Lookout located on a hilltop surrounded by diamond fields, and one of the best Bull Elk wintering areas in the County, Gilliland Gap. Diamond Point Lookout was built as a crude platform in 1927 and replaced with the current tower and living quarters in the 1930s.



(Forest Service archive photo)

Ice crystals had already formed above the fire plume the first afternoon of the fire. A by-product of combustion is the release of water. This moisture rises into the atmosphere along with the smoke, burning debris and heated air to create a plume. Strong winds can disrupt the plume, spreading it out, but if strong winds are absent, the plume just develops and can create its own weather. Fires as small as 100 acres have been known to generate sprinkles of rain on firefighters. FS Video.

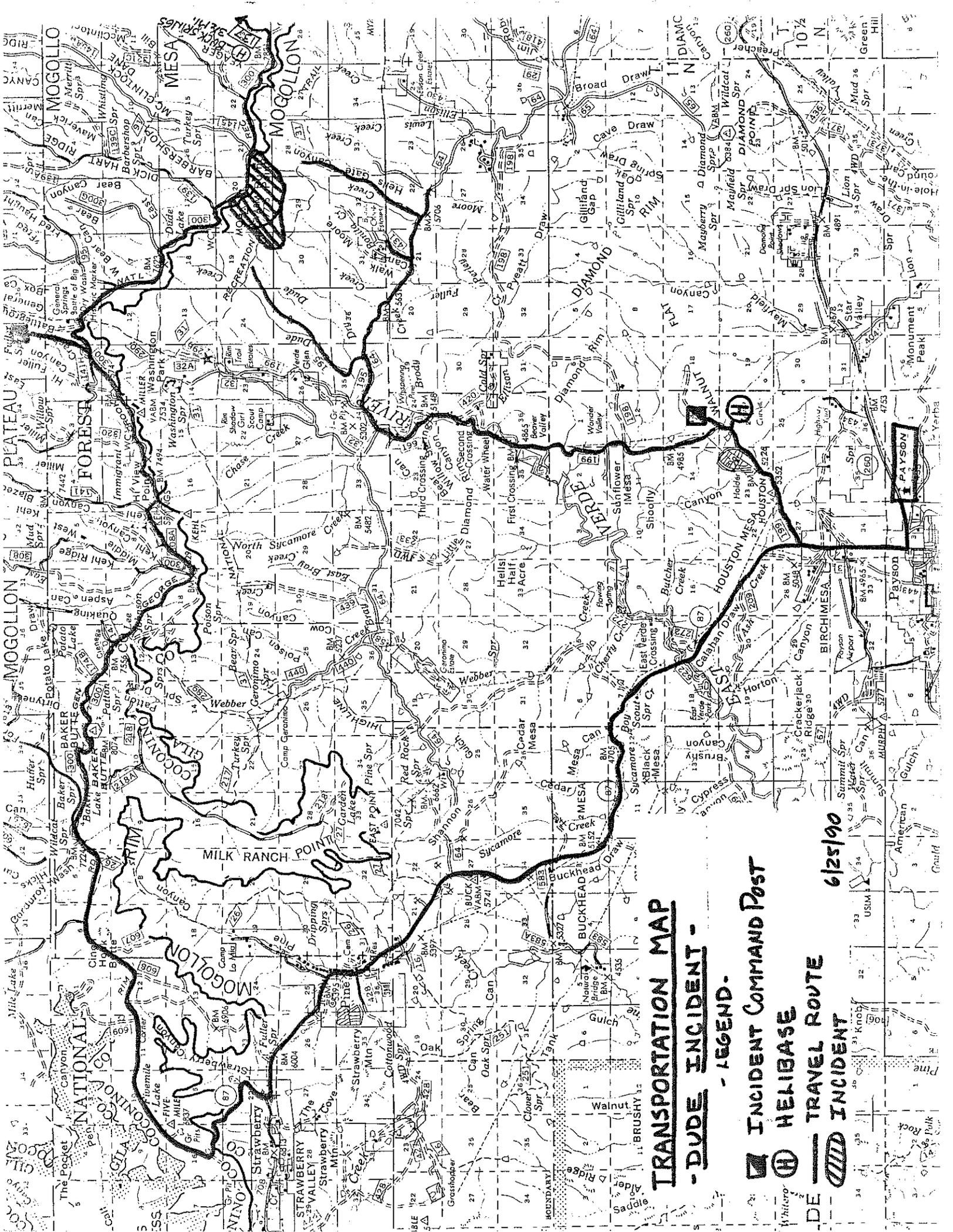
Lead planes and slurry tankers were active on the fire through the first evening. The tankers left the fire toward the West for their base in Prescott, under a few widely scattered clouds lit by the setting sun. After the air tankers left for

the evening, the helicopters all came in except 323 which stayed over the fire to reconnoiter. The airattack plane was also still up assessing the fire. Forest Road 300 runs along the top of the Rim, very close to the edge of the escarpment. It is often used to stop fires which run up the face of the Rim. It can be a dangerous place to work, uphill from the head of these fires, at the top of chutes and chimneys. Spotting over the 300 Road is also a common problem. The burnout along the 300 Road was going well though. The fire was still active on the East side under the Rim but appeared to be laying down at sunset. Mature Pine and Fir were torching along the face of the Rim. The nightly downslope winds had not yet started.

By 1800, eighteen crews (360 firefighters) had been ordered in addition to the initial attack resources. A Type I Incident Management Team was ordered at 2105 when it was clear that this fire would exceed the capability of a Type II Team's resources. 24 more crews were also ordered. By the time Perryville arrived at Bonita Creek, the fire was making a downslope push toward the cabins at Bonita Creek, consistent with the usual night time downdrafts off the Rim.

Dale Ashby was in the Bonita Creek area during the night. He called in to Command to ask what his assignment was going to be, and was assigned as a Group Supervisor on the Incident Command Team, to Group F. Group F, he was told, consisted of an Engine Strike Team and a handcrew to protect the cabins at Bonita Creek. The assigned resources were Bob Scopa as Strike Team Leader, as he was the strongest engine man and had lived at Bonita Creek, and the Perryville Crew. Ashby finally located Perryville along the Control Road.

The "Control Road" was originally named the "Fire Control Road" and had been constructed for that purpose years before. It ran East and West across the base of the Mogollon Rim, a few miles South of the escarpment. Paved highways intersected both ends of the Control Road, and these highways went up and over the Rim. Forest Road 300 on top of the Rim connected at both ends to these same highways, forming essentially a large rectangle of roads around the area, with the fire located in the middle of it. By this time the fire had run up the natural chimneys of the Rim and was bumping the 300 Road on the North side. If it spotted over the 300 Road that night it would have many miles of contiguous fuels to feed on.  
Transportation Map.



**TRANSPORTATION MAP**

**- DUDE INCIDENT -**

**- LEGEND -**

**INCIDENT COMMAND POST**

**HELIBASE**

**TRAVEL ROUTE**

**INCIDENT**

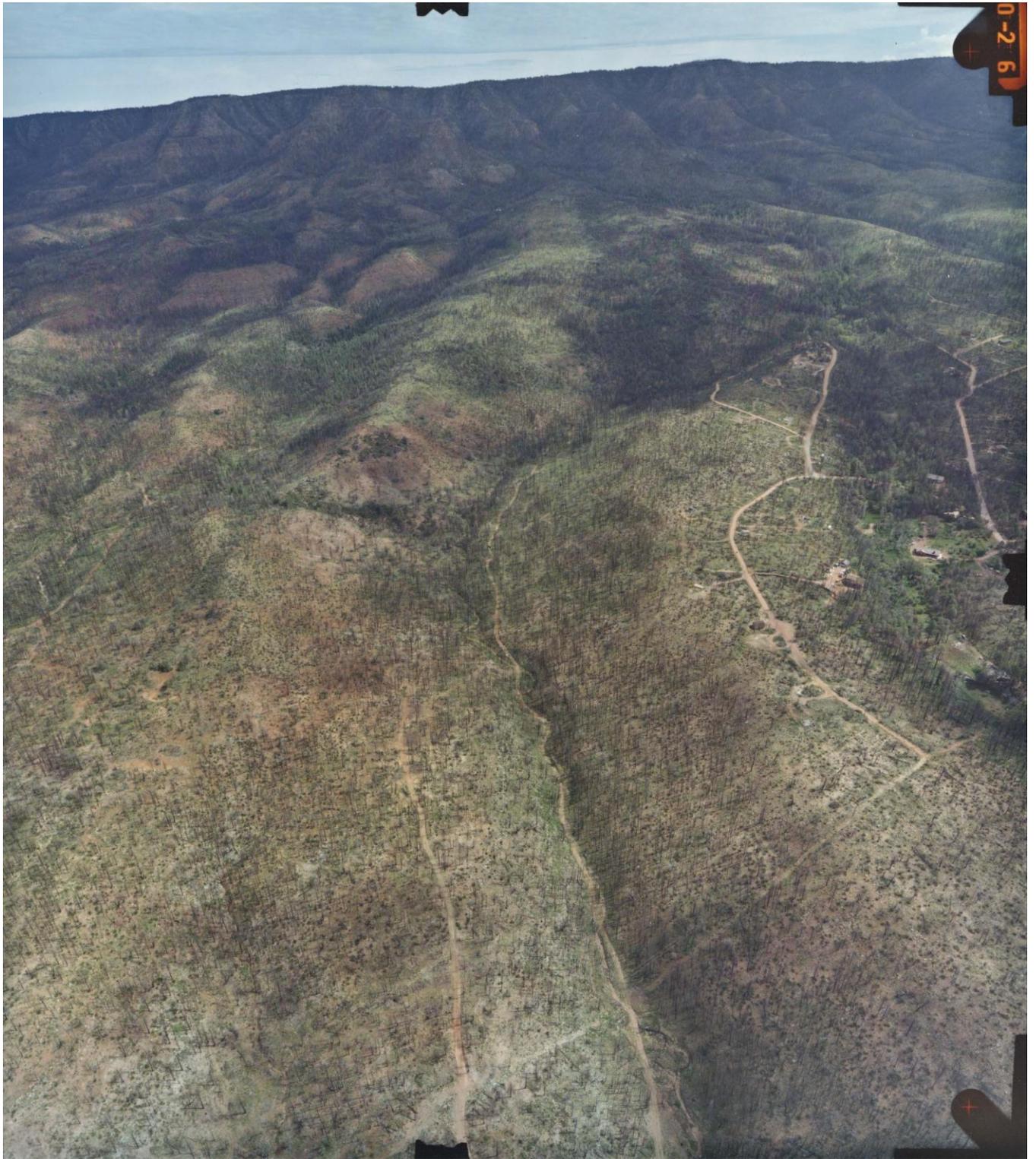
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**PAYSON**

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Ashby had a new King radio, and was monitoring the Tonto Fire Net. Ashby couldn't reprogram his new radio so LaTour reprogrammed it to include the Mutual Aid frequency, 154.280. They had good communications except for lapses when Ashby was communicating on other channels. Terra and inmate James Denny had the other two radios, and Bob Scopa, with the Engine Strike Team, was brought into the loop via 154.280.

More shuttling. Ashby had told them to cut a line to Bonita Creek, but the crew was redirected to the junction of the Control Road and Walk Moore Canyon, where they arrived at about 0230. The word "canyon" is an ominous one for wildland firefighters, but most drainages under the Rim were named either creeks or canyons, depending on whether they had scarce surface waters. Walk Moore Canyon was a modest drainage of rolling hills, and little more than a saddle at the top near Bonita Creek subdivision. Ashby and Tim Short, Field Observer, scouted the route for a fireline up Walk Moore on an old jeep trail, then East along a powerline to the subdivision. They flagged the route as they went. Ashby told LaTour to anchor to the Control Road and construct line up the jeep trail. The crew began clearing a fireline to mineral soil up the jeep trail. A dozer arrived but it didn't have lights and was ordered to wait until dawn. The Perryville Crew continued cutting line through the darkness, a long line of headlamps bobbing through the forest.



Walk Moore Canyon Litigation Photo.

Mark Tiffany sat on his Model 70 Pumper at the edge of the Bonita Creek subdivision from midnight to 0300. He watched embers fall and quickly turn into spot fires. There were reports of major runs to the Southeast toward Bonita Creek. The fire was spotting down slope. The fire moved into the crowns and out again. Runs lasted 60 to 90 seconds. It would move quickly for a distance, then die down. The fire would spot and then the main fire would catch up with the spot. To the Northwest of him, the Prescott Hotshots were maintaining a pretty good pace along the Southwest flank of the fire as downslope winds pushed the fire toward the Bonita Creek subdivision.

Piechura's Engine Strike Team had gone to the old shale pit West of Dude Creek's confluence with the East Verde River, and was told to bed down. On the Northeast side of this confluence lie the foundations and other remains of the old CCC Camp, and an older rock foundation of a schoolhouse abandoned near the turn of the century. The wind shifted at the shale pit, and they were sent to the staging area near Bonita Creek and the Control Road where everyone was re-grouping. Engine Strike Team Leader Scopa took some engines into the subdivision from there. At 0200 Strike Team Leader Piechura drove into the subdivision and checked it out, then returned to his engines at the staging area. Gila County Deputy Sheriff Bob Birgam told him to keep civilians out of the subdivision, and civilian vehicles continued leaving the subdivision through the night.

Ed Hollenshead was the Incident Commander of the Type II Team which had assembled on the fire. His Team had controlled the Bray Fire two weeks earlier a few miles to the West, at 635 acres, saving this author's historic Bray Creek ranch house in the process.



Bray Fire, photo by Mike Johns

Hollenshead arrived at Bonita Creek and met with Engine Strike Team Leader Scopa. There were shortages of wildland-type Personal Protective Equipment (PPE) for the structural engine crews and problems with communications. The Tonto Fire Net was to be used until the BIFC (Boise Interagency Fire Center) net could be established and compatible radios put into the field. Mutual Aid Frequency 154.280 was also to be used as a tactical frequency because some radios could not be reprogrammed. Hollenshead pulled Scopa's Strike Team out of the subdivision back to the Control Road, and pulled the handcrews and other resources out, because the area had not been fully scouted and the fire was just too active for that time of night. They were all ordered back to the Control Road to regroup. The fire was about a half mile from Bonita Creek, having already spread a mile and a half in the first 14 hours. They would reorganize and redeploy with the requisite care that the situation demanded.

Hollenshead participated in the first Dude Fire Staff Ride. He has dedicated his career to the search for root causes of wildland fire fatalities. By 2005, he would become National Fire Operations Safety Officer for the Forest Service and obtain approval from the Chief of the Forest Service and the Chief's National

Leadership Team to overhaul the entire Fire Suppression Doctrine of the Forest Service from the ground up.<sup>1</sup>

## 2. Reorganization

Hollenshead's Team prepared an Escaped Fire Situation Analysis which was approved by Acting Payson District Ranger Cliff Dills. Fire behavior was extreme, active on all sides, with high rates of spread and long range spotting with a 100% probability of ignition. Kiln dried lumber has a 9-10% moisture content while the fuels on this fire had a moisture content of 2-5%. Thundershowers with lightning were predicted. Firefighter safety was to be given the highest priority in all planning phases. Alternative B was selected because all forces were not in place at the time but would hopefully be in place to accomplish this alternative. The Transition of control over management of the fire was duly written up and officially made from the Acting District Ranger to, and accepted by, Ed Hollenshead as of 1800. He remained accountable to the Forest Supervisor's Representative Cliff Dills.

At the Eighth International Wildland Firefighter Safety Summit in 2005, Tom Leuschen presented a Potential Rate of Spread (PROS) Chart which he developed to assist firefighters in understanding the significance of certain environmental factors such as weather, fine fuel moisture, probability of ignition, etc. Factors at the Dude Fire (1990) were analyzed along with the same factors at eleven other fatal fires, Mann Gulch-1949, Loop-1966, Gibson Creek-1977, Spanish Ranch-1979, Mack Lake-1980, Golden Gate Estates-1985, Lauder-1987, South Canyon-1994, Kates Basin-2000, Thirtymile-2001, and Cramer-2003.<sup>2</sup> These fatal fires were used to identify an "Extreme Risk" area on the chart to help avoid situations where rate of spread may exceed firefighter travel rate to a safety zone.

Type II Safety Officer Hall Ashcroft had prepared a Job Hazard Analysis for the fire for each type of operation. The list of Actions to Eliminate Hazards included (1) full Personal Protective Equipment (PPE) and Nomex (2) Have escape routes, make sure all personnel know where they are, (3) use lookouts; erratic winds; be alert to blow up conditions and sudden weather changes; brush is high and thick, burns hot and quick, hard to move through, plan far ahead; have good

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<sup>1</sup>"The Review of Fire Suppression Doctrine for the USDA Forest Service", Ed Hollenshead, National Fire Operations Safety Officer, March 30, 2005, presented to the Chief and National Leadership Team in Albuquerque, NM April 7, 2005.

<sup>2</sup>T. Leuschen, Environmental Conditions as indicators of Potential for Rapid Rate of Spread in Wildland Fires, In: Butler, B.W. and Alexander, M.E. Eds.2005. Eighth International Wildland Firefighter Safety Summit- Human Factors- 10 Years Later; April 26-28, 2005 Missoula, MT. The International Association of Wildland Fire, Hot Springs, SD.

communications; brief crews on what to do when a warning is given; work safely (watchout work situations); review and be aware of the 18 Situations that Shout Watchout; review the 10 Standard Fire Orders. Under Fire Behavior he recommended reviewing the fire behavior forecast each shift and to watch for blowups, fast runs in brush, crowns in the timber, and weather. Under "radio" he listed- provide radios and batteries, keep good communications, talk to a minimum. He warned of lightning. A Health and Safety Message was issued to the field warning of various hazards including lightning, high intensity fuels, erratic fire behavior and steep slopes. It advised to study "Watch Out" situations and the "Survival Checklist" with text of those included. It warned of extreme fire behavior, spotting and gusty shifting winds. Safety Officer Ashcroft then left the Ranger Station and went into the Bonita Creek subdivision the first night.

Engine Strike Team Leader Scopa was familiar with the area. His family had built and owned a cabin at Bonita Creek. Scopa was experienced in wildland as well as structural fires with the Forest Service, the State Land Department and the Central Yavapai Fire District. He had gone out to the water tower at Bonita Creek and assessed the fire and returned to the District Office. Later that evening he wrote the Structure Protection Plan for the next day's shift plan, and headed back out to Bonita Creek. The Bonita Creek Subdivision Structure Protection Plan described the situation and conditions, and called for the use of engines using water from Bonita Creek. It provided that a dozer line, hose line and burnout might be attempted and, if so, a hand crew should be used on this line to improve and hold the line.

Just 100 miles north of Phoenix, and 100 miles south of Winslow, the Mogollon Rim country had provided lumber, livestock, fruit and vegetables, and moonshine whiskey to the low-desert and high-plains dwellers of Arizona. Wagon loads of food and lumber were hauled to support the construction of Roosevelt Dam, which closed in 1914 at the confluence of Tonto Creek and the Salt River, home of the Pleasant Valley feuds among stockmen. An investment stock-fraud scheme called for construction of a railroad linking these towns, and a tunnel was pioneered into the Rim at the Western edge of the Dude Fire, now known as the "Tunnel Trail". Later, copper giant Phelps Dodge would try to punch another tunnel through the Rim to get water from Blue Ridge reservoir to the Verde River, but that tunnel was also abandoned in favor of a pipeline and pump system. The combination of aggressive timber and forage harvest, tremendous regeneration of Ponderosa Pine saplings, and a half century of fire suppression, left the Mogollon Rim ripe for a catastrophic fire.

Glen Dundas, Operations Section Chief with the Type II Team, had also been on the Bray Fire. He arrived on the Dude Fire the first night and he and Bob Wagenfehr, Tonto Fire and Aviation Staff Officer, flew the fire and agreed they

should call for the Type I Team. At 2030 Bob Wagenfehr and Incident Commander Hollenshead decided to order the Type I Team. The Type I Team was originally intended to take over the fire at 0600 the next morning but this would be delayed as they would not all arrive by then.

