Q: [0:00] So we're just going to start with a little bit about your background, who you are, orienting our conversation to you. So we like to start with how do you like to introduce yourself?

A: [0:10] My name is Kristin. Just usually introduce myself that way.

Q: [0:15] Great. And what's your last name?

A: [0:18] Isfeld.

Q: [0:19] And can you just say a little bit about what it is that you do?

A: [0:22] I do so many different things, but I am an aquafarmer, sea farmer, aquaculturist – lots of different names that you could apply to what I do. I have a small oyster farm, and I do some seaweed as well in the wintertime.

Q: [0:40] We're going to dig more into that soon, but sticking with the background for a moment, could you tell me a little bit about what year you were born and where you grew up?

A: [0:49] So I was born in 1969, a North Carolina girl, hence my boat of choice is a Carolina skiff. And I grew up in in the Southeast, in North Carolina and Virginia, grew up a lot on the water. My dad was from Iceland. We had a couple boats throughout my life. He loved the water, and I loved it, too.

[1:12] And I've always – almost always lived on the coast. I can't go very far away from it. I get dizzy. I need to be near the water. I'm also a Pisces, so that makes a difference. I think I was a fish in another life, actually. Yeah, so I grew up kind of doing that, but never really thought of aquaculture as a career. It sort of came to me accidentally later in life. But I grew up near the water, on the water – boating, fishing for oysters with my dad just for ourselves in the Chesapeake Bay and the Lynnhaven River down south.

Q: [1:46] And could you tell me a little bit – you mentioned your dad and his background – like what they did for a living?

A: [1:53] My dad was in the military. He moved to the States from Iceland when he was nine years old in 1951, so just after the war – not long after the war – and yeah, grew up sort of middle-ish America, and then joined the Marine Corps after college and served two tours in Vietnam. When I came around, he was done with Vietnam, but he was a career Marine, stayed in until late retirement. We just were lucky enough to be stationed near the coast.

Q: [2:28] And your mom?

A: [2:30] My mom was also a Marine. That's how they met – in a recruiting office in San Francisco. She grew up in Mississippi. Her mom was a showroom waitress, actually, in Las Vegas, one of the OG showroom waitresses at the Flamingo, which

was the original gangster-like place. And her dad worked on an oil rig down in Louisiana.

Q: [2:59] Do you have any siblings?

A: [3:01] I had a brother. He passed, unfortunately, in 2020.

Q: [3:04] Oh, sorry. And do you have any history of fishing or working on the water in your family?

A: [3:11] Yes. In my Icelandic family, my dad had a lot of family that worked on the water – were fishermen. A large contingent of our family lives in a town called Grindavik, and it's very much a fishing town. Our cousins there have been fishing for several generations and still fish. My dad, however, got very seasick, so he wasn't a seaman in that in that sense. He didn't go into that. He wanted to. He went back to Iceland when he was a late teenager and tried to go on a fishing boat for the summer. It didn't work out. (laughter)

Q: [3:49] And you mentioned maybe some recreational kind of fishing with your family growing up.

A: [3:55] Yeah. But he did love the water, and he loved boats. I think it was just being way out on the ocean for long periods of time. But being on the bay, on the river – so we had boats – or one boat and then a little bit bigger boat. And we fished. We got oysters. We went in the mud flats and got oysters out of the Lynnhaven River in Chesapeake Bay and – yeah, just grew up with that. We went fishing all the time. I mean, my dad was still fishing when he was in his late 60s, early 70s. He passed at just shy of 72. But he used to take my son fishing, so got him interested in that. My son is actually the luckiest fisherman I know. He pretty much catches something every time he casts a line out.

Q: [4:41] That's so cool. And is there any history of maybe other roles in the fishing industry in your family, such as bait, bookkeeping, processing, marketing, gear?

A: [4:51] Well, again, the family in Grindavik in Iceland – yeah, they have a whole factory – fish processing. So they would fish, and they would process and package the fish for sale.

Q: [5:03] And you and your son – as you were growing up, did you get to go back to Iceland and connect with that side of the family?

A: [5:11] Not much when I was growing up, but I married a guy from Iceland. So our kids grew up going back to Iceland every summer. We lived there until our daughter was six and our son was four, and then we moved to the States. So that was 2003. And every summer, we went back to Iceland for pretty much the whole summer. We had our own business, and then when we merged with another company, it was an Icelandic company. So he was able to work – he was able to take these extended periods away from the company here and just work from the

home office in Iceland. So our kids got to spend a lot of time there. And our daughter's really into horses. Our son was really into soccer. So they grew up with both cultures. And they both love the water.

Q: [5:58] And I'm sorry if you mentioned this, but your husband's Icelandic family – do they have any fishing connections?

A: [6:04] No. They're very connected to the water, though, especially my mother-in-law's family. Her grandfather was one of the big proponents of swimming in Iceland. So he had swimming pools built and taught swimming. So the water in that sense was very important to that family, and they still swim regularly. My father-in-law's family – he grew up in a fishing town, but his father was a minister, so not really any commercial fishing or anything like that on that side.

Q: [6:37] And can you describe your educational background for me?

A: [6:41] I have a bachelor's degree in English literature, which doesn't do me much out on the water, unless some Chaucer pops into my head or something, which it usually doesn't. And then I have some certificates in other things like yoga, and I'm about to get my captain's license. Just recently finished the course. So I have a certificate in that.

