Episode 3 Transcript and Show Notes: Listening to Fire Knowledges in and around the Okanagan Valley

Title: “The lighter footprint of fire”

Website Summary: *This episode features interviews with ignition specialist and ecosystem scientist Sonja Leverkus; forester Dave Gill; wildfire and fuel management consultant John Davies; Vernon Fire Chief David Lind; South Okanagan BC Parks supervisor Wendy Pope; Canadian Forest Service research scientist and Indigenous fire stewardship expert Amy Cardinal Christianson; and Fire Keeper and former wildland firefighter Joe Gilchrist. We discuss cultural burning, prescribed fire, reducing wildfire risk, and balancing multiple values on the land in the Okanagan Valley and BC.*

[00:00:00]
Narration, Judee Burr:
Hi, it’s Judee. This is the third and final episode of my thesis podcast, *Listening to Fire Knowledges in and around the Okanagan Valley*. In making this episode about cultural burning and prescribed burning, I’d like to start with a special thanks to Joe Gilchrist and John Davies for inviting me to attend and learn from their spring burns. I’ve shared some resources for those interested in learning more about living well with fire in the Okanagan on my thesis website, listeningtofirepodcast.ca. I hope you enjoy this last episode. Thanks for listening.

[Music begins[1]]

[00:00:48]
Sonja Leverkus, Interview Recording from 14 February 2022:
I think that, ecologically, if I had one thing for you to take away, it’s to remember that even when we burn a landscape or a landscape receives fire, it’s not always going to be all black, forever, nuclear devastation. There is a lot of vegetation that respond very quickly, immediately after a fire, especially when the ground is black and there are seeds under the soil. And maybe there’s communities that have experienced catastrophic fire, and that’s not what I’m talking about. I’m talking about the lighter footprint of fire, moving across the landscape, not coming into our communities.

[00:01:38]
Sonja Leverkus, Interview Recording from 14 February 2022:
My name is Sonja, and I live in Fort Nelson, which is in Northern British Columbia – one of the most remote communities in our province and just below the Northwest Territories. I own two companies: Shifting Mosaics Consulting, which is an ecological consulting company, and Northern Fire WoRx, which is a specialized fire company. I’m also an adjunct professor at the University of Alberta in the Wildfire Analytics Lab. I’m a registered professional forester and a professional agrologist and a registered professional biologist in British Columbia. I have a PhD from Oklahoma State – go Cowboys!

[Both laugh]

I’ve chosen to live in Fort Nelson for the last sixteen years, or perhaps it has chosen me to be here.

[Music changes[2]]

[00:02:27]
Sonja Leverkus, Interview Recording from 14 February 2022:
I was born in Lethbridge, Alberta. My parents had a very large ranch beside the Head-Smashed-In Buffalo Jump, right in the middle of many different Reservations in Southern Alberta. We had a cow-calf operation, beef cattle. When I got old enough to go to school, we moved to the East Kootenays of British Columbia, where we had another couple of ranches and we had a large range tenure, which is Crown land leased from the government, for our cattle. We ran our beef operation there with over a thousand head of cows and calves.

In 1985, we had just moved over to the East Kootenays, to the Windermere Valley in 1984 to one of the historic ranches, the Elkhorn Ranch. And in 1985, I was this little five-year-old at six in the morning in the summertime. It was the first time I’d ever heard a helicopter, and it landed in one of our hay fields next to the cabin my parents and I were living in at the time. And the Forest Service told us that a huge wildfire had broken out in the middle of our range tenure where our cows were. It’s the first time our cattle, had experienced mountains, and it was definitely the first time our cows had experienced fire. Then, the Forest Service asked if they could use our ranch, the Elkhorn Ranch, as the base camp for the whole fire operation that summer, up the Findlay Creek and Fir Mountain.

The things that I remember from then are my parents going out and trying to get our cows to go across creeks and work with the Forest Service. Helicopters constantly landing and taking off from our haystack every day. And it was really dusty and really smoky in the Windermere Valley that whole summer. And I remember looking up and seeing chunks of ash falling.
I didn’t know at the time that the people who were staying on our ranch and fighting that fire were people that I was going to work with later in my career or meet or interact with. I also, when I look back on it, growing up next to the Head-Smashed-In Buffalo Jump in Southern Alberta, was a really monumental experience as well to grow up in a place and a land that bison roamed.

[Music changes[3]]

In a very roundabout way, I find myself in my professional career with bison and wildlife and cattle and fire and wildfire and prescribed fire.

[00:04:58]

Narration, Judee Burr:
Sonja Leverkus runs her two businesses – Shifting Mosaics Consulting and Northern Fire WoRx – in Fort Nelson. I wanted to talk to her because her research on fire ecology and her practices of prescribed burning have important implications for the Okanagan Valley. Prescribed burns are fires lit purposefully by credentialed fire experts after a detailed burn plan has been made and approved. They can be used for many purposes, including reducing wildfire hazards on the land and burning fire-maintained landscapes for ecological benefits.[4] Although they can have similar benefits, prescribed burns are different from cultural burns, which are conducted by Indigenous Knowledge Keepers as a cultural and spiritual practice. You'll hear more about prescribed burning and cultural burning in this episode.

[Music ends]

[00:05:46]
Sonja Leverkus, Interview Recording from 14 February 2022:
I'm a ranch kid, so grasslands are one of my favourite ecosystems. I love the boreal and our boreal rangelands for sure up here. I think that when I think about the Okanagan, and when I see when I watch up here on the satellites, watching where fire is spreading and has spread this past year in the fire season, it really makes me want to help or provide support to apply fire to that landscape in times where it's under a prescription instead of a wildfire ignition starts and it's a state of emergency.

[Music begins[5]]

One of the concepts that I developed my PhD was this thought around "fire-absorbent landscapes." When I think about grasslands, we can apply fire in a grassland setting and keep it within a certain prescribed fire unit, and it doesn't need to be extensively complicated unless we're right up against communities or lots of values at risk. Even then, we can plan and apply fire to that landscape in a very, very safe way under certain indices and prescriptions. I think the application of fire can happen anywhere, and I would definitely see the Okanagan as being a great place for that with a rich history, as you noted, traditional and by ranchers and the cattlemen and cattlewomen of BC. I also think about fire-absorbent landscapes where we can put fire in a good place, so that if – when – wildfire comes, we can pull that wildfire into these fire-absorbent landscapes. So, it's almost like a sponge. I feel like we need to have wording around fire that is accepting. I feel like when we talk about fire-absorbent landscapes, where we can allow fire to move into places that we have already pre-planned or pre-burned for other landscape objectives or reasons.

