

BONNIE Hey, *Introduced* listeners. We'd love to learn more about you, so we're asking you to fill out our listener survey in the description below. It will take you only about five minutes and it will help shape the future of what Wisconsin Sea Grant makes. So click pause, fill out the survey, then enjoy the show.

[MUSIC PLAYING]

SYDNEY I'm Sydney.
WIDELL:

BONNIE I'm Bonnie.
WILLISON:

SYDNEY And this is *Introduced* from Wisconsin Sea Grant.
WIDELL:

BONNIE Sarah Dance thinks about wild rice a lot.
WILLISON:

SARAH DANCE: It's on my mind all the time. I think about wild rice from the moment I wake up to the moment I go to bed. I have no idea why, but I know other researchers that have a similar phenomenon that happens. Because it's so pervasive in so many parts of your life, because it's so tied to culture, and society, and politics.

BONNIE That was Dance. I talked to her through Zoom in June, and it was great. Her rabbit was hopping around in the background for a little bit.
WILLISON:

SARAH DANCE: My name is Sarah Dance. I go by Dance. I'm from the Lumbee Tribe of North Carolina. I came to Wisconsin at the beginning of 2018.

BONNIE She actually started researching wild rice through a project with Wisconsin Sea Grant, and that's where I became familiar with her work. Dance is part of the Environmental Chemistry and Technology Program at UW Madison. She's interested in how chemicals introduced by mining impact wild rice and its ability to take in the nutrients that it needs to grow.
WILLISON:

Wild rice is really important to the indigenous people of the Great Lakes region. It's important as not only a food source but also as a spirit, as a way of life. In Ojibwemowin, the language of the Ojibwe people, wild rice is called manoomin. Sarah Dance has gotten to know a lot about how wild rice grows on the lakes and rivers across the Great Lakes region.

SARAH DANCE: So in the earlier season, it just looks like a typical wetland--

BONNIE Wild rice habitat might look like a typical wetland. The seed germinates and it goes through a submerged leaf stage, and then the leaf comes up to the surface.
WILLISON:

SARAH DANCE: As we go throughout the season, then there is the floating leaf stage where it's these long tendrils of the wild rice that's actually like-- it's trying to get the most sun for it to photosynthesize as possible. So once it hits that water surface it creates this long leaf. So it almost looks like this hair that's across the surface of the water.

BONNIE At this time the plant is really sensitive to uprooting, so you want to be careful if you go out on the water or don't go out at all.

SARAH DANCE: And then after that point, as they emerge into the air, it's these tall dense stands that kind of-- they line the outside of waterways, so as you're navigating through-- you've got your canoe, and if it's a stream you're navigating through this clear pathway and then you've got wild rice to your right and left.

BONNIE In the fall many Ojibwe communities go out to harvest wild rice in canoes. Some of that rice then falls back into the water and is reseeded and the cycle continues. Dance initially knew she wanted to research environmental issues that affect tribal nations. She thinks a lot about, one, the science of rice but also, two, how to do research for the benefit of her tribal partners.

There's actually a long and fraught history of University researchers harming tribal nations. Dance told me about one example in Minnesota.

SARAH DANCE: From my understanding in some of the research that I've done, it was the University of Minnesota a few decades ago. Went to one of the nation's reservations in Minnesota and they asked to have some of the seed from a seed bank there, and they took it and they selectively bred it. It's not genetically modified, but they selectively bred it to become this paddy wild rice that is what people typically eat now. And so when they did that they gave no credit, no any kind of financial divestment to the tribes or the nations or anything like that.

So that took off, I mean that market has totally destroyed the natural wild rice market. So, you know, that's what people mostly eat, that's what people actually associate mostly with wild rice instead of the natural manoomin.

BONNIE For some tribal members who rely on rice for their income, this has been pretty devastating as an economic loss to them. So how does Dance work through this complicated history?

SARAH DANCE: It's just a lot of relationship building, it's a lot of understanding. Understanding and learning about their culture, their relationship with manoomin, understanding our university's history. I go out with people, I learn a lot more about it, I engage with them on the front of selecting sites, selecting research methods, and really just keeping this idea of relationship building and trust building.

SYDNEY How does Dance study the rice?

