The World on Fire

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Announcer: This is Climate One. Wildfires have always been part of the landscape in the American West. But the size and intensity of fires over the last several years is something new. People's lives are being upended by the flames.

Lizzie Johnson: It's really hard to rebuild a normal life when your job is disrupted. You don't have housing. You're trying to find housing but there's really no place for these people to go.

Announcer: Solutions include starting some fires.

Rich Gordon: The first peoples who are here, they actually would set fire knowing that would actually improve forest health by removing the underbrush and leaving the taller trees.

Announcer: The Word on Fire. Up next on Climate One.

Announcer: Megafire. It's a new term in the climate change lexicon. These are wildfires, burning at a high intensity, which cover more than 100,000 acres each. And we are seeing more and more of them. Today we're exploring what is causing these megafires, the damage they are unleashing on life, property and natural ecosystems – and how forest management techniques can provide solutions to this increasingly devastating problem.

Welcome to Climate One – changing the conversation about energy, economy and the environment. Climate One conversations are recorded before a live audience and hosted by Greg Dalton. I'm Claire Schoen.

Announcer: The American West is on fire. Of the 20 largest wildfires in California history, 15 happened since the year 2000. And damage from western wildfires in 2017 alone cost $18 billion. The higher temperatures and lower humidity, brought on by climate change, are whipping up hotter and bigger wildfires.

Scott Stephens: What it does is it just sucks out moisture out of fuel. So if you actually make fuel drier, you're just gonna be able to burn it easier and have higher intensity more flame lengths.

Announcer: That's Scott Stephens. He's a Professor of Fire Science at the University of California, Berkeley. He is an expert on wildfires and has written about managing fire and forest in a changing climate. Stephens talked with our host, Greg Dalton, at a recent Climate One event. Lizze Johnson was part of the conversation as well. She covers wildfires as a reporter for the San Francisco Chronicle. And she understands the toll that these fires are taking.

Lizzie Johnson: The fires are coming into more developed areas like Santa Rosa. These are people that never thought that their home would burn down and now they're getting evacuated in the middle of the night with no warning. They're terrified they're traumatized.

Announcer: Greg's third guest on this panel is Rich Gordon who represents the timber industry as President of the California Forestry Association. Gordon points out the contradiction that past policies of fighting every blaze has actually added to the problem.

Rich Gordon: We have too much fuel. Our forest are too dense. We have allowed them to overgrow because we have aggressively fought fire and done fire suppression. A thinner forest is a healthier forest.

Announcer: Before getting into the conversation, Greg played a clip for his guests from a survivor of the Tubbs Fire north of San Francisco in 2017 that killed more than 20 people and destroyed nearly 3000 homes.

Announcer: Caitlin Tucker's home was one of them. She described what it was like to grab her kids and run for their lives in the middle of the night.

Caitlin Tucker: There was no warning. The power had gone off our fan had stopped working. It was warm in our bedroom I thought that was odd but I knew it was windy and went back to sleep. And I woke up the next time around 2:30 and my husband had heard something outside and it was a policeman driving up our road yelling "You need to get out of your houses a fire is coming." I have two kids. My daughter is 11. My son is 9. So my heart was pounding and as we put them in the car it was almost like snow. The ash was so thick already the smoke was so thick already. I think I was in shock about the whole thing when you don't have any warning that there could be a fire and then you're evacuated and you're worried about losing your home it's just so surreal. I mean I've obviously heard of people losing their homes in fire. I remember the fire up in Lake County a couple years before. The fire is now part of my story and I definitely still have trauma, your know are we building in the same place and that gives me some anxiety. People keep saying things like, "Isn't it crazy this has happened, like so unusual and I can't believe this is happening." And now I feel like because of the choices we're making in terms of our climate, I just feel like stop saying, It's crazy. This is so atypical." This is the new norm. I think the new norm is gonna be one thing after another and that's what really scary to me is that I know how hard it is to lose a home and have your entire life disrupted because of that.

Greg Dalton: That was Catlin Tucker. She's currently living in the town of Sonoma while her family rebuilds their home in Santa Rosa north of San Francisco. Lizzie Johnson, let's hear about another victim, Ed Bledsoe, 76-year-old man. Tell us his story.

Lizzie Johnson: Yeah so Ed Bledsoe lives up near Redding with his wife and their two great grandchildren. And during the Carr Fire it swept in really suddenly. He had just gone down the street to pick up a check from his doctor. And, you know, while he was gone for those 15 minutes his wife and those little kids they were 4 and 5 years old they both burned in their home. And it shocked a lot of people just because it came out of nowhere and they were two little kids and they were some of the first victims of that fire tornado.

Greg Dalton: And Scott Stephens, one reason that Ed Bledsoe didn't take those little kids with him that day, it was 113°. So tell us how the high temperatures and the low humidity is kind of amplifying these fires we've seen recently in the West?

Scott Stephens: Yeah we have temperature like that and humidity. What it does is it just sucks out

moisture out of fuel. So dead fuel certainly gonna get drier and we know that's happening already just because of climate change and warming. And even the green fuels can have impacts from drought. So if you actually make fuel drier, you're just gonna be able to burn it easier and have higher intensity more flame lengths.

Greg Dalton: So climate is making it drier, hotter s of the records that we're seeing. Are there really more fires or is it just our perception is it just because they're hitting urban areas.

Scott Stephens: There's no doubt fire season is getting longer because of climate change, more variation, precipitation we can have fires on the ground longer. That's absolutely true. And we're seeing fires impact people. So when fires impact people and communities and kill people as we just heard, that I think elevates the whole discussion that happens around fire. And I think that's what happened with the conversation.

