



Western Edition Episode 7
 “The West on Fire: Climbing the Tower”
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(MUSIC – RADIO KEEPS ME ON THE GROUND (SLIGHT RETURN))

BILL DEVERELL: Hi, I’m Bill Deverell, and this is *Western Edition*, season one: “The West on Fire.” For over a century, the U.S. Forest Service has posted fire lookouts at the tops of mountains and trees – men and women who gaze out at the horizon, watching and waiting for signs of smoke. They serve as the eyes for fire crews who go out to battle the blazes. Increasingly, those human lookouts are being replaced by drones and satellite technology. And we’ll get into that in a moment. First though, let’s meet one of these lookouts. Philip Connors keeps watch over one of the most fire-prone forests in the country: the Gila National Forest in New Mexico. Every summer, for nearly two decades, he sits in a tiny cabin at the top of a fire lookout tower with his binoculars, maps and notebooks, standing guard. That experience formed the subject of his book, *Fire Season: Field Notes from a Wilderness Lookout*.

PHILIP CONNORS: So, in 2002, I took vacation time away from my day job, which was as a copy editor at the *Wall Street Journal*. And I went to New Mexico and visited a friend of mine who had this crazy job that I couldn't believe still existed as a fire lookout in the Gila. And I was itching to get out of New York and itching to leave the newspaper and find something else to do with my life. And I arrived at my friend's fire tower and just instantly fell in love with the idea of the work and the contour of the landscape. I spent three days there. And by day three, I had talked myself into her job. She would go to her boss and make a plea whereby she would be released to go do something she wanted to do, which was go fight fires. And she would arrange

to have a replacement handy so it wouldn't trouble him over much to try to hire somebody to fill in for her. And that replacement was me. And, you know, the only thing he asked me was, 'okay, Mr. Wall Street Journal, you think you know what you're getting into here?' And I said, 'well, I did spend three days there. So yeah, I think so.' And so that's what I did. I flew back to New York, gave my notice at the paper, flew back to New Mexico 15 days later. And that was 19 summers ago. I've held the job. It's a seasonal job, only half the year, but I've done it ever since.

DEVERELL: Did you climb the fire tower to write the book?

CONNORS: No. I climbed the fire tower, I thought, to look back and have time to think about everything that had brought me there. Part of it was just a way too up close and personal encounter with Ground Zero on 9/11, which was, you know, I don't know that I've still quite reckoned with just how much that impacted my subsequent life choices. But I think there's something to the fact of me fleeing a job in an office tower in Lower Manhattan for a, a tower in the Gila wilderness and finding the second of those two much more agreeable. And, you know, I quickly grasped that the job was essentially a paid writing retreat with good views. You know, there were obligations and duties and I fulfilled them. But you also had all this free time. And I was slow to realize that what I really wanted to write was less, you know, an excavation of my past than an exploration of the present out my window.

(MUSIC – FRAIL)

DEVERELL: The job of a fire tower lookout has long been seen as a refuge for those who could use a break from civilization or just a quiet place to write. Jameson Karns is a former firefighter who received a doctorate in the history of science at the University of California Berkeley. He's now part of the Institute on California and the West's team for "The West on Fire" project. Jameson Karns says fire towers first came to the U.S. as a European import.

JAMESON KARNS: The American fire lookout, fire tower, if you will, can be traced back to some of the exchanges we see in the late 19th century and between American foresters and naturalists that travel abroad to receive their education in forestry. Gifford Pinchot is a great, notable example. Of course, Gifford Pinchot would later be the first chief of the United States Forest Service. While they're there, primarily in Germany and France, they come encounter with what are essentially Feuertürme, or fire towers. They can be traced to the Prussian military. Originally called Wachttürme, they were used as observational points.

DEVERELL: Observational towers for troop and population surveillance?

