

Greg: So we're lucky to be here today with Adam Cantor, a Wiyot botanist and tribal spokesperson, and our topic today is indigenous land management over the past millennium. Adam will be here to tell us some of the interesting aspects of that, some of the complexities of the society, and maybe a little bit of myth-busting along the way. Well Adam, thanks for being here, it's wonderful to be in your home, and to meet you. I was wondering if you could tell us a little bit about your responsibilities as the botanist of the Wiyot tribe and tribal spokesperson.

Adam: Yeah well, first, thanks for having me. It's a joy to be here, at the solstice time of year, and hope everyone is well. As a botanist for the tribe, I'm one of the many people that works to caretake the Wiyots' resources and the Wiyots' land, and also help to try to restore lands within ancestral territory. I work with the tribal historic preservation office as well, and in that office we do project review impact assessments centered around protecting and stewarding the tribe's resources.

Greg: How many Wiyot are in our community today?

Adam: There's around 800 registered Wiyot citizens, but that includes folks that live outside the Humboldt Bay area. At the Table Bluff Reservation there's around 100 Wiyot, several hundred in the greater community.

Greg: Well getting to our topic at hand, indigenous land management over the past millennium—that's a long time—how would you generically characterize the quality of lifestyle of not only the Wiyot during that period, but Native Americans in general?

Adam: One of the big myths that we're told in school is that Native Americans were hunters and gatherers, and kind of wandered aimlessly looking for food. That's a complete lie. We know that today that in order for art and civilization to flourish, we have to have somewhat of a sedentary lifestyle, to be able to enjoy the spare time to develop these artistic pursuits.

You know, it was thought that around the time of contact, that there was around 1000 to 1200 Wiyots living in villages that were spaced around the lower Eel River, Humboldt Bay, and the Mad River estuaries and really used the estuaries and the bays, and really developed this linkage of sites that for the most part could be accessed by canoe, and were known to manage, harvest, and tend Indian potatoes, or edible bulbs, geophytes as they're known today in the botanical world, and use fire to maintain the coastal prairies. The prairies were really a lifeline and this habitat mosaic, that the tribes worked to develop, really shaped the diversity, created edge habitats, created fire breaks, and helped control catastrophic wildfire. And of course salmon and lamprey and sturgeon were really big resources. But

also, surf fish. The Wiyot were masters of surf fishing. It was a pretty good life, you know.

They were semi-sedentary, so they had developed technologies that allowed them to gather all the resources that they needed for a whole year close to home.

Migration was no longer needed. They had perfected salmon fishing and eeling.

They had developed eel baskets and these really complex fish traps and weirs, using hazelnuts. And had really become masters of their environment. I call them master permaculturalists, but not in the way that the modern humans are, where we tend to not know when to stop, and let nature reciprocate and heal.

Greg: So Adam, what can you tell us about fire as a cultural tool?

Adam: I think hundreds of years ago we didn't have brush cutters and weed whackers and lawn mowers. Fire was really a tool to manage the land. As you get closer to the coast, the vegetation, with increased rains and summer fogs, it's voracious, and you get encroachment into prairies in the absence of fire, and of course we're seeing that. It happened with the oak woodlands, just off the coast. But fire was critical to the Wiyot. It's how they kept their villages open. It's how they burned out their dugout canoes. It was said that from Table Bluff, if you looked out over the Eel River bottoms that you could just see hundreds of fires glowing, because every family was always working on their next dugout canoe. It was just a constant process, slow process, of burning out these huge, 15 foot long redwood canoes. And then just as a tool to keep villages open, to keep bugs down, to keep ticks and insects down.

Fire had a myriad of uses, many of which don't come to mind today, but as I said, huckleberries were burned every three years to promote new growth, as were hazelnuts. It's the new growth that's spawned by fire that really makes the useable, workable materials to make things like fish traps and weirs and burden baskets and eel baskets. Baskets were used in every facet of life. It's how things were cooked and stored and collected, and how reputations were built—everyone knew who the most revered basket weavers were, and even today, those women in indigenous cultures hold some of the highest esteem.