Greg Dalton: And so why are fires coming to people now more than in the past. What is it about the last couple years that suddenly, I've been covering climate for 10 years and kind of knew about fire, but it's really become kind of the headline issue the last couple years.

Scott Stephens: We're building in areas that are just more vulnerable. A great example, Napa Valley had a fire in '81 that actually burned maybe 50, 60 houses. The same perimeter 2017 burned 600. You know, so you're seeing so many more people living in places that are beautiful, but they're fire places. So we're seeing them really have vulnerabilities and fires hitting them.

Greg Dalton: And we'll come back to that wild land urban interface in a minute. Rich Gordon, some people think that the timber industry is using these fires, exploiting this opportunity to get relax restrictions to get more logging. Is that happening?

Rich Gordon: No, it isn't happening. Our lands are fairly well-managed. That has to be done because of the way timber harvest is done in California. But what we're concerned about as an industry is our neighbors. Today when fire starts next-door, it can encroach on to our lands. So we've actually taken a position that really wants to look at forest health in a very broad way, concerned about all of the forest in California not just the ones that the timber companies manage.

Greg Dalton: And Lizzie Johnson you've been on the frontlines talking to people what are their experiences, people saying like, Wow this is different we've seen fires but this is different." What are they telling you?

Lizzie Johnson: They're horrified. The fires are coming into more developed areas like Santa Rosa. These are people that never thought that their home would burn down and now they're getting evacuated in the middle of the night with no warning. They're terrified they're traumatized they think it's going to happen again.

Greg Dalton: Those people want to rebuild. In fact, Catlin who we spoke to is rebuilding in exactly the same place. Lizzie Johnson, are there any laws saying well maybe we shouldn't rebuild there because these fires tend to come back every few decades, right?

Lizzie Johnson: Yeah, so that's where we're at right now we're trying to figure out what comes next. There is no precedent saying that you can take a land owner's right to rebuild away. So they can rebuild if they want to. And oftentimes because they have those emotional attachments to their homes they want to rebuild it just how it was thinking that lightning won't strike in the same place twice. But areas that experience fire will often experience it again.

Greg Dalton: And Scott Stephens, people in Northern California, in the West, love to have trees

next to their homes and, you know, live near nature and it's very idyllic and pastoral and yet it's dangerous.

Scott Stephens: I think you're right. But if you live in these areas, you can still have trees near your home and beautiful vegetation but you can also manage it to lower its density. Less trees per acre. Less fuel in the ground. You know, make your house a little bit more resistant to fire. So there's things you can do to really make a difference. So there is great hope that we could actually make things better here in the state too.

Greg Dalton: So what are some specific examples of that. I mean put mesh on your rain gutters, and even a nice little fence that goes to your house is a pathway for fire. So I mean pretty much clear-cut around your house, right. Is that what needs to happen?

Rich Gordon: You're right you can do things like not having a wood roof, not having wood siding for your house. Another thing you can do is get to know your communities, you know. That's one thing that's a challenge because sometimes, you know, fires on top of you but maybe you got a 78-year-old person next-door that's not mobile. And then you have a plan that if fire comes you're gonna make sure you get them out. And maybe you got a neighbor over there with a small child. So you make a plan with your community that you can execute the plan when the fire happens versus trying to run around at the time.

Greg Dalton: Want to talk about the people who are fighting these fires, you know, people who are actually some of the heroes on the front lines. Josh Bregman is a wildland fighter for the city of Santa Fe Fire Department he's been working for the last two years and has already been all over the Western United States. We asked him to tell us about some of his experiences and what he thinks the future holds for him and his profession.

Josh Bregman: This season we've been to Taos. We're on our way to Oregon at the moment and we're hoping to do some firefighting in California as well this year. Last year we had some pretty dramatic days on one of our deployments. We worked a fire and then we got fire in northeastern New Mexico and it was threatening a watershed area for I think it was Branson, Colorado on the other side of the border. And we kept the fire pretty much out of the watershed so we preserved the water supply for the town.

There's definitely a sense of we're gonna be busy into the foreseeable future, you know, I don't think anyone expects that there will be any kind of drop off or downturn. This will get worse as climate change progresses as temperatures continue to rise. Weather patterns become more erratic a lot of firefighters will become, you know, sort of a staple kind of occupation in the public consciousness cause it's just gonna be constant footage of these tremendous fires. And even if you live in an urban area you're still dealing with smoke fallout, you know, the possible contamination of water supplies. When the forests aren't healthy it affects you even if you don't live in or near a forest.

Greg Dalton: That was Josh Bregman, a wildland firefighter for the city of Santa Fe, New Mexico. Lizzie Johnson, you've interviewed some of these firefighters tell us about, you know, first of all the fatigue they must be going through because this is nonstop.

Lizzie Johnson: Morale is definitely lower this year because there have been so many firefighter fatalities. I was up in Ukiah at the fire camp the morning after one of their firefighters died on the Mendocino Complex. And it was the first fatality for that fighter and there was just this sense of shock and disbelief like we're out here trying to save houses and stop this fire and people are dying and now we have to go do it again. It seems very real to them all of a sudden how many risks come along with that job.

Greg Dalton: Risks and really high cost. Do you have a sense of how much is being spent on firefighting in California. I mean it's bigger, bigger part of the state budget. Scott Stephens?