An Incident Status Summary was prepared at 2345 by Dan Eckstein, Assistant Fire Management Officer. It indicated the fire was in excess of 650 acres, was 5% contained, that containment was expected on July 1, 1990 with control by July 5, 1990. Predicted control problems included erratic winds, extreme fire behavior, steep slopes and low fuel moisture. Current weather was 0-5 mph SW winds, 77 Degrees and 31% RH. Predicted weather was 5-15 mph SW winds, 95-100 Degrees and 10-15% RH.

Ron Regan, Communications Technician for the Type I Team, was dispatched to the fire at 0100. The Type II Team was in place and had set up a BIFC Cache repeater on the Rim. A communication plan had been put in place by Rufus Cole. Everyone was still on the Tonto Fire Net or the Mutual Aid frequency. Later, another BIFC Communication Unit arrived and Fred Buhr, Type I Team Communications Unit Leader worked on establishing a new system.

While the Perryville crew was working toward the subdivision in the early morning, Ashby met with the crew several times, checked their progress and gave them information about the fire. LaTour stayed in contact with Ashby all morning by radio.

About an hour before daylight Type II Operations Section Chief Butch VanTilborg met with Dundas and Hollenshead along the Control Road and discussed strategy. VanTilborg suggested they run line from the Control Road up the jeep trail in Walkmoore Canyon, around the subdivision and then to the Northeast. They didn't expect to contain the Northeast but were trying to hold the Control Road and herd the fire around the Northeast to protect the subdivision. The strategy was to complete the line from the Control Road Northeast and burn it out. He told the Type II supervisors the strategy and to work together preparing the line and burnout operation. VanTilborg was to stay and direct in crews, Dundas was to fly at daylight and Hollenshead and Dundas were to do planning at camp.

At 0400 Mark Tiffany arrived at Walk Moore Canyon and the Control Road and set about 600 feet of hose up the jeep trail to the powerline to support the burnout from the bottom of the canyon.

During the night, the Prescott Hotshots had been reluctantly pulled off line construction and burnout along the South side of the fire. They thought

they might catch the fire that night if they kept up the pace, but Overhead thought it was too dangerous and unpredictable given the downhill runs the fire was making, across un-scouted terrain. They were moved to Walk Moore Canyon and the Control Road. They discussed the escape route back to the vehicles for escape to a safe area. They had been up for nearly 24 hours but were still ready to fight fire. They walked up the jeep trail which Perryville had cleared. They turned right, up the powerline toward Bonita Creek. When they reached the Perryville Crew on the powerline, they bumped up above them and went to work. It was light enough that they didn't need headlamps. The Perryville crewmembers were doing a good job improving the line and appeared fit. When the two crews reached the subdivision they took a break together near a shack. Prescott then left Perryville, which was still on break, to triage homes.

Glen Dundas worked with Operations Chief VanTilborg who was handling operations on the ground. Dundas met with some of the Type I team at 0430. At 0800 to 0830 he reconned the fire with George Leech. The strategy was to burn out around Bonita. Because they knew the team was going to be replaced, they doubled up the Division Supervisors on the East side and the bottom because these were the critical areas. He met with Wagenfehr to agree on the strategy.

Allen Farnsworth, Fire Behavior Analyst Trainee for the Type I Team, ran some BEHAVE fire spread and fireline intensity predictions at 0430 for the next day. BEHAVE did not predict for crown fires, only ground fires and spotting. The Crown Model for predicting rate of spread through crowns was not yet available.

By 0500 brisk down canyon winds had pushed the fire to 1900 acres. At that time the winds subsided and the fire laid down. Hollenshead had kept the dozer at the Control Road and Walk Moore because it had no lights. Also by that time the Perryville Crew had cleared the line up the jeep trail and East along the powerline to the Bonita Creek subdivision where they continued to work. While Perryville was working the houses, Ashby scouted the route for the dozer from the powerline directly up Walk Moore to surround the subdivision's West and North sides. He and Tim Short walked down Walk Moore and found a spot fire and put a line around it. It was about a quarter mile from the main fire and about a tenth of an acre.

The Alpine Interagency Hotshot Crew had driven all night to the Dude Fire. Jim Mattingly was the Superintendent. They arrived at the Payson Ranger Station at 0530 on June 26, 1990. Mattingly, along with Crew Foremen Benson and Kaib received a briefing from Operations Section Chief Glen Dundas and Plans Chief Bud Shaver of the Type II Team. They were told to report to Group Supervisor Ashby, that the fire was being run on radio frequency 170.500 with a repeater using 171.500 to transmit and 170.500 to receive, and they were given a map showing the assigned area and access. They received a Day Shift Plan with Weather

and Fire Behavior information. Mattingly programmed his King radio and tested it against Dundas's and Shaver's and the repeater. Success hitting the repeater from the Ranger Station was only sporadic.

Dan Eckstein arrived at the fire at about 0530 to 0600. The supervisors were generally working together as a group in the vicinity of the Bonita Creek subdivision; Phil Gil, Dale Ashby and Jeff Whitney.

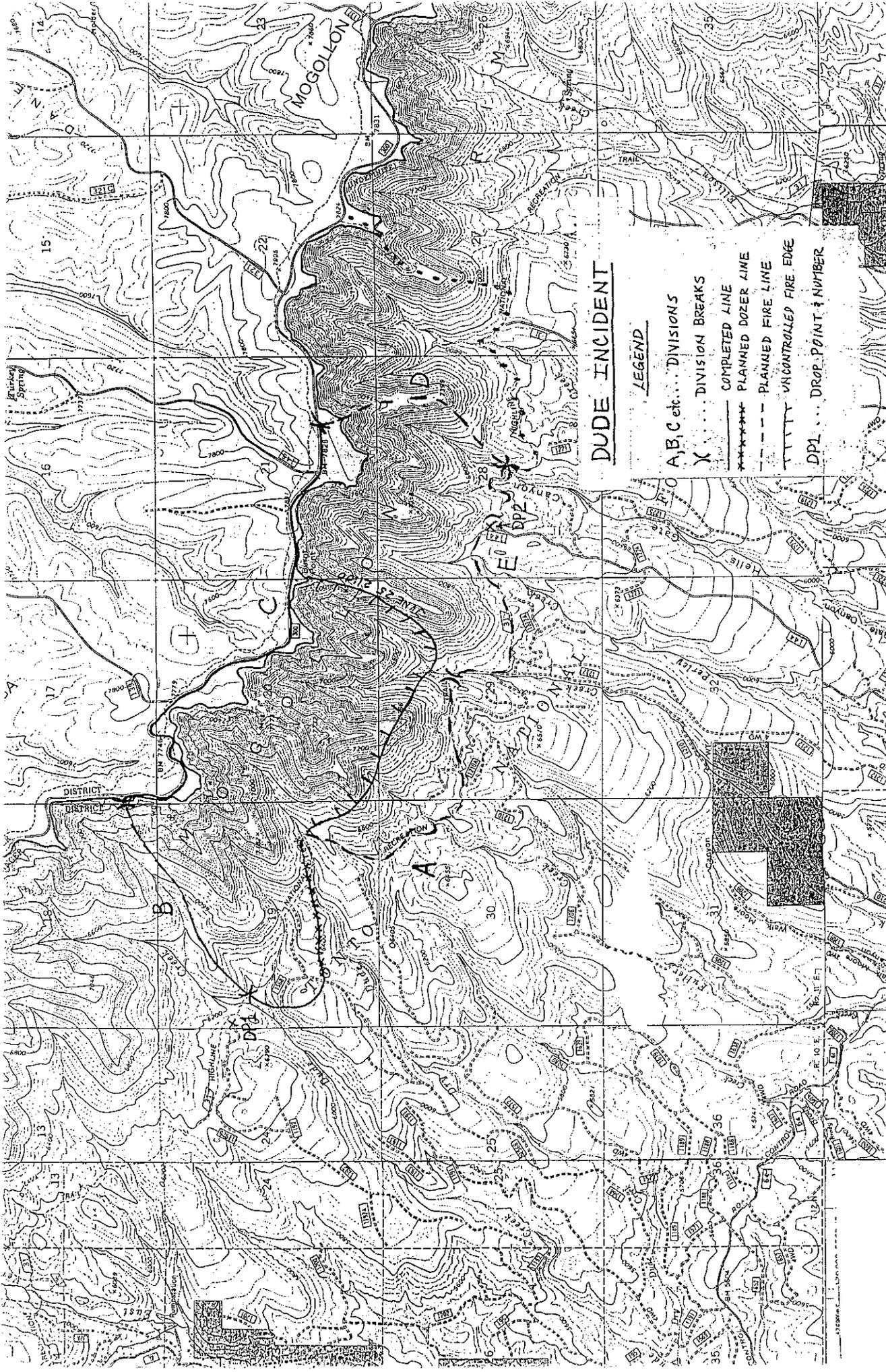
Coronado Hotshots, from the Coronado National Forest in Southern Arizona, recorded belt weather for 0000 (75 degrees, 20 RH), 0100 (73 degrees, 20 RH), 0200 (73 degrees, 23 RH) and 0530 (66 degrees, 28 RH).

A Fire Weather Meteorologist was not yet on site. Bob Berkovitz, with the National Weather Service in Phoenix, had been dispatched the night before but had been ordered to wait until morning so he could bring up some mobile weather equipment which had also been ordered. Resource Order O-208 was made at 0420 for 1 Meteorologist IMET needed at 1200 at Base Camp. The Resource Assigned at 0745 was Bob Berkovitz with E-72, the Weather Forecast cache, ETD 0900, ETA 1200. Resource Order E-72 was made at 0627 for 1 ATMU Weather Forecast Cache (Air Transport Module) needed at Base Camp at 1600. The Resource Assigned at 0745 was to be brought by Bob Berkovitz (O-208) ETA 1600.

At about 0600 Scopa told Piechura that a division or group supervisor told him to have Piechura space his 2<sup>nd</sup> Strike Team of engines along the Control Road for point control, to watch for spots and provide support. Piechura initially had five engines. He spaced them out along the Control Road. Diamond Star was placed just East of the road into Bonita Creek subdivision. The Heber engine was placed just West of the subdivision road and East of Walk Moore. Tiffany was initial attack Forest Service and not part of his team and was already at Walk Moore Canyon where it intersected the Control Road West of the subdivision road. Piechura placed Johnston's Rural Metro engine crew at Fuller Creek. He placed Heger's Rural Metro engine crew about halfway between Fuller and Brody Creek. He placed a red engine crew West of Brody Creek near Drop Point 106. The red engine crew left due to mechanical problems later that day. There were no spot fires south of the Control Road. They could see the main fire smoke rising to the North of them.

The Operational Planning Worksheet for the Type II Team for 6/26/90 listed the Work Assignments for Divisions A-E and Group F, as well as Engine Strike Team assignments. Eckstein's Division E was to tie the line into A on the West and D on the East while Group F protected the subdivision with Scopa's Strike Team engines. Dozers were to be sent to the A)(E Division break at the end of road 1210 (Bonita Subdivision road and Highline National Recreation Trail) with a

note that they could go East to Division E. Division E was assigned 5 crews and a safety officer and 2 strike team Crews. By the beginning of the shift these lines had all been crossed by the fire which had run further than expected during the night. The Highline Trail had been used since prehistoric times and was improved at the turn of the 19<sup>th</sup> century to move cattle and connect homesteads which were limited to the fertile valleys. It was improved again by the CCC. It runs east and west at the base of the cliffs of the Mogollon Rim, where springs and creeks provide water every couple of miles. It is rocky, with a lot of switchbacks but well maintained by hikers and horseback riders. Part of the trail has been incorporated into the Arizona Trail from Mexico to Utah up the center of Arizona. The Highline Trail is often used as a fire line to keep the fire from moving south, away from the Rim. Shift Plan Map.



**DUDE INCIDENT**

**LEGEND**

- A, B, C etc. ... DIVISIONS
- X ... DIVISION BREAKS
- COMPLETED LINE
- \*\*\*\*\* PLANNED DOZER LINE
- PLANNED FIRE LINE
- ||||| UNCONTROLLED FIRE EDGE
- DPZ ... DROP POINT & NUMBER

A line officer briefing was held by Fire and Aviation Staff Officer Wagenfehr at about 0500 on June 26, 1990: The fire had exceeded all estimates moving South last night. The Structural RFD was noted to be without Nomex clothing or communications. The RFD engines had pulled back to the Control Road for safety due to poor PPE and communications. Five Crews and one dozer were trying to protect the subdivision using the Control Road and Walk Moore. Two more dozers were expected. The Lead Plane was expected over the fire at 0600 with airtankers available at 0630. Two dip sites were available for the helicopters. One medium and one light helicopter were on site with two heavy, another medium and another light on order. One Radio Starter kit was on site with a satellite dish on order. Transition from the Type II Team to the Type I Team was tentatively reset for 1200 since everyone was not in place. Tonto Fire Net was 171.500 to transmit and 170.500 to receive. All aircraft requests were to go through Tonto Dispatch 164.825. Tonto Air Attack was to be released as soon as the Incident Air Attack could be functioning. Transition of the planning unit went well.

At 0615 ashes were accumulating again on the deck at Stuzman's home 2 1/4 miles Southwest of the fire.

The dozer, with Mercer as Dozer Boss, went up Walk Moore and called Ashby from the powerline, asking which way to go. Ashby called VanTilborg and explained his preference for the dozer line to be built up the jeep trail in Walk Moore rather than the handline along the powerline.

The Alpine Hotshot Crew arrived near Bonita Creek at 0630 and contacted Ashby on Tonto Net. He assigned them to improve the dozer line up Walk Moore Canyon Northwest of the homes until they were needed for the burnout of that line. They parked near Walk Moore and the Control Road and geared up. Jim Mattingly, the Superintendent, briefed the Crew. They discussed the assignment, fire status and safety considerations. They established a crew talk channel to avoid tying up the tactical channel. Mattingly assigned Squad Boss Dave Niemi to record weather observations on the hour and Benson to do the same on the half hour. He also told the crew that their escape route was back down the line to the Control Road. He saw no safety zones constructed or visible in the area where they started work.

Jeff Whitney, a Type I Team Supervisor, arrived at the fire at 0500 and was briefed at 0630. Cooke assigned him to protect the Bonita Creek Subdivision, an assignment which Ashby had for the Type II Team, Group F. Whitney shadowed Ashby at Bonita Creek until the transition. Prescott and Perryville had pretreated most of the homes on the West side of the subdivision. The air was clear

and no inversion was noted. The Prescott Crew discussed whether their efforts were being wasted because they were so far from the fire.

At 0700 the Navajo Scouts 2 Crew showed up at the fire camp and had their King radio cloned by Communications. Navajo Scouts 1 also cloned at the same time and had no communication problems throughout the day. These SWFF (South West Fire Fighting) Crews are Native American crews which are on call for fire duty. Unlike Hotshot Crews, which are Type I hand crews, these Type II hand crews are only on the job when called and assembled for a specific fire. Nonetheless, these crews have a lot of experience fighting fires throughout the country.

During the morning, extreme temps, low RH's, and fire behavior were called in to Fire Behavior by forces on the Rim. At 0730 Farnsworth and Melcher climbed up on the water tank at the Northeast corner of Bonita Creek subdivision, glassed the fire, noted it was fairly active for 0830, observed some pockets of flame and a lot of areas that were heating up and smoking heavily. At that time the rates of spread were less than 1 chain per hour. There was a retardant drop on the West side of the Canyon. Winds were calm. The fire was "cooking" under an inversion. Farnsworth took the temperature and humidity. Heavy fuel loading was noted along with structure protection problems. They felt defending the subdivision would be difficult because of poor access, extremely dry fuels, poor topography and poor fire prevention measures. They returned to the Ranger Station for a strategy session for the night shift.

At about 0730 Mattingly and Benson, Alpine Hotshots, walked up the jeep trail/dozer line in Walk Moore to preview the work needed to tie in with the next crew. After walking 300 yards they met a dozer being walked back out the line and radioed the crew that it was coming. About another 300 yards up the line they found a squad from Plumas Hotshots which had lined a 50 foot by 50 foot spot adjacent to but inside the line. A dozer lined this spot later. About another 175 yards up they met the Westernmost crewmembers of the Prescott Hotshots at a point very close to cabins, which had at least 1 Strike Team of engines deployed for structure protection. The line at this point was mid slope about 100 to 200 feet downhill and North-Northwest of the dwellings. This would become known as the Northwest corner of the subdivision, or the Corner House.

The fire's convection column began to build and the smoke began lifting off the fire. There was little fire spread but tremendous heat from the heavy fuels.

The Flathead National Forest Interagency Hotshot Crew, Paul Linse, Superintendent, had arrived at the fire camp at 0600 on June 26, 1990. At 0800

an Arizona State engine with a Division Supervisor directed them to follow him out to the fire. The Division Supervisor had them wait on the Control Road while he found the night shift Supervisor. The Supervisor sent them on out to the Bonita Creek subdivision area where they made contact with the Operations person there. Operations at Bonita Creek subdivision directed Linse to take his Flathead Hotshot Crew back out to the Control Road, park with the Alpine and Prescott crew carriers, and walk up Walk Moore, up the dozer line. Because of the fire behavior Linse had already seen, he briefed the crew before they left their buggies on what to expect, and to pay attention to their squad leaders. They proceeded up the dozer line. After about 30 minutes they met the Perryville crew. Linse stopped and found out from Perryville where the other crews were working, and then proceeded up the line to just below the Corner House, where they met the Alpine Hotshot Crew. They continued up the line to the handline which Alpine had cut around the Corner House, and met the Prescott Hotshots.

Glen Dundas and George Leech went up and reconned the fire from the air at 0800.

At 0810 Alpine Hotshots recorded 83 degrees and 35 RH. At about 0830 a Squad from Plumas left the spot they had lined and returned to their crew. At 0900 Niemi reported 17% RH and winds calm.

At 0900 Alpine Hotshots recorded 90 degrees and 17% RH.

At 0930 the Type I Team held a strategy session to plan the Night Shift Plan.

At 0930 Alpine Hotshots recorded 80 degrees and 24 RH. This was a cooler, wetter change from 0900 (90 degrees and 17 RH). A similar change would occur at 1310.

### 3. The burnout around Bonita Creek Summer Homes

Burnout of the constructed line was started in the Northeast corner of the subdivision above the water tank, and proceeded downhill toward the Northwest corner of the subdivision. Phil Gil, the Type II Team Division Supervisor for Division D, stayed on and assisted Dan Eckstein because of the emphasis to protect the Bonita Creek subdivision. He was joined by Whitney, the Supervisor for the Type I Team. Gil acted as the firing boss and they began the burnout. The firing was handed off to successive Hotshot Crews down the line. Tankers were dropping slurry

and helibuckets were being used to slow the progress of the fire while work continued to improve the line in Walk Moore Canyon where the burnout would be brought down to the Control Road.

Dundas began monitoring the burnout operations on both the East and West sides of the fire. Slopovers were occurring from the start without a Southerly wind.

At about 0900 to 0930 Mattingly heard a radio inquiry concerning whether fire shelters for the engine crews were on their way out to Bonita. About 0940 Mattingly heard Plumas report some spotting from their burnout operation progressing from the end of the dozer line moving Westward toward the Alpine Crew, and Mattingly noticed many flareups on the ridge to the North. He ordered his crew to come up the dozer line and continue the prep work closer to the burnout show.

Convective buildups began about 1000, with the heaviest activity over the White Mountains 50 miles East of the fire. A convective cell also began building over the fire about 1000. The combustion of fuels was adding both thermal energy and moisture into the convective cell. Inflow at the surface was observed all around the fire, as it sucked air into its base.

At 1000 Mattingly heard some engine captains radio that they would not stay for the burning show without shelters. Alpine Hotshots recorded 92 degrees and 15 RH and winds light, upslope and up canyon. Dan Eckstein brought more fire shelters out for the engine crews.

Flathead belt weather observations at 1030 were 92 dry, 59 wet, 15RH and winds gusty to moderate 3-6 mph W-SW.

Paul Gleason, Zigzag Hotshot Crew Superintendent, could see high level cumulus clouds from camp on the way to the fire. They were sent up Walk Moore Canyon. While walking up the canyon Gleason could see cumulus. They passed the Perryville and Navajo Crews which were widening the dozer line.