WIDELL:

BONNIE Yes, so she grows wild rice in these five-gallon buckets and so she's able to have control over them and simulate different conditions, and see how the rice responds. So she drops the seed into the sediment in April or May, and then by September the rice is tall and it's anywhere from three to four feet tall above the water.

It's not particularly easy to study rice this way because it's really hard to get wild rice to germinate in buckets. The life stages might not be the same as in the natural environment, and you also need to have a certain number of plants next to each other for cross-pollination.

SARAH DANCE: Manoomin is notoriously difficult to grow outside of its environment. I'm currently frustrated with some of it and I've been very frustrated with in the past, and it's definitely gotten me down a lot because I mean any student-- when your research isn't working out, it's very distressing.

And then I had a meeting with someone who has a more personal relationship to manoomin. They're part of their tribal community. And they kind of brought me back to this idea of it's not really-- I'm looking at it from this point of view of something to get from it. When in reality, I'm trying to cultivate this relationship with manoomin in order to benefit both of us because that's what relationships are. It's this mutual friendship, this mutual beneficial outcome. So I think that was really the most striking moment of changing my perspective when things weren't working out. If that's part of manoomin's life, that's just part of manoomin's life.

**BONNIE
WILLISON:**

We were really interested in learning how invasive and introduced species impact wild rice and the Native American communities in Wisconsin, but while we were reporting this story we quickly learned that aquatic invasive species are not the only challenges facing wild rice, and to understand these challenges we had to see connections between wild rice and everything around it.

Melonee Montano is a Red Cliff tribal member, and she works for the Great Lakes Indian Fish and Wildlife Commission.

**MELONEE
MONTANO:**

Melonee Montano. I grew up learning plants and medicines and things like that.

**BONNIE
WILLISON:**

And from what she was taught, everything is connected.

**MELONEE
MONTANO:**

You know at the end of the day something from the cultural lens is that everything is connected. And so if we're going to be looking at aquatic invasive species or the beings of the water, then we should be looking at what's surrounding them too, because in order to understand and perceive the world and try to help, we're eventually always making these boundaries and disconnects.

**BONNIE
WILLISON:**

This episode might be a little less focused on aquatic invasive species than our usual episodes.

**MELONEE
MONTANO:**

And it's important that we get back to a holistic perspective and look at things from both the micro and the macro lens, and remember that all those are connected. And so it's not just about the aquatic beings at the end of the day, if we want to be able to make a difference or be of help.

**BONNIE
WILLISON:**

In this story we look at wild rice as part of the whole ecosystem. So back when we were talking to wild rice scientist Sarah Dance, she recommended that if we wanted to get to know more about wild rice we should contact the Mole Lake Band of Sokaogon Chippewa. And that's how we came to talk to Peter.

**PETER
MCGESHICK:**

My name is Peter McGeshick, or [INAUDIBLE], which is Thunderbird. I am a member of the Sokaogon Chippewa community in north eastern Wisconsin. We're a band of Lake Superior Chippewa Indians, and I am the rice chief. I was appointed rice chief last year. I actually inherited it. My father passed it along to me.

**BONNIE
WILLISON:**

We caught Peter in his office on the Mole Lake Reservation in Crandon which is in northern Wisconsin. He's been harvesting wild rice for 50 years. He harvests on Rice Lake, which is the only lake on the reservation left that still has wild rice, and Rice Lake has got a reputation for having some of the best rice in northern Wisconsin.

**SYDNEY
WIDELL:**

What does he do as a rice chief?

BONNIE Yes, Peter told me about that.

WILLISON:

PETER First and foremost I pray to the Great Spirit every day for the wild rice and for the spirit of wild rice. Wild Rice is
MCGESHICK: more than just an aquatic plant, it's the spirit. And I pray for that spirit, and ask for that spirit to-- for the creator to look over that spirit. I look at our lake, my responsibility is to make sure that there is nothing that harms the wild rice, that people understand the importance of the wild rice. I advocate for it on a daily basis.

BONNIE So some of Peter's tasks as a wild rice chief-- he teaches people how to harvest rice, how to put out tobacco and
WILLISON: pray to the Great Spirit for the rice, and the rice chiefs open up the lake every year by going to the tribal council. To see if the rice is ready to harvest you have to pay really close attention. You can sometimes see changes in the rice over the course of one day.