Scott Stephens: The last number I saw it and probably little out of date about $430 million has been spent by the state this year on firefighting. It doesn't include probably the federal firefighting as well. And I think we've almost actually used up the entire allocation for firefighting as of probably right now. So everything else is gonna be in excess of what's been budgeted.

Greg Dalton: So close to half a billion. And how does that compare to say 10 years ago?

Scott Stephens: You know, back around the mid-90s, the mid-90s when we look at the budget of firefighting through the whole nation it was around $200 million, $150 million. That was in the whole nation and today very typical for us to spend 2.5 billion. So it's gone from something on the order of, you know, 200 million, 250 million in that range to 2.5 billion from the mid-90s.

Announcer: You're listening to a Climate One conversation about wildfires and climate change. Burning wood releases the CO2 that trees have been storing. The Rim Fire in 2013 which burned a quarter of a million acres, released the equivalent of more than 2 billion gallons of gas according to the EPA. Coming up, Greg asks Scott Stephens just how serious this is.

Scott Stephens: I think a lot of people have looked at the forest to at least maintain carbon stocks. But of course we're seeing now fires actually burning forests. And I know there's really concern about this because we're wondering maybe this is beginning to really short-circuit our longer-term plans to reduce emissions.

Announcer: That's up next, when Climate One continues.

Announcer: We continue now with Climate One. Greg Dalton is talking about wildfires in the West with Rich Gordon, President of the California Forestry Association; Lizzie Johnson on staff at the San Francisco Chronicle; and Scott Stephens, Professor of Fire Science at University of California, Berkeley.

Greg Dalton: Rich Gordon, there's something called the fire fix, I believe, it's one of the rare bipartisan efforts that Congress did. Tell us about that they actually came together around fire and did something, actually worked together.

Rich Gordon: Yeah. So the federal level, the U.S. Forest Service has never had a dedicated source of funding for firefighting. So what they've had to do is take money out of maintenance and restoration in order to pay for the fires and firefighting. What Congress did last spring in the omnibus spending bill was fix that. The fire fix means that for the first time now the U.S. Forest Service actually has a dedicated, will have in 2020, a dedicated source of funding to fight fires. The positive nature of that is that they will no longer have to steal money from restoration and maintenance and that's a positive in terms of improving the health and resiliency of the federal forests.

Greg Dalton: And Secretary of Interior Ryan Zinke said that part of this is human cause, Rich Gordon, that there should be thinning of the forest would reduce the fuel that then makes these mega-fires. You probably agree with that?

Rich Gordon: Well I don't necessarily agree with the approach that the Secretary suggested. But what is important to understand is that we have too much fuel. Our forest are too dense. We have

allowed them to overgrow because we have aggressively fought fire and done fire suppression.

Greg Dalton: Smokey the Bear is part of the problem.

Rich Gordon: Unfortunately. And maybe Bambi too, I don't know. But a thinner forest is a healthier forest. It is better for the watersheds. It's better for carbon sequestration. So we're not talking about going in and clearcutting a forest that actually would be disastrous. What's important is to go in thin and leave the stronger, healthier trees that are good for carbon sequestration and good for forest resiliency.

Greg Dalton: Scott Stephens, some environmentalists would hear that and say, you know, the thinning is actually home to ecosystems and species and that thinning is kind of, is damaging to forests.

Scott Stephens: Well I hear that too and I -- you know, there's no doubt when you put a machine into a forest that's not a natural event. But I agree that so many of our forests are in conditions that are really unsustainable. You look at the mortality that happens just from drought and insects and we put fire on top. And also the other thing that's so important is we call it, we call it surface fuel. Surface fuel is simply is a dead and down woody material on top of the floor.

Greg Dalton: Dead and down. Okay.

Scott Stephens: Yeah, the wood on the ground, right. And turned out in about 70% of cases that's gonna be maybe the highest amount of energy in a wildfire. It's not the crowns the crowns certainly can make huge flames and they do, but you really need to have that surface fuel to have a high amount of heat initiate that crown fire. So one of the challenges is you can reduce tree density too and you also have to reduce that woody fuel on the ground.

Greg Dalton: It's expensive to do that, right. So what are the economics of clearing that and who's ensuring, Scott Stephens, that it's done in an environmentally sensitive way versus coming in and just kind of whacking it, right.

Scott Stephens: Luckily California really does have some strong policies. They're trying to make sure we do things correctly from an environmental standpoint. And you're right, it's gonna be costly in some places but there's also some places you can actually remove some trees and actually offset the cost.

Greg Dalton: And there's some organizations trying to develop products, an economy around moving those kind of thinner trees that are not, perhaps don't sequester the same amount of carbon. Perhaps not the same ecosystem value but trying some economic value to turn them into wood products and they're trying to work on that so the economics work.

Lizzie Johnson, tell us about the phases of disaster after these fires come in, they devastate a community. What do the people go through?

Lizzie Johnson: Yes, so the human impact of this you have the disaster and then you have all these heroic events where you hear about people running into houses to save the puppy and camping out in a pool overnight and surviving. And then the entire community is really cohesive, they're together.

And then they slip into disillusionment where it seems like everyone else is moving on. They're seeing their friends having holidays in their homes and going to life milestones while they're still displaced in hotels living with friends and family. And you really have not gone that far. And then

the rebuilding really starts to happen after that. The first year is the hardest part.

Greg Dalton: And there's housing shortage. So there's 3,000 homes destroyed in one area north of San Francisco. Then the rents go up for everybody else. People want to rebuild, but it's hard to get a contractor and a plumber and an architect. So tell us about that part, you know, afterwards, you know, do people come back, some do some just like walk away.