[00:08:02]
Sonja Leverkus, Interview Recording from 14 February 2022:
When I was in my PhD, we developed a management system called the landscape disturbance matrix. Basically, it's a matrix that talks about having places that have been recently burned, that have not been burned for some time, that haven't been burned for

a really long time. Then that also supports all these different species across a landscape. So, I think that the Okanagan is a good place for that.

[00:08:36]
Narration, Judee Burr:
In Sonja's description of her work, I hear echoes of the story that Nancy Turner shared with us in the first episode from an Okanagan Elder.

[Music changes[6]]

[00:08:43]
Nancy Turner, Interview Recording from 25 January 2022:
It's like creating different patches at different successional stages all over the territory of people …

[00:08:52]
Sonja Leverkus, Interview Recording from 14 February 2022:
So, ecologically, I think that these are important discussions. But then, culturally, I think it's important for us to recognize that Indigenous people have been lighting fire for centuries, and that non-Indigenous people have also been lighting fires. So, I speak to that. I do see opportunity for a really amazing interaction between Indigenous knowledge holders and Indigenous communities, and ranchers that used to use fire, and people that used to use fire, and now are trying to incorporate it with various different governments and other fire professionals. I also think the Okanagan is a great place to show people and teach people about fire because there are so many people across the landscape doing demonstration prescribed fire, doing trials. I think that would be really beneficial.

[00:09:53]
Sonja Leverkus, Interview Recording from 14 February 2022:
I think that that cultural, that human interaction of putting fire on the land, is very, very important. I think that it needs to be better recognized, especially as people in our province talk a lot about the importance of it. But we see this significant decline in the approval of prescribed fire from the BC government and in the tightening up of what is expected in order to put fire back on the land. I think that a lot of people can talk the talk, but there's only a handful of us that are willing to really walk the walk and fight the fight. I think that there needs to be many of us being voices for fire provincially, nationally, internationally.

[Music ends]

[00:10:53]
Judee Burr, Recording at prescribed burn in Vernon, BC, 7 April 2022:
[Sounds of fire crackling] Could you say your name for the –

[00:10:56]

David Lind, Recording at prescribed burn in Vernon, BC, 7 April 2022:
David Lind. I'm the fire chief for the City of Vernon.

[00:10:59]
Judee Burr, Recording at prescribed burn in Vernon, BC, 7 April 2022:
Awesome. Yeah, what's going on? Tell me what we're seeing right now.

[00:11:03]
David Lind, Recording at prescribed burn in Vernon, BC, 7 April 2022:
Well, so, the fellows with the drip torches are lighting some of the underbrush and so there's some hardwoods in there. This land has had fire excluded from it for quite some time. So, we've done some clean up, some mechanical thinning. And now they're applying a prescribed burn. So, they're applying fire under the right conditions to return the land to a more natural state. So, it's reducing the fire risk. It's actually healthy for the land and the habitat. This environment, this land should have fire on it from time to time. And so we're getting a good effect. We're probably about a week too late. As far as optimum burn, but we're still having a good effect and we're reducing the risk for the rest of the season.

[00:11:51]
Judee Burr, Recording at prescribed burn in Vernon, BC, 7 April 2022:
Yeah, it's like we're – I'm looking across and I'm seeing the fire that I'm seeing these houses right up against this brush filled area. And it does – is that one of the reasons, this site was chosen because it's right up against these properties that could be really in danger from like a big wildfire event?

[00:12:08]
David Lind, Recording at prescribed burn in Vernon, BC, 7 April 2022:
Absolutely. And so this land that we're on right now belongs to the City of Vernon and, in the city, we've been making efforts to try and have everyone around us, take part in reducing their fuel loads, doing FireSmart activities, and those kinds of things. So, we're recognizing that, as a city, we have a responsibility to take care of the lands that we own. This specific site, as you mentioned, has homes backing right onto a gully, a ravine, and the response area is about ten minutes away from our closest fire hall.

[Wind sounds]

So, if we were to have a fire in this area in August with the fuel loads remaining on the land, there's a good chance that it could spread to a home or multiple homes. So, it's really a preventative maintenance, kind of strategy.

[00:12:56]
Judee Burr, Recording at prescribed burn in Vernon, BC, 7 April 2022:
I'm with John Davies, looking at fire and smoke from this prescribed burn. John, what are we seeing happen right now?

[00:13:05]
John Davies, Recording at prescribed burn in Vernon, BC, 7 April 2022:
So, we're in a small draw behind people's homes in the foothills in Vernon, and we're in a fairly open conifer stand, and it's got a lot of shrubbery, but beneath it, also a lot of needle litter. And behind people's homes. We had hose lay in place, and we've started black lining at the top. So, we're just starting to put more torches on it now and get it done. And then we have Rider Ventures, which is an Aboriginal company based out of Vernon here. And they have twenty people out here, of which, I believe, eighteen are Métis or First Nations. Yeah, multi-agency, multiple companies out here putting fire on the landscape.

[00:13:49]
Judee Burr, Recording at prescribed burn in Vernon, BC, 7 April 2022:
Yeah. It's awesome.

[00:13:53]
John Davies, Recording at prescribed burn in Vernon, BC, 7 April 2022:
I agree.

[00:13:55]
Judee Burr, Recording at prescribed burn in Vernon, BC, 7 April 2022:
Actually, a lot of smoke columns around today it seems like. Is that kind of normal?

[00:14:00]
John Davies, Recording at prescribed burn in Vernon, BC, 7 April 2022:
It's a good burning day for the Okanagan, and that can be a rarity with the venting index requirements that the regional district or the Province puts in place. It probably would have burnt through here every, you know, maybe six, ten years to thirty, forty years. And so you can imagine how many fires have been missed in the Silver Star, BX Foothills area and just how much more fuel there is here than would have been historical. And that is a problem right across all throughout BC.

[00:14 :32]
Narration, Judee Burr:
Those were recordings from April 2022, from the first prescribed burn I attended in the Okanagan. I was excited to attend. *This* is what needs to be happening I thought. Why is it so hard to get these light spring fires going I wondered –

[Music begins[7]]

to care for the spaces around our homes and the landscapes beyond them. I keep wondering. This episode takes us deeper into conversations about applying fire to the landscape. You'll hear more about the promise of cultural burning and prescribed burning, and some of the challenges to making good fire happen.