Take what happened in 2019 for example. It was early, early in September and Peter knew that the rice on Rice Lake was getting close to ripening, and he talked to another wild rice chief, James Polar Sr. And they were like, we checked the rice in the morning and it's not ready for harvest but should we check it this afternoon too? And they decided that would be a good idea. So, at about 4:00 PM, Peter and James headed out to the south part of the lake which is the part that usually ripens first. And they get to the rice and they start bending it over, and giving it a close look.

PETER He's bending it over and tapping it lightly, and I'm poling. And he grabs it and all of a sudden, whoosh! You just
MCGESHICK: hear that rice just hit the boat, just like rain. We call it-- when the rice comes off, when it's real ripe, we call it raining. I look at it, I physically look at the plant. I bend it over the canoe and I look at it. You can read the rice. You can see, you can read it by how it looks whether it's ripe or not. And that's what we teach our people, to look at it and to see that-- it was amazing to us as rice chiefs to see it change so quickly.

BONNIE They spent over half an hour out there and they harvested 25 pounds of rice, which is a lot of rice. And then they
WILLISON: see the third rice chief, Steve, at the landing, but something's worrying them.

PETER A storm is about to move in, I mean we're supposed to get severe thunderstorm. Here-- and the clouds are
MCGESHICK: building, and here's the three rice chiefs standing there. What do we do? This is going to be ripe-- this is ripe, this section of the lake is ripe. This rice is all going to fall off because it's going to rain hard. And we're sitting there-- well, what do we do? We're talking and we're looking at the rice, and it's like we've got to start telling as many people as possible.

BONNIE So they get on their phones, they start calling people and telling them to bring down their canoes, and telling
WILLISON: those people to call other people and get down there. They harvested for 45 minutes before the storm finally came and they had four boats out there and they ended up getting 158 pounds of rice. Peter says that for less than an hour of harvest that amount is pretty unheard of.

They were feeling bad though because it was so rewarding to be out there and they were like, what are we going to do with all of this rice? So they processed it and gave it to the community. And that marked the start of ricing season. Ricing season brings a certain spirit to the community.

PETER And our community changed, it instantly went into wild rice mode, and the happiness that you saw in the faces
MCGESHICK: of our people knowing what was going to happen, what we were going to do, and the camaraderie that you feel and the teasing that you take while you're doing this is incredible. And you'll see it, you'll feel it, the hearts of the people they just explode with excitement. It's exhilarating to see this.

SYDNEY What does the ricing harvest look like?
WIDELL:

BONNIE Yes, so I've admittedly never been ricing. Peter invited us to come up but there's a pandemic. So we couldn't go
WILLISON: this year. But basically people go out in canoes and one person's standing in the back, and they're using a really long pole to push the boat along in these straight stripes across the lake. And the person in the front of the canoe is using two sticks to bend the rice over the boat and knock the rice kernels down into the boat.

Sarah Dance told us about her first time ricing. It was in 2018 and she had the privilege of going out with the Lac Du Flambeau ricing chiefs and technicians. Sarah Dance had studied wild rice for six months at this point, and this was her first time going out and she was kind of worried about doing it the wrong way, which I think I would be too.

SARAH DANCE: And then there's like spiders and bugs. And-- [LAUGHING] when you're actually hitting it into the canoe, and it's filling up-- the canoe's filling up as you're ricing, so it almost feels like water is filling up the boat. You almost have a little bit of a panic because you see your feet disappear, and it's also these bugs that are crawling around.

BONNIE Yes, Dance was a little bit scarred by the bugs, which is the most intense memory of her time going ricing. We
WILLISON: also talked to Nathan Podany, and he's from a suburb West of Milwaukee. He was hired as a hydrologist for the Sokaogon Chippewa and on his first day of the job his boss brought him out to Rice Lake for the first time.

NATHAN First day I started here, my boss, the environmental director, Tina VanZile, brought me over to the historic
PODANY: marker. And it talks about the battle that was fought, and the amount of people that died protecting this lake. It's tangible.