Lizzie Johnson: Yeah it's really hard to rebuild a normal life when your job is disrupted. You don't have housing. You're trying to find housing but in a place like Sonoma County the vacancy rate is 1.5%. So there's really no place for these people to go. So they're trying to rebuild but the resources aren't there. They're trying to find a place to stay while they rebuild. They're trying to do their job and pick up the kids from preschool and take them to school and, you know, that's a lot to manage at one time.

Greg Dalton: Scott, have you done, looked into kind of the economic impacts on communities. We hear a lot about Houston and Miami after hurricanes so we know the devastation there. You know, New Orleans never came back after Katrina. A lot of people moved. Do we know about the fire impacts?

Scott Stephens: Area of northern California, Lake County, is an area they had a fire big one, you know, it really burned up a lot of houses. And you go up there today grammar schools' population down 50%. Community still rallying to try to get small business back. A lot of people have no fire insurance that lost their home, zero. So it looks like they're never gonna rebuild. So I think we have to think maybe a little longer sometimes about maybe the impact of these fires because, you know, the flames get our attention and they should. But when you think about how a community rebuilds and how it actually is able then to prosper once again it is a long haul and we don't do very well there understanding that.

Greg Dalton: Lizzie Johnson how about insuring the people you've covered, do they have insurance, can they get it again to rebuild?

Lizzie Johnson: It's a mix bag. Some people had great insurance and after the fact they're like awesome. We have just enough to get by and rebuild our house. And other people suddenly realize that they didn't have the right package and, you know, they're faced with all these mounting costs so they can't rebuild or their insurance isn't the same as what it was before they're in a fire prone area.

Greg Dalton: Right. And there's always that replacement value whether you rebuild your home to new code or the way it was 10 or 20 years ago. Scott Stephens, the insurance industry statewide, insurance companies leaving, is the state gonna step in like they've done for earthquakes because no commercial company wants to touch it?

Scott Stephens: A lot of people are getting letters in the mail today that are cancelling their fire insurance. I have friends that are getting this today, you know, and this is really difficult, right. So you got a house and you have your possessions and you are getting these letters and the state is actually considering being a fire insurer like they are for earthquake because so many organizations and companies are getting out of some of the markets. And you get that letter and all of the sudden you have no insurance and you go Holy Toledo, right, I got to do something because my house is at risk and here we are.

Greg Dalton: And your bank probably doesn't want to continue your mortgage if you don't have fire insurance.

Scott Stephens: That's true, you know, if you have a mortgage then I think by law, you have to have fire insurance so that's an interesting dilemma. But right now unless you have a mortgage, I believe in the state you don't have to have fire insurance.

Greg Dalton: And are these wealthy people with a second or third home in Lake Tahoe? Or are these people in rural communities who are less fortunate, this is their primary home.

Scott Stephens: The biggest impact is the rural areas with lower income, because of their low insurance rates, not as much employment. So I think it really hits lower area communities with lower resources.

Greg Dalton: I'm Greg Dalton and today we're talking about forest fires in American West on Climate One with Rich Gordon, industry representative the California Forestry Association, Lizzie Johnson, who covers wildfires and other stories for the San Francisco Chronicle and Scott Stephens, Professor of Fire Science at the University of California at Berkeley.

Rich Gordon, you talked about less harvesting of timberland in California. I'm curious about the demand side for recycled. So many people think that if you recycle that napkin, it's one less tree, right. So tell us about the demand side for recycled products. Is that robust?

Rich Gordon: Very robust in California. We have really strong environmental values here in California. It's what makes us unique I think in many ways. So recycling is a part of our ethos . I's what we do. And it does have a positive impact on the planet on climate issues.

Greg Dalton: We've heard though that China is not accepting a lot of recycled products. A lot of stuff goes to China. A lot of it depends on the commodity market prices for aluminum, tin, paper, et cetera. So China saying, "No, no we don't wanna be, you know, the dumpster for the global economy." How is that affecting the demand side for recycled products?

Rich Gordon: Well it's not affecting the demand side. People still are looking to buy material that's been recycled. The challenge is that China was the number one source of recycled paper. They took our wastepaper here, recycled it and returned it to us. If they're not doing that as is happening right now, we've got a backlog of product here in California that needs to be recycled. That is an opportunity for California industry potentially.

Greg Dalton: So any of your member companies moving from recycling napkins rather than cutting down trees?

Rich Gordon: [chuckle] Our companies still cut down trees. That's where the lumber comes from. Interesting enough, California does not have a paper producer in the state. In fact most interesting is the fact that during the timber wars 20 years ago California adopted as Dr. Stephens said some of the strictest timber harvest rules in the world. And all of the multinational publicly traded companies left California. We don't have Louisiana Pacific we don't have Weyerhaeuser. None of those companies are here. Companies that do timber work in California are all family owned or owned by family trusts. So these are people who stayed because it was their land and this was their home. And so it's a very different kind of world in California. The folks really take a close look at what they do and most of the companies now have policies of, you know, of being very selective in their harvest to generate the lumber that's needed but not to over excessively reduce forest lands.

Greg Dalton: Oil companies are getting into biofuels. You know, energy companies are getting into solar or wind diversify they kind of see what's coming. Do timber companies have the same kind of diversification or they still more traditional into what they know?

Rich Gordon: A number of the timber companies are involved in bioenergy taking wood waste and wood products that we're not using for any other purpose and turning them into energy.