I met John Davies about a month earlier when I interviewed him for this podcast at the Frontline Operations Group office in Vernon. He is a registered professional forester who co-founded Frontline Operations Group, a company specializing in wildland fire management.

[00:15:25]
Judee Burr, Interview Recording from 19 January 2022:
Yeah. Can you talk more about what's distinctive about fire in the Okanagan Valley? Now your business is based here and you're doing all kinds of fire work here. Can you speak from some of your work experience?

[Music changes[8]]

[00:15:30]
John Davies, Interview Recording from 19 January 2022:
Yeah, I think differs in the sense of say something up in the boreal, because up there the fuel types are primarily dense white spruce, black spruce, muskeg-type fuels. Whereas, in the Okanagan, a lot of times at the valley bottom, you're dealing with grasses, grassland fuels. Something starts in someone's backyard, or roadside accident, or a cigarette on the road, it gets into grass, moves really quickly. Then if there's a treed slope up above, then it moves into some heavier timber and you get into heavier fuels. Then the other aspect is that there's just a lot of interface. So, there's a lot of structural human-made values in the Okanagan valley bottom. I think we're also blessed in the sense that we have a lot of lakes, right? We have lakes in the Okanagan from north to south. So, we usually have pretty good access to water when we do have that valley bottom proximal fire. So, that really helps. I think the other challenging part of it is we just don't always have the access to get to where we need to go because of private land or no roads or steep terrain.

[00:16:43]
John Davies, Interview Recording from 19 January 2022:
It was after I started firefighting. I started firefighting in '93, and then I started my forestry degree in '94. So, '94 was a really busy year. At the end of that summer I ended up going back to Ontario to fight fire, and I got a message on my phone at home that I had received a letter that I had been accepted at UBC. So, I managed to pick out my courses and stuff while I was on the fire line, and register for those. Then, yeah, I think within three days of leaving Ontario, I'd flown back, driven back to Thunder Bay, flown back to Kamloops, driven to Salmon Arm, packed all my stuff up on a Sunday night, and driven down to UBC, slept in my truck, and went to my first calculus class Monday morning at eight-thirty. That was how I started forestry.

[00:17:28]
Judee Burr, Interview Recording from 19 January 2022:
With calculus.

[00:17:30]

John Davies, Interview Recording from 19 January 2022:
Horrible.

[00:17:32]
Judee Burr, Interview Recording from 19 January 2022:

[Laughs]

Do they teach you how to burn in forestry school?

[00:17:36]
John Davies, Interview Recording from 19 January 2022:
No. They didn't when I went. There was one class, one semester, three credits that was focused on fire. Then, in ecology, there was one chapter in a book that was focused on fire. It's a forgotten part of forestry, which is unfortunate because it's an integral part of our ecosystems. That might be changed now, where they have more fire focus and I believe that it is.

[Music ends]

[00:18:06]
Narration, Judee Burr:
Even in the past few decades since a positive conception of fire has come back into favour in forest management, putting fire back onto the land has been extremely challenging.

[00:18:15]
Audio Clip from "Black and Green," an episode of the television series *Westland*, 1984[9]:
There have been a lot of films that talk about forest fire prevention, or about fighting fires. This film talks about lighting fires.

[00:18:28]
Narration, Judee Burr:
This is a short film about prescribed fire in BC that was produced by the BC Ministry of Forests and aired on the first season of the television series *Westland* in 1984.

[00:18:37]
Audio Clip from "Black and Green," an episode of the television series *Westland*, 1984[10]:
Wildfires must be controlled as always, but foresters and other resource managers are learning that prescribed fire can be a useful tool in the management of many public resources. Among professional resource managers, there is now almost total agreement that if we are going to practise good forest management, or silviculture, if we are going to maintain good winter ranges for wildlife, if we want to control forest succession onto grasslands – then, we will have to have more fire.

[00:19:11]
Narration, Judee Burr:
Not every intentional use of fire is the same. For example, throughout much of the twentieth century, the timber industry has used permitted, controlled burns to get rid of slash – or timber debris – before the hot, dry summer wildfire season makes that debris a hazard. These burns were used to prevent valuable timber from burning up in wildfires. So, some forms of controlled burning have been used by the BC Wildfire Service alongside fire suppression tactics, while other forms of intentional burning – like spring and fall cultural burns that cultivated a biodiverse landscape – greatly decreased in use. It's also important to point out that slash burning and other forms of prescribed burning have been decreasing in BC for the past thirty years.[11] Despite alarm bells ringing about the need for more intentional fuel management, including prescribed fire, and the ecological, cultural, and wildfire risk reduction benefits that adding cool burns to the land can bring, it's getting harder to burn instead of easier. When it was more common in the seventies and eighties, controlled burning did serve a teaching role for foresters. For most of the foresters I talked to, using fire wasn't something they learned in school but something they grew comfortable with after fighting fires or conducting prescribed burns.

Sonja described how fire can be used to sustain ecosystem health and support livestock.

I asked a number of my interviewees more about current practices of managing fire-prone landscapes in the dry forests of the southern interior where fire has been excluded for so long.

[00:20:47]
Judee Burr, Interview Recording from 19 January 2022:
Can you tell me more about the projects that you're working on in the Okanagan, like some of the prescribed burns and fuel treatments that you guys are doing?

[00:20:54]
John Davies, Interview Recording from 19 January 2022:
So, we've actually had a couple landscape-level fuel breaks that were tested by wildfires, one was in 2020 in the Mount Christie fire up at Heritage Hills. And the second one was at Westshore Estates on West Side Road this year, on the White Rock Lake fire. So, we've been lucky that way, in the sense that we've been able to go out to a site that's needed to have something done, figured out what needed to be done, prescribed it, implemented it, and then actually had it tested to show the results. Yeah, that's interesting to be able to walk into a stand and see the fire effects.

[00:21:29]
Judee Burr, Interview Recording from 19 January 2022:
Yeah. How did it look?

[00:21:32]
John Davies, Interview Recording from 19 January 2022:
Both of them were successful. Talking to the fire professionals on site, the fire departments, there was a noticeable change in fire behaviour, which is great. That's the whole idea. Heritage Hills, that fire came through, burned a good chunk of the canopy, but then dropped down on the ground before it got to the homes. Then similarly, in Westshore Estates, it just went through a corner of it, it never actually went towards the structures, but hopefully, you know, that was maybe a result of running out of fuel. Fire will always follow the fuel.