BONNIE The historical marker talks about the Battle of Mole Lake. In 1806, Sioux tribes tried to gain control of the Mole
WILLISON: Lake rice beds and there was a hand-to-hand battle, and over 500 people were killed, but the Sokaogon Chippewa persevered and they retained their rice beds.

NATHAN I know that people have given their life for this lake so why can't we give a little more time to help protect it or
PODANY: restore it.

BONNIE The Sokaogon Chippewa are here because of the rice in every way. Their origin story says that 1,000 years ago
WILLISON: they moved west where the food grows on water and that was wild rice. And thinking back a few generations, there was wild rice on seven bodies of water on Sokaogon Chippewa ancestral land and now there's only one, which is Rice Lake. After the break, fighting for the rice.

[MUSIC PLAYING]

Wisconsin Sea Grant and the Center for Great Lakes Literacy are proud to bring you the Aquatic Invaders Attack Pack, a grab-and-go teaching tool to educate students and the public about aquatic invasive species. Sydney, what's your favorite thing in the Attack Pack?

SYDNEY WIDELL: I love all of the specimens. There's a preserved sea lamprey inside each pack, which I think is amazing. And the packs also include a little resin box with a lot of different specimens, like, they have rusty crayfish and round goby and a lot more. It was my first time seeing some of these species in real life which is kind of cool. How about you?

BONNIE WILLISON: I love the cut-outs of bighead and silver carp. And they're life-size, so I can imagine a kid standing next to one and getting a sense of how big that these fish can get. Each pack includes these items and more, along with a guide with curricula and activities. If you're a Wisconsin resident, you can borrow an Attack Pack and have it delivered to your local library free of charge. Visit the educational resources tab at seagrants.wisc.edu for more information.

[MUSIC PLAYING]

During nights when it looks like rain, Nathan-- the hydrologist that we talked to earlier-- is always on his phone anxiously checking the weather.

SYDNEY WIDELL: Is that because he's worried about the rain knocking down the rice that's ripe?

BONNIE WILLISON: Yes, but there's more to it than that.

NATHAN PODANY: So this last month, July, up here we got over 10 inches of rain and that's the middle of summer. We're supposed to be at baseflow conditions, low water, it's ridiculous.

BONNIE WILLISON: We've been having a lot of rain around here, and climate change will only make things wetter. Predictions show wetter winters and springs in the Great Lakes region in the next only 80 years.

SYDNEY WIDELL: How does that change impact the wild rice?

BONNIE WILLISON: Yes, so let's talk about how the wild rice prefers to live first. Wild rice has this natural cycle.

PETER MCGESHICK: When you get right down to it, we're all a part of nature. And we know that there are going to be good years, there are going to be bad years in wild rice, and we accept that. We may not particularly like that but the creator gives us what he gives us for a reason.

BONNIE WILLISON: Some years Rice Lake has no rice, it's just really bare, but there are some years where the lake is just full. And there's this old adage where out of every five years you'll have one boom year, one bust year, and a few middle years. So if you imagine Rice Lake it's got three streams going in, and one going out, there's this flow created by that-- flow through the lake. And this flow is really necessary for the rice.

Rice also needs water with certain shallow depth so it can only grow in several inches to several feet deep. And so all this rain that Nathan's talking about can raise lake levels and drown the rice. Nathan also talked a lot about culverts.

SYDNEY WIDELL: Culverts? Like the ditches by the side of the road?

BONNIE WILLISON: Yes, exactly those pipes that go through under the roads. So we build roads through wetlands and then we put culverts in to let the water flow, but oftentimes these culverts are actually too small especially with a lot more common large rainstorms.

And this isn't the only way that climate change is affecting wild rice. So with increased humidity, you can get this disease called brown spot disease which is a fungus that will kill wild rice, and you also have warmer temperatures which are kind of pushing the rice's natural range north. Climate change could also make areas more habitable to new species that could survive and compete with the rice.

SYDNEY WIDELL: What species impact wild rice? Are we getting to AIS part.

BONNIE WILLISON: Exactly, Yes. If you are wondering when we were going to talk about invasive species, this is kind of the time. And of course, there are different ways to describe invasive species. Tribal entities, like the Great Lakes Indian Fish and Wildlife Commission, they use the term non-local beings. We, here at *Introduced*, are partial to the term, introduced, but the word *invasive* is still mainstream.

