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Transcript

Have you ever watched a little kid play with a jack-in-the-box? Let's call it a little girl. First she'll turn the crank, and when Jack pops out she'll either laugh or cry. It doesn't take too long for her to try to keep Jack from popping out. She claps her hand down on the lid, but the arms are still sticking out. Then she pinches her fingers trying to stuff in the arms while keeping the back held down. A little later, she figures out how to ease up the lid with a gentler touch, even while the music is playing.

Jennifer Balch says that we've got to stop thinking about fires like a jack-in-the-box, like something that pops out all of a sudden and surprises us. I have five boxes up here . . . and my friends are working away on them. We know that as long as the crank is turning, jack is going to be released. For kids, at least, the anticipation builds as the music progresses. They know he's coming, but the sudden release gives them a little jolt, and it's fun to be caught off guard.

The analogy, of course, is that the crank is the sun, the energy in the spring is the energy stored in vegetation, and jack is the fire, inevitably released.

Every year, hundreds of thousands of fires burn roughly 350 million hectares, an area five times the size of Texas. Hundreds of thousands of jacks are going to pop, wherever vegetation accumulates, followed by a sufficient dry period. That drying period could be an annual dry season, could be a multi-year drought, or artificial drainage. At the global scale this process is continual, predictable and inexorable.

But each fire is basically local, igniting in a particular place at a particular time in a particular social context. Bowman and others put together this conceptual model of pyrogeography, and in an applied sense, this is what I call a fire system.

This evening I want to present a suite of case studies from around the world. They include systems where there is too much fire in vegetation, not enough fire or the wrong kind of fire. In some places the fire system is strained or broken. In others it is being repaired in creative ways that can inspire application in other places. Overall, I'm going to borrow the words of my colleagues in the Fire Learning Network who say "We need more good people putting more good fire on the ground." Finally, I hope to show that doing that is a viable way to fix a number of fire systems, especially those that are temperate or tropical.

The danger in a synthesis like this is that everything I use is borrowed, and I might mangle your stories by not knowing the details. My apologies in advance. Each fire system is complex—but with any luck, these surface impressions will add up to something meaningful.

Let me explain what I mean when I borrow the term "good people" in the context of fire. "Good people" are both "good fire people" and "good-fire people." These are individuals and groups that take the time to understand the complexities of their fire systems, weaving together the geophysical, biological and social elements. A lot of good-fire people have come to know fire in a specific landscape, where they and their teachers have observed fire burning over and over again. They develop a deep sense for how fires behave, how the weather works and what relationships fire has to the plants, animals and people there. They themselves have a genuine relationship with fire. Outside of the extremes, they see fire as flexible and pliable. Over many years they develop the skill and the humility to understand its nuances, to keep it supple and to shape it.

First let me talk about some fire systems that got broken.

In 1871, the Peshtigo Fire occurred near Green Bay, Wisconsin very close to Lake Michigan. The community was busy establishing small family farms, cutting away white pine forests, making wood products. A drought came along. Loggers and farmers noticed their burn piles refusing to go out and a feeling of still air hanging, eerily seething in the woods. Then came a big wind storm.

The accounts are horrific. Women's long skirts and long hair caught fire as they ran from the flames. A log carried by updrafts from the fire landed on a ship in Lake Michigan, seven miles away. Large balls of burning gasses rolled overhead as people and animals fled to the river. Some families huddled under wet blankets in their fields, but afterwards only piles of ashes, or maybe a wedding ring, remained. In all, 1500 people died in the Peshtigo Fire; more than a million hectares burned in Wisconsin and Michigan that year.

So, who or what in that fire system was to blame?

First it was the weather. Weather monitoring and prediction weren't very well established. Yet, the reconstruction from available records depicts a storm of significant size.

Settlement and industry looked like this: Logging slash was burned in piles or scattered. Factories and sawmills had stockpiles of wood and wood by-products. Sparks from railroads were a source of ignition. Everything was made of wood—houses, factories, even sidewalks. Floors and streets were covered with sawdust.

And the immigration history revealed another thing. Long and Voss produced this graphic showing the origins of immigrants throughout the history of Wisconsin. The people who immigrated before the Peshtigo Fire were German, Norwegian, Swedish, Irish, English, Swiss and Dutch. The community of Peshtigo was largely Belgian. I'm not really sure they knew the landscape they were in—or how they were shaping it to burn.

Madagascar. Here's an example of a current fire system that is broken.

Madagascar is the fourth largest island on Earth. It's about the same size as Texas. It is home to about 250,000 known species, 70 percent of which are endemic. The pink color on the map represents land that is considered "severely degraded or very severely degraded" by the United Nations Food and Agriculture Organization.

Among other things, a significant threat to the biodiversity of Madagascar is uncontrolled burning by local people. Each year local farmers burn about half of the country's forests and fields, including 250,000 hectares of moist tropical forest.

What are some underlying factors driving the system? Madagascar has suffered a tumultuous history of French and British colonization intertwined with repeated rebellions by the local Malagasy people. In 1907 and 1913, French colonizers imposed wholesale restrictions on local burning, ostensibly to protect timber and other resources. Burning that was once an ordinary practice became illegal and punishable by heavy fines and imprisonment.