The Zigzag, Redmond and Flathead Crews had hiked up Walk Moore past Alpine and over to the burnout operation. Flathead Hotshot Superintendent Paul Linse found four structure engines parked in the Corner House's driveway. Prescott had been on the fire since 1700 the previous day so Linse gathered all the information he could from their Overhead. He left his crew there and walked up the road where the dozer line continued, and met a group supervisor for the Type II Team, who directed him up the dozer line North and East of the structures to tie in with another division supervisor, Type II Division Supervisor Phil Gil, who had

trouble holding the line all morning. Linse found the Plumas Hotshot crew burning out the dozer line coming down the hill toward the subdivision. Redmond was below them. When in position the crews were about due North of the subdivision. The burnout was spotting, and Plumas lost a spot North of the subdivision which Operations, from a helicopter, decided to drop water on and line it later with a dozer. Plumas turned over the burnout to Redmond and the Plumas Superintendent discussed the spots, which were continuing to grow to the East, with the Type I Team Division Supervisor. Plumas continued to help hold the line.

Scott Hunt, Arizona Division of Forestry was a Type II Team Division Supervisor. He had arrived at the fire on the evening of the 25<sup>th</sup>. He had helped organize, equip and train the Perryville Crew. He was told he would be assigned to the day shift so he bedded down near the fire camp at the shale pit. However, the camp was moved during the night further away from the fire toward Payson. He found Dundas and others at the briefing at the Ranger Station the morning of the 26<sup>th</sup> and was assigned to Division A on the West side of the fire. Mike Behrens and Brice Botts were the night shift supervisors on the scene when he arrived at the fireline midmorning about 1030. Because the Type I team was going to take over about noon and Behrens and Botts already had the crews working, Behrens and Botts told him they would continue to supervise the crews until the transition and that he should just assist them until the transition, which he did. They conducted some burning out of the cat line which was being constructed Eastward toward Bonita Creek. He made some strategy and safety suggestions concerning where to start the burnout and the suggestions were followed.

Dick Cooke, Type I Operations Section Chief, met with Pat Velasco, District Fire Management Officer, about 1030 and went out to the fire. Velasco was providing intelligence for future suppression actions. They drove to Bonita Creek and made contact with Type II Operations Chief VanTilborg who was checking the burnout. All the Type I Division Supervisors were in the area, shadowing for the transition; Jeff Whitney, Varnell Gatewood and Paul Bead.

Perryville had worked around homes in the subdivision until 1000. As they finished work around the Corner House, where the jeep trail tied in with the subdivision, they ran into the Prescott Hotshots again. Prescott took about a half hour break. Ron Meyers traded patches with a Perryville crewmember. Suzette Jones from Prescott talked with Corrections Officer Sandra Bachman. No one was sleeping, just relaxing. There were lunches and plenty of water during the break. LaTour doled out the lunches. Guy Jirrels, Chandler Fire Department, ate lunch with Perryville and hosed them off to cool them down. Terra mentioned to Prescott Foreman Tony Sciacca that Perryville was trying to get Hotshot status. The Perryville crewmembers didn't appear to be any more tired than everyone else. Sciacca discussed with his crew

the use of the burnout as a safety zone. Two weeks earlier the Perryville Crew had been on the Doce Fire on the Prescott National Forest and had performed very well. They had constructed line on the night shift and then were assigned to mop up for the day shift, working a 24 hour shift with no problem. Hollenshead had written in the Hot Fire Critique from that fire that the Perryville Crew was well behaved, motivated and trying to get Hotshot status.

At the Corner House Ashby was there with Perryville, and after they ate lunch told them to improve the dozer line down Walk Moore. Ashby told them their escape route would be down the dozer line. LaTour told the crew about the dry state of the fuels, that they were in taller timber, discussed fire behavior and told them to watch for spot fires. They could see the main fire about 200 to 300 yards away from the line, with fire from the burnout only a few feet from them and the Corner House. LaTour pulled Perryville down the line while Prescott was still breaking.

Flathead belt weather observations at 1035 were Dry 92, wet 59, Wind 3-6, WSW.

Zig Zag belt weather observations at 1045 were 95 dry, 62 wet, 15RH with no entry for wind.

At 1058 tankers were active on the West side of the fire several miles away on Division A. Division A was asking for bucket drops and eventually received them. By 1101 dark smoke was appearing, surrounded by blue sky, with a few widely scattered small clouds. At 1108 a large cumulus cloud was visible far to the North of the Rim on the horizon. Also at 1108 a large cumulus or possibly the top of the convection column was visible toward the North side of the fire. The rest of the sky was clear and blue. Video.

After Piechura had all his engines in place along the Control Road, he went back into Bonita Creek subdivision. Piechura talked to Scopa at the Corner House-fuels were being pretreated below the dozer line. Scopa told him to stay on the mutual aid frequency 154.280. Piechura had a King and a truck radio. The truck radio had a Tonto net already on it but it was the net being used to talk to Phoenix Dispatch from the District. He had heard LaTour on the radio in the morning. The Heber crew called with a person in need of food due to a diabetic condition at about 1100. Scopa told Piechura to go into camp for food and other supplies including two BIFC radios for he and Scopa. Piechura had his own radio cloned in camp and kept the mutual aid frequency on it. The shift plans were being copied and none were available so he wrote the BIFC net frequencies on his hand and then onto a piece of paper. Piechura gathered all the supplies and would leave fire camp later in the afternoon to return to Bonita Creek (1330).

Because there were so many resources in the area the crew superintendents lined their crews out along the line preparing it for burnout and helping to hold the line. There was good air attack and air support at that time. A division supervisor was in contact with a helicopter which continued to patrol the line for the burnout and advise them of its progress.

Ashby called LaTour to be sure they were spread out, watching for spots and improving line. LaTour could see the fire slowly coming down toward them but not yet in their drainage. Ashby called and told them to stay below the Alpine Crew. They had about a 200 yard gap between them. Ashby told the burnout crews not to burn so deep in toward the main fire.

Mark Tiffany with his pumper at the Control Road and Walk Moore Canyon started to respond to a spot fire but another engine was sent.

At 1100 Alpine Hotshots recorded 93 degrees and 14 RH.

During the late morning, FBA Trainee Alan Farnsworth called the National Weather Service in Phoenix asking where Fire Weather Meteorologist Bob Berkovitz was. Farnsworth reached Fire Weather Meteorologist Craig Ellis and also discussed the weather forecast with him. Farnsworth made some notes on a Fire Weather Special Forecast Request form. Ellis made some notes of telling Farnsworth similar conditions as the past 24 hours with variable winds mostly from the North or downslope late night and early morning hours occasionally to 15 mph becoming mostly from the Southwest or upcanyon upslope 10 to 20 mph, few thunderstorms afternoon and evening hours with little or no rain. Strong gusty variable winds near thunderstorms, which appeared to be developing on radar near the fire area already.

A Fire Weather Special Forecast Request filled out by Ron Melcher for June 26, 1990 at 1115 indicated today, thunderstorms possible in the vicinity of the fire, upslope S-SW 5 to 15, temps 80's to 90's with RH in the low teens, tonight downslope 5-10, temps low 70's with RH mid to high 20's.

Farnsworth issued his Fire Behavior Forecast No. 1 for the night shift. The Fire Weather Special Forecast Request filled out by Farnsworth at 1115 on June 26, 1990 was recorded as S-SW 5-15 mph, thunderstorms E-SE-NW of fire, 10-20% chance of lightning, downslope, lower RH's, general flow all mixed up. Attached records for the Ranger Station at 1100 were 99 dry, 63 wet, 27% RH, 0-5 mph S, less than 10% cumulus. Attached records for the West Side on top of the Rim at 1000 were 82 dry, 56 wet, RH 0-1 NE. Attached BEHAVE printout predicted with no wind 3 ch/h (chains per hour) Rate Of Spread, 550 heat per unit area, 30 fireline intensity, 2.1 foot flamelengths and 3988 reaction intensity. This indicated that hand crews could still effectively fight the fire.

No "Red Flag" watch or warning was issued by NWS, Phoenix Fire Weather, and no Severe Weather Watch was issued from NWS Kansas City. People on the current shift knew there were thunderstorm buildups in the vicinity so they didn't feel it was necessary to call the line and tell them that thunderstorms appeared on radar to be developing in the vicinity. NWS would have issued a "Red Flag" warning if they had forecast sustained winds of 25 mph or greater, or an outbreak of dry thunderstorms following a long, dry period. After the Dude Fire, NWS changed their "Red Flag" criteria. Now they issue a Red Flag warning whenever thunderstorms are forecast following a long, dry period.

Zig Zag belt weather observations for 1130 were 94 dry, 61 wet and 14RH with no entry for wind. At 1130 Alpine recorded 96 degrees and 19 RH.

The Navajo Scouts 2 crew had brought a King radio with them from Fort Defiance. It had been cloned by Communications at the fire camp at about 0700. The Navajo Scouts 2 were told to contact VanTilborg, the Type II Operations Section Chief, at Bonita Creek. At about 1130 the Navajo Scouts 2 arrived at Bonita Creek and VanTilborg was not there. At about 1200 the Crew went back to the Control Road, where they met VanTilborg at the intersection. He briefed Dave Dennison and Crew Boss Louis Sorrell and gave them instructions on where to work. VanTilborg ordered Sorrell to walk up the canyon and patrol, hold the dozer line, watch for hotspots, tie in with the Perryville Crew and help them. VanTilborg then called Ashby and reported that the Navajo Scouts 2 were coming up Walk Moore.

At about 1145 Mattingly sent Kaib out to the Alpine vehicles on the Control Road to bring the six-pac truck up to the subdivision with their drip torches and fuel. Linse also sent one of the Flathead crew with Kaib to get their truck and torches. Niemi gave Mattingly another weather report at this time.

Alpine continued to improve line between 1000 and 1200. Mattingly re-briefed the other Alpine Crew Overhead as to escape routes contingent upon where the fire would cross the line. If the fire escaped to the East of them they would go down the line to the vehicles. If the fire escaped to the West of them they would go up the line into the subdivision. At about 1145 Mattingly received a report by radio from Kaib that a Type II handcrew from Perryville Correctional Facility was bumping in past Alpine coming down from the subdivision and walking down to the West. They were assigned to be part of the holding forces for the burnout. Kaib also reported that another Type II Crew, Navajo Scouts 2, had arrived and positioned themselves below the Perryville Crew.

At the Bonita Creek subdivision Type I Operations Section Chief Cooke met with Type II Operations Section Chief VanTilborg to discuss Overhead transition. VanTilborg asked if he was taking over and Cooke said he wanted to tie in with his Division Supervisors first, and left VanTilborg to do so.

At about 1200 on June 26, 1990 Safety Officer Hall Ashcroft learned that the fire had spotted across the burnout area. The burnout had otherwise gone well.

Fire Weather Meteorologist Bob Berkovitz of the Type I team arrived at fire camp at about 1200 on June 26, 1990. He had experience at Yellowstone and other large fires in Idaho and California. He saw some small buildups around the area. Someone in camp said they had seen lightning and there was some static on the radio which sounded like lightning. There were no phones in camp yet, so he drove into the Ranger District office to set up his computer. The moisture present in the atmosphere was probably a gulf surge from the SW rather than the monsoon. Monsoon moisture arrived later during the Dude Fire

from the SE. Berkovitz would explain later that without the fire, there would have been cumulus but probably not a downburst. There was no way to predict a downburst based on what he could see. During the Dude Fire litigation a research meteorologist for the Forest Service, Donald Haines, who is famous for the “Haines Index” for predicting blowup conditions, agreed that a downburst was not predictable.

Upper air sounding data, if plotted, would show the classic inverted V shape, indicating conditions conducive to the generation of microbursts. At that time, such conditions would not generate any official Red Flag Warning. Today, the same conditions still don't generate a Red Flag Warning, or any other warning to firefighters on the line. Perhaps such conditions occur too frequently, or perhaps fire managers have devised no effective strategy to deal with them, so little has changed. On June 8, 1981, two firefighters operating a dozer and plow were killed fighting a wildfire on Merritt Island, Florida. In 1986, Donald Haines, wrote about this event in “Downbursts and Wildland Fires: A Dangerous Combination”. Haines recommended development of a management response at the field level, but to date there has been no official response adopted to deal with atmospheric conditions conducive to downbursts. On June 26, 2002 during the Rodeo-Chediski Fire, atmospheric conditions were nearly identical to June 26, 1990 and several downbursts occurred on that fire, but inside the huge perimeter and no one was immediately threatened.

By 1215 they had finished preparing the line at the Corner House, with the burnout proceeding right behind them. Some small spot fires were put out with the engine hose lines.

At about 1215 to 1230 the Alpine truck arrived with the torches. Mattingly went down the line to inspect it. As he approached Perryville and Navajo Scouts 2 and the earlier spot fire which Plumas had lined, he noticed it had escaped and was running East within the line. He called a squad and eventually his whole crew to catch it before it crossed the dozer line. Wind was light and variable. Mattingly was acting as lookout for his crew and was comfortable with the situation based on factors such as experienced people up at the subdivision, being able to see the fire backing slowly downhill several hundred yards away into the light wind, with low flame lengths.

Cooke had the Day Shift Plan and intended to generally use the strategy in it. He had Leech in the air to get a better idea of the fire perimeter and other information for him. At that time he did not establish specific division breaks, which had expanded with the fire, but sent the supervisors to scout their areas while he did the same. Cooke made assignments to Type I Division Supervisors Bead, Gatewood and Whitney. Cooke sent Bead to the West side of the fire to assess the situation and gain intelligence. He told Gatewood to continue the line work with the dozers to the East of the subdivision and to see where they could find a place to pinch off the fire. Cooke assigned Whitney to take over the subdivision protection and burnout from Ashby. He told Whitney to stay there at the subdivision and tie in with the folks doing the structure protection and burnout. Dundas called VanTilborg back, reporting that the transition of division supervisors was completed and he could leave.

Cooke then walked down toward Walk Moore Canyon and met with Engine Strike Team Leader Scopa. Payson FMO Velasco was walking up the Canyon and they met part way. Cooke and Velasco discussed the fire behavior and hazards. The lowest Prescott Crewmembers were about where the fenceline crossed the dozer line. Cooke walked on down the fireline in Walk Moore Canyon with Velasco. As Cooke and Velasco walked down Walk Moore the main fire near the Perryville Crew was 200 to 300 yards from the dozer line backing down the sideslope with calm winds. Cooke thought it would be a fairly easy burnout in that area.

Gatewood had reconned the fire in the morning with his partner Paul Bead. Gatewood talked to a Hotshot Crew near a dozer which was further Northeast. Allen Kelso was the dozer boss near the Bonita Subdivision. Gatewood pulled the dozer back from a slopover it was working because he felt it was too far ahead of the line crews. The dozer was way up to the NE with only one hotshot crew nearby to its South. Gatewood's primary objective was to continue the work started by the Type II Team, to continue line construction North East from the Bonita Creek subdivision. This was flanking the head of the fire and progress was slow, and there was little expectation of containment unless they could find a place to pinch off the head of the fire.

Zig Zag belt weather observations for 1230 were 95 dry, 61 wet and 13RH with wind gusts 6 from the SE. At 1230 Alpine Hotshots recorded 96 degrees and 13 RH.

Perryville was improving line in Walk Moore Canyon below the Alpine Crew. TaTour could see the fire in the distance above them to the North, and saw a slurry drop to the East of them. The fire was making some runs, but well above Bonita Creek on the other side of Walk Moore. Ashby alerted them to watch for spot fires, and the crew was notified and they began to watch for them. Fire would come to the ridge and then die down. Latour had the crew spread out and watching for spots. Ashby called again to be sure they were spread out, watching for spots and improving the line below Alpine. LaTour ate lunch with an Alpine Hotshot Crew leader. There was some wind, squirly with some spots showing up in the drainage.

Jeff Whitney had seen the Perryville Crew bus parked on the Control Road at Walk Moore Canyon but he didn't talk with LaTour that day. Dundas and Leech were his contact in the air. He heard them (about 0830-0900) redirecting 2 dozers. Despite the horrific events he would experience this day, Whitney would work his way up to a National Type I Incident Commander. In 2004 his Team stopped the 120,000 acre Willow Fire from destroying the towns of Payson, Pine and Strawberry - another June lightning strike in the Tonto National Forest.<sup>3</sup> At about 1230 he went down to check the burnout near the Corner House.

Whitney had been shadowing Ashby since about 1000. Ashby told him that Perryville and Navajo were down below in Walk Moore and Navajo was the last crew. Because Whitney had the BIFC frequencies, Ashby told him he could contact the crews through Scopa. Ashby also asked Whitney if the crews would be relieved because the Prescott crew had been on the fire since initial attack the day before. Ashby told Whitney which crews were in the vicinity. Whitney wrote the crews down on paper, including Perryville and Navajo Scouts 2. He thought Perryville and Navajo were further down the canyon

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<sup>3</sup> See archived Willow Fire website: [http://www.fireteam-sw.com/whitney/past\\_assignments/willow/index.html](http://www.fireteam-sw.com/whitney/past_assignments/willow/index.html)

toward the Control Road. He did not know exactly where Bead's crews were working to the West or Gatewood's crews to the Northeast. After they discussed the transition Whitney released Ashby. He used his list to check off the crews in the safety zone later that day.

Sorrell with the Navajo Scouts 2 crew met with LaTour. They exchanged fire status, weather conditions, watch out situations and escape routes. At about 1315 Sorrell strung out his crew down the dozer line. He warned them of slurry drops, sudden wind changes, what a dangerous place they were in and the escape route. Sorrell walked the line a few times to scout the situation.

#### 4. Official Transition

As of 1300 on June 26, 1990 Type I Incident Commander Shaw was officially delegated authority over the fire, accountable to the Forest Supervisor's designated representative, Fire and Aviation Staff Officer Bob Wagenfehr.

#### 5. Raindrops

A drizzle fell on Phil Gil shortly after 1300. Except for a spot fire to the Northeast near the head of the fire, all the spots were between the dozer line and main fire except the small one Northeast of the Corner House and North of the road, and it was easily put out with water from the structural engines at Bonita Creek.

Melcher, the Type I FBA, and Farnsworth, the FBA Trainee, had gone to look for Berkovitz, the Fire Weather Meteorologist. The convection column was building over the fire. On the way to Payson there was a rain shower for a half to three quarters of a mile which required use of the wipers. At 1315 there were gusty winds in the fire camp on Houston Mesa about 5 miles South of the fire. There were a few drops of rain in camp.

Redmond belt weather observations at 1300 were 90 dry, 58 wet, 13RH and winds 1-3 upslope. This was their first weather entry. The temperature was lower than earlier reports.

LaTour had called Ashby asking for water. Ashby asked Eckstein to call in an order for 200 sandwiches and 200 gallons of water. Latour called Ashby again later, still on the mutual aid frequency, and asked Ashby to call in the prisoner head count to Arizona Department of Corrections (ADOC). Ashby called operations to have them relay the prisoner count to ADOC.

At about 1300 a few drops of rain fell on Tiffany at Walk Moore Canyon and the Control Road. LaTour was now aware of two spot fires between the dozer line and the drainage. He heard about the first one, he saw the second one about 1300. He also heard on the radio there were spot fires in the area of the subdivision. At 1300 to 1330 the spot along the dozer line in Walk Moore really went. They fought the spot, still inside the fireline. Mattingly recorded rain drops at 1310 in his belt weather record.

At 1310 Alpine Hotshots recorded 88 degrees and 24 RH. Temperature dropped from 96 at 1230 and humidity rose from 13 at 1230. A similar drop in temperature and increase in humidity had occurred between 0900 and 0930, 90 to 80 and 17 to 24.

At about 1315 Mattingly was still observing the main fire flaring and backing down off the ridge to the North. He walked West down the line about 400 to 500 feet from the last Alpine Crewmember to the Perryville Crew which was spread out in a holding pattern about 50 feet apart. Mattingly met LaTour about halfway through the crew. They discussed the burnout operation and the main fire on the ridge. Mattingly asked if they would start in with the same type of ladder fuel reduction the Alpine Crew had been doing to improve the line. LaTour agreed and left to get the Perryville crew moving on this work. Mattingly sat down for about 10 minutes when Velasco came up the dozer line and they talked about other fires and how Mark Kaib, a former Payson Hotshot, was doing on Alpine. After Velasco moved on, LaTour walked down and Mattingly reprogrammed LaTour's king radio for him. He checked it to make sure it worked to match his. It worked OK but not all the time. At about this time Kaib called and requested that he move the six-pac back to the control road with the other Alpine Vehicles, and Mattingly told him to go ahead.