So I needed more time to talk to Peter, so I sat down with him again and this time he was sitting in a screen tent in his backyard.

PETER MCGESHICK: Can you hear them dogs barking in the background?

BONNIE WILLISON: I can hear them vaguely, yes, but they're not too loud.

PETER MCGESHICK: My uncle lives behind me, and he had 17 puppies this year.

BONNIE WILLISON: Oh my gosh.

PETER MCGESHICK: And they've got a handful of them left, I think 5, and it must be dinnertime. And back to invasive species, the other thing that we've got is Yellow Lily Pads. And that has been something that historically that-- my father tells me stories of the chief getting the people out there to pull the Lily pad roots because those roots can get six inches in diameter, and be 20, 30 feet long if not bigger.

BONNIE WILLISON: So they've had Lily pads for a long time, and the Lily pads are like 15 inches across. They grow quickly, and shade out the baby rice when they really need sun and they're not new to the lake obviously. From the stories Peter's father told him, he knows that the tribe has been removing problematic Lily pads for 120 years at least.

PETER
MCGESHICK: Lily pads are important to the lake, OK? The creator put them there for a reason. He put all these plants together to benefit themselves, to benefit each other, but we know that too much of a good thing is too much of a good thing. But, you know what, wild rice has been around for tens of thousands of years, and it's still here. So nature takes care of it. It's man who messes things up-- really, it is!

BONNIE
WILLISON: Lily pads aren't the only species capable of overwhelming wild rice on Rice Lake. There's another plant, and this one is tall and it has these brown cylindrical seed heads at the top that become really fluffy when they're giving out their seeds. We're talking about Cattails, or hybrid Cattails which are a hybrid between native and invasive Cattails, and even the experts can hardly tell them apart at this point.

It was after a drought that the Sokaogon Chippewa rice chiefs were noticing that Rice Lake was slowly getting cattails, and losing wild rice. Biologist Mike Preul was able to confirm this. The Cattail patches were changing the flow of water through the lake, and the rice needs that flow. So to fix this they got a swamp devil that is this big machine that goes up and chops up the cattails, and then they've used them for mulch.

PETER
MCGESHICK: I've always been taught, we're here because of the rice, and rice has sustained our people and that's why we're. So it's easy for me to say, anything that threatens wild rice is a threat to our people and to our culture. We've got to fight that. We've got to do those things.

BONNIE
WILLISON: There's other aquatic invasive species that could affect wild rice, we just aren't quite sure of the effect yet. We talked about maybe snails could affect-- invasive snails could affect wild rice in a negative way, or silver or bighead carp, but right now we're just talking about the species that are impacting Rice Lake.

Starting with European colonization, non-native people have been moving and settling on lakes in what we now know as northern Minnesota, and northern Wisconsin, and Michigan. Nathan talked about how the way you envision a lake is often different than what a lake would naturally look like. When you envision a classic Wisconsin lake, is there an image that comes to mind for you?

SYDNEY
WIDELL: Yes, it's really big, it's clear and blue, and deep. Yes, probably something like that. Lots of room to boat.

BONNIE
WILLISON: Yes. Yes, a lot of people have fond memories of water skiing or boating on this really wide, clear lake, and Nathan said this vision is kind of like you're envisioning a giant swimming pool. On a good year for a wild rice though, the wild rice grows in a way that makes the whole lake almost look like a field like you can hardly see the water or tell it's a lake almost. It's definitely not matching up with this swimming pool vision of a lake.

And boating can really disrupt wild rice. Some settlers think of wild rice as a nuisance plant unfortunately.

PETER
MCGESHICK: As people moved up here and they wanted their lake frontage, they looked at wild rice as a weed, and raised the water up-- they found that they could raise the water up and kill the wild rice off, so that's what they did. Now they're understanding how important wild rice is to the lake, and that it's an indicator species and indicates if you can-- if rice can grow in your lake, you've got good water with good flow, you know, so the nutrient level is there.

SYDNEY
WIDELL: Are they trying to restore rice to any of these lakes?