[Music begins[12]]

Yeah, you can walk through the stand, you can see what the fire did, how it changed.

[00:22:22]
John Davies, Interview Recording from 19 January 2022:
When I think back to the early nineties –

[Music ends]

when I started, the first interface fire that I remember was the Garnet Fire in Penticton, '94. Then, a red truck showed up on our base, and we had to learn – it was basically a small fire truck. We were going like, "Okay, we're going to start going out and protecting homes, and not just fighting fires in trees." So, through that career, it started to become more common to have interface fires, even though they probably had always happened just more rare. Certainly, since Kelowna, in 2003, and all the other interface fires that happened that year, it became more at the forefront. Then there's been a ton of fires since then that have been interface and destroyed communities, including this year.

[Music begins[13]]

[00:23:13]
John Davies, Interview Recording from 19 January 2022:
We are pushing development further out into wildlands. People are spending more time out, so you have more potential for human risk. We stopped burning as part of fire management slash burning and whatnot in the eighties. So, you know, we're forty, sixty years of built-up fuel. We mentioned earlier about how planting dense stands of lodgepole pine or whatever else that we planted eighty or a hundred years ago, are now mature stands that have been impacted by mountain pine beetle. So, we have a different fuel load there. We have these huge tracts of continuous fuel. And so I think, you know, we're at that point where we're paying for it.

[00:24:01]
John Davies, Interview Recording from 19 January 2022:
It's frustrating to me as a resident, as a taxpayer, as a fire professional, as a forester, because we need to stop building homes that burn down, for one. That starts at the

developer and local government planning department level. That's all real basic FireSmart stuff. That's just building materials, landscaping materials, and treatments around the development to protect it. That is stuff that's all handled at a local government level, so that's a city or municipality's planning department putting in some very specific development guidelines and then standing up to them. So, a lot of local governments now are moving towards developing Wildfire Development Permit Areas, within which, if a developer or homeowner wants to do something on a property, they have to have a wildfire risk assessment done. Same as they would have environmental report done or a hillside stability report done.

When I see these developments or individual homes pushing up a hillside into the grasslands or the forests and their cedar shake roofs, or they're landscaped inappropriately with cedar hedges and juniper bushes and vegetation right up to the home. One way in, one way out. I just shake my head. It's just a matter of time. You can see those old developments scattered all down the Okanagan where you can point out and go, "That's going to burn eventually." I look across the lake every day at a hillside that's just a matter of time. You know, they're little developments that are on big lots that are one way in, one way out. There's root rot all over the hillside, so all the Douglas fir is dying and falling down and creating a fuel hazard. It's full of recreational trails. It's on a west aspect. It's got a road at the bottom of it susceptible to human caused ignitions. Really it's the perfect storm, and it just needs the spark.

[Music ends]

[00:25:58]
Wendy Pope, Interview Recording from 23 February 2022:
After my biology degree, I could tell you more about what the inside of a plant looked like than what the actual plant was called, or what is uses may be.

[Music begins[14]]

But it was definitely my work and my career as a naturalist and a park interpreter that helped me develop my current understanding of fire ecology.

[00:26:19]
Wendy Pope, Interview Recording from 23 February 2022:
Wendy Pope, area supervisor of the South Okanagan BC Parks. I also use she/her pronouns. And I also feel incredibly fortunate to live as well as to work, and most importantly to play, in the traditional territory of the Syilx people. It's absolutely a beautiful landscape where I find myself. So, I'm very grateful.

[Music ends]

[00:26:44]
Wendy Pope, Interview Recording from 23 February 2022:

I've got a wildfire risk reduction project, and in government we're calling these WRR. We've got to abbreviate everything, because we use too many words. So yeah, wildfire risk reduction project. Personally, I haven't dipped my toes into these kinds of projects yet. But, actually in the Okanagan office, another area supervisor has just transferred over from BC Wildfire, and he brings a tremendous amount of expertise. He's been just really going blazes on – no pun intended – he's just been going great blazes on these on these WRR projects. I suppose I've been influenced by just kind of watching what he's doing. But, in my own little area, there's Fintry Provincial Park, and then there's, to the west of it, there's a much larger Fintry Protected Area. At the south end of that protected area, there are a couple of communities. There's Upper Fintry, and there's also La Casa. These communities are the urban interface. They are butted right up against the forest. They are probably less than a kilometre south of the White Rock Lake wildfire of last year of 2021.

[Transition music[15]]

[00:28:07]
Judee Burr, Narration:
Wendy explained that BC Parks has been working with the community in La Casa to manage the impacts of ATV use around the park area. For Wendy, proposing a fuel treatment project that would reduce the risk of wildfires reaching the community was a way to continue building that relationship and goodwill while also supporting the fire-maintained ecosystems in the park.

[00:28:27]
Wendy Pope, Interview Recording from 23 February 2022:
This year, I put in a pretty general proposal for this area behind La Casa, and said on top of it ticking the boxes of urban interface, ecological restoration – for me, it actually helps tick a box of building relationship with a community that we are asking for a change of behaviour from. And I think that's really key.

[00:28:55]
Judee Burr, Narration:
I also reached out to Wendy because I wanted to talk about the relationship between land conservation and fire management in the Okanagan.

[Music begins[16]]

Many scholars have written about the way parks in North America were created with a particular settler-colonial conservation mindset, in which landscapes that we care most about should be cordoned off and left alone rather than actively managed by people.[17] This cultural story fails to engage with our Okanagan landscapes as places where Syilx Okanagan people have lived and actively cared for the land with fire for millennia. Wendy and I had a great conversation about this.

[Music ends]

[00:29:34]
Wendy Pope, Interview Recording from 23 February 2022:
Yeah. Moving away from the idea of "Do the parks need to be protected from the people?" I guess, the key in that idea is: Who are the people? Are they the people who have cared for and really loved and lived in harmony with the land for so long? No, those are not the people that we are protecting the parks from. We're protecting the parks basically from the colonial mindset. The entitled, consumptive, selfish relationship that a lot of people, unfortunately have had fostered in them just because of the culture and the time that we now find ourselves in.