Greg: What materials were baskets made from, or were they made for different things based on different purposes for the basket?

Adam: There were lots of materials, but hazelnuts is a common theme, and was commonly used in the foundation or the frame of more intricate baskets. Some of the really commonly used materials are hazelnut (*Corylus cornuta* ssp. *californica*), but you see the maidenhair fern (*Andiantum aleuticum*), giant chain

fern (*Woodwardia fimbriata*), bear grass (*Xerophyllum tenax*), spruce root (*Picea sitchensis*), and willow. So if you go up to Fern Canyon in Redwood National Park and see all the maidenhair, the five finger fern, the black-stemmed fern. So any of the really ornate black weave work in our local indigenous baskets, that's all pretty much from maidenhair fern. I always wonder if, you know, Fern Canyon was like the supermarket for maidenhair fern, and if the Yurok had a hold on that industry. Greg: Take the hazelnut—can you just use the plant as it is, or do you really need to do something to it to get the type of material quality characteristics that you need for the basket.

Adam: Yes, you *have* to burn it. Because once a fresh shoot puts out a side bud, it become unusable. You need a straight, unbranched stem that can only be promoted through fire, or potentially pruning.

Greg: How do you think people learned stuff like that? That's pretty amazing to me.

Adam: I think it was passed down from generation to generation. White people like to call it traditional ecological knowledge. It's collective knowledge about the ecosystem that was passed on from generation to generation, over thousands of years. And just living intimately with your environment. You figure things out through observation, through experimentation.

Greg: Do you think these people had anything equivalent to what we might call scientific method?

Adam: Oh yes. Nature is in your front view all the time. You're watching the seasons. You're watching the stars. You're trying new things and seeing what works and what doesn't, and if something works more than it doesn't, you'll probably continue to practice that method or that technology. So yeah, I think the scientific method was employed by indigenous peoples since time immemorial. Today we have the bureaucrats coming back to the tribes and wanting this traditional ecological knowledge, you know, for the benefit of either themselves or the larger community. That's a subject on its own, is when do the traditional knowledges and practices, when should they be proprietary, what do they want to hold for themselves and what do they want to share, what might be exploited and what might be shared to benefit the larger society.

Greg: So I've read a few of the original diaries of some of the first Europeans that came here, some sea captains and people that came ashore and wrote back pretty detailed descriptions of the people and what they saw. And one of the stories that you might hear come out is, "Oh this land is like a paradise, you know, there's

animals, I just hit 'em with sticks, and I got ten quail. It's gorgeous, and it's bountiful," and kind of this garden of Eden description of paradise, with these people that don't really know how to use it, or haven't fully used it, and they just can't wait to come to this paradise land.

And then the other side of that story is kind of like, from maybe the Native American side, and this is what I'd like you to comment on, is "Wait a minute, this isn't just paradise, this is our yard, this is our farm. You're looking at thousands of years of modification, and you're not looking at this wild garden of Eden that God just made." So credit was not given for the quality of the landscape that the Europeans saw. They saw it as wild and undeveloped, and the Indians said, "Say, if you want to see wild land, we'll take you there, we don't like going there, 'cause you get your eyes poked out." [Adam chuckles.] There's this myth. Can you speak to that myth.

Adam: Yeah, I think you hit it right on the head there. You hear so much about the early European colonizers talk about how California was this beautiful park-like landscape, and just thought it was a product of the heavens. When in reality, they were very naive to the fact that it was the indigenous peoples of California that had tended and shaped and cared for the rich habitat mosaic that California represents. It's one of the most biodiverse places in the entire world, with the some of the highest plant diversity in the world. And a lot of that directly was attested to due to cultural practices.

Early explorers, Juan de Crespi and others, noted indigenous peoples using fire on the prairies to maintain them for particular bulb plants and whatnot. The word wilderness itself in many tribal languages actually is kind of a bad word, it means like a land that is uncared for, is really what wilderness means. And so it's interesting how there's a dichotomy now where—myself, living in this day and age, I want to say that wilderness is a thing that I yearn for and think should have the highest efforts for preservation, when to Native American people, that might have a totally different connotation.