Most of that though is being done in local communities or running a sawmill somewhere in California. That energy is still very expensive and so it's not necessarily purchased on the grid. That's very rare. There are I think seven bioenergy facilities that have contracts for the energy companies to buy that fuel, that energy.

Greg Dalton: Forests are now carbon sinks so there's actually value for sequestering carbon in forest and land. People can get paid basically. Is there economic opportunity there for your members, Rich Gordon?

Rich Gordon: There are certain conservation easements that many of my member seek that provide additional protections for lands that they're not going to harvest or don't want to harvest. And there are some trade-offs that they can do in terms of carbon credits for protecting those.

Greg Dalton: Scott Stephens, California has led the country in attacking climate change and it really started with tailpipes and smokestacks. And then it got to, you know, the exhaust from cows and farms and forests were kind of further out there even yet. Tell us how forests are not really part of the state's climate plans. They're kind of on the periphery. Some people would like them to be more front and center.

Scott Stephens: I think a lot of people have looked at the forest to at least maintain carbon stocks. But of course we're seeing now fires actually burning forests, shrublands, grasslands and all these other activities that we're seeing more and more smoke going up. And I know for sure in the state capital in Sacramento that there's really concern about this because we're wondering maybe this is beginning to really short-circuit our longer-term plans to reduce emissions.

Greg Dalton: Forest are supposed to, right, put carbon back in the ground.We basically been burning it, sending it up into the air. And we don't know how that math is working out.

Scott Stephens: We look at some parts of the state as you know Northwestern California, you have Redwood you have Douglas forest that are wet. So those places are still sequestering carbon, you know, big time because of just their growth. And you can put some of those products into things like houses so you can sequester wood into long-term use. So it's gonna be a combination I think of both having forest that sequester carbon, try to hold it better in the face of climate change and fire and also continue to do things with wood because wood is a very environment friendly material to build homes and other things.

Greg Dalton: Rich Gordon, the California legislature passed a bill that did some things on electric utilities as well as ease restrictions on some thinning and logging about a billion dollars using cap and trade funds. Tell us about that what that law will do.

Rich Gordon: It was a comprehensive piece of legislation. It dealt with utility liability issues. It dealt with firefighter protection. It dealt with emergency response and emergency preparedness. And it also dealt with forest practices. And part of what they did with forest practices was make it easier for small landowners to remove excess fuels from their lands. So now neighbors can collaborate together if you have a project less than 10,000 acres working together you can clear trees around your homes makes it easier to do that.

Greg Dalton: Well some of the environmentalists have written and said, "Well, there's already exemptions for fire that already existed. Why do we need this? This was, you know, candy bar for

logging, something like that."

Rich Gordon: Our forest practice rules stay in place. The exemptions don't exempt folks from following our environmental standards. They exempt them from some of the paperwork that's involved. It essentially becomes a checklist rather than a full-blown report. But what this does particularly for the small landowners is allow people to work collectively together and then you get to an economy of scale that will allow the kind of thinning around homes in the neighborhoods that we've been talking about tonight that face this kind of wildland urban interface, clearing in those areas.

Greg Dalton: Lizzie Johnson, smoke has come into areas, some people in urban California walking around with these masks on. What do we know about the human health impacts of breathing smoke for weeks at a time

Lizzie Johnson: They're still trying to figure that out. But it's something crazy, the equivalent of like smoking a pack of cigarettes if you breath in that smoke for a day. And they're still figuring out what the long term impacts are too. Like up in Sonoma County right now they're having a study of pregnant women who gave birth after the fires to see what those impacts were. It's not anything good I can tell you that much.

Greg Dalton: Birth weight, that sort of thing.

Lizzie Johnson: That sort of thing, yeah.

Greg Dalton: Right. Scott Stephens, what kind of research is there on the health impacts of breathing smoky air. I mean Sacramento, British Columbia it's all up and down the West Coast in North America, more smoke than we breathed in our lifetime.

Scott Stephens: No, it's true when we think about smoke impacts this year, Bay Area has been smoked out, Sacramento for months, northern parts of California for months at a time. So it really impacts probably the highest amount of people really the indirect impact of smoke because it just spreads all over the state. British Columbia had 550 lightning fires in three days this year in August. And that smoke actually made it to the Bay Area. It made it because it went out into the Pacific and the jet stream took it to us. So there's no doubt smoke impacts are huge.

And if we're gonna go to using fire maybe to actually manage forest, we're gonna have more smoke in the air.

Greg Dalton: So you're talking about prescribed fire or planned fire, you're talking about burning forest in a controlled way before they get out of control and that's like okay we're gonna burn at a certain time and just okay people here it comes.

Scott Stephens: It's right and it's something that I think we're gonna try to really do more of in the state. And I think right now with the governor's bill that just got passed, $35 million a year for the next five years is actually gonna put that prescribed fire application.

Greg Dalton: What about the impacts, Scott Stephens, I talked to someone who lives in Montana, Whitefish, Montana, her husband works in the tourism industry people go there for Glacier National Park. They need to make their money in like four months of the year. It gets smoky and the tourists don't wanna go to a glacier to paddle or cycle or hike. So what about the tourist impact of this?

Scott Stephens: I think it's very large. But some of the rural counties of this state in northern California where tourism is really big, you know, fishing, hiking, camping, big fire years can

basically take the tourism economy down 50%. So that is really difficult and how do you think about a place like California going into a warming climate with more variable precipitation, ignitions by lightning and people. Fire just doesn't come out of the equation, right. So somehow we got to be able to think about how we can maybe work with fire and do the best we can. But the idea that we can continue just to exclude fire, exclude it, exclude it like we have for the last hundred years we can see now that it's not working and it's time for some innovation and some new ideas and some places to change.