BONNIE Yes, they are. They've been trying to restore rice in ancient traditional rice beds near the reservation, but it's not always an easy process. At the beginning they were fighting with a lot of lake associations which have a lot of control over the lakes.

SYDNEY Lake associations are the groups of homeowners who have property on the lake, right? And have a lot of control over how they want to manage the lake?

BONNIE Yes, the lake associations were more in favor of this clear lake for boating and water skiing than having a wild rice lake. But now it's turning around in some places and some lake associations are starting to want to plant wild rice.

Peter said the tribe has been working with a lake association on a nearby lake to restore wild rice. They have this agreement where the tribe will plant rice in an area that's currently unusable to recreation because there's really thick Lily pads, so people can't boat anyways. And at the risk of sounding too negative, I'm going to talk about one more invasive. This invasive is huge and greedy, but it isn't biological. Here's Peter.

PETER I was 18 years old and the only job there was was being the secretary and it was funded through the Department of Energy, that's when the United States government was looking for areas to develop a low-level nuclear waste repository site in Wisconsin.

BONNIE Have you heard about this nuclear waste repository, Sydney?

SYDNEY I did not hear about the nuclear waste repository.

BONNIE So in the 70s and 80s, the US was looking for a place to store all of their nuclear waste in one location. And so the Department of Energy was ranking places that we might want to do this, and they ranked Wisconsin's Wolf River area as one of its top three options. I guess Wolf River has this batholith, which is in northeastern Wisconsin, and it's this huge section of underground granite. And so they look for giant underground granite or rocks where they can dig into to the house this nuclear waste, and in Wisconsin we also don't have earthquakes, and we don't have other natural disasters that made us a good site I guess.

But if the radioactive materials ended up coming to Wisconsin and leaking, that water could flow into the Wolf River, into the Fox River, into Lake Winnebago, and Lake Michigan, and that water could affect Rice Lake as well. And if that's not enough, Peter also mentioned that around the same time in the 70s, there was this mine that was proposed for a site in Crandon, which is really close to the Mole Lake Reservation.

Crandon, the town, sits on this deposit of hard rock that has valuable metals in it like copper and zinc, and the mine was going to be a metallic sulfide mine. In order to get valuable metals out of the land they break apart rock, called sulfide ores, which releases toxic waste water. This mine was proposed to go directly adjacent to the Mole Lake Reservation and it was clear to the tribal nation that toxic runoff had the potential to cause harm to wildlife, and aquatic species, and especially Rice Lake.

SYDNEY Yes, which brings us back to the beginning, right, with Sarah Dance who is talking about specifically how sulfide mining is so harmful to rice.

BONNIE WILLISON: Yes, exactly. Dance, she grows wild rice in buckets as a way to study how sulfide is processed by the rice, and it is not good. Sulfide is pretty toxic to the plant. If wild rice is exposed to this, population's will die within five years of exposure.

SYDNEY WIDELL: So what happened with the Crandon mine?

BONNIE WILLISON: So Peter and other tribal advocates, they fought for 30 years to keep this mine off of their adjacent land. This little community, the Sokaogon Chippewa community, and neighboring Forest County Potawatomi, they kept protesting and forming coalitions and challenging legislators about this mine. And finally they defeated the world's largest multinational mining conglomerate. And after 30 years, the Mole Lake Sokaogon Chippewa and Forest County Potawatomi were able to purchase the 5,000-acre mine site.

I just imagine a young 18-year-old Peter, who's faced with incoming threats to his people and land from all directions.

PETER MCGESHICK: I learned to fight corporations and federal government, and so I bring that experience to fighting for the rice because that's really, truly what we are in right now, it's a fight for the rice. Now it's my responsibility to make sure it's there for my children, for my children's children, for those seven generations. You know, those people went through that whole European settlement era and they knew enough to fight for the rice, and the animals, and the environment, and tied that up in treaty rights and retaining that right to the harvest.

Without them doing that, I wouldn't be doing what I'm doing. So it's up to me to make sure that I continue that fight, to continue to learn as much as I possibly can scientifically. But at the same time you've got to put your tobacco up, this is our faith the creator gave us, this is more than just the plant. It's who we are, it's why we're here.

[MUSIC PLAYING]

BONNIE WILLISON: We'll be right back.