Greg: So fire as a cultural tool. How did that relate things like fish, and oak meadows, and what happened in that area, what can you tell us about that?

Adam: That's a good question, and I think people don't see the direct relationship between fire and healthy salmon populations. But one thing that we're seeing, it's not just people directly sucking water out of our rivers and streams that are causing low flow rates, but it's increased evapotranspiration in our watersheds from all the young Douglas fir forests that have been able to come up in the absence of fire and

the absence of indigenous peoples stewarding these oak woodlands and maintaining them. Most oak stands and hazelnut stands, it would have been the responsibility of a particular family and family group, and it would have been their responsibility and right to maintain those groves for the benefit of not just their family, but also the larger community, because everything was shared.

Greg: So when you say grove, this is a concentrated area of oaks, as compared to just oaks spread out through the woods everywhere?

Adam: I guess I was thinking more like tan oak, which was the most prized of all the acorns by local tribes, because it's such a large acorn; apparently it tastes better than black and white oak. And so yeah, tan oak groves were definitely cared for by families.

Greg: Now, when you say cared for, what does that mean?

Adam: I guess I'm meaning, they used fire to care for them and keep out encroaching Douglas fir. But the smoke also kept down pests and bugs that would eat the acorns, or mold that makes them not palatable.

Greg: So it would be a zone where these trees would be concentrated and they would burn out the understory?

Adam: Exactly. And there were fire practitioners, almost like medicine people, you know, folks that had been studying fire for generations. The Wiyot, being a more coastal people, they didn't have quite the access that a lot of the surrounding tribes would have to acorns. And so that's why I think they had more of a specialization on hazelnuts. You can still see these really impressive hazelnut scrublands, which is a rare vegetation type in the state, around Humboldt Bay. We also have stories of Wiyot women getting chased down from Kneeland by Whilkut women as they would try to sneak up and get oaks on the fringes of the prairie up there.

Greg: When you say you can still see hazelnuts on Table Bluff, how do you know the difference between, well there's just a hazelnut, or there's a hazelnut that's been modified by people for a reason?

Adam: I guess when I think of hazelnut, when I first think of it, I think of it as an understory species. But, in and around Humboldt Bay, you actually see hazelnuts growing fully dominant, not with an overstory, but as the dominant vegetation type on the landscape. Some of these hazelnuts have really ornate canopy architectures. Wiyot elders talk about the pinching and pruning off and snapping of the branches while they were harvesting hazelnuts. But you also see the coppicing that we were talking about. Where you see maybe a really old primary stem, but then around it are a bunch of younger stems. And so low intensity fire would have

been employed to both to increase the resprouting of the really valuable hazel sticks, while also keeping down encroachment of Sitka spruce and other unwanted plants.

Greg: So are you suggesting that they would prune and pinch to make a strong nut-producing tree, and then they would burn maybe for coppicing to use the material in a completely different way, for baskets or something like that?

Adam: Yeah.

Greg: So the tree could manifest itself in several different forms. Your saying you can still see those various man-made forms in our environment today that are remnants.

Adam: Um-hum. Yeah. Pretty fascinating.

Greg: Does fire and this management impact fish and other things that seem to be maybe unrelated to that?

Adam: One reason that our stream flows have declined is just more growth by Douglas fir in these watersheds. It's one of those things that you hear a lot about riparian plantings and riparian revegetation projects, which is important to help reduce erosion and to help generate certain types of habitat. But I think it's also something you have to approach with caution. You don't want to overplant a watershed or a riparian corridor that's already being taxed by the environment and by humans.

Greg: People, plants and animals migrate all over the world and they've hitchhiked on the backs of everybody that ever moved around. What's truly a native species and what's not is probably pretty questionable in a lot of areas. What would you say about how these people might have moved plants around?

Adam: Working to bust the hunter and gatherer myth, we know that indigenous people transplanted plants. It's part of innate human nature. What's really fascinating with the Wiyots is, we actually have some living examples of plant translocation and transplantation, where at some of the old Wiyot village sites in the dunes systems of Humboldt Bay, we actually find bulbs that are really associated more inland with oak woodlands and grasslands and savannahs. Sort of being sort of an indirect indicator of those being transplanted and brought from areas outside the coast into these dune environments and actually surviving. Pretty cool.