Announcer: This is Climate One. You're listening to a conversation about megafires. Coming up, Greg Dalton asks Scott Stephens how we should rethink forest management in this new reality.

Scott Stephens: Well doing things like, you know, thinning forests. Cut the small trees, try to enhance the large ones. Doing prescribed fire. We have really good things we can do today and science shows that it works.

Announcer: That's up next, when Climate One continues.

Announcer: You're listening to Climate One. Greg Dalton is talking about managing our forests in the face of wider and wilder fires with Lizzie Johnson a reporter at the San Francisco Chronicle; Scott Stephens, Professor of Fire Science at the University of California, Berkeley; and Rich Gordon, President of the California Forestry Association.

Greg Dalton: Scott Stephens, talk about around the world we've seen places that don't usually burn have been burning. I mean it really is a world on fire.

Scott Stephens: No it's true, Scandinavia countries this year big reports of burning happening in northern boreal forests that haven't burned much at all. British Columbia, Canada, right next door, last year was one the biggest fire years, was the biggest fire year in their history. And they're also trying to understand how do they go forward. So things are changing there's no doubt. And climate change is no doubt a part of that because we're getting more variation on temperature, humidity, you know, fuel moisture.

But again, you know, there's still this idea sometimes I feel that this perception that fires is just coming down the tube all we can do is react to it and get, you know, get out of the way or get knocked over. There's still so many things we can do better. How we plan our communities. How we actually live in our communities and help each other. How we can manage forest sometimes actually reduce their risk. But it's gonna take some innovation and actually some ability to move. We got to be able to move and actually do some of these treatments at scale.

A back-of-the-envelope calculation tells us at least on federal lands in the state that we need to maybe restore 10 times as much as we do in an annual basis to make a difference. So 10 times what we're doing today. Sometimes you say that and people start to wonder how in the world can we ever do that. But the consequences is as if we don't do this in 10, 20, 30 years then our kids and our grandkids are basically gonna be reacting just like we are but they're gonna have less space to do something about it. Because it's gonna be warmer it's gonna be more variable and they're not gonna have that chance that we did.

Greg Dalton: So restoring you're talking about replanting?

Scott Stephens: Well doing things like, you know, thinning forests. So we cut the small trees, try to enhance the large ones. Doing prescribed fire. Some places we even manage wildfire. We can do more active timber management and actually do some work, you know, again for wood creation. So it really is in the forest we have really good things we can do today and science shows that it works.

When we get into the chaparral or the shrublands or the oak woodlands in those areas, it is more difficult because those systems burn differently. They don't have, you know, understory fire that burns through them typically, 300, 400 years ago. They basically burn much higher intensity and they do it episodically. So those places are harder. When we think about the forests in the state we have some really good things we could do. But the other vegetation types were a little bit more of a struggle.

Greg Dalton: The pine bark beetle has devastated forests in the West and that's because, as winters are warmer the larvae doesn't get killed in winter like they used to. So all the way up and down. I've driven across Wyoming it's all the way up to British Columbia, Scott Stephens, tell us how the pine bark beetle has created just -- do we know how many dead trees that are then fuel for fire?

Scott Stephens: No it's very true. If you look at the southern Sierra Nevada we had the drought for about 4 or 5 years and that caused the bark beetle then to basically enhance itself and kill trees. We saw 150 million trees die in those 4, 5 years. I look at that as a symptom of unsustainable forest condition.

But if you just go down a little bit further south there's one place I've been working for a number of years called the Sierra de San Pedro Martir it's in Northern Baja, Mexico. It's a place that actually had no real harvesting at all and fire suppression didn't begin until 1970. We've been working down there for about 25 years now. They had the same drought in the late 90s and 2000's as Southern California but when we go down there and look at mortality about one and a half trees per acre died. One and a half trees per acre died. You go down there and you see the most resilient forest condition I've ever seen in my life. And the forests are very similar to forests in California, Jeffrey pine, white fir, sugar pine. So that forest is in a state that when drought hits it and bark beetles start to kill trees it basically pushes back. Forest is basically enabled and actually continues.

In Southern California we had bark beetles in a condition that actually the forest could not really pushback very effectively and we have 150 million dead trees and now we're gonna have to live with that probably the next few decades. But again, it just shows us in a forest condition that actually has a capacity to deal with those stresses it's actually something that works along but we need to get there.

Greg Dalton: What could be learned from indigenous communities that we pushed aside, Scott Stephens, to manage forests?

Scott Stephens: As you know, people live in the state for thousands of years maybe 10,000, 6,000 years they're people in the state. There's no doubt then I think we can learn from them. And there is actually kind of a groundswell of local communities and native communities trying to actually work together to maybe think about forest management.

I think it's an area of innovation that really could take off. There's been reluctance in the federal side frankly to do this at any kind of scale. I think it's always been this challenge about we're a federal entity, we're the U.S. Forest Service, we're the National Park Service, Burea of Land management. By statue we control this land and we're not really too sure how to work with these indigenous communities. But there really is some innovation in the state some things in the north

parts of the state and you're right, you know, we got so much land in the state. When I look at it can we get a little creative and maybe have, you know, few tens of thousands of acres for indigenous communities or more. It seems like very logical.

Greg Dalton: We're gonna go to our audience questions and invite you to join us with your comments or questions. Welcome to Climate One.