Have I seen a shift over my time? I guess I have. I was actually speaking with my supervisor, Mark Weston, this morning and saying, you know, I don't personally have the longevity with this agency to speak to that. What have you seen in the South Okanagan? He actually told me, he said, back in 2007, Mahoney Ecological Reserve, which is – I guess it's closer to the town of Okanagan Falls – but back in 2007, there was some, I don't know what to call it, I think it was some type of prescribed burning that happened. There was definitely engagement with the Lower Similkameen Indian Band at the time. Of course, 2007 was right around the time that that UNDRIP was adopted. I know at that time, there was a growing awareness and a push to involve and engage First Nations partners. Apparently that project went quite well. Since then, I think the process has become – it's hard to describe – I think the process has basically become more complex. You're going to get different answers depending on who you ask, but in my humble opinion, it just feels less meaningful. I have a feeling that back in 2007, there was a push to engage First Nations partners, and it was a relatively organic process. Now in 2022, we find ourselves in this very scripted, very precisely prescribed, paper exchange where we send referral letters, and we are supposed to send them on every single thing that we do.

[Music begins[18]]

It's totally overwhelming to both governments. It's way easier to talk about than it is to implement the type of involvement and the type of collaboration that I think most of us, really, really do yearn for. When you look at the history, there's obviously tremendous and understandable amount of distrust by Indigenous communities of government. One of the main problems is that we are trying to build that relationship and build that trust, but we're doing it within the context of these really high-pressure situations.

[00:32:58]
Wendy Pope, Interview Recording from 23 February 2022:
We as government employees, we tend to come to the consultative table with a set of objectives. We are looking to our First Nations partners for a yes or a no, because that's all we really have time. Just give me a yes or a no. Instead of coming with a bunch of objectives, why aren't we coming to the table with a bunch of questions? What do *you* feel are the priorities? How would *you* like to see this park managed? Instead of government coming to First Nations communities and saying, "We want an approval to

do the things that we've identified as important" – why aren't we asking First Nations Partners what they feel is important?

We really need some added capacity to build the relationship. Because, without that, we are just coming to the table with an emergency and a set of solutions. And I just don't think that that makes for the most meaningful relationship-building between governments. Until we have capacity funding to actually enable First Nations to contribute their time towards this referral process – and also allows them to live in capitalist, 2022, North America and pay the bills – I think we're more just going through the motions. It's really difficult to ask for something and offer nothing in return.

[00:34:30]
Wendy Pope, Interview Recording from 23 February 2022:
Fast forwarding from 2007 where we did a pretty successful burn project in in Mahoney Lake with some good engagement from local Indigenous communities, this year, there's going to be some burning happening at Conkle Lake. They're working really closely with Indigenous partners to roll that one out, so that's certainly very encouraging.

[Transition music[19]]

[00:34:56]
Dave Gill, Interview Recording from 15 February 2022:
My career up to working with Westbank has mainly been in industry and a little time with government. I tell you, when I started here with Westbank, my whole paradigm on forest management went through a huge shift. I felt like I was standing on my head half the time, not really understanding. Like, "This isn't the way that that I was told or taught how to do things. It's not the way that I've been doing things my whole career. Everything has shifted."

But, there came a point where I was in the forest one day, and walking through it, and trying to determine whether or not we should log this area or not, and how to, if we were, and some of the values. It kind of hit me in a strange sort of way. It might sound a little bit – I don't know – a little bit crazy, but it kind of came together for me. That here I am on unceded land, on unceded Syilx territory.

[Music begins[20]]

I'm making decisions on land that I don't own, land has been cared for by the Syilx people for thousands of years – what gives me the right to be making this decision? And what are the implications of that decision? And how long will the implications of that decision last? I thought about that for a while, and I didn't make any decision. I came back to the office.

[00:36:46]
Judee Burr, Narration:

That was Dave Gill, who you heard from in the last episode, about managing the Westbank community forest. Community forests are a form of land tenure in British Columbia where a specific parcel of land is managed by a local government, community group, or First Nation.[21] Dave and I talked a lot about the challenges of managing a landscape while keeping multiple values in mind. Deciding to manage the land to reduce wildfire risk to properties, to protect the watershed, to support old growth, to generate timber income, to revitalize cultural burning practices, or for a few of these values at a time – those are intentional decisions that are rarely uncontentious. Dave talked about the process of managing the Westbank Community Forest with Westbank First Nation values at the forefront.

[00:37:36]
Dave Gill, Interview Recording from 15 February 2022:
We do have regular meetings through the ONA Forestry Working Group, and there are Elders and Knowledge Keepers that are often on these calls.

[Music ends]

Just listening to what they have to say and the responsibility that they still see they have on caring for the land, and looking through every decision through a seven-generation lens. What will be there for your grandkids or great grandkids? And understanding that the values that are on the land may change, but sometimes that's not a bad thing. Sometimes that's a good thing.

[Music begins[22]]

So, understanding and envisioning in your head, what you would like to see here 120 years from now.

[00:38:28]
Dave Gill, Interview Recording from 15 February 2022:
We started our wildfire mitigation program even before I started. We did a project back in 2011, I believe. Then, since that time, we've been actively doing it just about every year since 2013. The areas that we've focused on have been up in the West Kelowna area, the Upper Glenrosa Community primarily, and some areas around Rose Valley. And we're busy. We're actually doing some right now, on Westbank First Nation land. It's work that is very difficult, but, at the same time, it's quite rewarding. Especially with the Mount Law fire that came through this past summer, and just hearing from the fire chief that when that fire hit the area that we treated, he said his crew said the roar went out of the fire. So, it shows you that this work is expensive and it's tough, but it *is* effective. There's a lot of talk of cultural burns, and that's … an awesome way to manage this in the long term. But because we've been hitting fires hard for the last one hundred years, we've got an incredible build-up of fuel in the forest. To get back to the cultural burns is going to take a little bit of work. And some of that work is mitigation work. Once we do the mitigation work, cultural fires, I believe, can be conducted and should be conducted in many of these areas where we've removed a lot of the fuel.

[00:40:15]
Dave Gill, Interview Recording from 15 February 2022:
The funding is never enough to do what needs to be done. We have so much that we could be doing, and I'm talking about managing for fire at not just on the interface, the urban interface, but out on the landscape as well. I don't think that, despite the fact that fire is a natural event here, I don't think there is a lot of people that really would say, "Yeah, it's okay for thirty thousand hectares to burn here, and forty thousand over there." I just don't think we're there anymore. We've got too much happening on the land. There's infrastructure all over the place. There are values that people hold dear all over the place. We're going to have to manage fire, and we're not going to be able to do let fire run like perhaps it did historically.