Although the traditional fire knowledge of the Malagasy people prior to colonization is largely undocumented, slash and burn agriculture was—and still is—part of the picture. But after a century of sanctions a different sort of fire system has emerged. Christian Kull and others teach us that in contemporary Madagascar, fire management is a clandestine affair. Fires are lit by individuals operating in secret, often at night. And they start their fires in places that are hidden from view.

Fire practitioners decide when to burn based in part on the political environment, knowing when the government is likely to enforce sanctions and when it isn't. Local communities protect a burner's identity, frustrating government investigations into who started a particular fire. Now, take a deep breath and reflect on this situation for a second. Think of all the ways that setting fires this way would undermine the former fire system. Visible firebreaks wouldn't be very popular. Patch sizes would be different, nobody could stay and tend the burn, much less mop it up.

There is another element I should mention. Burning is also used by local people as a protest against the government—the kind of government that arose from colonialism. Burning as political resistance asserts local autonomy and affirms cultural identity.

And this motivation for burning isn't unique to Madagascar. If you haven't talked with Francisco Seijo from Spain, ask him about burning by traditional herders in Galicia, which is a legacy of the Franco dictatorship.

I want to turn now to some happy examples of fire systems that are being repaired.

In Zambia, Kafue National Park is managed by the Zambia Wildlife Authority. The park is eight times the size of Yellowstone. The dominant vegetation is fire-prone Miombo Woodlands. The climate provides ample moisture, broken by a five month dry season.

Unregulated fires from local people toast two-thirds of the park every year in the hot and dry season. McRee Anderson says that "everyone burns for every reason . . . and the park's annual fire budget is \$5000."

The safari business is growing and tour operators are putting pressure on the agency to get control of the fires. They argue that the late season fires started by local people pose a threat to their facilities and are hard on wildlife. Late season fires can become very large—like as big as 90,000 hectares. They create extensive areas of blackened ground and smoke, which safari companies say their European customers don't appreciate.

Under political pressure, park rangers needed a way to gain some measure of control over the fire regime. With few breaks in the flammable landscape and that meager budget, they teamed up with the U.S. Forest Service and The Nature Conservancy. They gathered a small group for some training exchanges, and wasted no time putting good fire on the ground.

They also began training staff of the adjacent game management areas. Using thatch bundles for torches and simple hand tools, they started burning in the early dry season, lighting along trails used for safaris, stimulating fresh green shoots to attract wildlife and reducing fuels around structures. At the landscape scale, areas burned in the early dry season provide a more desirable vegetation mosaic.

What I love about this case is that in a vast, flammable landscape, in a park with no hope of enforcing any kind of regulation, a handful of people are creating a shift in the fire system that is culturally and ecologically appropriate. It is financially feasible and quite possibly sustainable. They are using good fire to address their problems with bad fire.

Australia. In northern Australia, as in so many places, European invasion displaced indigenous peoples and decimated their culture. Over time, as traditional fire management became weaker, wildfires became stronger. There's a remarkable recovery of traditional fire systems underway—with a climate change twist.

As it turns out, the ancient practice of burning in the early dry season not only protects biodiversity and cultural heritage, it also emits less greenhouse gases than late season wildfires. The science and mapping to support this is quite sophisticated.

In one project, the West Arnhem Land Fire Abatement Project, early season burning by indigenous rangers over large protected areas avoids the equivalent of 100,000 tonnes of CO₂ emissions. Credits for these avoided emissions are sold on Australia's carbon exchange market. In this case, ConocoPhillips has agreed to invest \$1 million dollars per year in West Arnhem Land carbon offsets for 17 years. The money goes to the indigenous communities that own the land, and they are reaping the benefits of 200 new jobs, robust tropical savannas, and cultural revitalization—which is priceless.

Spain. In my last example, Spain has started something interesting, a program called Equipos de Prevención Integral de Incendios Forestales, abbreviated EPRIF. Following decades of political policy that weakened traditional farming and herding communities, people are leaving the countryside. They either sell the land to vacationers from the cities, or abandon it altogether. As you would expect, without tending, the vegetation accumulates. Subsequent wildfires burn with a vengeance, killing firefighters and unwary newcomers alike.

After years of government insistence on fire prevention and suppression only (during which some local people kept burning), Spain's Ministry of Agriculture and the Environment is experimenting with EPRIF, a program to work together with good local people to put good fire on the ground.

Government firefighters run the program during the cooler, wetter time of the year, exchanging information with the farmers, planning controlled burns together. They actually do the burns together and evaluate the results together. It appears that the program is expanding and it will be interesting to see the impact it has upon an otherwise deteriorating fire system.

So how does all of this apply to where we are today, here in the United States? We have a fire system in which the public hasn't insisted on maintaining its fire knowledge for about three or four generations. And the world's largest and most capable firefighting institutions are buckling under the weight of accumulated fuels and a changing climate.