At 1315 to 1330 the crew sequence down Walk Moore Canyon was Alpine, Perryville and Navajo Scouts 2. No burnout was taking place there. The fire was backing down across the Canyon about one third the way down from the top. Vegetation in Walkmoore was much lighter than above. Air turbulence was also less.

Flathead belt weather observations at 1323 were 105 dry, 64 wet, 11RH and winds SSW swirling, picking up, 5-10 mph.

Linse's belt weather observations at 1323 were Dry 102, Wet 64, RH 11, Wind 5-10 360 variable.

At 1326 helicopter N40MC piloted by Dean Battersby departed the helibase for Division C with an external sling of lunches, returning at 1359.

Redmond Hotshots completed the burnout around the Corner House that had the handline around it. Zigzag Hotshots took over the burnout and continued down the dozer line at about 1330.

Over on the Southwest side of the fire at about 1315 to 1330 Dundas pulled crews back from their burnout operation because it was apparent they would not be able to contain the fire and should let it go on down toward the Control Road rather than try to build new line East toward Bonita Creek. This was not an evacuation, only a tactical decision to discontinue that burnout operation and use the Control Road as the new fireline.

It sprinkled on LaTour briefly at the Perryville crew. LaTour discussed the sprinkle with his crew and with the Navajo Scouts; that there was a possibility of thunderstorms, and he continued to watch for thunderstorm indicators. Sandra Bachman said to several Perryville crew members including Carillo that she hoped it would rain some more to help put the fire out. The possibility of thunderstorms did not prompt LaTour to remove his crew because the fire was West of them on the ridge and above to the North of them. He didn't believe they were in jeopardy from a thunderstorm. In fact, normal thunderstorm winds would not have driven a flame front fast enough to cut

off their escape. The Navajo Scouts 2 had lunch after they met up with Perryville. They watched for spot fires while eating and could see the burnout making runs into the head of the main fire. The fire activity was moderate.

Redmond belt weather observations at 1335 were 98 dry, 61 wet, 40RH and winds calm, upslope. This was the highest RH recorded that day.

The Central Yavapai water tender was operated by Rick Fergusson with Bill Barringer, Bill Tidwell and Brian Wilharm. They brought a load of water from the East Verde to the subdivision. There was no spot fire South of the Control Road and they did not see any thunderstorm activity along the way. After unloading the water at the Corner House they followed a Forest Service unit and started to draft water from Bonita Creek near the center of the subdivision.

Scopa left the Corner House and drove up to a higher house in the subdivision and looked at the fire. The main fire was still to the North of the subdivision and on the ridge to the West of the Corner House. There was no fire to the Southwest of the Corner House. He then drove back down to the Corner House to walk down to LaTour.

## 6. Walk Moore Canyon

Scopa walked down the line to the Perryville Crew and told LaTour they were bringing the hose lay on down to their location. They discussed the fire and the radio frequencies and made some small talk. Scopa's radio batteries were getting low so he borrowed a Perryville radio from Terra to make a call. Scopa also had a radio in his truck. Terra and Scopa discussed the need for more fuel reduction in the canopy along the line, but Scopa decided to discuss it with Whitney rather than LaTour, consistent with the chain of command. Light upslope winds were keeping the area free of smoke. Alpine was just above Perryville where crewmembers could see each other. The Alpine Crew was bucking logs about 50 to 100 yards up the dozer line from the Perryville Crew. Scopa did not see the Navajo Scouts. Scopa then returned to the Corner House.

Mattingly returned to Perryville and walked Southwest down the line through the Perryville Crew and into the Navajo Scouts 2. There was no significant gap between them. The main fire on the ridge, now to the Northwest of them, was still actively burning about midslope with smoke blowing to the Northwest. It appeared to be a little closer to the dozer line at this location but of no immediate threat to the line. The last Navajo Scout to the Southwest was the Crew Supervisor, Sorrell. Mattingly asked if they could work on the ladder fuels and work together with Perryville to widen the line and remove the crown closure down to the Control Road and they agreed. At about this time Kaib called to report he had returned the six pac to the original location on the Control Road.

Sorrell walked the line to inform his crew and told them to move up the line to help the others. LaTour was operating on a different frequency from Navajo 2 so LaTour reprogrammed the Navajo 2 radio to match his frequency. This did establish communications with the Navajo 2 Crew. After LaTour cloned the Navajo 2 radio that crew had communication with Perryville, Alpine and Blue Ridge and they were also receiving weather reports on another channel and air to ground. The crew were told to keep a lookout and let someone know if they left to go to the bathroom.

Glen Dundas was flying the fire with George Leech and they discussed the moderate fire behavior.

The water ordered for Perryville had not arrived in over 45 minutes. Dennison told LaTour that he had seen an ATV at the Control Road which could be used to bring water to the Perryville Crew. LaTour sent Terra to get water and saw gas. Terra took Crew Member Fred Hill with him. Terra left Assistant Crew Boss Sandra Bachman in charge. He left his radio with Sandra Bachman. He also sent out two, 2 person lookouts, to check the fire before he left to get water. Terra passed LaTour on the way down and noticed an air tanker had dropped retardant on him. The lookouts scouted and returned to the line.

It sprinkled rain on Hill and Terra as they walked down the line to get the water. Also, about five drops of rain landed on Gleason near the corner house.

Helicopter C-FARC piloted by Les Hanberg left the Dude Helibase at 1348 to make water drops on Division A, and returned at 1419 to refuel. Hanberg did not notice any unusual weather or clouds. It was windier on top of the Rim than below the Rim. On the North side of the fire along the Rim, indraft surface winds were consistently spilling off the Rim into the main fire area during the morning and early afternoon. Fire spread and intensity remained within the range of control by handcrews. Dry, heavy, dead and down fuels contributed to development of the convection column.

At about 1350 LaTour heard some radio talk about bombing Fuller Canyon which was to the West of them. At 1355 Mattingly noted wind gusts.

By 1350 there had been talk about possible evacuation of the homes on the West side of the fire, Division A, several miles away. There were a few small scattered clouds South of the fire. At 1355 Safety Officer Shelton inspected Division A on the West side of the fire and noted lookouts posted.

At 1359 helicopter N-40MC piloted by Dean Battersby, which had gone to Division C with an external sling of lunches, returned to the helibase. He made a second trip later.

During a helicopter flight Glen Dundas first checked the West side because he had fewer overhead there, with the priority being the Bonita Creek subdivision where most of the overhead was. He then checked the burnout around the subdivision. The operation was hot but was going OK. Leech observed that the fire perimeter did not have ragged edges, except for a few doglegs on the West side of the fire. The fire was not being wind-driven. They would not have continued if the winds were strong and he decided not to change the tactics, but to continue with the burnout to protect the subdivision. There was no rain or unusual wind during the flight except some gusts on the way back to the helibase. The air tankers were being used on a division other than Bonita Creek.

At 1400 Alpine hotshots recorded 87 degrees and 21 RH.

Strong high pressure persisted over Arizona. Atmospheric moisture was limited, but enough for a threat of some thunderstorm activity over mountainous areas such as the Rim. Satellite photos indicated convective buildups beginning as early as 1000 with the heaviest activity over the White Mountains 50 miles to the East of the fire. A large convective area matured over the White Mountains a few hours before the blowup. Satellite imagery indicated a weak convective outflow boundary from this complex reaching the fire at about 1400. This outflow boundary did not cause the downburst from the convective column of the fire.

TV 12 News was interviewing a Hotshot Crewmember from Montana and remarked that it had gotten cooler in the Bonita Creek subdivision area. Several crewmembers also remarked that the fire was a normal fire, the terrain flatter relative to their home territory, with vegetation not as thick as other fires. TV 12 Video.

## 7. Status at 1400

Hollenshead and Shaw had transitioned at the fire camp for official turnover. Winds were calm, the fire was backing down the North ridge toward Walk Moore 200 to 300 yards from Perryville. Flathead and Zigzag were conducting the burnout down into Walk Moore. Scopa had met with LaTour at Perryville regarding the hose line and was walking up Walkmore to the Corner House again. Cooke and Velasco were walking down Walk Moore. Tiffany was at the Control Road watching the fire come down. Heger, Johnston and the Heber engines were watching the fire from along the Control Road. Terra and Hill were walking back up Walk Moore. Ashby was leaving the subdivision. VanTilborg was also leaving Bonita about now. Dundas and Leech were in the air along with both airattack planes. Pensyl was making water drops with his helicopter near the subdivision burnout operation. Piechura was returning from camp and saw a thundercell over the fire, probably the plume itself. The fire was being stoked by indraft winds, creating more black smoke. The main convection column from the fire was leaning at the top toward the East Southeast. As Piechura drove toward the subdivision he stopped at each engine along the Control Road to drop off supplies, but only for a moment as he was in a hurry. He saw no spot fires along the Control Road. He went on to the Heber engine just West of the road into

Bonita Creek. After dropping at Heber he went on toward Diamond Star, East of the subdivision road. There were some rain drops at the Control Road and Bonita Creek road. Diamond Star was gone so he called Scopa, who said he had them with him. Battersby was delivering lunches to the top of the Rim in his helicopter. Hanberg was dropping water on the West side with his helicopter. Tankers and the lead plane were also present. Neither Johnston, Heger, Heber, Yavapai Water Tender, Tiffany, nor anyone else had seen any spot fires below the Control Road.

Redmond belt weather observations at 1400 were blank for dry, 60 for wet, 4RH and winds calm, upslope.

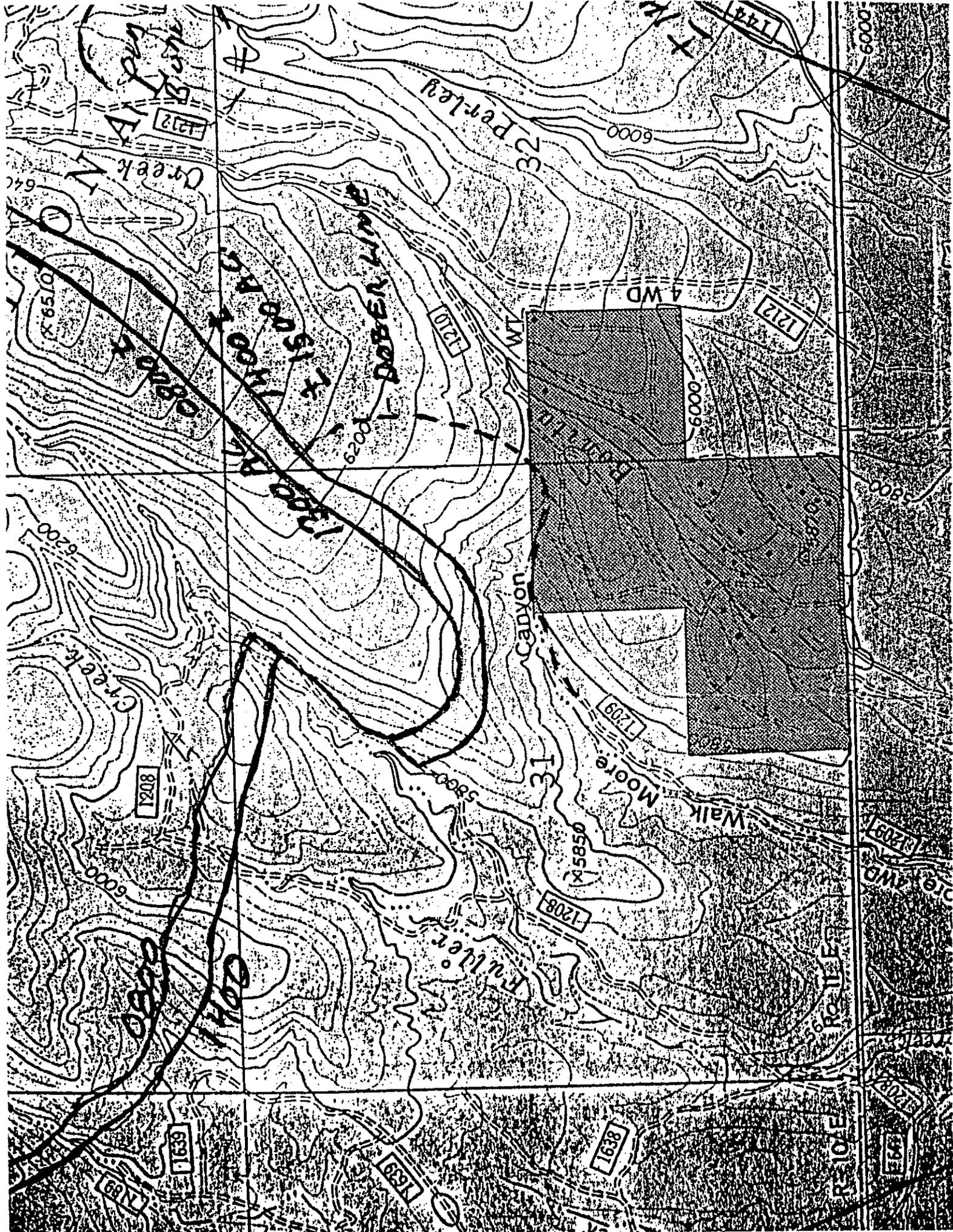
#### 8. Fire Spread during the day

Gila County Deputy Sheriff Bob Birgam was sitting on the porch at the old Bonita Ranchhouse near the Southwest corner of the subdivision, from where he could see Walk Moore Canyon. The fire was to the Northwest. The wind was coming from the South going up slope to the Northeast. He left to drive to Whispering Pines, driving West on the Control Road.

As Velasco and Cook walked down Walk Moore they could see the main fire across the canyon from where Perryville was working. The fire was about a third of the way down the ridge with flame lengths about a foot. The fire was all along the ridge West and Northwest of the crew. Cook observed that the fire was 200 to 300 yards from the line near Perryville burning downslope into light winds, presenting no apparent problem for the burnout operation and no indication of a run. There was no unusual danger and the strategy to continue the burnout down the dozer line appeared to be working.

The fire perimeter maps show only modest spread in the direction toward Walk Moore Canyon all day. This was consistent with the observed fire behavior, terrain and weather. This modest spread reinforced the opinion that the burnout down to the Control Road could be completed in time to herd the fire around the cabins at Bonita Creek.

Fire perimeter map.



VanTilborg left the subdivision to return to camp at about 1410 and was driving West on the Control Road. Gil called him and asked him to return to the subdivision to give him a ride to camp, so he turned around on top of the ridge West of Walk Moore on the Control Road, where he saw a spot fire South of the Control Road. It was about a tenth of an acre and not running. It presented a suppression problem but not a threat to safety. The area was smokey but he did not see a blowup in progress. He reported the spot to Prescott. He then received a call from Dundas reporting the spot fire and VanTilborg told him he was already there and had seen it. He also told Dundas he was returning to pick up Gil. He tried to contact Whitney but was not successful. Dundas advised VanTilborg that the Control Road might not be defensible as the fire had crossed it. A Forest Service engine and crew responded to the spot. The spot was West of the vehicles parked at Walk Moore. It was about a hundred yards South of the road in the flats a long way from the main fire which was still to the North. Dundas told VanTilborg that the vehicles should be moved. He heard VanTilborg report the need to move the trucks, due to fire below the Control Road, to the Prescott Hotshots and others. The spot was 20 to 30 feet in diameter, 1 to 2 foot flame lengths in light fuels.

Prescott Foreman Tony Sciacca sent crewmembers to retrieve their vehicles from the intersection of the Control Road and Bonita road. Linse also heard over the radio that the fire had crossed the Control Road and decided to send someone to move the rigs further East. Linse sent three crewmembers. Kaib called Mattingly again and recommended that the trucks be moved because the fire was getting more active down near the road. Mattingly told him to go ahead and hustle up some drivers if he could, and do it. Alpine drivers went down to the trucks with Prescott.

After Linse's crew finished the prep work to the Corner House they continued below the house on the dozer line. They all felt large rain drops and became soaked-in with smoke from the main fire.

The Navajo 2 Crew's Edison Notah was on a rise along the dozer line where they were working, mixed in with the Perryville crew helping that crew. Mattingly was walking back up the line past the Navajo Scouts 2. About the time he reached the Perryville Crew he met Velasco and Cooke who

were walking briskly back down the line. They stopped to talk very briefly and Velasco told him that Dundas had just reported that the fire had jumped the Control Road to the West and he and Cooke were on their way to check it out. Continuing up the line Mattingly noticed the Perryville Crew working, with none of the crew more than 15 feet inside the line. He stopped and talked again with LaTour about his crew "getting after it" and they both introduced themselves by name which they had not done before. Mike Hanna was driving the water up to Perryville on his ATV when he passed Velasco and Cooke walking down Walk Moore Canyon.

While in the helicopter, Glen Dundas had turned responsibilities over to VanTilborg. After discussing the spot fire across the Control Road with VanTilborg, Dundas continued flying the fire with Leech over Bonita Subdivision. The fire was backing down toward the subdivision. The fire was more active nearer the Rim. There was not much wind except very gusty winds for 2 to 3 minutes, 20 to 25 mph, on the way back to camp. There was a convection cell above the fire and some cumulous beginning to develop in the area, mostly Stage 1.

At 1410 helicopter N-40MC piloted by Dean Battersby left the helibase for Division C with lunch cargo, returning at 1430. Rules prohibited him from also carrying passengers. Jim Landel was the mechanic for helicopter N-40MC. They delivered lunches that day and did no recon. The weather was calm.

As Scopa was walking back out to the Corner House from Perryville he called Whitney but reached Cooke to discuss the need to improve the line down the drainage. He was told to grab one of the Hotshot crews and get them to clean up the line. Scopa had good communications all day with Ashby on 154.280 and in person. When Scopa reached the Corner House, Ashby called from the intersection of Walk Moore and the Control Road reporting he had water and food which Scopa was trying to get for the Glendale crew. Scopa left for Walk Moore and the Control Road to pick it up.

Gleason's Zigzag Crew was conducting the burnout along with the Flathead, Alpine and Redmond Crews. They were burning a section then

handing off the torch. They conducted the burnout in 150 to 200 foot strips perpendicular to the dozer line. This left a green patch. They tried to stay even with the main fire. Gleason felt there was no effect on the main fire from the burnout operation. Eyelevel winds were in their favor so they continued the burnout. Linse's Flathead Crew took over and continued the burnout to the Southwest of the corner house down Walk Moore. Linse's crew finished the burnout down below the "for sale" sign and pile of poles another 30 yards or so. Prescott was going to take over from there on down. They had a hose lay in place. Gleason sat down there to eat a sandwich and was talking to his foreman. Prescott was strung out from there on down to the fenceline which was another 50 yards down the line. The burnout had stopped just below where Gleason was sitting, or about 40 yards above the fenceline. Prescott had not yet started burning. At about 1415 Linse and Gleason decided to discontinue the burnout because the wind picked up, gusting from the NNW.

The NWS Observer in Payson, Anna Mae Demming, observed scattered clouds at 25000 feet at 0540 and 0746. At 0746 forest fire smoke (FFK) was obscuring the Rim NW-SE, reducing visibility from the usual 30 to 20 miles. At 0945 FFK was in all quadrants, there were scattered clouds at 6000 feet and broken clouds at 25000 feet. At 1245 there were broken clouds at 5000 feet and 25000 feet, FFK and CB in all quadrants and 102 degrees, the first wind that day from 220 degrees (SW) at 7. There was no wind at 1414, broken clouds at 5000 feet, overcast at 25000 feet, 10 sky cover, 9 opaque sky cover, 96 degrees, FFK obscuring Rim NE-E, CB in all quadrants. The high reached 106 at 1645, with a remark the highest ever recorded since records began in 1908. At 1645 FFK obscuring Rim NW-E, CB in all quadrants, pressure was falling (614), clouds were 1933 indicating the presence of low based CB. No towering cumulus, no thunderstorms or lightning or rain at 1415. Clear is less than 1/10, scattered is 1/10 to 5/10, broken is 5/10 to 9/10, overcast is 10/10.