KARNS: Absolutely. And one of the things we see is that these towers become particularly useful, particularly in Poland. The actual landscape in Poland is different than in many parts of what is now modern-day Germany. They're difficult to see through. And so, when fires do take place, they find that using the same tools and communications that they would utilize for their army work exceptionally well for directing, what's oftentimes those same troops, to extinguish and exterminate wildfires. And they do this through a series of communications with bells, occasionally whistles, as well as flag communications to convey to what's essentially the Prussian troops-turned-firefighters on the ground where the fire is moving and shifting. And so, it's really from that tradition that American foresters adopt the fire lookout. And you, you do see in the early 20th century, the adoption/creation of fire lookouts throughout the United States Forest Service, but as well with state forestry agencies that are, are just taking off. However, it's, it's not really until the World War II period that we see a boom in many of these fire lookouts. One of the reasons, first, is that many of our nation's fire lookouts are actually built and developed by the Civilian Conservation Corps. Of course, this is one of Franklin Delano Roosevelt's answers to the unemployment situation that's taking place at that time. It's also during this period, more so during the so-called Beat Generation, that fire lookouts become kind of cool. As I'm sure you're aware, Jack Kerouac...

DEVERELL: Yeah.

KARNS: ...is a very famous American author. And he famously took to the fire lookout on Desolation Peak in the Mount Baker National Forest in Washington to write some of his work. He, he had a difficult time doing so, but eventually published two books, *The Dharma Bums* and later *Desolation Angels* – which is directly attributed to his time in the fire lookout. So, amongst American culture, it kind of becomes this cool hip place where you can take a summer job where you're not only provided an income, but also becomes a place where one can reflect and contemplate the larger scheme of things.

DEVERELL: So, is it almost like a 20th-century version of Walden Pond?

KARNS: Absolutely. I think that's a great comparison.

DEVERELL: Amazing.

KARNS: It's, it's one of those, those rare conduits where you can be completely immersed in nature and focus on whatever subject you feel is best, any avenue of existential or something...

DEVERELL: Right.

KARNS: ...that, that you see fit. And of course, your needs are being provided for. Food and supplies are regularly brought to you. So, it's, it's a very unique place in American culture.

(MUSIC – STEALING)

DEVERELL: The writer Edward Abbey also worked as a fire lookout in Arizona, and he made the protagonist in his novel *Black Sun* a fire lookout. In his book *The Journey Home*, Abbey wrote about working as a fire lookout at Glacier National Park, quote, “We are being paid a generous wage (about \$3.25 an hour) to stay awake for at least eight hours a day. Some people might think that sounds like a pretty easy job. And they’re right, it is an easy job, for some people. But not for all.”

(MUSIC – STEALING)

DEVERELL: Phil Connors has returned to the same tower every year for the past 18 years.

CONNORS: The tower is five miles from the nearest road. So, beginning the process of getting there involves a two-legged commute, uphill all the way. The tower is a 50-foot-tall tower with a seven-by-seven-foot room on the top of it, accessed via a trap door. So, there's several landings worth of steep stairs and then a trap door and you pop into this little room that has a fire finder in the middle of it, the Osborne fire finder, the same tool fire lookouts have been using for a century. It allows you to essentially draw a straight line attached to a compass degree reading from your location to some other fixed location and allows you to determine the precise location of the smoke. And when I'm there, I'm instructed to do a full 360 degree sweep of the landscape for evidence of smoke every 15 minutes. Most days I work between an eight and 10 hour a day, depending on level of fire danger. Sometimes it's longer when there are crews on the ground or lightning storms or possible eventuality that makes my being in the tower important. And every morning at 9:00 AM, I take a series of weather measurements with some specialized tools – temperature, relative humidity, wind speed and direction, dew point, any precipitation received in the past 24 hours down to the hundredth of an inch, and then sky conditions and lightning report for the previous 24 hours as well. Essentially all else I do; I keep up facilities cause I'm the only person who lives there really other than the relief lookout who spends less time there than I do. And I'm a communication relay. I'm in a high place. I have a two wave, very high frequency radio. And so, I can be a link sometimes between dispatchers and crews on the ground, whether fire crews, wildlife biologists, archeologists, trail crews. They might find themselves in a place where it's hard to hit dispatch directly off a repeater tower, so they'll use me as a relay.

DEVERELL: Tell me a little bit about your, your visual acuity up there and any changes you've seen in your visual acuity sharpening or otherwise over those 19 years or 18 years. And also, if you could, tell me about any kind of fire sense and intuition you might've developed that 'well, today I think we may see a fire.'