As scientists, we've dissected our fire problems quite thoroughly. And to tell you the truth, before I read one more scientific paper in which U.S. fire ecologists call for more prescribed burning, I would like to focus on solutions.

There really are a lot of good things happening in the U.S.:

- Prescribed fire councils are growing and gaining influence. Recently, the work of the Northern California Prescribed Fire Council and others resulted in the Governor Jerry Brown of California calling for more prescribed burning across the state.
- Ranchers are forming controlled burning associations, and getting them insured. Here in Texas, where private control of land is a source of pride and identity, there are eleven prescribed burning associations, and the same thing is happening in Oklahoma.
- Our federal fire agencies are working more and more in partnerships across agency boundaries. And even fire managers, who tend to move from place to place, are broadening their relationships with local communities.
- The Western Klamath Restoration Partnership is one example in which citizens are training in national fire standards and they are working as community liaisons on Incident Management Teams during wildfires—big, nasty fires. The Karuk Tribe entered into a cooperative agreement with the Klamath National Forest to co-manage a sizeable sacred area. Part of the task is to restore the tribe's ancient ceremony of world renewal, which requires sending burning logs rolling down a certain mountain, at exactly the right time.
- The fire adapted communities movement is rapidly spreading. Local efforts have grown into state-wide efforts. Participants are combining neighborhood relationships with extensive social media to support what is becoming a real revolution in American's ability to live well with fire.

Given these examples and many more, we can still look at our present fire system and find fantastic opportunities. Take our wildland fire workforce—the number of federal, state and local people who work with vegetation fires in this country exceeds 175,000 people. If that doesn't light your imagination, think harder. These are people who like to be near flames—and who might just take the challenge of putting more good fire on the ground.

Okay, I'm going to tie things up with a few creative ideas inspired by our federal fire workforce and then conclude my talk. Our smokejumpers are hailed as the elite of the elite among our wildland fire fighters. Smokejumpers: thank you for your service. What if we shifted the fundamental purpose of smokejumpers from putting fires out while they're small to parachuting into an ignition site and to immediately begin designing the safest and most effective way to stretch the fire into the largest burn area practical, given current and anticipated conditions? Wouldn't that become more rewarding for them and for our country in the long run?

I have to tell you something: it's already been done. During a field trip to a recent wildfire, Karuk tribal member Bill Tripp pointed to a far off sugar pine high on a nearby ridgetop. For millennia, he said, the Karuk People of California trained elite warriors to run as far as 13 miles in steep mountains to address a lightning strike. When they arrived, they used pine needles and pitch-sticks to pick up the fire and draw it down the mountain. They were managing the landscape and keeping communities safe from wildfire.

And our beloved Hotshots: thank you for your service. What if we granted them the role of walking with fire, not just in our late dry season, but of putting good fire on the ground in our early dry season, every day when the conditions are right. If we held the Firewalkers in as high regard as we do the firefighters, we could further shape our fire future.

I have to confess that I borrowed the term Firewalkers from Volusia County, Florida, where the structural fire department rewards their best firefighters with a chance to serve on its prestigious team of controlled burners. And get this—the National Fire Protection Association says that today, right now, the U.S. has 1.1 million structural firefighters, 100,000 of whom already work in the wildland-urban interface. Think what we could accomplish if we shifted things in this direction, just a little.

Here's another idea: If the taxpayers of this country are going to spend \$2 billion federal dollars in federal firefighting each year, and another \$2 billion in state and local firefighting, I say we use one tenth of that, and invest \$40 million in figuring out how to do large-scale controlled burns that get something proactive done at the scale that can make a difference.

Create and support community-based, cross-cultural teams of practitioners who train together, plan together and burn together. In areas of extensive public lands, give teams that want to plan and complete burns of 10,000 acres or more a special, well-funded cost center. Put a few million dollars in there to provide them aerial support and anything else they need to run a large prescribed fire operation. When the burn is done well, give the burn boss a bonus—and the team a big community celebration. These brave souls can become our national heroes. And for gosh sakes plan in advance to back them up like patriots, to stand by their sides, during and after the painful analysis of things gone wrong.

In conclusion—So what if fires like the Peshtigo Fire made us focus too much on fire suppression for three or four generations? Big deal. Let's dedicate a couple of generations more to bringing fire systems back in balance. After all, we are good-fire people. We have an affinity to good fire and well we should. As Steve Pyne says, we have a deep evolutionary connection to fire—roughly 750,000 years' worth—and that's at least 30,000 generations.

And finally, a note to ourselves. The Association for Fire Ecology is the only organization of its size that is committed to fire systems in the full array of their complexity. Next time you're tempted to waste your time blaming others for the fire problems we share, from place to place around the world—take some responsibility. Reach out to local people to answer this question “How can we get more good people putting more good fire on the ground, right here, in my lifetime?”

The Association of Fire Ecology and its many partners really can change the world's future with fire. If we stand up and make a fierce commitment to this purpose, we can lead the way until good fire wins over bad fire, everywhere on Earth where fire belongs.

Thank you very much.

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