[00:41:09]
Dave Gill, Interview Recording from 15 February 2022:
We're in a significant time of change, as you've probably seen and heard on the news. I do believe we're at a point in time where more decisions about the forest have to be driven by local communities. The decisions for good forest management don't come out of Victoria, they come out of the local community. They come out of First Nation Knowledge Keepers. They come from people who have been on the land, whether they're Indigenous or not, for years – who understand the land and can see what's going on and what's happening, and give a heads up when they see something that isn't right.

[Music ends]

And that's a huge shift. That is a shift that we haven't seen in this province. It's always been driven from the top. I really see that depending on where you are in the province, the focus on fire management will be playing a huge role in how we are managing forests around communities. We've seen too much devastation over the past couple decades. That's always going to be fresh in people's minds, and they're going to be looking at these community local tenures to be protecting their communities, and to be using fire or to be managing for fire to ensure that they are protected.

[Music begins[23]]

[00:42:43]
Amy Cardinal Christianson, Interview Recording from 28 February 2022:
I'm Amy. I'm a Métis woman from Treaty 8 territory. My family's the Cardinal and Laboucane families, which are two pretty prominent Métis families from the Fort McMurray and Owl River areas. I grew up in a little town called Whitecourt, Alberta, which is in Treaty 8, and I live now in Treaty 6 territory in the little town called Rocky Mountain House. I'm also a research scientist with the Canadian Forest Service where all my work is on Indigenous fire – looking at evacuations, and return of fire to the land, cultural burning. Basically, I do a lot of, I guess, more national-level work on supporting Indigenous Peoples in returning fire.

[00:43:29]
Judee Burr, Narration:
Amy Cardinal Christianson's work and research has been important for understanding the social aspects of living with fire.

[Music ends]

As she said here, much of her work has focused on Indigenous fire management. It's included understanding the promise of cultural burning and obstacles to it; the disproportionate impacts wildfires pose to First Nations communities; and the experiences of Indigenous people working in wildland firefighting. She is also the co-host of the *Good Fire* podcast. She made a lot of connections for me between national and global conversations about fire and local needs for changes in fire management and response.

[00:44:06]
Amy Cardinal Christianson, Interview Recording from 28 February 2022:
I think anytime it seems like Western nations are faced with these big bad fire events, that people start looking for other solutions. We saw that in Australia, in California, we're seeing that now in Canada. There's been some really bad summers where millions of people have been impacted, not only by fire, but by smoke for a long time. We didn't have hardly any fires last year in Alberta, but we were smoked out for a month from the BC fires. So, it really can impact people a far ways away.

I think that one of the big swings that I've seen is, even just in my career, I've been with the Canadian Forest Service ten years, and the first five years nobody talked about Indigenous people or cultural fire. Part of that was our federal government at the time, which was the Stephen Harper Conservative era. I'd say, in the last five years, we've seen a real swing or attention to this area, and so that's been really exciting. Of course, for many Indigenous people, it's not fast enough. Like, for me, I'm always frustrated.

[Laughs]

But when I sit and think back five, ten years ago, what it was like when I first started my career, there has been big changes.

[Music begins[24]]

I think another really big thing that I've seen is just the focus on prevention and mitigation in Canada. We have the FireSmart program in Canada that started in the 1990s in Alberta, but it really saw limited attention for a lot of years, despite amazing people really trying to push FireSmart and FireSmart activities. But in the last, again, five to ten years, it's really become a national program and more agencies are really picking it up. So, that's exciting.

We just had that UN report[25] come out that I was a co-author on that showed that I think it was 99.8 percent of international spending is on fire suppression and 0.2 percent is on mitigation and prevention of wildfire. That's something that we really need to see shift. I think in Canada, we do spend a bit more on mitigation and prevention, but we still see the vast majority of funding going to fire suppression campaigns. I think that that's something that people are really noticing – that we just can't keep up with this anymore.

[Music changes[26]]

[00:46:26]
Amy Cardinal Christianson, Interview Recording from 28 February 2022:
In my current role, I'm just seeing the increasing impact every year on Indigenous communities. At the Canadian Forest Service, we're a research agency, we're not a fire response or management agency – usually my role is always media or trying to give advice to government operations centres that are running things. Usually what happens is the communities start getting evacuated, all the calls and concerns start happening, and then you're just worried the whole summer for all these communities. It's just so frustrating, I think, seeing the same things over and over again. I heard that this summer and a lot of the interviews with different Chiefs and other First Nation evacuees, it's like – when are we going to do something different? They're just so frustrated and tired of being repeatedly evacuated from some of these events.

[00:47:20]
Judee Burr, Interview Recording from 28 February 2022:
Yeah. It was really scary to see the fires this summer in BC and so tragic to see Lytton being impacted, burned out the way it was. I'm like torn between asking more about some of these common problems that come up, and between just asking what feels hopeful.

[Laughs]

I don't know, which of those would you rather speak to – or both? Just to wrap us up, like what are these things that anyone who's listening to this interview maybe should be aware of that Chiefs continue to say in these evacuation circumstances, and are there any ideas and important notes to end on for action items that we should be pushing our communities to take?

[00:48:16]
Amy Cardinal Christianson, Interview Recording from 28 February 2022:
Sure. I think every summer we're seeing just a frustration from the communities that I'm working with, that basically they're not allowed in the fire management equation. You know what I mean? They lots of times have to get evacuated or forced out of their communities, even though they feel like they have the local knowledge. We've seen like Chief Joe Alphonse with the Tŝilhqot'in and other Nations that have said, "We're not evacuating. We're going to make our own decisions here based on our local knowledge." Skeetchestn was another one, this summer, that did that as well. Although

there's many issues, many frustrations on trying to get cultural fire back, on trying to get Indigenous people more involved in fire management – for me, there's also a lot of hope in it. Because there's just so many Nations now that I see that are just standing up and saying, either in media or privately, that they want to take more of a role in fire stewardship and bringing fire back to the land. Which I think is really exciting. I think that many too aren't going to take no for an answer.

[Laughs]

They're determined to be able to do this and lobby basically for any policy or regulation or certification or things that they need to be done to do that.

[Music begins[27]]

Whereas, a few years ago, there was only a few of us working or interested in this file. There's a lot more people now and a lot of really good allies too that have come forward to support the work. I think that that's one of the promising things from it.

