



*What is resilience?
How do we get it?*

Text by Jonetta T. Holt



Photo courtesy Esteban Tenorio of the Redding Hotshots

Managers who lead crews and teams into high risk environments want to believe the group they are leading is skilled, capable, strong... resilient, even. Do we know what we mean when we are talking about having resilience or behaving resiliently?

Karl Weick and Kathleen Sutcliffe say in *Managing the Unexpected*, "The fundamental characteristic of a resilient organization is that it does not lose

control of what it does in adversity but is able to continue and rebound. It is, in the simplest terms possible, the ability to cope. Resilient organizations absorb the strain of bad outcomes and continue to function. They recover quickly from surprise and collect new knowledge from experiences to reference in future events.”

So how does the situation, “No money, limited resources and a big fire,” sound? Is it familiar? Dave Bunnell, now retired from the Forest Service, describes the first fire he worked on, that “exceeded every expectation he had for fire,” and how he and a crew handled the challenges of a fire that grew to about 50,000 acres. Read his story about the Gates Park Fire – one of the few that did not make headlines in 1988.

Dave Bunnell, then Fire Staff Officer for the Flathead National Forest, arrived at the Gates Park Fire on the Lewis and Clark National Forest when it was several weeks old and about 20,000 acres in size. The fires in Yellowstone were receiving national attention at the time and the Canyon Creek Fire, located ten miles away, was being managed as a Prescribed Natural Fire (PNF). The Gates Park Fire was also being managed as a PNF.



“I saw the Gates Park from the air and I remember thinking ‘this thing looks like an amoeba.’ It was everywhere with all kinds of edges and unburned islands of fuel. Some were several hundred to a couple thousand acres,” Dave recalled thinking. “What, if anything, could I possibly do that would be effective.” Although some elements of the fire looked familiar Dave says, it had already exceeded every expectation he had for fire; it was already larger and more complex than any fire he had ever seen.

“This was a fire that had some maturity. It had demonstrated its capability to grow in variable conditions over time. I spent the first two or three days visiting with people who had been on the fire, gathering their thoughts and ideas about how the fire was progressing; and most importantly, how it had moved into its current position, and what their experience was, because we were going to start working on something bigger than they, or I, had ever worked on before,” Dave says. The BearTop Lookout had been the first individual to see the fire and he had watched it every day. As part of his daily duties, the Lookout had also been logging weather data. “He became the eyes and the historical record of the fire for me.”

Dave recalls that the forest gave him a Mark 3 Pump, about 200 feet of hose and a five person wilderness crew. The Forest Supervisor outlined the objectives for the fire: 1) “we don’t want this fire to come out of the wilderness and 2) we don’t want it to threaten a ranch inholding.” Dave had to figure out how to meet resource objectives, keep the fire from threatening the ranch, and keep it from exiting the wilderness boundary. “It had the capability to do all three of those. But I could not order air resources or get crews for suppression,” Dave says. The PNF program, in 1988, was basically unfunded and nearly all available resources were already engaged at Yellowstone National Park and

committed to protecting communities and natural resources from advancing fires in the Helena and Missoula areas. By mid-August of 1988, every fire index had been exceeded across much of the intermountain west, and resources were either committed to community protection, high value resource components on National Forests or National Parks.

The fire's behavior drew Dave in. "This fire would make a big run then it would sit for 10 days without moving much. What I decided I needed to do was to pair up the information I'd gotten from the people who had been on the fire with the Lookout's weather data and figure out two things; what weather variables were present when the fire made a big run, and, more importantly, what weather variables were missing on days when we could work around the perimeter safely." Dave called Rick Carlson, a trusted colleague and fire behavior officer, and the two matched the day-by-day history of the fire with weather data. They identified the critical days and found that the fire had developed a "needs list," Dave said. "The fuel, topographic features and oxygen were always there, but when relative humidity, temperature, wind speed and angle lined up, this fire got what it needed and ran wherever it wanted to."