Cooke and Velasco reached the Control Road about 1415. From Walk Moore and the Control Road, Cooke and Velasco drove back to the East to tie back in with Gatewood to find where they could tie some roads into the fireline on the East side to pinch off the fire. Cooke was cloned to the BIFC frequencies and also had Tonto Fire Net scanning. He did not have the NIIMS Frequency, 154.280 which the engines were using. He intended to get together

later in the afternoon after getting more info and giving more strategy direction to his division supervisors. Work was still being done to set up the BIFC repeaters.

#### 9. Status at 1415

At about 1415 Cooke and Velasco had reached the Control Road and Walk Moore. Whitney was getting his truck in the subdivision. Leech and Dundas were returning to the helibase. Scopa was near the Control Road and Walk Moore getting lunches. Ashby was there also. The drivers for Prescott, Alpine and Flathead were headed for the Control Road to move their rigs. VanTilborg was returning to the subdivision to pick up Gil. Both Airattack planes were up transitioning at the Northwest side of the fire. The lead plane and tankers were also present. Pensyl was completing his water drop near the subdivision and returning to fill on top of the rim. Battersby was delivering lunches to the top of the Rim. Hanberg was completing water drops on the West side. Damerow's helicopter was at the helibase. Piechura had been dropping supplies from camp at the engines along the Control Road and was near the entrance to Bonita Creek. Hanna had delivered the water to Perryville. Perryville crewmembers Davenport and Love were the last two to get water. They then carried some water cans down toward the Navajo Crew and tied in with the work. Hill and Terra were walking up Walk Moore. Sgt. Birgam was leaving the old Bonita Ranch to go West on the Control Road. Gleason had sat down to eat a sandwich. Mattingly was walking back up toward Alpine. LaTour started walking up the line to check for spots.

Fred Hill and Larry Terra were walking back up the dozer line after sending up the water. It got dark and one of them looked at his watch and remarked "it's too dark to be 2:15".

The main fire could be seen on the ridge to the West and to the North from along the dozer line where Perryville was working. LaTour acted as a lookout, primarily for spot fires, and from time to time Terra, Bachman, Hatch and Denny were sent out to watch for spots, so that someone was doing so at all times. LaTour had gone up the hill while they were working on the powerline to look for spots. He would walk around to get a better view where foliage interfered, never getting more than 100 to 200 yards from the crew. They used the more experienced people for lookouts. Where they were working with the Navajo Scouts 2 in Walk Moore Canyon they could see the main fire and there

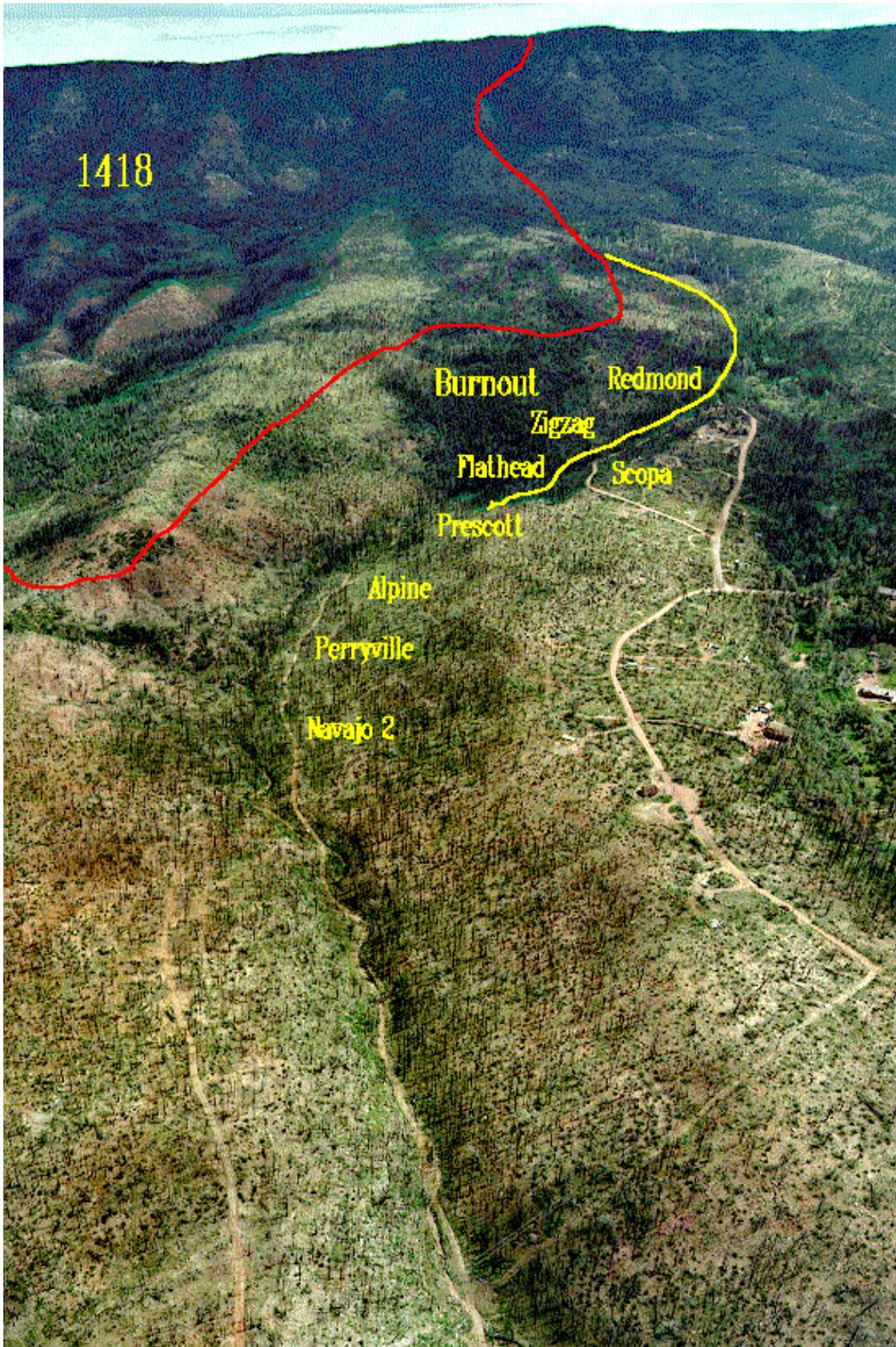
was no reasonable place to post a lookout who would have had a better view of the fire.

Dean Battersby, the pilot of helicopter N-40MC, was carrying a sling load of lunches to Division C. His second trip doing so was 1410 to 1430. He contacted the lead plane to let them know where he was. He went through the fire area to climb to 8000 feet. At about 8000 feet he experienced a downdraft and dropped several thousand feet at 3000 feet a minute. He contacted the helibase and asked for weather information. After he got out of the downdraft he climbed back up and looked for the people at his destination point, but they were gone. He found some people near some firetrucks and they offered to take the supplies. He called the helibase but was told to keep looking. He flew the Rim several times unable to find them, brought the load to the people near the firetrucks and was jostled around by turbulence while dropping the load. He had trouble releasing the load this trip and had someone on the ground unhook the load as his release had failed. He didn't see any other unusual weather and only heard about the wind at the helibase.

While Scopa was with Ashby at Walk Moore picking up food and water for Glendale, Piechura called to report that fire had jumped the Control Road to the West. At about 1419 Ashby left to the West and Scopa left for the Corner House to deliver the water and sandwiches to Glendale. Scopa passed the Central Yavapai water tender which was filling up where the road crossed Bonita creek in the center of the subdivision.

Helicopter C-FARC piloted by Les Hanberg returned to the helibase from water drops on the west side, Division A, at 1419 according to the Helicopter Manifest recorded by Henderson. He had been drawing his water from a nearby fishpond. Hanberg did not notice any clouds or unusual weather during this flight. It was windier on top of the Rim and calmer below it.

The crew sequence in Walk Moore Canyon was Navajo Scouts 2, Perryville, Alpine, Prescott, Flathead and the Zigzag or Redmond Crew was along the handline around the Corner House at Bonita Creek, and east along the road to the Plumas which was where the dozer line started back up to the Northeast from the subdivision road.



## 10. Downburst

June 26, 1990 at 1419

The Perryville Crew had gathered around the water cans 3,300 feet from the Control Road to fill their canteens and had just returned to work at 1419. Squad 2 (Squad Leader Hatch, Assistant Squad Leader Love, Chacon, Harder, Guy, Hoke, Enriquez and Springfield) was working above Squad 1 (Squad Leader Denny, Assistant Squad Leader Hill, Ellis, Davenport, Contreras, Carrillo, Flippen, Pender and Smith). Some of the squad members overlapped along the dozer line.

The upper group consisted of Love, Hatch, Bachman, Denny, Springfield, Ellis and Contreras. Below them were Chacon and Hoke. Guy was below them throwing fuel over a fence near the dozer line. Below Guy, Enriquez was working among 5 or 6 Navajo Scouts. Below Enriquez, Carrillo was running a saw and Flippen was swamping for him. Davenport, then Smith, Harder and Pender were lowest. Love had been helping fill the water bottles. Hoke had taken a break after swamping and was returning to the line, putting his water bottle back with one glove off. Chacon now had the saw. Hoke and Contreras were together down the line from the water cans but just above the Navajo crew. Glenn Harder and Tim Smith were helping the Navajo Crew clearing brush. All the Perryville Crew members were within 20 yards of the Gerry cans.

Edison Notah was acting as a lookout for the Navajo Scouts. He had been watching the fire backing down the ridge to the West of them along a saddle, and could see it torching as it came up the steep nose of the same ridge further Northwest of them. Flame lengths along the ridge were low except for the torching in steep terrain up on the nose to the North. He stepped back from the work and walked around to get a better view of the fire to the North and to the West. As he was standing above the dozer line looking at the fire to the West along the saddle of the ridge he saw a rolling crown fire come up the back of the ridge from **inside** the fire and roll over and down the ridge to where the ground fire had been backing down. Notah shouted to everyone to run, pointing out the flame front. Davenport had just tied in with the crew to resume work when he

heard Notah yell and saw him point. He couldn't understand what was shouted but could see a rolling crown fire where Notah was pointing. The fire was on the ridge across from them moving from the Northwest to the Southeast. Hoke heard someone yell "get the fuck out" and he saw flames. Hoke looked up the line toward the water cans where Chacon and his bosses, Denny, LaTour and Love were, to see whether he should run or not. Hoke and Contreras then started running. Guy heard the Navajo Scouts crew yelling, looked up and saw the fire coming toward him. Guy looked up the dozerline and heard Hatch, Dave, or somebody else yell "move out".

Latour was running down to his crew when Notah sounded the alarm. He had been about a hundred yards above Perryville checking for spots when the winds kicked up and the fireline smoked in, obscuring both the fire and the Alpine Crew. Burning debris started falling all around him and it got dark, like a sunset. He ran down to the crew and heard the shouting about evacuation. Embers the size of pine cones were now falling. When he got down to the crew he saw people running downhill below them. LaTour reached the uppermost crewmembers, said "let's go" and grabbed a water can to take along. Denny grabbed a water can and the rest of them grabbed tools. LaTour made sure everyone was moving out, and he brought up the rear, walking fast rather than running, so as not to panic the others. They could hear the fire roaring but couldn't see it through the smoke, and within a few seconds they all started running. LaTour had his 14 channel Johnson radio on 154.280 and he tried to call Ashby twice as they were running; "Ashby, this is Latour, Perryville", but got no response.

Louis Sorrell, the Navajo Scouts Crewboss, and Dennison and the other Navajo Scouts heard a loud explosion, looked across the ridge and saw a fire ball. One of the Navajo Crewmembers shouted "there's the fire escape" and pointed to it, the dozer line, and crews ran down the line to out-race the fire. Some ditched their tools as they ran. The fire was increasing rapidly and running parallel on the slope adjacent to them as they ran, crowning through the tops of the trees. Dennison and Sorrell brought up the rear of the crew. Some of the Perryville Crewmembers passed them on the way down.

As Terra and Hill continued up the dozer line toward Perryville, they heard wind like a locomotive and saw a wall of flame on the ridge across from them. Three of the Perryville crew ran down past them at top speed without saying anything. Three more ran past. Smith, Harder, Carrillo, Enriquez, Flippen and Pender. Terra stood along the dozer line telling Carrillo and the others to continue running down the line. Carrillo looked back at that point and saw behind Flippen what looked like a volcano with a vacuum which then closed in. Terra asked Flippen if there was anybody behind him, and Flippen looked back and could see only a wall of flame. The weight of Pender's pack prevented him from opening his shelter container. Pender fell on some rocks and contused his posterior ribs. They tried to pull their shelters while running but could not open the shelter pack because of the packs full of fuses and inability to feel with gloves on. Hill turned and ran down with the others.

The crewmembers ran down the dozer line at about 7 mph, consistent with Ted Putnam's experience and Brian Sharkey's "Fitness and Work Capacity". The rate of fire spread was between 11.1 and 12.7 mph South from Fuller Creek. Putnam determined a possible rate of spread of 18 mph at the deployment site based on time to run distances. Patricia Andrews calculated a predicted maximum spread rate of 5.2 mph with the crown model at only 40 mph maximum sustained windspeed. Her report also recognized that the fire flashed across the canyon at a greater rate than this. A 60 mph wind would put the predicted spread rate above 9 mph which is the top of the chart. TV 12 video shows an 11+ mph spread rate between the deployment site fire location at 1423 and the road into the subdivision at 1425. Rate of spread Southwest toward Brody Creek and the Control Road was about 11.1 mph. Rate of spread Southeast was about 9.2 mph and about 7.7 to 9.2 mph East to the road into the subdivision. Rate of spread to the intersection of Walk Moore and the Control Road was about 8.3 mph. This appears to have given the crews some extra time to get onto the trucks and leave as the fire crossed the Control Road at Fuller and the subdivision road above the Control Road. Rate of spread was less up-canyon toward the Northeast. Spread rate to the Perryville work-site was about 4.34 mph. Spread rate further Northeast would be timed later by Gleason at less than 1 mph. That area did have faster spread rates later in the sequence of events. Spread rates varied widely even within small areas, so these are averages from point to point.

There were also multiple runs from different directions, especially after the first few minutes.

June 26, 1990 at 1420

At the time of the blowup, wind suddenly dominated the fire environment. The fire ran about 1.5 miles during the first strong wind event. The fire crossed Walk Moore Canyon during this time, flashing from the West side to the East side of the Canyon, followed immediately by burning of the surface fuels, much faster than the hourly rate of spread.

Fire spread map.



In January 1991 the USDA FS, Richard C. Rothermel, would publish Research Paper INT-438, *Predicting Behavior and Size of Crown Fires in the Northern Rocky Mountains*, in which “plume dominated” fire behavior was first described. The Dude Fire would be cited as an example of a “plume dominated” fire, a term of art coined by Rothermel in this innovative paper, in which a downburst of extremely strong wind blew outward near the ground from the bottom of the fire’s own convection cell, greatly accelerating the fire for a short period of time. In 2001, Paul Gleason would present Dick Rothermel with the Wildland Fire Safety Award for his important work in the field of understanding and predicting fire behavior.

At 1420 Cooke and Velasco were driving East from Walk Moore. Whitney was getting his truck with Gil and VanTilborg. Scopa was returning to the Corner House. The crew drivers were still approaching their rigs which were at the Control Road. Ashby was driving West on the Control Road to check reports of the spot across the Control Road. Sgt. Birgam was also near the spot fire across the Control Road. Pensyl was returning with a bucket of water. Hanberg had just landed at the helibase. Battersby was dropping his cargo and returning from the top of the Rim. Both Airattack, the lead and the tankers were up. The Perryville and Navajo crews in Walk Moore were running down the canyon. It was still calm at Tiffany's pumper at the bottom of Walk Moore at the Control Road and at the subdivision.

Sorrell and the other Navajo Scouts were running under a ceiling of fire with fire whirls mixed in. They stopped about 4 times as they went down, and considered deploying along the way. Smoke reduced visibility to 20 to 30 feet. Some Perryville passed them and others were behind them with saws. Sorrell shouted to them to drop the saws but they couldn’t let go of them. Carrillo saw a male Navajo helping a female Navajo run. Guy also saw this, the man with his arm around the woman encouraging her to keep going. Smith was also there encouraging her to run.

Contreras was running about 10 feet behind Hoke. Guy was running with Carrillo. Guy and another passed Enriquez. Guy told Enriquez to "come on" as he was starting to slack off a little. They were throwing fuses from their packs as they ran. Guy stopped to help Harder pull fuses from his pack.

Smith caught up with them there and passed Guy and Harder. Smith and Harder tried to pull their shelters but were impeded by a pack full of fuses and by gloves. A Navajo Scout came back up and encouraged Smith and Harder to run. Smith shed his pack. Enriquez, Guy, Harder, Pender and Smith all passed Flippen. Carrillo was running with his saw and had to stop a couple of times to pull up his chaps, so Flippen took the saw from him so he could hold up his chaps to run faster. Flippen fell and a Navajo helped him back up. Flippen sustained a low back muscle strain. Flippen tried several times to throw down the saw but was unable to let go of it. Carrillo was alternating sprinting and then walking. When Carrillo stopped, a Navajo Scout told him "don't stop, the flame is on you". The fire was so close he had to just keep running.

LaTour and Denny had grabbed water cans to carry them out but eventually dropped them. Hoke and Contreras saw LaTour and Davenport dropping back as they ran. Bachman fell down and Denny helped her up.

Hill and Terra caught up with Enriquez who was walking down the dozer line. The wall of fire on the East was now advancing faster than the front on the West, a 100 foot wall of fire, radiant heat, smoke, debris and superheated air. Terra, Hill and Enriquez then caught up with Flippen. They all ran on from there, with fire on the East still advancing faster than the front on the West. A strong wind started pushing Enriquez when the fire caught up with him. Guy and Carrillo also noticed strong winds as they ran out. Enriquez was unable to let go of his pulaski. Terra sustained second degree burns on the back of his neck and upper airway thermal damage and smoke inhalation. Smith and Harder ran under a ceiling of fire with fire whirls.

At the end of Tiffany's hose lay near the powerline the fire was right behind Flippen. Flippen ran with fire all around him and the smoke and heat impaired his breathing. He had to stop several times to catch his breath. Flippen saw an Elk running out along side him about 35 feet away with fire five feet behind the Elk. Smith also saw the Elk. Flippen saw smoke being sucked down, shifting winds and a downdraft. Flippen had fallen once and had stopped several times. Burning debris fell into Flippen's shirt and he tried to put it out but Terra told him to keep running. Flippen fell a second time and Terra helped him

up. Terra had to pull the saw from Flippen's grip and Terra carried it out. Hill sustained smoke inhalation as he ran.

## 11. Cut Off

June 26, 1990 at 1422

A total absence of wind, a calm, was noted at various places in Walk Moore Canyon, followed by the blowup with downburst winds from the convective cell created by the fire providing winds estimated from 40 to 60 miles per hour in the Walk Moore Canyon area. Nearly all other areas of the fire subsequently experienced gusty winds flowing out from the center of the fire area, which is confirmed by the fire spread pattern. After the initial winds, which only lasted 5 to 10 minutes, the cell provided winds of 20 to 30 mph for another 30 minutes or so.

About 1422 Prescott Hotshot Foreman Tony Sciacca and Superintendent Nando Lucero had scouted about 150 yards West of the Corner House. Sciacca saw the smoke and fire behavior changing but not running. He saw the smoke laying still on the ground. It made him uncomfortable so he suggested to Lucero they should pull the crew back. Lucero agreed and the Prescott Shots began walking out in an orderly manner. They were adjoining the Alpine Crew and told them they were pulling out. Sciacca would later become an Incident Commander with his own Team. As the Prescott Crew was pulling out up the dozer line Lucero tried 3 or 4 times to reach Perryville on the Mutual Aid frequency to tell them they were pulling out. He got no response. They were already on the run.