I think too, there's been a lot of recent studies that have just come out on how Indigenous people steward biodiversity and also can provide nature-based climate change adaptation solutions. And some of those are through the use of good fire in our territories.

So, I think although it's sometimes it's frustrating that we shouldn't need Western science – like, people should just listen to our Elders and what they're saying – sometimes the colonial governments rely more on Western science to make decisions. But I think in that way, there are changes afoot to get Indigenous people more involved in fire. In BC as well, we're seeing there that they're constantly talking about prescribed and cultural fire now; it's always kind of used there as well. How that will look in reality, you know, I think everyone's still trying to figure it out, but definitely I think that there are signs for hope there.

[00:51:02]
Amy Cardinal Christianson, Interview Recording from 28 February 2022:
The work that I always – and Pierre is part of that group – is the Interior Salish Fire Keepers organization.

[Music ends]

I mean, the work that they're doing – so Harry Spahan and his partner, Jennifer Morrison, are leading that, and Joe Gilchrist is on that team too – for me, that is the exciting thing. That's where we should be, with local Indigenous people leading.

The thing I think that they and many other Indigenous groups are really confined by is the inability to access or burn on any Crown land. Any cultural burning or anything that they can do has to be on reserve. Especially in BC, the reserves are basically down in

the valley because they didn't want to give any of the timber to the Nation that's on the slope. Really, that's where the fire risk is coming from, but they're unable to burn or do any sort of management in that area.

[Music begins[28]]

[0051:58]
Amy Cardinal Christianson, Interview Recording from 28 February 2022:
One thing that people often don't understand with fire is that they think, "Well, it's just burning" or "It's just fire." But for Indigenous communities, it's more than fire, right? It's about relationship with the land and about that role that we have with Creator to be stewards. I think that as we're trying to get more and more fire on the ground, it's also just about that reconnection and reclaiming territory. In the end it kind of comes down to "Land Back" and Indigenous autonomy and sovereignty over our lands. But I think that that's also then where lots of the issues arise, because it's not as simple as just saying, "Hey, yeah, you can go burn over there," but it's saying "If we let you burn over there, what does that mean for who owns what and who makes decisions over what." But at least we're starting to have those conversations.

[Music ends]

[00:52:52]
Judee Burr, Narration:
As I've conducted this research and as I've spoken with people who know fire, it continually strikes me both how much a hundred years of settler-colonial management has shaped Okanagan ecosystems; and how little one century seems against the millennia across which fire has helped form the entwined natures and cultures of this place. Fire has shaped this place, and it's not going anywhere. With climate change bringing hotter and drier conditions, more large fire seasons are expected. But there are many good ideas and practices circulating about how to live more consciously in community with fire in this valley. We are living in a fire culture very different than a culture of comfort with a mosaic of burning that existed before 1850. Experts agree that some form of fire suppression needs to continue, and we need to support the wildland fire fighters and other first responders engaged in that work. But we can also listen to the lessons from Fire Keepers and practitioners of newer forms of light burning for ecological health. And we can practise more active land care in this place with an awareness that it is home to fire too.

[Music begins[29]]

[00:54:10]
Joe Gilchrist, Interview Recording from 12 February 2022:
The other challenge is the government itself, not being allowed to burn and the criminality that comes along with burning off the Reserve. Even on the Reserve now, it's getting harder. Because now everybody owns their little piece of land and their house, and some people are afraid of fire and don't want fire. It's almost a fifty-fifty split of

people that want fire and don’t want fire, that see … fire control as a way of life now, rather than fire management.

[00:55:04]
Judee Burr, Narration:
Joe Gilchrist again.

[00:55:06]
Joe Gilchrist, Interview Recording from 12 February 2022:
To get people back comfortable with fire, and to be able to spread it onto traditional land, which is now Crown Land, it’s a battle.

[00:55:21]
Judee Burr, Interview Recording from 12 February 2022:
Yeah, when you’re talking to people who don’t know a lot about First Nations fire stewardship and burning practices – to folks who are just used to that fire control mentality – what do you say? What are some of those hopeful things that you want to convey to people who are just like, ‘put the fires out and that’s it.’

[Music ends]

[00:55:52]
Joe Gilchrist, Interview Recording from 12 February 2022:
I was doing a burn one time, and I was burning with the fire chief on the Indian reserve and we were burning for wood ticks around the school. We did that burn, and he decided he wanted to do – we had time to do another burn, which was the hillside near the Indian reserve. So, I said, yeah, okay, there’s shale there, we could use that shale. Then just did a little guard across this part right here. I started to burn it, and I was coming down, and then it’s getting to the point where we were just … it’s called the black line. So, I had the black line built across the top, and I was layering it down the hill. That makes the black line bigger, every layer makes the black line thicker, right? So, then, I was able to go to the bottom and just light it up and let it run to the top, because at that black line it would go out.

And as the fire was climbing the hill, there was one tree on that hill, and an Elder came running to me and he says, “I don’t want that tree to burn.” It wasn’t even a mature tree, it was only thirty, forty years old maybe, and it was maybe sixteen feet tall or something like that, and it had some rose bushes and stuff underneath it. He wanted me to go and put the fire out before the fire got there. I said, “There’s no time for me to go up there and put the fire out before it got there.” I said, “It’s going to burn around there in about thirty seconds.” And he was saying, “You get up there, and you put that out! You make sure that doesn’t burn!” and all kind of stuff. And this guy is an Elder, my Elder, eh? You don’t question and you listen to what an elder says, right? But I told him, “Just watch.” I said, “The fire is only burning three metres long, but that’s uphill, so the actual flame height from the ground is only maybe fifty centimetres, right?” So, I told him, “It’s going

to burn around that tree, but it’s not going to kill it. It’s only going to make the bottom one or two feet of that tree black.”

So, we sat there and we watched the fire go around it. The way the wind was blowing and everything up the hill, it didn’t kill the tree and the bark saved the tree, which is what it’s supposed to do. He was happy at the same time. We got to talk about the wood ticks and the mice and all this kind of stuff, that it was taken care of killing all the wood ticks. I told him, in two, three weeks when the rain comes, I said, “That’s going to be a really super green colour. Everything else will be all yellow because it’s not burnt, but that area where it’s burned now is going to be green.”

[Music begins[30]]

And, sure enough, you know, that said that’s exactly what happened.

[00:59:24]
Judee Burr, Interview Recording from 12 February 2022:
That’s awesome.