Greg: So Adam, everyone's always interested in eating. What did the Wiyot tend to eat, and what was some of the variety of their diet?

Adam: I don't want to use the over-trendy word "paleo," but I think they maybe

had a paleo-type diet. Very high in protein, but indigenous people have known forever that you can't just survive on meat. Maybe if you're an Inuit. We really depend upon green plants to give us the micronutrients and vitamin C that we need to keep us healthy. And so a lot of Wiyots, I've heard them refer to themselves as "clover eaters." They loved clover, *Trifolium wormskioldiae*, which is the spring bank clover. It's a beautiful native clover that you see, it grows on the fringes of our salt marsh but also on coastal prairies. In one of the investigations of shell mounds, the Wiyot shell mounds of Humboldt Bay, clover remains were one of the highest percentages of plant remains found in the mound. So that kinda supports the oral history of them being clover eaters.

Acorns is kind of an acquired taste, a lot of processing, but hazelnuts you can eat, you can just crack 'em and eat 'em raw, and they're delicious. I think they're a lot better than the European filberts. And so I encourage any one and everyone to try to taste a native hazelnut if they get the chance. A lot of people, when I talk to them about hazelnuts, they say "Well I see them all over the place, but I never see any nuts." And I think that's just because they're not cared for, or they're overly shaded, maybe they need some of this pruning and love, and get opened up to kind of re-stimulate their nut production. The filbert blight is decimating the commercial hazelnut market, and there's been a big effort in the Midwest, like Minnesota area, to look at these neo-hybrid hazelnuts. Basically taking wild hazelnuts and breeding them with the more traditional filberts. and getting these really yummy but also blight-resistant hazelnut varieties. I always wonder if maybe we have a future in that out here, to contribute to that market. But pepperwoods or bay laurel were a super important nut source as well. You keep hearing about hazelnuts but peppernuts are pretty awesome too. If anyone ever roasts or tastes them, they have kind of a coffee, chocolatey taste that's really really good.

And then of course the Wiyot were known for being bulb farmers, and tended our coastal prairies for various bulb species, from wild onions to brodiaeas to lilies, to *Triteleias*, so many different edible bulbs on the landscape, and pretty much all the tribes through the communal harvesting of these bulbs, were aerating the soil, preventing encroachment by other species, and there was also the universal practice of scattering the small bulblets as they were harvesting the larger ones, and so thereby expanding the population of bulb foods. So I always wish I could go back and see our prairies and our grasslands before the introduction of all of our European forage grasses. It would have been some beautiful diverse, palatable, greens and bulbs. That would have been fun to see.

Greg: I imagine the women had a lot of recipes and ways to process this food. For example, if someone just gave you a turnip and said "Oh, people eat these things," and you bit into a turnip, you'd say "This is not very good." But acorns and soybeans and everything has to have usually some kind of storage or processing to make it into something delectable.

Adam: A lot of people are familiar with the camas bulb, because Lewis and Clark infamously got sick when they first crossed over the divide, and they went from the Plains and the buffalo tribes to these salmon and bulb eating tribes. And camas has to be cooked for over 24 hours to break down the starch that we can't digest if it isn't cooked. So yeah, there's many practices. One of the more common meals that I've heard about is this really yummy salmon-hazelnut-berry mush. Kind of like a casserole, with everything all mixed together, and salal berries and salmon and hazelnuts. Sounds pretty good to me. There was also an art of making hazelnut broth, which was a really potent medicine and was given to babies and the sick and to the elderly.

Greg: Well that's another topic that often characterizes a civilization, is medicines. What do these forestlands around our county yield in the area of medicines or cosmetics or those types of non-food items.

Adam: There's some really cosmopolitan herbs that are pretty abundant in Wiyot territory that a lot of people have probably heard about: mugwort or wormwood or artemisia is good for many different ailments and colds. Lots of members of the Apiaceae or the carrot family like angelica. Angelica is both a sacred root to our local tribes, but was also a medicine. Many members of that group are known to reduce inflammation and have other benefits as well.