[AUDIO PLAYBACK]

- Water research mysteries, teachers connecting kids with the Great Lake and their communities, erosion and dangerous currents, these are just some of the stories offered by Wisconsin Sea Grant and the University of Wisconsin Water Resources Institute. A monthly podcast series, *Wisconsin Water News*, highlights stories previously available only in print from these programs. Series narrator and science communicator Marie Zhuikov brings the stories alive by featuring in-person and phone interviews with the people behind the news. Listen and subscribe to *Wisconsin Water News* on iTunes, Spotify, Google Play, or at seagrants.wisc.edu.

[END PLAYBACK]

BONNIE WILLISON: Wild rice has this natural cycle. It has boom years, it has bust years, it has middle years, and there's a really *chemically* background to this. I'll let a scientist explain. Here's Sarah Dance, and there will be a pop quiz so take notes on this.

SARAH DANCE: It has like this cyclical relationship with the environment and that has a lot to do with the nutrient concentrations and whether nitrogen is being mineralized, or immobilized, and this buildup of organic matter. That's the very scientific background to it.

BONNIE Did you catch all that, you understand?

WILLISON:

SYDNEY I think so.

WIDELL:

BONNIE So the way I've been thinking about it is kind of similar to garden compost. So you have to wait a little bit for the
WILLISON: compost to decay before you can put it on your plants. And the same thing is happening with wild rice on the bottom of the lake, because the wild rice plants die in the fall and that matter has nutrients for the next generation next year, but it isn't fully decayed by next year. Sometimes it takes up to two years for that to decay and so the nutrients, the nitrogen, isn't available for that next generation until they're built back up over the next few years.

So therefore you have those boom years, and bust years, and middling years.

SARAH DANCE: That's the very scientific background to it, but out when we're talking to communities it's much more about the stories of wild rice having this amazing resiliency. There's also evidence, or anecdotal evidence, traditional ecological knowledge that these plants are extremely resilient and they have the ability to make a comeback if we can do the right restoration work.

BONNIE So we've heard a lot from Peter about what it feels like when the Mole Lake Sokaogon community has a really
WILLISON: good ricing year, but I also asked Peter about what it feels like when there's one of those bust years when it's really thin out on the lake.

PETER So it's like you're seeing another side of the lake, and there's beauty in that. And you pray for that lake, and you
MCGESHICK: say OK, what am I going to do? Well, I can't pick any rice here on the lake. I might as well go fishing, you know, something else for my people, or duck hunting-- I still got to provide for my people.

You know, it may not be rice, but I'm bringing them something. I'm providing for that day, and that's how we view it today. We don't want it not to have rice, but we understand that it does that. That's nature taking care of itself.

BONNIE It's more easy to protect wild rice really than it is to restore it, and the Mole Lake Sokaogon Chippewa are doing
WILLISON: restoration on their historic ricing lakes. But for that you need funding, you need community buy-in from people who aren't tribal members like Lake associations, and natural resource managers. And researchers can help as well if they're as thoughtful and intentional as Sarah Dance.

SARAH DANCE: As a researcher I've really fallen in love with the idea of having a relationship with the thing that I'm studying. I think researchers that don't have as much of a relationship with manoomin definitely have a negative outlook, and I think that that has merit.

There is a grim outlook for climate change. I mean, the recent coronavirus-- a lot of companies and legislators have seized on the opportunity to move forward on mining, pipelines, things like that. But I believe in the stories. I believe, based on the relationship I've had with manoomin, that it's resilient and that we have to uphold our part. Whether that's the-- our part on the side of our treaties, or our personal relationship with manoomin, to have a positive outlook and keep things moving forward for restoration and protection.

I think we owe it to ourselves, we owe it to manoomin, we owe it to our communities to not just give up on this or put it aside or say that it's too difficult. It is difficult, but it's not too difficult. So we need to ensure that the future for manoomin is bright and I absolutely believe that we can do that.

BONNIE And what gives our wild rice chief, Peter, hope?

WILLISON:

PETER You've got to have faith. You put your tobacco down every day, and you pray for it. And at some point, you just
MCGESHICK: got-- it's faith, you know, it's not hope, it's faith. You've got faith that the creator's taking care of it.

[MUSIC PLAYING]

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