Armed with this knowledge, Dave called Jerry Williams, Fire Management Officer on the Lolo NF who served as his operations specialist and who helped him "define the fire."¹ Driving the plan of action that they developed were three important factors: 1) The forest's directive to protect the ranch inholding and keep the fire from exiting the wilderness boundary; 2) the fire's historic inability to breach the high and relatively fuel free ridge on the east side (it tried twice) and the fact that the wilderness extended far enough to the north that a season-ending event would catch up with it before it breached the north boundary; and 3) establishing a strategy to "stall" the fire, not suppress it, in a low gap on the south flank – the place where it threatened the ranch inholding and exposed the wilderness boundary for fire escape.

"The only chance we had was to reduce the fuels on the perimeter, prior to the weather variables lining up, so that the fire would make a run. By reducing or eliminating the fuels before the fire hit it, we could reduce its intensity and subvert its movement. We could stall it before it got there and run like hell when it got bad," Dave says. To stall the fire, he needed a hotshot crew, a helicopter dedicated to the fire and someone to monitor the fire's behavior while the crew was working in the timber.

"The objective for the crew was very clear," Dave explained. "I told them, we have no need to stop this fire. We'll delay it. And we'll do that by reducing the intensity of the fire's movement in key sections of the perimeter. Each day that we could subvert a major run or southern movement, was a day closer to the season ending event." Delaying it helped Dave and the crew to gain an operational period or even a day. They were on their own, often working at night. Working in the dark, they were surprised to find some of the fire's most intense burning periods were at night. The crew's makeshift camp burned over and they were chased out twice. Dave discovered that because the inversion would lift late in the day at 2 or 3 p.m., radiant heat would then start building and the fire would burn hot well into the night. Weather data revealed that the relative humidity would stay

in the 40s while the smoke inversion was in place, and then drop rapidly to below 20 percent when it lifted. The crew adjusted their work hours and tactics continually to take advantage of the safest times to work on the fire's perimeter. They received continual updates from the lookout who alerted them to small changes in weather variables.

During the five weeks Dave and the crew worked on the Gates Park Fire, it grew to 50,000 acres. The fire's perimeter was over 100 miles. Flying the fire became impossible because one helicopter could not make it all the way around the fire without running out of gas and flight hours had to be closely scheduled for only critical logistic and operational needs. Of the 100-mile perimeter, the hand crew worked primarily on a three-mile segment of it, scratching in line, occasionally using burnouts that were sometimes successful and other times not. Over those weeks, the crew got pushed back over two and a half miles of terrain giving the fire the least amount of ground possible.

Daily conversations with the crew were critical, Dave said. "Every day they gave me their assessment of how they did that day and, more importantly, they assessed how their previous day's work had impacted the fire's movement." On August 18, the area received 0.18 inches of rain and lesser amounts each of the following two days. Dave and the crew estimated they had 72 hours before the effects of the rain wore off. He rotated the tired hotshot crew out and ordered a fresh crew, four smoke jumpers and a blast master. With these resources, strategy went from indirect to direct. In three days, firefighters built three miles of line stretching from the river to the ridgeline. The tactic was successful; it took the fire seven days to get past the line and when it did, the line was re-established, burned out and mopped up inside the perimeter for 200 feet.

On Sept. 7, 1988 a well-predicted wind hit the fire directly from the west. Although nearly every fire in the vicinity blew out, Gates Park remained within wilderness boundaries and at its most vulnerable point, the crew's line remained in tact. When the season-ending event finally did arrive, Dave said the fire was still six miles from the ranch inholding and it never exited the wilderness boundary.

Two things had to happen in order for the fire to be managed the way they did it, Dave said. "We had to be able to accurately predict the weather and have it monitored constantly. That means both you and your crew maintain a guarded confidence in the science that is backing you. The daily evaluation of the effects of the operational period became a validation of the predictions and our ability to artfully implement our strategic actions. We also had to rely on the few resources we had because that was all we were ever going to have. That means we had to have complete confidence in the people we were working with and that they would do what they were told to do and nothing more."