[00:59:26]
Joe Gilchrist, Interview Recording from 12 February 2022:
Yeah.

[00:59:28]
Judee Burr, Interview Recording from 12 February 2022:
Yeah, that’s a hopeful story.

[00:59:45]
Judee Burr, Narration:
In this episode, you heard parts of my interviews with Sonja Leverkus, John Davies, David Lind, Dave Gill, Wendy Pope, Amy Cardinal Christianson, and Joe Gilchrist. We discussed the many faces of fire – wildfires, cultural burning, and prescribed fire – and we considered how to reduce wildfire risk while balancing multiple values on the fire-prone landscapes in the Okanagan Valley and BC. These are difficult questions, and they continue.

[01:00:18]
Judee Burr, Narration:
I have a lot of people to thank! I’d like to thank everyone who I interviewed for this project. I’d also like to thank everyone who gave me background information, feedback, or advice throughout this research process, including the archivists at the Greater Vernon Museum and Archives, the Oliver Archives, the Enderby Archives, the Armstrong Archives, UBC Special Collections on both campuses, and the BC Archives.

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You can listen to many of the full interviews from this project on my thesis project website, listeningtofirepodcast.ca, and you can find transcripts of those interviews there. My transcripts of each of these podcast episodes include citations for my research. This research was supported in part by the Government of Canada’s New Frontiers in Research Fund through UBC Okanagan’s Living with Wildfire project.

Another reminder that you can take important steps today to prepare your home base and protect yourself from wildfires.[31] Find out more at the FireSmart Canada website. And keep an eye out for ways to support or even start organizations that care about good fire and fire ecology in your community. I’m Judee Burr, and thanks for listening.

[Music ends]

Show Notes

[1] "Stilt" by Blue Dot Sessions, https://app.sessions.blue/browse/track/102063.
[2] "Vela Vela" by Blue Dot Sessions, https://app.sessions.blue/browse/track/109928.
[3] "Algea Tender" by Blue Dot Sessions, https://app.sessions.blue/browse/track/110710.
[4] See my full interviews with Sonja Leverkus and John Davies for more about prescribed burning best practices.
[5] "Flatlands 3rd" by Blue Dot Sessions, https://app.sessions.blue/browse/track/110884.
[6] "Vela Vela" by Blue Dot Sessions, https://app.sessions.blue/browse/track/109928.
[7] "Valantis" by Blue Dot Sessions, https://app.sessions.blue/browse/track/111212.
[8] "Di Breun" by Blue Dot Sessions, https://app.sessions.blue/browse/track/111055.
[9] Used with permission from UBC Open Collections; Mike Halleran, "Westland: 'Black and Green: A Film on Prescribed Fire in British Columbia,'" video, *Westland*, 1984, UBC Open Collections, 10.14288/1.0109062.
[10] Used with permission from UBC Open Collections; Mike Halleran, "Westland: 'Black and Green: A Film on Prescribed Fire in British Columbia,'" video, *Westland*, 1984, UBC Open Collections, 10.14288/1.0109062.
[11] "Prescribed burning in British Columbia by year and area" [chart], from Kira M. Hoffman, "Our Future with Fire: Barriers and Opportunities for the Revitalization of Fire Stewardship," accessed 24 May 2022 at https://www.youtube.com/watch?v=_QD3qezRW7o; "Total provincial silvicultural prescribed burning declined from about 60,000 ha per year in the early 1970s to approximately 17,000 ha per year in the late 1970s and early 1980s": John Parminter, "Burning Alternatives Panel: A Review of Fire Ecology, Fire History and Prescribed Burning in Southern British Columbia," presented to the Sixth Annual Fire Management Symposium Southern Interior Fire Management Committee (Kelowna, BC, 29 May 1991).
[12] "Vela Vela" by Blue Dot Sessions, https://app.sessions.blue/browse/track/109928.
[13] "Our Only Lark" by Blue Dot Sessions, https://app.sessions.blue/browse/track/110679.
[14] "Valantis" by Blue Dot Sessions, https://app.sessions.blue/browse/track/111212.
[15] "Pencil Marks" by Blue Dot Sessions, https://app.sessions.blue/browse/track/102138.
[16] "Great is the Contessa" by Blue Dot Sessions, https://app.sessions.blue/browse/track/111198.
[17] William Cronon, *Uncommon Ground: Rethinking the Human Place in Nature* (New York: W.W. Norton & Co., 1996); Alex Wilson, *The Culture of Nature: North American Landscape from Disney to the Exxon Valdez,* 2nd ed. (Toronto: Between the Lines, 2019).
[18] "Valantis" by Blue Dot Sessions, https://app.sessions.blue/browse/track/111212.
[19] "Vela Vela" by Blue Dot Sessions, https://app.sessions.blue/browse/track/109928.
[20] "Vela Vela" by Blue Dot Sessions, https://app.sessions.blue/browse/track/109928.
[21] Kelsey Copes-Gerbitz et al., "BC Community Forest Perspectives and Engagement in Wildfire Management," report to the Union of BC Municipalities, First Nations' Emergency Services Society, BC Community Forest Association and BC Wildfire Service, September 2020; BC Government, "Community Forest Agreements," accessed May 2022, https://www2.gov.bc.ca/gov/content/industry/forestry/forest-tenures/timber-harvesting-rights/community-forest-agreements.
[22] "Damaroon" by Blue Dot Sessions, https://app.sessions.blue/browse/track/111319.
[23] "Voyager" by Blue Dot Sessions, https://app.sessions.blue/browse/track/102060.
[24] "Damaroon" by Blue Dot Sessions, https://app.sessions.blue/browse/track/111319.
[25] United Nations Environment Programme, *Spreading like Wildfire: The Rising Threat of Extraordinary Landscape Fires*. A UNEP Rapid Response Assessment, Nairobi, 2022.
[26] "Four Count" by Blue Dot Sessions, https://app.sessions.blue/browse/track/122474.
[27] "Orchard Lime" by Blue Dot Sessions, https://app.sessions.blue/browse/track/102061.
[28] "Respite" by Blue Dot Sessions, https://app.sessions.blue/browse/track/110669.
[29] "Marble Transit" by Blue Dot Sessions, https://app.sessions.blue/browse/track/109828.
[30] "Paving Stones" by Blue Dot Sessions, https://app.sessions.blue/browse/track/109837.
[31] FireSmart Canada, https://firesmartcanada.ca/.