Hoke was running down the dozer line with Contreras right behind him and Flippin below him. He saw the others in front of him round a corner. Suddenly fire crossed the dozer line right behind Flippen. The fire approached diagonally (from the NW to the SE) at over 9 mph to reach the dozer line ahead of Hoke. Hoke stopped, turned and saw fire above him cross between he and Contreras. It looked to Hoke like Contreras ran right into the fire, but the fire was playing tricks and was real smokey, so he wasn't sure. The fire swept

over Hoke's head while he discarded his pack, moved about 10 paces away from it because there was fuel in it, and began to deploy his shelter.

As fire crossed the dozer line in front of him, Contreras turned around and with LaTour and the others, ran back uphill. As Contreras and the others turned back up, LaTour, Davenport and Love were furthest up. They had been bringing up the rear. LaTour heard yelling and saw people coming back up hill and a solid wall of fire behind them. It was roaring and solid black. He turned and went back telling people to get shelters out but don't deploy until uphill. As they were running Davenport saw a wall of flame rotating clockwise cross the dozer line below Hatch. They ran about 300 yards at 5.4 mph.

In the absence of a downburst, typical thunderstorm winds can be expected at 10 to 30 mph at 20 feet above ground level. Berkovitz estimated that thunderstorm winds can go 20 to 40 mph in Arizona. Patricia Andrews calculated predicted rate of spread of crown fire under 40 mph maximum sustained wind at 2.2 to 3.7 (75% range) and a maximum of 5.2 mph. Perryville was not caught by an unknown fire hook but by a flame front coming toward them from the main fire. Even at the maximum rate of spread for thunderstorm winds they could have all successfully outrun the fire and escaped. Spread rate for 60 mph winds goes off the chart which is 9 mph. Times and distances put the spread rate at 9-11+ mph. It all happened in the less than the 5 minutes Pensyl was gone in his helicopter.

## 12. Escape

All morning Tiffany had watched the white, black and red clouds of smoke from the burnout. Tiffany saw what he thought was the burnout coming, it looked nice, winds were NE at about 5 mph. The head was moving SW. He watched the smoke coming, thinking it was the burnout. Winds then became dead calm at the Control Road and Walk Moore.

Hanna reached the Control Road on his ATV after delivering the water. He loaded his ATV onto his truck. As he walked over to where Tiffany was sitting and eating, they heard the fire roar like a jet engine or a locomotive. The ridge line blew up. There was a 50 to 60 mph blast of wind for 2

1/2 to 3 minutes. It got dark and seconds later they could see flames rolling high in the treetops as it came over the ridge Northwest of them a few hundred yards away. It was not coming down the canyon. They could feel the wind pulling around them. They dropped everything and started to evacuate. Hanna's truck wouldn't start at first. Tiffany started cutting his hoses.

Sorrell had to help others who panicked to keep them running. He considered deploying just before reaching the Control Road because two of his crew had stopped again, but they resumed after his encouragement. The Navajo Scouts began reaching the Control Road along with some of the Perryville crew. The fire was right on their tail as they came down the line.

As Tiffany was cutting his hoses to escape, Navajo and Perryville crew began running out and jumping into their rigs. At 1423 Ashby showed up at Walk Moore where the Navajo and Perryville crews were running out.

Carrillo was still running out when he saw red taillights and ran faster. Enriquez, Flippen and Terra were the last ones out and jumped onto the tailgate of a truck which was already full of people.

Those who escaped reached the Control Road at 1423 to 1425, covering 3,500-4,000 feet in 5-6 minutes at 6 to 9 mph, a pace of a 9 to 7 minute mile. This is consistent with Putnam's experience, downhill running with gear at 6.7 mph, and with "Fitness and Work Capacity" - a 45 scorer running 1 1/2 miles at 7.3 mph, unfatigued on a track without gear. Springfield had scored 67 and could be expected to run 1 1/2 miles rested on a track at 10.9 mph. Bachman, who scored 37 could be expected to run 1 1/2 miles at 6.4 mph. Assuming a 4000 foot downhill run on the dozer line, at that speed she would only have been 33 seconds behind a 45 scorer at the road, less at only 1,000 feet when she was cut off. Springfield would have been over 2 minutes ahead of a 45 scorer at the road. They were both cutoff together with the rest of the crew. Fire spread rate could not have been much slower than 9 mph and was probably faster in some locations. The eleven who were cutoff would have been 15 to 30 seconds behind the lowest Navajo simply based on the crewmembers being spread out over 100 yards.

Sgt. Birgam drove around the curve into Fuller Canyon going West on the Control Road and saw a wall of flames on the West side of Fuller Canyon on both sides of the Control Road. The fire was running through the tops of the trees and then the ground fuels would ignite. The wind had shifted and was coming from the North. A Forest Service pickup, S-10, stopped and told him he could not get through. He and a Sheriff's van following him turned around to go back East because they could not continue West. Sgt. Birgam stopped at Walk Moore where two Navajo and one other crewmember jumped into his truck. The wind had shifted again and was coming from the West along the North side of the Control Road but from the Southwest along the South side of the Control Road. Sgt. Birgam continued Easterly on the Control Road.

Piechura had continued West on the Control Road and told Johnston to go East. Embers were falling at Johnston's location. As Piechura continued West there were spot fires all along the way on both sides of the road.

Mattingly had walked up past the last Perryville crewmember and was with the first Alpine crewmember. The wind had almost completely died. The Alpine crew was still doing preparation work. He moved past an Alpine saw team (James Higgins and Mark Spruill) and suddenly felt a strong gust of wind from the North or Northwest. It was a sustained wind like that from a thunderhead downdraft. He saw the main fire, which had been about mid slope on the ridge due North of the fireline and subdivision instantly race for the fireline with great intensity. He yelled for everyone to come up to the line, specifically the saw team working about 40 to 50 feet inside the line, and pushed the crew up the fireline to the East toward the subdivision. After seeing that everyone was moving in that direction he turned around and walked West back down the line to where he had last seen the Perryville Crew working. As he moved briskly to that location he tried to contact Perryville 7 to 10 times to warn them to move if they were not currently doing so. He got no response on the radio, arrived at their location and they were gone. At this point the fire was bumping the line very hard with full runs through the canopy and Mattingly saw three spot fires taking off above to the Southeast of the line. Mattingly determined that Perryville had taken off down the line and he returned up the line to the Alpine crewmembers. The fire was making large, crowning runs behind

them and they had to run up the line to escape the most intense ones. As they moved up the line they pushed other crews toward the subdivision.

Piechura and Heger were driving West from Fuller and the Control Road and had sent Johnston East. Prescott and Alpine were pulling out. Scopa was arriving at the Corner House. Ashby was checking the spot. Cooke and Velasco were driving East on the Control Road or NE on Forest Road 144 east of the subdivision. The Perryville crewmembers had been cut off and were moving back up the dozer line. Fire approached the Control Road and Brody Creek.

After sending Johnston East Piechura reached Heger. Piechura told Heger to leave the Fuller Creek area and head West on the Control Road. When they reached Brody Creek (less than a half mile from Fuller) the fire was about 100 yards from the Control Road with flame lengths of 100 to 150 feet. The fire went over the Control Road as they drove West.

At 1422 fire had crossed the dozer line in Walk Moore Canyon and blocked the lower end and cut the Perryville crew in half. Mattingly would have made his first physical attempt to find them while radioing also, while the fire was bumping the line and spotting across to the Southeast on his first try.

At about 1422 VanTilborg found Whitney on foot in the subdivision and Whitney asked for a ride to his truck. They then saw Gil and picked him up and dropped Whitney off at his truck.

At 1422 Mark Zumwalt, Division Supervisor on top of the Rim, was conducting a burnout along the 300 Road in the center of Section 21. They were staying just ahead of the movement of the main fire. There was a lot of heat in Section 28 and the smoke from Section 21 was being sucked into Section 28. There were thundercells to the North of the Rim, not over the fire. Minutes before Bonita Creek blew up, the fire in Section 28 blew up and ran into Sections 33 and 34 down to the Southeast toward Ellison Creek Summer Homes and Diamond Point Lookout. Zumwalt advised Cooke of his observations (as Cooke was on 144 Road just before the deployment report). The fire to the East thereafter collided with the fire to the West at the subdivision. This was visible on

video tape. Cooke acknowledged his report and recalls the main fire then ran toward Bonita and the fire running toward Ellison collided with the main fire in the vicinity of Bonita Creek subdivision. Video.

### 13. Deployment

June 26, 1990 at 1422

As the entrapped crewmembers got cutoff at about 1422, and turned around to run up the line, Greg Hoke was the lowest. He then saw another flame front ahead cutting him off again below the rest of the crew, between he and Contreras. Hoke deployed about 300 yards below the main deployment site. The wind almost blew him over as he lay in his shelter. His shelter reached 500 degrees and nearby objects on the ground less than 300 degrees. There was very little heat damage to his shelter or clothing. He sustained second degree burns on his elbows, and smoke inhalation, with lung damage aggravating his asthma.

June 26, 1990 at 1423

The main deployment site was reached at about 1423. There were two people running uphill from LaTour, and about half way back up Walk Moore they had to deploy while running. LaTour made the decision to deploy when the fire was about 75 feet from the crew. LaTour ordered deployment, did a nose count, and was reporting it on the radio. Chacon deployed and Denny helped Bachman unbuckle her shelter and deploy. Ellis deployed below Bachman. LaTour, Love, Davenport and Springfield went up another few yards and got into their shelters. Davenport had already pulled his shelter out and deployed in 12 seconds. Before LaTour got into his shelter he could see them inside on the ground pushing out the corners and tops consistent with training. He told them to talk to each other and to pass it on down the line. A fire covering 75 feet at 5.2 mph rate of spread gave them 16 seconds to deploy, 11 seconds at 7.5 mph and 6 seconds at 9 mph. Denny deployed sixth from the top above Contreras and Bachman and below Hatch. Love deployed furthest up the line. He saw Chacon deploy before he did. Davenport deployed next to Love, down the hill from the water cans, and communicated with others in their shelters. LaTour was directly behind him.

LaTour tried again to reach Ashby as they deployed, but got no response. Before he got into his shelter he reported the deployment to Scopa who acknowledged. He counted out-loud over the radio eleven crewmembers to Scopa. After he was deployed in his shelter he was unable to reach anyone, and was still using only 154.280. He could hear radio talk while in his shelter.

LaTour had called to report the deployment within one minute after Scopa had arrived at the Corner House. Scopa received the call on 154.280. The PAO, Pete Libby, was right there with a radio when LaTour called and Libby handed his radio to Scopa, who called Whitney and Operations to report the deployment, actually reaching Cooke. Cooke recorded the time as 1423 on a scrap of paper. The TV 12 News video shows Scopa reporting the deployment to Cooke. Video.

Ashby heard Scopa report the deployment and tried to call Perryville but got no answer. At the Western fire edge at Drop Point 106 Piechura heard LaTour report that Perryville was deploying, "This is the Perryville Crew, we are deploying shelters". They waited there for the fire to calm down. At that point spread was more to the East than to the West. Slurry was being dropped in their area. He used the BIFC net to report the deployment to fire camp Communications.

At the deployment site three firefighters were above LaTour- Love, Springfield and Davenport. Below LaTour were Hatch, Denny, Chacon, Contreras, Bachman and Ellis. LaTour told them "We are going to make it, stay calm."

#### 14. Flame Fronts

Direct flame contact can cause fire shelter materials to break down. The glue used in the shelter material produces gas and can fill the shelter with smoke. The gas and smoke are flammable, and if flame enters the shelter through a pinhole or under the edge, the gasses can ignite and cause a flashover. The shelter material continues to burn after the flashover, and damage ranges from small holes in the aluminum outer layer to large holes in the aluminum and fiberglass cloth to total destruction of the shelter. The limiting factor on the shelter's durability appeared to be off-gassing and ignition of the adhesive. The

ignition inside the shelter causes rapid delamination and flaking of the aluminum foil, but when the heat load outside is reduced, the shelter material stops burning in a matter of seconds. If the intense external heat load continues, offgassing and combustion also continue. Shelters continued to be improved after the Dude Fire.

The fire hit on the downhill left side of Dave LaTour's shelter, tore it and lifted it but he held it down. He tried calling on all channels but got no answer. He did hear radio traffic that help was on its way. When the first flame front hit the screaming started.

James Denny had deployed after helping Sandra Bachman deploy. During the burnover, James Denny got up and headed down the line, abandoning his shelter. James Denny's clothing reached 500 to 824 degrees with the most damage of the group with damage all over. Joseph Chacon got up to help James Denny, forcing James Denny under him inside his own shelter. Joseph Chacon's shelter reached 600 to 700 degrees and totally delaminated. His clothing reached 500 to 824 degrees, worse on the front than on the back, and worse on the right than on the left. Heat damage indicated exposure to the flame front. Joseph Chacon died on top of James Denny, who also died, while under Joseph Chacon's shelter.

Curtis Springfield had deployed second from the top on the side of the road where the main flame front hit. Curtis Springfield's shelter reached 600 degrees and delaminated with greater heat on one side. During the second flame front he shouted "I can't take it anymore", and got out of his shelter, hitting and damaging Donald Love's shelter. His clothing reached 500 to 600 degrees, with damage front and back. The right inside heel of his boot melted at 340 degrees. His left side burned worse than the right. He walked about 150 feet down the dozer line to James Denny's abandoned shelter. Curtis Springfield fell onto his back, was burned by hot coals on the ground, then rolled over, downhill, onto his side with his arm reaching out toward James Denny's abandoned shelter.

William Davenport's shelter reached 500 to 800 degrees and delaminated, with nearby objects at 300 degrees. His shelter sustained the highest temperature of all the shelters. His arms were burning from touching the side of the shelter. A burning branch dropped on his shelter and burned his legs. When

William Davenport heard Curtis Springfield scream "I can't take it anymore", he also screamed from fear. He lost his glasses and Harley Davidson head band.

Alex Contreras had deployed next to and just above Sandra Bachman, below James Denny. His shelter almost totally delaminated at 600 degrees. His clothing reached 500 to 824 degrees with the most charring of the group. Charring was heavy in the chest area and both legs. His skin did not burn under his chest clothing, indicating high temperature but short duration flame contact. Nearby ground articles reached 420 degrees. Alex Contreras died with his shelter lying on him but his upper and lower body exposed. After he died, burning debris rolled up against him.

Donald Love, an Assistant Squad Leader, was experiencing a relatively normal deployment, with first degree burns and smoke inhalation. Objects on the ground nearby him reached 300 degrees. He would make it through this but would suffer severe PTSD and survivors' guilt syndrome due to his leadership position on the crew. Vivid nightmares of the incident haunted him for years.

James Ellis, an Assistant Squad leader, stayed in his shelter through all three flame fronts. His shelter reached 600 degrees and delaminated. The shelter tore open on the right side and burned his leg. He then he got up and headed down the dozer line toward the Control Road.

Sandra Bachman, who had deployed eighth from the top next to Alex Contreras, below James Denny and above James Ellis, was upright in a flame front, causing heat damage high on her body. The wind blew the shelter up and over her hardhat, pulling up the leg straps to where they were around her upper thighs. Her hardhat melted to the inside of her shelter. She fell over backwards and hit her head on a rock. The shelter ended up at her lower legs and feet, with the sole of one boot melted to the shelter. Her shelter was in the best condition of the lower shelters, as was her clothing, except for Ellis. The shelter reached 600 degrees and totally delaminated but remained intact, her clothing 500 to 824 and nearby objects 420.

Geoff Hatch had deployed fifth from the top below Dave LaTour and above James Denny. His shelter went to 600 degrees. He got up and saw Sandra Bachman lying on her back on top of her shelter in the open, exposed, face up. He left the site and started walking up the dozer line, receiving his most severe heat damage from radiant heat on his back side. His clothing sustained damage ranging from 500 to 824 degrees. When he was beyond earshot of the deployment site he called out for God to take him.

Dave LaTour experienced three distinct flame fronts. His shelter reached temperatures to 600 degrees and suffered delamination and tears from turbulence or contact by others, with nearby objects 300 degrees. Dave LaTour sustained 2nd and 3rd and worse degree burns over 12 % of his body.

#### 15. Around the blowup

Both airattack planes were in the air during the downburst, as they were transitioning at the time, which includes briefing the incoming plane. None of these four people observed anything unusual about the weather or fire before the downburst. There was cumulous along the Rim to the NNE of the fire, which was reported by Mark Glos before he heard of the blowup. The area where Perryville was located burned over very quickly, within the time it took to fly a circle around the fire. Both aircraft flew the scene after the blowup at the request of ground personnel to determine whether slurry could be dropped. The lead plane flew it also and confirmed it was too dangerous. Smoke obscured the area of the subdivision.

Joe Pensyl, pilot of N49673, one of the 212s, was the only helicopter making water drops during the blowup. He had been dropping near the groundcrews burning out near the subdivision and had been instructed by them not to drop on their burnout. The weather was clear with a few scattered clouds at best. The wind was South to North with occasional spotting. He had made a drop and filled his bucket on top of the Rim, flying around the column. During the 5 minutes he had left and returned the wind had shifted and was blowing smoke over the fireline. He jettisoned his water and flew under the smoke. The smoke was about 50 feet above the treetops. There was a wall of flame between the treetops and smoke as far as he could see in either direction. He then flew around

the East side of the fire and back into the burned part of the fire to look. The subdivision was no longer visible because of the smoke. He could not work or assist, he called airattack and the tankers told him to stay off the air so he returned to the helibase.

The fire continued with intense rapid spread in all directions. By 2100 it had spread 1.5 miles to the East and South, 2 miles Southwest and 1.75 miles Northwest. By 2100 the fire was 8-9 thousand acres.

Run-time for a firefighter, downhill with gear, is 9 minutes per mile per Putnam, or 6.7 mph, which was not fast enough to stay ahead of the flame front even for some of those who escaped. A 5 minute mile is 12 mph. A 6 minute mile is 10 mph. A 7 minute mile is 8.57 mph. An 8 minute mile is 7.5 mph. A 9 minute mile is 6.7 mph. Five minutes to run about 4000 feet is 800 feet per minute, 9.1 mph, a 6-7 minute/mile pace. Six minutes to run about 4000 feet is 7.5 mph, an 8 minute/mile pace. Performance was consistent with Brian Sharkey's "Fitness and Work Capacity". A theoretical 45 fitness scorer would run 1 1/2 miles at 5000 feet elevation in 12.25 minutes, 647 feet/min., 7.3 mph, an 8.2 minute/mile pace. Even Bachman, with a fitness score of 37, would only be 33 seconds behind the 45 scorer at the Control Road. Springfield, with a score of 67, would be 2.24 minutes ahead of the norm at the Control Road at 10.9 mph, better than a 6 minute/mile pace.

The official Accident Investigation Report of today's events does not mention the word "downburst" because the evidence was felt to be equivocal and the report had to be completed in just 30 days so any safety messages could be sent back to the field ASAP. The safety messages generated by the investigation were, indeed, appropriate, such as avoiding transitions between shift-changes and improved fire shelter deployment training. Following the Dude Fire litigation, Fire Weather Meteorologist Dave Goens and Fire Behavior Analyst Patricia Andrews, both members of the accident investigation team, published a paper confirming that downburst winds caused the fire to change from a fire backing through the understory to a fire that spread rapidly through the overstory. Goens, David and Andrews, Patricia WEATHER AND FIRE BEHAVIOR FACTORS RELATED TO THE DUDE FIRE NEAR PAYSON, AZ. Patricia Andrews, recognizing the need for better fire behavior

prediction methods out in the field, would also develop the Fire Danger Rating Pocket Card for Fire Safety.

In addition to evidence of a downburst, there was evidence of horizontal roll vortex similar to that encountered in the fatal Mack Lake Fire, which was also left out of the report as equivocal. Typical of this phenomenon is unburned strips of fuel created by the forceful horizontal vortex fire winds pulling fire away from the fuel and leaving it unburned. These strips of unburned fuel were visible in aerial photographs after the fire. The evidence of Horizontal Roll Vortex indicates a run of that type to the South along Walk Moore Canyon and a run of that type to the East below Walk Moore Canyon and the Control Road. The strip running parallel to Walk Moore Canyon is shown in a sketch from the accident investigation file. Photo Log Sketch.