CONNORS: My visual acuity is probably relatively unchanged over the years. I know better what it is I'm looking for than I once did. And I also know the false alarms to watch out for in a way that I didn't when I started. You know there are places where there's mining activity that kicks up dust sometimes that can be mistaken for smoke. There's a phenomenon called the waterdog, where mist rises off of ridges and out of canyons after a hard rain and it can look very much like smoke. And so, you have to figure out a way to understand that it isn't smoke. You know, over the years, I think you do develop a sixth sense for at least the level of danger of a fire.

DEVERELL: And what happens at night in terms of fire lookout? Is that just then return to satellite observation or something?

CONNORS: Well, on the Gila, we're off at night, typically. We might work late if there's a crew on the ground; we're watching weather for them. But the thing about nighttime and fire activity is that if a fire doesn't get going during daylight hours, it's very rare that it gets going at night because the temperature's always lower. The humidity's always higher. And the thing we're looking for, which is smoke as the first sign, not necessarily open flame, you don't see that until the fire gets much bigger, you're not going to see a little smoke after dark anyway. You know, satellite observation isn't yet quite good enough to, to replace us. So, on the Gila, it's all fire lookouts and aerial surveillance by airplanes at this point. And that all happens before dark.

(MUSIC)

DEVERELL: Phil Connors mentioned aerial surveillance. To offset the costs of human fire lookouts, fire officials began putting video cameras and thermal imagers on the towers, powered by diesel generators or solar panels. Then there was the dramatic rise in the use of unmanned aerial vehicles, or UAVs, also known as drones, beginning in the 1990s and early 2000s. Back to Jameson Karns.

KARNS: They offer many, many tactical advantages, right? Many of them are situated with high-definition imagery, and this imagery can be shared in real time to multiple parties. Also, particular types of drones come with infrared technology. And this is huge because what

essentially it does, it allows us to cut through the smoke and the ash and to see the base of the fire, where the fire is actually moving. And gives us one of the clearest depictions of fire behavior that we've ever had before.

DEVERELL: Vince Ambrosia is a senior research scientist at Cal State University Monterey Bay. He works with NASA and other agencies on using tools like satellites and drones to observe and combat wildfires.

VINCE AMBROSIA: When I first started working with the wildland fire community back in the '80s utilizing imaging sensor data. Yeah. We didn't see the, the extremely large fire events happening as frequently as they are today. And over the last probably five to 10 years, we've seen a massive increase in the scale and size of wildland fire in the, primarily in the Western United States, but we're also seeing it over the globe. So, it's become the new normal for us.

DEVERELL: Is the satellite imaging, is that used to spot wildfires or is it used to help manage them once they've begun?

AMBROSIA: A little of both. There are thermal infrared channels on board our satellite observation systems, some of them, and they're used to monitor hotspots all over the earth surface, which includes wildfires of course, volcanoes and other activity like that. So those thermal channels are used to identify fire on the landscape at its earliest detection when those satellites pass overhead. In addition to that, those same satellites, with those other spectral channels, allow us to do post-fire mapping of the severity of the fire to give the rehabilitation teams on wildland fires enough information to make mitigation solutions possible. So yes, our satellite data is used all the way from actually predicting a fire location based upon vegetation health, and then active fire monitoring, and post fire rehabilitation and recovery operations.

DEVERELL: Well, I'm just curious, you know, given that kind of overwhelming nature of Western wildfire that we're all seeing, either with our own eyes or with these sophisticated observational tools, is it your sense that we should throw all kinds of observational techniques at these fires? In other words, you know, we've got a fairly, compared to what you do, a fairly primitive fire tower with a person in it. You've got obviously aircraft observation, drone observation, satellite observation. Does each have a place in our observational work?