Greg: So, in this culture, besides eating foods, there's all kinds of tools and niceties that make life worth living. There's chairs and tables, and tools, bows and arrows, and rope and twine, and all the things that people need in life to make life good. So what kinds of plants, and what does the forest yield, and then what did they do with these plants to make these tools of their civilization?

Adam: Wow, well we talked about fire, and of course fire was a major tool that was used to promote plants to make materials that were useable, to make certain things, like baskets for example. We talked about hazelnuts, but beargrass is critical in basket making for most of our local cultures. If it wasn't burned, you didn't get regrowth that was long enough stems to be adequately used.

The iris beds that were once much more common on the coast, that was the major cordage material. It was used by soaking iris leaves and peeling them and braiding

them into cordage. We talk about how Native Americans have helped shape the vegetation mosaic in California, and I think that can't be reiterated enough, that in order to be looking into the future and saying well, we're gonna need hazel sticks next year, we're gonna need berries for years into the future. Management was constantly having to be employed by the indigenous people. They were constantly thinking about which berry patch or which hazel patch needed to be burned next in the cycle of things. All of these different resources and vegetation types and their different management strategies both created a landscape that was resilient to fire but also a highly biodiverse landscape that was constantly going through a phase of succession.

Greg: So why don't you give us, out of all the millions of examples, one specific example. Let's say I got up tomorrow and I wanted to have a really good bow and arrow. [Adam chuckles] I want it to be powerful, and I want it to shoot straight. So it's gotta have equal pull on both sides of the bow, probably gotta taper, I've gotta get some good cordage on there. Where do I go look for that kind of material?

Adam: Where I would go, is I would go to the edge of a prairie, and I would start looking for some *Holodiscus* shrubs, and start looking for those resprouts which, you know, are really good for making arrow shafts. But, if I wanted to make a bow out of yew, around here you have to go to the creeks and you have to have your elkhorn wedges and all your tools that would be needed to both harvest and process the wood in an ornate fashion.

Greg: Would there be any coppicing involved?

Adam: For arrows, yes, It's kind of like with hazelnuts you want these unbranched shoots that really make your arrow shaft more aerodynamic, and I think stronger.

Greg: Some of the baskets were used to cook in, and actually boil things. So the basket itself had to be totally waterproof. How did they make a basket waterproof that could take heat?

Adam: A lot of cooking that was done with baskets was by placing hot rocks into the water, into the baskets. So the basket wasn't burned or consumed in the cooking process. And it's a testament to the skill and the tightness of the basket weave that indigenous women around here were able to create and to craft.

Greg: Is there a certain plant that is really good for a waterproof basket, compared to another kind, a sifter basket, say.

Adam: I would say that you would want something that has beargrass in it, that has the maidenhair fern, the Woodwardia fern, and a frame of hazel. That's how a lot of baskets were started.

Greg: Where would they get a waterproofing agent?

Adam: Well, the sticky sap from the cottonwood buds. I'm not super sure about the use of sturgeon glue. But over time, as the basket's used more, it's going to naturally more covered in oil and particulates that make it more waterproof.

Greg: So Adam, thank you so much, we've just touched on so much here. In kind of a wrap, Where are we today, good practices, bad practices, you've got a very interesting perspective, what do we need to think about?

Adam: I think that's a great question. I think that looking to indigenous peoples as a voice for how we should approach the future is what we should all be doing. This year, I think the inequalities of our civilization have been put into full view, and we can finally start to finally grapple with a century of genocide and of harm that we did to Native Americans. And really try to respect and listen to their perspective and their traditional ecological knowledge as we try to grapple with these bigger issues of wildfire and catastrophic fire and climate change. It's not always a technological fix that's going to get us out of this mess. And so, what can we really do to encourage and to allow Native American knowledge and land stewardship practices to continue and what can we do to support those, and how as a larger culture can we emulate these ancient knowledges and perspectives in the future.

Greg: Adam Cantor, Wiyot spokesperson and botanist, thank you so much.

Adam: Thanks for having me.