As Johnson went East on the Control Road the fire crossed the road between Brody Creek and Fuller Creek. He heard of the entrapment on the radio and returned to the Walk Moore area. Dale Ashby was there with them and followed Johnston Eastward. The fire seemed to be following them East in the rear view mirror at a high rate of speed. As they passed Walk Moore the Perryville and Navajo Crewmembers were jumping onto engines. Some jumped onto their engine. The fire appeared to "funnel" down the drainages. At the Perryville crew vans someone tried to start one but Johnston had him come with Johnston on the engine. While people were jumping on at Walk Moore, Johnston heard LaTour report that Perryville was deploying shelters. Roy Sandoval was driving a Forest Service pickup and was also parked near Walk Moore and the Control Road eating lunch. The sky grew very dark and smoky and they positioned to leave as the Navajo and Perryville crews came running out. Hanna was the last one out (about 1425). They left the area in less than five minutes from seeing the flames. One of the Perryville crew who jumped into Hanna's cab told him all the crewmembers did not get out.

A Type 2 Engine Crew from Rural Metro Shop 958, Jim Heger (Foreman), Mike Baker and Bill Tuvell, was near the Bonita Creek Subdivision assigned with Piechura's Strike Team 2. Their assignment was to watch for slopovers at Fuller Creek and the Control Road. They watched the fire North of their location starting to build. That area had been building and dissipating on and off all day. Strike Team 2 (Piechura) was dropping off water and food at their location when Heger brought the flare up to his attention. He told them to leave the area and go West on the Control Road. By the time they crossed Brody Creek the fire was about 100 yards from the road with flame lengths of 100 to 150 feet. Heger advised Strike Team 2 of the situation. As they crossed the intersection of Forest Road 195 just West of Brody Creek the fire was to the road with flame lengths of 150 to 200 feet. They heard LaTour report the entrapment at 1423 from this location. Heger advised the units to the East to be extremely careful. Within minutes they were working two spot fires with Strike Team 2.

Curtis with the Prescott truck dropped the Alpine drivers off just East of Walk Moore and continued toward their rigs parked West of Walk Moore. At Walk Moore Navajos were evacuating but the fire was not there yet

(1423-1424). When they rounded the Walk Moore corner to the West there were small spot fires all around their parked rigs and at the base of one of them. The main fire was crowning just to the North of them. They returned with the rigs, and a water tender was at the intersection (1425) into Bonita and said fire was into the subdivision, so they all went East on the Control Road.

Before Gleason could finish his sandwich the area smoked in and he heard reports over his radio that the fire crossed a road. Linse was with Gleason and heard Alpine say they were coming up the line because the fire had crossed the line below them. They decided to check the slopover to see if they could catch it, and he and Gleason started down the line to look. At about this time they heard radio reports of a shelter deployment. They didn't realize the deployment was near their area.

1424

The Central Yavapai water tender with Fergusson had started setting up to draw water from Bonita Creek at the center of the subdivision. They had not yet started drawing water when the wind picked up and the sky became dark. A Forest Service person asked "do you feel that wind picking up?" and they said yes. The Forest Service person told them to pull out to the Control Road and they pulled their hose and left (1423-1424). As they drove South out of the creek bottom uphill they could see flames above the treetops about a block Southwest of them.

When Scopa reported the deployment to Cook, he told him he would call the other crews near Perryville and have them pull out. Jeff Gobster was in charge of an engine crew supporting the burnout with hose lines and Scopa called him to get the crews out. Gobster had been running a hose lay down Walk Moore. They ran it past the ERA Realty sign and on past the fenceline to a corner beyond the burnout by about 100 feet. Guy Jirrels was at the end of the hose line above the Alpine crew. Gobster reported to Scopa that there was only one engine crew below him, above Perryville, and he would tell them all to pull out. The weather was still calm at the corner house, with no sign of a blowup. Gobster went down with a radio and told Jirrels to drop the hose and head back to the safety zone, which they had been told earlier in the day was the burnout. The area had smoked in and the winds were calm, but not like a dead calm before a storm.

Jirrels could feel the heat. A hot blast of air came up into his face. Then it shifted and he could feel it on the back of his neck. Jirrels fled up the line, but when he reached the burnout a few minutes later it cooled off. Gobster checked to be sure there were no more engine crews below. LaTour's report of the deployment was the first indication of any danger to Gobster.

1425

Gleason told his Zigzag Crew Foreman to stay with the crew. He and Linse headed Southwest toward the area and passed the Alpine Crew which was running up the line toward the safety zone, bumping the Prescott Shots. They met Mattingly who warned them not to go on down the line and that the fire had crossed it. The fire behavior was still not extreme in that area and Gleason was still not uncomfortable for his own safety but would not have brought his entire crew on down at that point. Instead, he ordered them to proceed to the safety zone. Gleason decided to go on down. He stopped to time the runs which the fire was making, which were about 80 feet a minute. It was an active ground fire which would rise into the crowns and then drop back down to the ground. It was not an independent crown fire. There were downdrafts. The fire burned in little strips, not a wall of flame. There were strong convective currents. It had become a wind driven fire. Gleason observed the heat appearing to be trapped, pushed or pulled down in Walk Moore below him.

As the Central Yavapai water tender left the South edge of the Bonita Creek subdivision toward the Control Road the fire crossed the road right behind them with spotting ahead of the main fire. Fergusson reported this to Scopa as 300 foot flames 50 feet from the road (1425) and said the road would not be passable. Scopa confirmed the escape route East. They headed East on the Control Road toward Tonto Village, joining a convoy headed East. This report is on the TV 12 video within two minutes after the deployment report. Within two minutes of deployment the fire had reached the road into the subdivision nearly a half mile Southeast of Perryville. At the Control Road intersection, the main fire was not quite there, but was still to the NW, N and NE of them across the subdivision road. Video.

Ashby called to report their evacuation at 1425. Fire swept over them to the ridge South of the Control Road. At 1425 fire also crossed the road into the subdivision. The main fire was crossing over the Control Road all along a mile length to the South. Ashby radioed that he was with the Navajo Scouts 2 crew and they were pulling out with the Model 70 (Tiffany's Pumper Truck) to go East on the Control Road. There was still a Prescott rig parked at the Control Road as they left. Within a few seconds he heard the water tender's call reporting that there was a 300 foot wall of flame 50 feet from the road and that people in the subdivision would not be able to make it out now. On the television news videotapes, and according to witnesses, there was still no strong wind at the corner house where crews were leaving the top of Walk Moore Canyon to the safety zone.

Whitney, VanTilborg and Gil tried to leave Bonita Creek subdivision to return to camp. They found to their surprise that the subdivision was surrounded by fire. Whitney heard from others trying to enter the subdivision that they could not enter. Whitney saw 150 to 200 foot flames, knew they were trapped and called the line, reached Prescott, and told them to pass the word to get into a safety zone. There were a few rain drops. All the Type I Crews were communicating among themselves, Alpine, Prescott, etc. which he could monitor. His priority was set on a tactical frequency. He did have a King radio and did get a response from Prescott to his advice to pull to the safety zone. Sciacca was either on the Tonto Fire Net or the BIFC Tacs and was also scanning 168.350, the crew net often used by crew supervisors to talk among themselves. It took 6 to 8 tries to talk to people. At about 1427 Tony Sciacca is walking out of Walk Moore behind his Prescott crew and Scopa is seen on the TV 12 video shouting to Sciacca "Where is Whitney?". Sciacca shouts back that Whitney is down the road into the subdivision and is cutoff by fire blocking the road. There is still no wind at the subdivision. After the Prescott crew was up on the road on the way to the safety zone Sciacca heard Whitney calling about getting crews to the safety zone. As the Prescott crew reached the road at the Corner House they were walking to the safety zone when there was a downblast of wind of 35 to 40 mph. This was the first strong wind they encountered in Walk Moore. Video.

After the dozer had been pulled out from the line North East of the subdivision, Gatewood had been working a slopover with two Hotshot

Crews. The wind died down and there was a light sprinkle. He began hearing radio reports of the fire making runs and then his area blew up so he called Cooke or Leech by switching to a BIFC net channel on his King and told him he was pulling his crews back because of major runs. He told his crews to fall back into the subdivision. He did not hear the transmission from Whitney to pull the crews back. He operated on the frequencies used by the Type II Team in the morning and never switched over to the BIFC net except to contact Cooke or Leech.

1429

When VanTilborg and Gil encountered fire at the south end of the subdivision VanTilborg called out flame lengths over the radio and also said "it looks like we are going to be surrounded" (This is on video at about 1429). VanTilborg told the fuel truck tenders to park it and asked Hall Ashcroft to take care of them, as he was present. VanTilborg and Gil returned to the burnout and Whitney also arrived in his truck. Gatewood also arrived. They decided to use the dozers to clear the safety zone out. They built the safety zone in the black from the burnout. Video.

As the Prescott drivers arrived at the trucks, fire was already at the Control Road. A water tender had been moved to block entry into the subdivision telling people to go East. Surprise Fire Department was also on the Control Road at the time of the entrapment. They were unable to enter the subdivision until after the blowup ended.

1430

Flathead belt weather observations at 1430 were 98 dry, 61 wet, 11RH and "winds gusty 6-10 S-SW becoming erratic?". The wind direction in the top end of Walk Moore Canyon was the opposite of the flame front running down the lower end of Walk Moore Canyon.

Farnsworth was in Payson and noticed the sky was very grey by the fire and believed the fire might get some rain. He was just getting started with Berkovitz on some forecasting when he heard of the deployment. He and Melcher headed out toward the area from the Payson Ranger Station to Whispering Pines subdivision and observed a large column of smoke in the Bonita Creek area

moving perhaps 10 to 25 chains per hour to the South Southeast. (Feet per minute equals 1.1 times chains per hour.)

At 1430 helicopter N-40MC piloted by Dean Battersby returned to the helibase from delivering lunches at Division C.

According to the Radio Log for the Dude Fire, at 1430 Strike Team Leader Scopa called for Operations reporting that the Control Road was overrun at Bonita Creek, that the structural engines were trapped and to inform Operations. The IC, Walt Shaw, attempted to contact Strike Team Leader Scopa without success.

At about 1430, shortly after the turnover meeting, word of the blowup and deployment with injuries was received. Operations Chief Cooke took charge of on scene operations and the Emergency Incident Action Plan which had been prepared by the Type II Team was initiated in camp. The fire had become active on all fronts with major runs in all directions. All other crews were pulled into safety areas. Engines in the vicinity of Bonita Creek Subdivision were burned over with no injuries, but several engines received damage. Subdivisions to the West of the fire were evacuated. For several hours the fire remained too hot to move crews.

Leech went back up in the helicopter after Shaw told him of the deployment. Leech is fire behavior qualified and did not believe the fire would make the kind of run it did when he observed it before the deployment. The fire had been hot but burning downhill and was workable with hand crews. He saw ice had developed over the convection column. He believes that Horizontal Roll Vortex also occurred during the blowup. Don Latham, FS Research Meteorologist, points out that all cumulus develops ice at -12 to -18 C. A downburst requires a certain vertical structure of moisture above a dry layer. There was no research at the time proving whether a fire plume by itself can cause a downburst. As a thunderstorm develops, air enters at all levels. Cold air has no terminal velocity. Air masses stay together, and a downburst may not even be noticeable from just up the canyon from Perryville. An iced out top indicates the cell reached maximum development. Dick Rothemel does not associate ice with downbursts in his works concerning the potential for downbursts in plume dominated fires. Donald Haines

agreed there was no way to predict a downburst from the convection column. Both Dave Goens and Dick Rothermel confirmed that downbursts like this one are not common even under these circumstances, and the appropriate response is to be careful but not to stop fighting the fire unless fire behavior actually changes and requires it. Experienced firefighters also confirm that they do not stop just because a downburst is possible. The calm indicates cessation of convective indrafts into the fire in that area. Wind velocity drops off from the center of a downburst at the ground by the square root of the distance, according to Latham. As Leech was flying the fire he also noticed the winds were coming from the Northwest at the West side of the fire but from the Northeast at the East side of the fire.

## 16. First Survivor Found

June 26, 1990 at 1433

At 1433 Mattingly, Gleason and Linse were making the second try to find Perryville. They walked about 150 feet down Walk Moore when they saw, walking out of the smoke, and up the line toward them, a badly burned firefighter, Geoff Hatch. Hatch was burned over 47% of his body and 60% of his face. They sat him down and called for EMTs and a Squad Boss with a radio to retrieve the burned firefighter. Gleason and Mattingly started down the line again below Hatch to look for more survivors. Alpine Squad Boss David Niemi went with them. Gleason had a lot of experience, including 6 previous fires involving fatalities. He could run a 5 minute mile but was only able to pass the step test 7 out of 23 years experience. Fire behavior was now at the outer limit of his expectations, within the top 5 of his 500 fires in extreme behavior. They went about 75 feet further down the line and Mattingly warned that from what he had seen they could not go much further without great personal risk, and they returned to the burned firefighter. Rod Goss, a Flathead EMT and EMTs from Alpine and Zigzag had just arrived. Gleason put himself between the fire and Hatch and the others so he could warn them to move if the fire got too close to them. Gleason would later be awarded a Superior Service - Heroic Action award for helping save the life of Geoff Hatch. Hatch mumbled several times "Those damn fire shelters didn't work." Mattingly called for more burn trauma gear and experienced persons to be sent down ASAP.

1434

At 1434 Cooke heard Gleason call for a burn blanket for Hatch.

1435

Pensyl took four photographs from his helicopter from the interior of the fire upwind from the Bonita subdivision looking toward the North. The photographs show the fire running downhill into light wind with the smoke column drifting toward the South or East. Flame lengths are longer than mature Ponderosa Pine trees on this side of the fire and there are wide continuous areas of active fire inward from the perimeter.

The Accident Investigators noted that there was virtually no fire spread to the North along the edge of the Rim during the initial minutes of the blowup. This can be explained by the fact that the Rim area falls off steeply for nearly 1000 feet in about one half mile, then gradually slopes off another 600 feet in the next one and one half miles. The outflow boundary gust front which reached the fire at about 1400 followed the terrain and could be compared to pouring a glass of water onto a sloping surface. The cooler and denser air followed the natural gravitational path of least resistance in spilling down the terrain. This is again verified by the fire spread pattern as the greatest spread was noted in the downslope direction.

The outflow boundary gust front was from the convective complex over the White Mountains 50 miles to the East of the fire. It contributed to indrafts from the North but the entrapment was caused by the downburst, not by this cooler air entering the North side of the fire.

1436

Helicopter C-FARC piloted by Les Hanberg left the Dude Helibase for Bonita Summer Homes for medivac at 1436, returning at 1539, according to the Helicopter Manifest. Hanberg noticed the smoke was drifting to the East at Bonita. The wind was not strong but was turbulent.

While working along the West fireline in Division A, Scott Hunt had overheard a discussion from a hotshot member that there had been a deployment. He decided to go back toward the Control Road to move his truck to a less vulnerable area. The fire was still off to the Northeast with no blowup apparent to him. As he was walking toward his truck he heard some radio talk that the crews he had been working with were pulling out, and all those crews began coming out. Hunt helped Pleasant Valley Hotshots turn around to go back to the Control Road. As the Division A people on the West side of the fire came out to where Hunt was retrieving his truck, they listened to the radio concerning the deployment. Hunt called Piechura on the radio to inquire about the Perryville Crew and was told they were involved. Hunt had also reprogrammed the Shift Plan BIFC net frequencies and the crews in Division A were still using the Tonto Net. Hunt drove out West on the Control Road and the fire was not to that road yet but was still up to the Northeast.

1438

When Mattingly returned to Hatch and the EMT's he insisted they all move Northeast up the line or be overrun. They reached a point about 125 feet down hill from the Corner House about 1438 and a backboard was brought down. As the backboard was starting down Walk Moore at 1438 the Flathead Hotshots were coming out near the Corner House and were being recorded on the TV 12 News video. Video.

The fire was constantly making runs behind them to the West which threatened the group of 8 to 10 people. They had to stop first aid and move the victim up the line to a safer place. Hatch could see the fire as he was being carried and kept saying "It's going to get me!". Bill Moe of Alpine, Bob Scopa, a Flathead EMT and Mike Beasley of Alpine assisted in the evacuation of Hatch. They reached the Corner House and stopped to rest and assess the situation. Mattingly considered deploying shelters there if he could not locate the crews and safety zone quickly. He called Benson and had the crew yell, which they heard, and Mattingly led them on through the vegetation in the direction of the yelling. After another 100 to 150 foot climb they reached the previous burnout and located the crew another 100 to 150 feet into the burnout in a safe area. Scopa helped carry Hatch to the safety zone. As they carried Hatch up the line on the back board the

fire continued to make a run on them and they questioned whether they could continue to haul Hatch and save themselves.

1449

According to the Radio Log for the Dude Fire, at 1449 Mormon Lake Hotshots called for Mark Zumwalt, Division Supervisor, to report a spot in front of the fire. The operator said try 172.300. Mormon Lake Hotshots called back at 1503 reporting they had made contact with Zumwalt. They were reporting spotting on top of the Rim, Northwest side of the fire.

17. At the main deployment site.

June 26, 1990 at 1450

Davenport got out of his shelter, followed by Love and Latour. LaTour told them to wrap their shelters around themselves and move down toward the Control Road. The three of them started down.

They found Alex Contreras with his shelter lying on him but his upper and lower body exposed. He had not survived. Sandra Bachman was in her shelter but had died lying on her back on top of her shelter.

Then they found Curtis Springfield, who had deployed between Love and Davenport but had moved down the line. He had died with his arm reaching out toward the bodies of James Denny and Joseph Chacon below him on the dozer line.

Joseph Chacon was found covering James Denny below the drainage considerably below the rest of the main group. He had deployed near Sandra Bachman but later moved down to where he helped Denny after Denny moved and abandoned his shelter.

Hoke, who had deployed first and lowest in the Canyon, had stayed in his shelter. There were two blow-overs, one from each direction. The needle set indicates the fire spread to the East, but in one location near the deployment site the needle set of the overstory was to the East while the leaves of

the shorter trees and bushes pointed West. Ellis came by Hoke, who remained in his shelter, and Ellis said he was hurt bad and his shelter didn't work. His clothing was the least damaged of all the crew-members, indicating he sustained most injury while walking in thermal hazards. Hoke told him to get some water from his (Hoke's) pack. Ellis said it was burned up and he walked away.

LaTour, Love and Davenport found Hoke in his shelter and Hoke started walking with them. Ellis was found wandering back up the line, turned around and started walking with them.

As LaTour and the others reached the hose lay near the powerline, Love made radio contact with Pumper Truck 2 and they continued on toward the Control Road. LaTour tried some other channels on his radio but couldn't reach anyone. As LaTour, Love, Davenport, Hoke and Ellis approached the Control Road, James Ellis said "I'm dead", sat down against a log, and died. The others continued down the dozer line toward the Control Road.

June 26, 1990 at 1452

At 1452 Fire Behavior recommended evacuation of other summer home areas including the East Verde River where Stutzman lived.

At 1454 Cooke heard an explosion from the Bonita Creek summer home area. He recorded that spotting took out the head of Dude Creek and also spotted one half mile East of the main fire at that time.

At 1500 Tonto Dispatch was notified of the deployment by PSC with a request to notify SWCC.

Hatch told Gleason other crewmembers had deployed. At 1501 Gleason advised Cooke that other members of Perryville were unaccounted for. At that time, Scopa's Strike Team 1 was in the black and safe.

As the last stragglers entered the safety zone the fire hit the houses and raced up into the East portion of the subdivision. The burnover made two major and one lesser run while they were in the Safety Zone. At about 1505

Mattingly had all the sawyers go up to a half-burned hill about 400 feet from the crews and build a helispot. From there they could see three houses fully engulfed in flames. Mattingly was finally able to reach Cooke who told him a helicopter would be arriving as soon as the helispot was finished.

At about 1505 an engine crew met the four Perryville crewmembers on the Control Road, where their work had begun just 14 hours earlier. The red and grey dust was now covered with ash and debris. LaTour found that the radio mike had shorted out while in the shelter and after he disconnected the mike at the Control Road the radio worked again on 154.280. They were able to talk to Piechura again. At the Control Road and Walk Moore, Melcher and Farnsworth met the four Perryville crewmembers and helped them out of the fire. Farnsworth evacuated the four survivors while Melcher started up Walk Moore Canyon on foot. From Walk Moore and the Control Road Farnsworth took the survivors to a clearing. The fire flared up and they were given new shelters and moved. Upon hearing the trapped crew had reached the Control Road, Heger's Crew and Strike Team 2 responded to assist but were turned back by the Forest Service to their staging area west of the 195 road where they treated the four injured firefighters as they came in. Strike Team 2 transported the firefighters to base and Heger's Crew was also ordered to base. At 1507 Cooke recorded that all of Perryville were not accounted for.