Male Participant: I'm curious what you've noticed in terms of any resistance to change in government local or state that is uncomfortable with fighting fire and coming up with new solutions.

Lizzie Johnson: You see that a lot in the rebuilding phase where communities quickly wanna prop up these resilient building centers so people can get their permits as quickly as possible and get people back into their homes which is great that relives pain and suffering for them. But that also takes away that sweet spot where you can actually have policy change in the way you rebuild. So you see the homes going up in the same places again and there really aren't that many changes in terms of how they are rebuilt.

Greg Dalton: Let's go to our next question. Welcome to Climate One.

Female Participant: I'm asking a question almost on the same line. Are there state code changes in how things can be rebuilt? There's a lot of prefabricated housing that's glass and steel, there is air-conditioning systems that actually take the 2.5 grains out of the air and clean air quality for human consumption even in the city like this. I mean is the state doing any requirements for building codes and air handling codes for handling this problem?

Greg Dalton: Good question. PM 2.5 the kind of tiny things that go past the human lung's defenses. Who'd like to address that? Rich Gordon?

Rich Gordon: Yeah, let me say that this year in the legislature there was discussion about this but no action. I expect that it will be part of the continuing dialogue about fires in California. And it does make absolute sense to take a look at the building codes and make some adjustments to them.

Greg Dalton: I had not heard of AC systems the filter the PM 2.5. Let's go to our next question. Welcome.

Male Participant: Hi there my name is Cole. My question is gonna be directed towards Rich. And I was wondering if any of these lumber companies conglomerates are focusing on pine beetle as a resource to harvest lumber and how valuable is that lumber after it's already been dead for a couple months, maybe even years before you can collect it?

Rich Gordon: The bark beetle trees do produce at a very nice blue stained wood but you've got to get that fairly quickly for it to have any use. So part of the challenge we've had is that the vast majority of 150 million dead trees are in federal forest land. And getting those trees, the dead trees, out of the federal forest has been a challenge. But there is a potential use for that if you get to those trees soon enough.

Greg Dalton: Our guests are Rich Gordon, President of the California Forestry Association, Lizzie Johnson is a staff writer for the San Francisco Chronicle, Scott Stephen is professor of fire Science at the University of California at Berkeley.

Let's go to our next question.

Female Participant: Hello. So in this panel we touched upon the ideas of a controlled burn so the

idea of creating a fire to prevent more. Can you tell us a little bit about that and what it looks like and what the purpose of it is?

Greg Dalton: Scott Stephens, let's get your thoughts on controlled burns.

Scott Stephens: Sure. You know, prescribed fire is another tool we can actually make a plan, prescribed fire plan and smoke management plan is required. You get the plan reviewed, approved and then you actually have a set of conditions, you can do your burning. We've done around 75 of these over so in California. So you then are actually putting fire on the ground for resource objective, maybe fuel load, maybe it's gonna be wildlife habitat, maybe reduce non-native plant. So it actually is then putting fire on the ground by humans for an objective and doing it deliberately. And I'm really strongly supportive of it because it really can be a big piece of this. So of course there's always risk, there's no zero risk. I've had some of my fire escape control lines had to take suppression action and this is something that you plan for so you have a contingency. So if you have a problem then you make a plan to try to make it. So it's fire on the ground for an application for objective.

Greg Dalton: Rich Gordon, I'm looking at you thinking you've been an elected politician in the state assembly, what kind of public squabbling, I just can hear constituents saying, why are you burning, why are you doing it, you're ruining my Sunday.

Rich Gordon: I think the issue of a controlled burn for forest management is something that is not well understood in California. First of all, we've not used it frequently in recent times, although it was a tool often used by the first peoples who are here.

They actually would set fire knowing that would actually improve forest health by removing the underbrush and leaving the taller trees. So we have to explain to people why this is a tool that can be helpful in thinning and removing the undergrowth. We also need to point out that we still follow all of the air pollution guidelines in California when we do this work. These plans are not approved unless the local air board approves them and approves the timing of it.

Greg Dalton: Let's go to our next question.

Female Participant: Katherine Randolf. I live in Mill Valley. And I've been teaching a class Fire in Marin for the last 10 years. I teach with the fire departments for the residents and, you know, there's been a big thing about the wildland-urban interface building codes that have been adopted by the state in most localities. But I think what we're seeing in these fires is that because of ember showers spreading embers far and wide that even if you're not in the WUI zone you're really subject to that kind of ignition.

Greg Dalton: WUI zone, W-U-I, wildland urban interface. Who'd like to tackle that?

Female Participant: Right. So, you know, is there any plan to expand those codes to areas that are not actually in the WUI?

Greg Dalton: Building codes. Everybody's in fire range. Rich Gordon.

Rich Gordon: There has not been a discussion about that in Sacramento, in the state capital, but there needs to be because in many ways, all of California is at risk. So we've gotta take a look at our building codes to make sure that just as we've done statewide for earthquake we need to have some statewide protocols for fire.

Greg Dalton: And Scott Stephens, does the same apply to Colorado, Oregon and Washington?

Scott Stephens: It absolutely does. Every western state got this issue. I think every western state legislature and governors are thinking about this because all of them have risk and the risk is increasing. And this is something that is totally western-wide. And even, places like Florida, they also have huge amount of risk in this, Eastern Texas, Western Texas. So, you know it's an area that actually is getting more and more consideration because so many people are at risk.

Greg Dalton: And there's something captivating about, you know, fire, it's immediate, it's visceral, it plays well on the evening news. Sea level rise is kind of slow and boring. Is there's something sort of visceral about fire, I mean, we are all pyros down, deep down, aren't we?