[Short video of Dave Bunnell telling his story.](#)

Organizations and individuals who are committed to resilience expect to be surprised in the course of their work, so they focus on building skills that will enable them to quickly cope with changes. They continually question what is happening, never assuming that they completely understand the situation. Weick and Sutcliffe say, "Resilience encourages people to act while thinking or to act in

order to think more clearly.” John Boyd describes this continuous loop process as observe, orient, decide, and act.

Let’s look at some of the resilient behaviors this group used.

Dave and his co-workers were working in an environment that they questioned on a minute-by-minute basis. They regarded their personal experience as a tool, not a safety net. In order to gain an early warning of a changing situation, their monitor tracked not just observable fire behavior, but also small changes in the weather variables that could affect the fire’s behavior.

Daily conversations provided a quick feedback loop for discussing what they had done that day and how effective the prior day’s tactics were at modifying the fire’s movement. Crew members used their training and knowledge to creatively adjust their tactics on a daily basis, sometimes abandoning burnouts when they did not work and pressing their advantage immediately after a wetting rain.

Finally, the crew measured overall success by an innovative standard of “delaying” the fire. By remaining true to the forest’s direction of, “We don’t want this fire to threaten the inholding or exit the wilderness boundary,” they were able to widen their response mechanism to redefine success.

Weick and Sutcliffe say that “A commitment to resilience is difficult to sustain because you have to keep learning without knowing in advance just what you will be learning or how it will be applied. Your challenge is to avoid adjusting to surprises in ways that reduce your adaptability.”

Consider using this HRO Story in a learning opportunity, teaching moment, or teambuilding session you design for your unit, team or organization.

Questions related to this event:

- What if the BearTop Lookout had not remained vigilant in tracking fire behavior and incremental changes in weather variables while the crew worked in dense timber where they were unable to watch unfolding fire events?
- How did it help fire managers create an understanding of “what success looks like” when forest personnel said “We do not want the fire to threaten the ranch inholding and we do not want it to exit the wilderness?”
- If you were a crew member working on a small portion of a 50,000-acre fire, would you be able to be innovative in your vision of success in “delaying” the fire? How would that affect your commitment to your work over a five-week period?

Broader questions to ask ourselves regarding our teams and organizations:

- Do we use our abilities and knowledge in creative ways to mitigate potentially harmful situations?

- Do we regularly audit our situation identifying: 1) our main capabilities, 2) our key vulnerabilities, and 3) ways to adapt?
- Do we regularly work to build people's competence and response repertoires?
- Do we encourage each other to learn from our experiences and properly frame them for possible future applications?
- Are we ready for the crises that will occur simultaneously on an event?
- Can we quickly identify what we must let go of in the face of change and what we should retain?

Notes

¹ *This instance became important as the Prescribed Natural Fire program, and subsequently the entire Fire Management program grew, in subsequent years. The collection of an Incident Commander, Operations Section Chief and Fire Behavior Analyst, coupled with a small force, became the first organized form of what was later formally recognized as a Wildland Fire Use Team committed to managing large-scale, long-duration fires by implementing less than full suppression strategies. Fire use team assignments were developed based on the needs of a single fire, total dedication to just a single fire over a long time period and resource values requiring fire perimeter manipulation instead of fire suppression.*



For more information on High Reliability Organizing and Organizational Learning, please visit the Wildland Fire Lessons Learned Center's website at www.wildfirelessons.net, or contact the LLC staff:

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For more resources on HRO Implementation, see Stories, Case Studies, Metaphors and Examples at www.high-reliability.org where several approaches are examined including John Boyd's OODA Loop.

Boyd's OODA Loop, (Observe, Orient, Decide, and Act)