By 1515 there were 200 people in the safety zone with Linse, including news teams. Alpine and Prescott were clearing the helispot above the safety zone. At 1515 Cooke recorded the West side of Dude was lost across Sections 21 and 22, a spot fire west of road 144 and the East side clear through Sections 33 and 34, which was 2 miles East of the subdivision.

Division Supervisor Mike Behrens had been working on the Southwest side of the fire in Division A. A dozer and Hotshot crews were constructing line toward Bonita Creek (East). It got dark and smoky above them. It became dead calm and rained a few drops and the fire began to run in all directions, cutting his division in half. He ordered his crews to pull out to the Control Road and he attempted to notify overhead and other crews, but radio traffic had increased and it was hard to make contact. The Navajo Scouts 1 crew with Nelson Roanhorse as Crew Boss received word to leave by radio from the Baker

River Hotshot Crew Foreman. By the time it took to regroup their third squad to leave, the fire was rolling, so Roanhorse led them into the black to the top of a ridge and advised the Baker River Hotshot Crew. From that spot they could hear the propane bottles explode at Bonita Creek and could see the fire in that vicinity. They watched the slopover on the West side too. He had cloned his radio the same as Navajo 2 and had no apparent trouble with communications.

At 1522 Helicopter N-549W piloted by Chuck Damerow left the helibase to recon the fire with Air Ops as a passenger, returning at 1631. There were 90 Degree wind direction changes every 15 minutes and he had to do 360 degree maneuvers. He could not climb in the downdraft. The heat and wind limited him to carrying one passenger. Heat from the fire made the plexiglass hot.

At 1525 Cooke recorded that the fire went over the 300 Road on the Northeast rim of the fire, it spotted one half mile, 30? acres above the Rim. The fire was running in all directions.

At 1530 an Investigation Team and Critical Incident Stress Team were ordered by Cooke. Word was received that the Investigation Team would arrive on June 27, 1990. Linse's belt weather observations at 1530 were Dry 98, Wet 61, RH 11, Wind 6-10 SSW.

At 1535 a 212 (C-FARC) broke through the smoke and circled the safety zone while the helispot was completed, landing at the helispot on the second attempt and evacuating Hatch at 1536. Mattingly could see structures burning and the propane tanks exploding.

About 1540 Gleason decided to try to get back down the dozer line. The fire had made a couple of runs around them but had cooled down below them along the dozer line. Linse warned Gleason to be careful and stay in communication.

Gleason went back down the line and reported finding 2 abandoned shelters, and then 2 fatalities, heard by Mattingly at 1543 and 6 fatalities by 1552. At 1552 Cooke ordered a fatality investigation team. At 1554 he recorded that there had been 6 fatalities and all others are accounted for.

Gleason met Ron Melcher who was coming up Walk Moore from the Control Road.

Helicopter C-FARC piloted by Les Hanberg made the medivac trip to Phoenix from 1555 to 1800. In Phoenix the temperature was 122 degrees and the jets had been grounded because there was no reliable data that fully loaded commercial aircraft could reliably operate in this heat. He was asked whether he was certain he could land, reported that he could, so they let him land.

While protecting a dozer back at the West edge of the fire Farnsworth had noticed the fire front advancing from the North Northeast. Following the blowup the fire continued to spread at a fairly uniform rate for two to three hours. Convective cells were noted on satellite and radar along the Rim all during this period. The terrain provides a natural lifting mechanism to enhance convective (thunderstorm) development along the Rim. Weather observations from the Payson airport at 1700 indicated thunderstorm clouds (cumulonimbus) along the Rim from the Northwest through the East. The building and decaying of these cells probably aided the continued fire spread Eastward throughout the afternoon.

At 1558 Ops and IC decided to pull back all forces from the South and East flanks, although most had already pulled back due to the observed fire behavior.

The fire tripled in size within three hours due to extreme temperatures, extremely dry fuels and strong winds. All existing firelines were lost with the exception of the 300 Road on top of the Rim.

Stutzman's video after the downburst taken from the Control Road and the cattle guard west of Weber Creek, as they evacuated West, shows the smoke column sweeping to the Southeast with clear sky all around. Video.

At 1601 Cooke recorded 35 mi. Easterly, move troops off west slope and regroup.

Berkowitz met the Fire Behavior Analyst at about 1600 to give him a briefing. He then returned to fire camp.

By 1620 the smoke column was toward the Southeast surrounded by clear blue sky.

The fire edge as of 1630 had run to about 3 miles East of Bonita as well as South of the subdivision.

At 1650 Cook recorded a minor run on the West, holding at the boundary.

At about 1700 Mattingly was able to reestablish radio contact with Kaib. They had picked up most of the Navajo Scouts 2 before heading East on the Control Road. They were able to return to the Alpine crew in the safety zone about 1900. Another safety area had been built about 300 yards East of the Alpine safety area with a dozer where other crews were located. Navajo Scouts 2 returned to fire camp.

At 1750 helicopter N-549W piloted by Chuck Damerow left the helibase to recon and guide at the Bonita area. He made contact with Navajo Scouts 1 which was still in the black on the West side. Navajo Scouts 1, Nelson Roanhorse, was still reluctant to leave. Damerow advised that he was a Navajo himself and promised to hover along the route and keep in contact so the crew could leave safely on the route indicated by Damerow, so the crew came on out. The helicopter returned to the helibase at 1820. Damerow had been on the Bray Fire two weeks before the Dude Fire.

Linse's belt weather observations at 1750 were Dry 90, Wet 57, RH 13, Wind WNW.

According to the Radio Log for the Dude Fire, at 1810 helicopter N-549W (Chuck Damerow) called Communications for Whitney to relay to Transportation to pick up 6 crews, 120 people at the intersection of Bonita Creek subdivision entrance and the Control Road. Transportation confirmed the message.

At 2000 a strategy meeting was held with many cooperators in attendance. By 2100 all the crews were brought off the line. Some had worked more than 24 hour shifts. Linse and others started leaving the safety zone to inspect the vehicles. Their truck was scorched but operable. The Prescott foreman advised Linse that Linse's three crewmen who went for the vehicles were OK and with the Prescott crewmen who had also gone. A helicopter circling over the area warned that the road out was still hot. Linse and his foreman drove out to check it and returned to advise the others that it was OK to move out. Linse's crew arrived at fire camp at 2200.

1:00 p.m. 1:05 p.m. 1:08 p.m. 1:27 p.m. 2:47 p.m.

# 118° 119° 120° 121° 122°

## 3 die in Valley — Today: Only 120°

**By Mike Burgess**  
The Arizona Republic

Lethal record heat gripped the Valley for the second day in a row Tuesday. The 122-degree scorcher was suspected in three deaths and dozens of hospitalizations; caused record power usage; and even grounded airliners.

And today is expected to be just as hellish. The high temperature is expected to hit at least 120, with a low of 86, according to ACCU-Weather Inc., a private weather-forecasting company.

"It's dangerously hot," said Steve

Jensen, a Phoenix Fire Department spokesman. "It's time to take a serious look if people ought to go outside at all."

Phoenix's all-time high — Monday's 120 degrees — was broken Tuesday at 1:27 p.m. when the mercury reached 121. It then reached 122 at 2:47 p.m.

Before this week, Phoenix's all-time high had been 118, set in 1925. That had been matched three times, most recently last July Fourth.

Monday's record was reached about 5 p.m. Tuesday of 91 degrees at 6:45

— See VALLEY HEAT, page A14



Michael Meister/The Arizona Republic  
John Tabot of Phoenix catches the sun's rays with some protection. Tuesday's low of 91 degrees set a record for a maximum low.

## Forget snow: Jetliners in Phoenix 'heatbound'

**By Guy Webster**  
The Arizona Republic

The Phoenix version of snowed-in runways debuted Tuesday. Hundreds of passengers at Sky Harbor International Airport found their flights grounded or schedules changed when the temperature topped 121 degrees while on its way to a record 122.

"At least 22 flights on five airlines were canceled, or delayed or diverted for about 90 minutes while temperatures exceeded

— See FORGET, page A2

## Regulator of body on overtime

**By Peter Aleshire**  
The Arizona Republic

Maybe you're a cop in a bulletproof vest. Maybe you're a roofer. Maybe you're just a fool.

In any case, as you stride out into the 120 degrees, your body starts a vigorous internal dialogue on which your life depends.

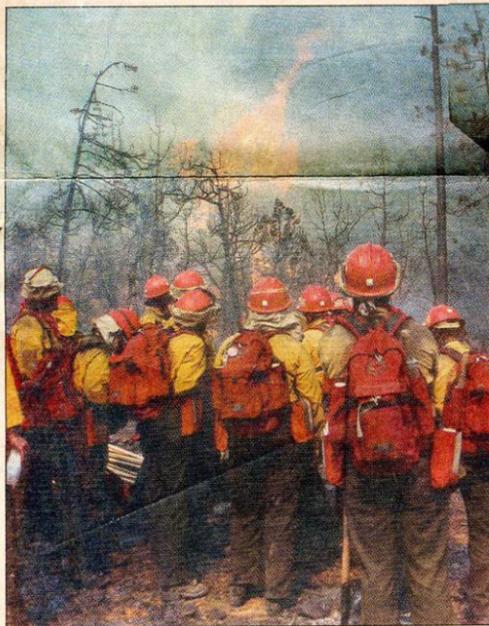
To be precise, your hypothalamus, crouched in its bunker at the base of your brain, sets to work desperately trying to turn a body designed as a biological furnace into an air conditioner.

This is no small trick. Ordinarily, the body turns food into heat to keep the body temperature at 98.6 degrees. Good thing — a few degrees off either way, and you're in big trouble.

"Your body is designed to produce heat," said Dr. Harvey

— See HOT, page A2

# Forest blaze kills 6 firemen



Photos by Tom Story/The Arizona Republic  
"Hotshot" crew members from Redmond, Ore., watch the fire move up the slope in the Tonto National Forest. The fire had consumed an estimated 6,000 acres of forest by late Tuesday.

## 5 prisoners, 1 officer from prison at Perryville

**By Fred Smith**  
and Paul Brinkley-Rogers  
The Arizona Republic

PAYSON — Six firefighters from the Arizona State Prison at Perryville were killed and at least five other firefighters were injured Tuesday as 1,500 crew members mounted an all-out assault on a huge wildfire that swept across 57 homes and threatened 250 others northeast of here.

It was the nation's worst forest-firefighting tragedy in the memory of Southwestern coordinators of the region's firefighting efforts.

No firefighter had been killed by a forest fire since three men died in 1987 in California, officials said, although several have died in non-fire-related accidents.

None of Tuesday's dead was identified Tuesday night, but officials said five were inmates and one a correctional officer from the Perryville prison. It was not known whether the men died of burns or asphyxiation.

Michael Arra, spokesman for the Arizona prison system, said Perryville's minimum-security San Pedro Unit sent a 19-man crew, — 17 inmates and two staff members — to the fire. Four of the five people down to Maricopa Medical Center for treatment in the burn unit also were prisoners, all convicted in Maricopa County, Arra said.

Dr. Jim Malone, chief of surgery, said 15 medical personnel, including some who had been called in for extra duty, were treating the victims.



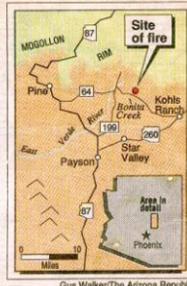
**FACING SASTER:** Residents had little to, B1

A Ruraleto Fire Department spokesman said one of the injured was a Rural/Metro captain from Tucson who also fights fires for the state.

He was notified as Capt. Dave LaTour, 30, who was reported in critical buttable condition with third-degree burns over 12 percent of his body.

The most seriously injured, Arra said, was Gerry Hatch, 27, who had been serving 25 years for burglary and theft. I was in "very critical" condition with burns over 40 percent of his body and severe smoke-inhalation damage of throat.

— See 6 KILLED, page A6



Prescott "hotshots" comfort each other after nearly being trapped by the forest fire. Erratic winds and a heat wave that has kept temperatures well above 100 for a fourth consecutive day confounded efforts to contain the fire.

June 27, 1990

The fire became extremely active again on the East side about midnight. Reports throughout the night indicated a major run in progress to the East. Between midnight and 0200 the fire grew by 10,000 acres, advancing East and South simultaneously. The fire ran about four miles at 90 degree angles to the canyons. All subdivisions to the East to Tonto Creek were evacuated at about 0200, and the decision was made and orders issued to branch the fire.

Expected weather conditions for June 27, 1990 were 104 degree temperatures and 8% humidity. As of 0600 on June 27, 1990 the Forest Service had about 2,000 people at the fire including 20 engines, 6 water tenders, 14 dozers, 5 skidders, 6 helicopters, 6 air tankers, 16 Type I Hot Shot Crews, 24 Type II Crews and 2 Camp Crews.

Helicopter recon at 0800 on June 27, 1990 revealed significant fire spread to the East but not as much as they expected. The fire on top of the Rim looked good but essentially all other line was lost.

By 1300 on June 27, 1990 strong winds had spread the fire to 21,000 acres.

June 30, 1990

By June 30, 1990 the spread was halted by three Incident Management Teams at just over 28,000 acres. Management of this fast moving fire was complicated by complexity of resources threatened and delays in supply of trained personnel and equipment due to regional shortages.

Accident Investigation Team Member Dick Mangan would publish a new guide through the Missoula Technology Development Center "Investigating Wildland Fire Entrapments", August 1995. Accident Investigation Team member Ted Putnam would publish a paper in which he points out that

firefighters can't follow the 10 Standard Fire Orders to the letter and still fight the fire.

Professor Jennifer Thackaberry (Ziegler) would later posit that the ethical model of the 10 SFOs, based on firefighter virtue would evolve into a duty-based model in which policies like the 10 Standard Fire Orders would be strictly enforced against firefighters, in place of professional judgment and discretion. "Wisdom in the Lessons Learned Library: Work Ethics and Firefighter Identities in the Fire Orders" 2005. With the change in fundamental fire Doctrine which is underway, the wildland fire community is moving back toward its roots, to the virtue-based ethical model and away from the duty-based model. Jennifer Ziegler's fascinating work with the 10 SFOs continues. See "The Story Behind an Organizational List: A Genealogy of Wildland Firefighters' 10 Standard Fire Orders", Ziegler, Jennifer A., Communication Monographs, Vol. 74, No. 4, pp. 415-442 (December 2007).

Ted Putnam was concerned about the reasons why fleeing firefighters could not dump their packs or drop their tools, a factor which slows down escape by as much as 30% and probably contributed to the death of 14 firefighters trying to escape uphill on Storm King Mountain, Colorado, in 1994. Ted Putnam was also on that Accident Investigation Team, and declined to sign the Accident Report. The establishment would not allow the team more time to study the human factors involved in that accident. The Dude Fire and the Storm King - South Canyon Fire investigations were pivotal for Ted Putnam, who went on to urge the wildland fire community to include human factors analysis in its investigations and to develop safety solutions based on human factors. "Leaders We Would Like to Meet", page 5, Fire Leadership, December 7, 2004. Despite agency resistance to his ideas, he organized the first Human Factors Workshop in Missoula, Montana in 1995, which published recommendations for improving firefighter safety. Eight human factors workshops were held, culminating in a ten-year review April 26-28, 2005, in Missoula, Montana. Ted Putnam was awarded the Wildland Fire Safety Award and the Paul Gleason Lead By Example award for his important work concerning human factors in wildland fatality incidents.

Paul Gleason was awarded the Wildland Fire Safety Award in 1998 and the Golden Pulaski Lifetime Achievement Award in 2001 for his

contributions to wildland fire safety and the lives saved by those contributions. The Dude Fire significantly influenced Paul Gleason's life.

For the 2001 version of "Your Fire Shelter", Dave LaTour once again relived and shared his horrific experiences so that others could learn and avoid their own death. By 2005 the work toward improved fire shelters, also initiated by Putnam and others at the Missoula Technology Development Center had yielded a new and better fire shelter.

Another chapter in the Dude Fire story has been written by Dr. Brian E. Potter, Research Meteorologist & Team Leader, USDA Forest Service AirFIRE Team. Dr. Potter published an article in 2005 explaining how the water produced by combustion in a wildland fire enters the plume and affects the likelihood of causing a downburst. The Dude Fire was among the most dramatic examples of this phenomenon in his article. "The role of released moisture in the atmospheric dynamics associated with wildland fires". Potter, Brian E., International Journal of Wildland Fire, 2005, **14**, 77-84.

The Dude Fire downburst article by Goens and Andrews is referenced in Dr. Potter's work. Dr. Potter calculated the DCAPE - Downdraft Convective Available Potential Energy - and the Dude Fire DCAPE values were among the highest of the eleven severe fires examined. Dr. Potter states: "Released moisture is not only a contributing factor, but at times a controlling or critical factor in fire-atmosphere interactions on time and space scales important to fire behavior and fire-fighter safety."

Given the 1500 acre Dude Fire (200 new acres that morning) over 5 million kilograms of water from combustion was released into the plume that day before the downburst. Without this added water the air would probably not have had sufficient water content to initiate and sustain the downburst.

Dr. Potter explains the need to add this to our predictive models:

"The traditional definition of fire behavior describes the controlling factors as fuels, atmosphere and topography. If released moisture is indeed an important factor controlling fire behavior, then it presents

an area of fire behavior research that requires strong knowledge and understanding of both fuel conditions and the atmospheric conditions. The link between these two becomes a strong two-way interaction that cannot be studied or understood in separate fuel and atmospheric pieces.”

Dr. Potter concludes with what needs to be done to put this knowledge to work on the fire ground:

“There are also implications of this work for management, though practical application is far down the road. If a manager knew that a certain rate of moisture release was a threshold for extreme fire behavior on a given fire and day, the manager may attempt to control rate of spread during a specific time period in the hope that the moisture release rate would stay below the threshold, thus preventing possible erratic behavior. Fuel managers could also begin considering fuel loads that would hold the possible released moisture down below a climatologically determined level that divided blow-up from well behaved fire probabilities.”

The Bonita Creek community constructed a monument to these firefighters and planted a tree for each of them at the site. A larger than life bronze statue of a firefighter was erected in recognition of their service and valor, at the old Forest Service Ranger Station in Payson, now the Rim Country Museum:

**“Dedicated to Firefighters who made  
the ultimate sacrifice to protect our  
magnificent Mogollon Rim  
Country”.**

Chuck Cochane TBM Air Tanker Pilot  
6/15/61 Roberts Fire  
Constantine (Corky) Kodz FS  
Employee 6/21/61 Hatchery Fire air  
crash  
Arthur G. Goodnow Pilot 6/21/61  
Hatchery Fire

Ernie Cachini Zuni Fire Crew struck  
by lightning 7/10/89 Horton Fire  
Sandra J. Bachman, Perryville Crew  
Guard, 6/26/90 burned over in Dude  
Fire  
James E. Ellis, 6/26/90 Dude Fire  
entrapment  
Joseph L. Chacon, 6/26/90 Dude Fire  
entrapment  
Alex S. Contreras, 6/26/90 Dude Fire  
entrapment  
James L. Denney, 6/26/90 Dude Fire  
entrapment  
Curtis E. Springfield, 6/26/90 Dude  
Fire entrapment

The Governor of Arizona pardoned the deceased inmates posthumously.

The Dude Fire continues to be studied by the wildland firefighting community. The old military training method of riding across old battlefields, called the “Staff Ride” was applied to the Dude Fire, the first application of the Staff Ride to a wildland fire, to train hundreds of firefighters about the lessons learned, and perhaps yet to be learned, about safe and effective wildland firefighting. Ed Hollenshead, Paul Gleason, Jim Mattingly and Paul Linse were there. Dave LaTour bravely participated in the Staff Ride at his “stand” in Walk Moore Canyon, re-living the events of that day so that others could learn from them.