Scott Stephens: I think you're absolutely right. I mean, we actually go camping. What we do is we create a campfire, we sit around it, we share stories. It's probably exactly what native people did for centuries and millennia. I think we're all fire creatures. It used to be the open flame was in front of us and we work with it. What do we do today? We jump in our cars and the flames inside an engine. We're just as much fire people as they were in native times but the fire is inside and we can't see it. We're all pyro people.

Greg Dalton: Next question. Welcome to Climate One.

Male Participant: Hi. My name is John Wade. I'm from Pescadero California and I live at the edge of a fault between farm and forest. My question is, there's a larger question though, which is how are we gonna manage the forest in the future to minimize global warming and climate change from all the soot and all the carbon thats going up from the fires?

Greg Dalton: Rich Gordon.

Rich Gordon: We're gonna have to look very closely at thinning our forests in a way that protects wildlife habitat that creates good soil conditions for water runoff into our streams. I think there are some things that we will have to do in forest management that can actually be done in a way that actually improves the carbon sequestration and helps us meet our climate change goals.

Greg Dalton: We haven't talked about watersheds. Before we go to the next question, Scott Stephens, what happens to watersheds after a fire? Because people don't, you know, realize that your water comes from a hill, you know, forest somewhere.

Scott Stephens: Well, sometimes when watersheds are burned severely it can be really impactful to watersheds, you know. A few years ago we had a fire called the Rim Fire. It was in central Sierra Nevada. It turned out to be 250,000 acres. You know, the first entity that called about the Rim Fire that's concerned was San Francisco Water and Power because the Rim Fire has Hetch Hetchy. Hetch Hetchy reservoir is a huge reservoir that basically serves San Francisco and a lot of the Bay Area. So it was the water managers that were the most concerned about the Rim Fire because maybe hitting Hetch Hetchy.

Greg Dalton: So it's soot running into the, ashes running into the water?

Scott Stephens: Erosion, ash, you know, going into the reservoirs clogging them, changing the water quality standards. But the other part of this is actually sometimes if you have fire working more ecologically, appropriately, we've done some work in the Sierra Nevada and we see that actually when fire is allowed to burn in Yosemite National Park for 45 years we actually see that we're seeing slightly increases in water coming out of these watersheds. And actually that is something that we don't see in places that don't have any type of fire at all. So I think there's a synergy between climate change, forest health and water that we might be able to explore in the

state to actually make a difference because if I think about natural resources in the state I'd put water as probably the top of the pile.

Greg Dalton: Yeah, we don't have the California dream without the water we're moving around. Let's go to our next question.

Female Participant: Lizzie, in your reporting and traveling have you learned of any other countries that are experiencing this in particular and how can they use California as an example?

Lizzie Johnson: I was actually in Sweden earlier this summer when they had all their wildfires going on and it was really interesting to see their response to it. They're really on this to getting a few wildfires every summer. And this summer practically the entire northern region it seemed was on fire and they were getting resources from Italy and from Spain and from Portugal. And so a lot of countries end up looking to California in our model here with Cal Fire to see if they need larger statewide mechanisms or countrywide mechanisms to battle these blazes. Because what we do have here in the state is very unique, it's not quite like anywhere else.

Greg Dalton: How so?

Lizzie Johnson: In that we have Cal Fire. It's a statewide firefighting agency.

Greg Dalton: Last question. Welcome.

Female Participant: Yes. My name is Betsy Ferguson and my husband and I were involved in the Oakland firestorm and lost our house along with lots of other folks and that was 25 years ago. So my question is, what mitigating things do you think have been done for the future? And just as an aside, one of my neighbors who lives down the street has been notified that her fire insurance is being canceled.

Greg Dalton: Jerry Brown also lives up there but he says, you know, he lives in a fire zone, in an earthquake fault but at his age, he can take the risk.

So Scott Stephens.

Scott Stephens: Yeah, the '91 fire, what a day. That was my first semester at U.C. Berkeley. And it really was transformative when you think about what it did to people, lives, you know, houses lost.

We've learned from it, but we've also, haven't done enough, you know. I think, you know, California got 58 counties, every county has land management plans. So when the state starts to get down on those counties, they start talking about the state putting more requirements, more land zoning requirements, more building requirements to build here. There's real tension between the counties and the state trying to get into their turf. But unless we do something like that we're basically gonna be chasing our tail forever. Australia has done a lot better than this. Australia is a place where this is done a little bit more systematically, people have learned and they're actually reducing risk in their wildland-urban interface and I have to commend them for that. And I do think the state has to step up and actually get a little bit more involved in this and probably get some people a little upset. But we just can't continue to keep building like we are in places and continue to burn up.

Announcer: Greg Dalton has been talking about wildfires in the West with Rich Gordon, President of the California Forestry Association, which represents the timber industry. He is a former State Assemblyman for San Mateo. Lizzie Johnson is a staff writer for the San Francisco Chronicle where covering wildfires is now a full-time and year-round beat. And Scott Stephens a Professor of Fire Science at the University of California, Berkeley. He's written about managing fire and forest in a

changing climate.

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Greg Dalton: Climate One is a project of The Commonwealth Club of California. Kelli Pennington directs our audience engagement. Tyler Reed is our producer. The audio engineers are Mark Kirchner and Justin Norton. Anny Celsi, Devon Strolovitch and Claire Schoen edit the show. I'm Greg Dalton, the executive producer and host. The Commonwealth Club CEO is Dr. Gloria Duffy.

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