AMBROSIA: Yes. They all have a place. And what we tend to focus on nowadays is this operational concept of a sensor web. So how do we combine through artificial intelligence and machine learning? How can we provide reliable information that is gathered from all these different platforms and surface measurements into a combined decision support system that

allows us to make use of all the available information that's out there? And in the case of a fire tower, some of the new advancements are in these fire tower cameras that kind of replace the fire watcher up in the towers, obviously, with a camera system. So how can we combine the information from those real-time camera systems and their modeling efforts of the imagery that they're collecting to recognize fire on the landscape and provide that information into a decision tree that allows us to identify that specific location of the fire and say, 'yes, that is a fire. That is a smoke plume.' There are a number of roles where small UAS are going to be a particular advantage to the firefighting community. And one you can imagine is the forward deployment teams, the hotshot crews having, let's say small backpackable UAVs that they bring into the firefight with them. And that provides them the operational use of imagery for over-the-hill assessment, so basically, situational awareness on what their surroundings are like when they're deployed, you know, remotely into these fires that are in steep terrain and areas where they don't have good overhead surveillance. And those high-altitude platforms, one of the interests has been in lighter-than-air vehicles. And lighter-than-air vehicles operating anywhere between 60,000 and 100,000 feet above the surface. And so, they're not affected by the fire or get into the fire aircraft data space, if you will, or, or flight space of a major wildfire event; they're just sitting overhead and observing the wildfire 24/7 and providing that real time information down to the fire crew. So, these are more like a Zeppelin, kind of like a Goodyear Blimp. So, they're more shaped like that and have controls on board that allow them to either hold stationary or to fly from point to point to hold the camera stationary. So, these are high altitude Zeppelins or similar to that rather than a free launch balloon that really has no control that's just at the whims of the wind aloft.

(MUSIC – WAYWARD)

DEVERELL: As wildfires become hotter, bigger, and more deadly, the technology is being pushed to improve at a rapid pace. Jameson Karns says there are other reasons why drones have become popular firefighting tools.

KARNS: When we do look back at the history of technology and in fire management, one of the things that we do see continually throughout American history is that, at the end of a major military campaign, we see an influx of decommissioned and demobilized military equipment make its way to the various fire management agencies across our state.

DEVERELL: And that's happened since the Second World War forward, I take it.

KARNS: Absolutely. You know, World War II, large influx of all types of mechanized equipment, radios. After the Vietnam and Korean era, we saw a large influx of not only helicopters, but as

well as helicopter pilots. And with some of the recent changes that we've seen, we can definitely expect to see more drone technology make its way into the hands of fire management officials.

DEVERELL: Certainly drones and other technologies offer important tools for monitoring and combating wildfires. But there are still advantages to having a trained human lookout with a sharp eye for reading smoke. Back again to Phil Connors.

CONNORS: In the beginning, it's often quite similar to all other fires. It's very light in color, kind of gray white. But you can also look at a fire and sort of tell if it's in the grass, maybe a little more dispersed. The lighter the fuel, meaning the finer the fuel, the less weight it has, the lighter the smoke. Heavier, big timber tends to burn with a darker color, gray, sometimes even black if it's a bigger fire burning a big chunk of timber all at once in like a crown fire. And yeah, the thing you learn about fire versus dust is just the color difference. Dust tends to be tan or yellow or have a slight brown tinge to it that smoke does not. Then those waterdogs tend to be almost a pure white that is a little purer than even the lightest wildfire smoke in grass.

(MUSIC – LAST ROUNDUP)

DEVERELL: That's Philip Connors. His book, *Fire Season: Field Notes from a Wilderness Lookout*, is set to be reissued in 2022 for a tenth anniversary edition. Thanks as well to Jameson Karns and Vincent Ambrosia for talking with me about the past and future of fire surveillance. And if you've ever harbored a fantasy about being a lookout yourself, you can live out your Jack Kerouac and Edward Abbey dreams of quiet solitude by renting a fire lookout station. The U.S. Forest Service rents out dozens of lookout cabins to visitors across the West. I'm Bill Deverell. Thank you to all of our guests this season and to you, our audience, for exploring the past and present of fire in the American West. We'll be back with season two, tracing the history of Los Angeles' historic Chinatown, early in 2022. *Western Edition* is produced by Avishay Artsy, Katie Dunham, Elizabeth Logan, and Jessica Kim. Our music was written and recorded by I See Hawks in L.A. *Western Edition* is a production of the Huntington-USC Institute on California and the West. Thank you for listening and be well.

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