Q: [7:08] And I'm just realizing I skipped over – what brought you up to Maine?

A: [7:12] So the company my husband worked for was the the Icelandic steamship company, Eimskip, that's here in Portland. He was their managing director for almost 10 years and moved the company up to Portland, because it was a better location than the port in Virginia – closer to Iceland. So we started coming in 2013 and then were officially moved by 2016.

Q: [7:41] And are you married?

A: [7:42] Yes.

Q: [7:43] And you mentioned kids. Could you note like age, gender?

A: [7:46] I have two children. I have a daughter who's 28. She lives in Iceland. She's a teacher in a Waldorf school. And my son is almost 26 – this month. He is a professional ski instructor, and he and my husband do boat tours on the bay now. My husband's retired from that company. They do boat tours out on the bay. So we're all on the water.

Q: [8:13] And you mentioned he's a great fisherman – mostly recreational, or is he taking tourists as part of the tour as well?

A: [8:18] Recreational. I mean, he does take as part of the tours – he doesn't do fishing tours, but they take people to oyster farms. But no, he doesn't do – and he hasn't fished a lot recently. It was more when he was a kid. Like every time he

threw it out, I'm telling you, fish would land. And my dad just was like, I don't even need to bother. (laughter)

Q: [8:39] It's in the blood.

A: [8:40] It's in the blood, yeah.

Q: [8:42] And would you want your children to go into fishing or aquaculture if they were interested in it?

A: [8:46] Absolutely. If they were interested. My son throws out five lobster traps every year. I think it's mostly to use so he can pull them up for the tours, and for us. I don't think that's going to be their route. (laughter) But absolutely, if they loved it as much as I do, I would be so happy for them to do it.

Q: [9:10] Now, shifting a little more into focusing on your role in the fisheries/aquaculture sector, could you describe for me your role in the fishing and aquaculture industry in Maine?

A: [9:20] Well, I have a couple of different roles. Like I said, I have a small farm. My farm is slightly on pause right now. I had an unfortunate incident last year – a massive mortality incident, we call it, where all the oysters died. So they were put down on the bottom for the winter, and the location where they were was muddier than I think we expected. So the cages sunk into the mud. But I'm told that you're not a real oyster farmer until you lose like a million oysters, and I only lost 30,000. So I guess I'm still not a real oyster farmer. So I'm working to rebuild that – to restart that.

[10:03] Currently, I work with a friend of mine whose farm is close to my location as well. She's another female farmer. So we work together. And then I had in the wintertime a couple of lines of kelp out, which are also currently on pause. That's only a winter thing, anyway, but hopefully next year.

[10:22] But I also am an aquaculture ambassador, so just sort of a person who walks around telling everybody how great aquaculture is in the community, and I'm just available for people to answer questions, any information that they need. It's kind of a program through the Maine Aquaculture Association. It's a casual program. There's not like an official – I don't wear a badge or anything like that, but people just know that I'm a person they can reach out to for information.

[10:53] And then I've done a little bit of work with the Maine Aquaculture Innovation Center promoting the educational programs surrounding aquaculture with Maine's community colleges. So I'm kind of in a lot of places in the industry, which I really like, because I'm getting up towards 60 – I'm over 55 now – and I don't know how long my body will handle lifting oyster cages out of the water. So I just want to stay relevant and in the industry, because I love it and I love the people.

Q: [11:23] And could you tell me a little bit about – like how did you get into this aquaculture world?

A: [11:28] Oh, gosh. Really by accident. I didn't intend to be like a sea farmer. We bought this island property out on Sturdivant in 2019, and I have 500 feet of waterfront, so I thought, oh, wouldn't it be fun to have some oyster cages? Because I grew up with that down in Virginia, and I saw how they were farming them in Virginia. It's bottom culture, and you just walk out in the flats and flip the cages and shake the bags, then you put them back down. The water flows over them. So I just wanted to do a few cages just to have oysters for ourselves and our friends.

[12:07] And I was talking to a friend that mentioned it to a friend who said, oh, you need to talk to this guy, and contacted me with another guy. That guy was like, oh, why are you just going to do a couple cages? You've got that island property. You have water right there. You have riparian rights. Why don't you just have a farm? OK, I guess so. (laughter) So I kind of went really blindly into it, and I hopped onto the aquaculture and shared waters course and just sort of started winging it.

[12:41] I joined the Maine Family Seafarm Cooperative, which is a group of small farmers, and have a equipment share program. We share a dealership, which is a really great program for us, because it's very expensive to own and run a dealership. We have a refrigerated container, so we all have access and use to that. And it opens it up for people like me who just have LPAs to be able to open up our market much wider, because LPAs are limited to the entities which they can sell.

[13:10] So anyway, got slightly off track there – ahead of myself – but that's kind of how I got into it. Just sort of accidentally – just wanted a couple cages, and I ended up with four LPAs.

Q: [13:19] Can you take me through kind of like when you first started farming and when your leases were approved?

A: (Redacted)

[13:27] So all my LPAs were approved in 2020. It was a pretty quick process at that time. I think it was just before everything started to boom and everybody wanted to get into it, and then the DMR started to be short-staffed. Now, I think the process takes a little bit longer. It's a little bit trickier. But I was pretty fortunate. It was fairly quick and fairly easy. And I do have some riparian rights in that area, and getting approval from the other neighbors was not a problem. It's a seasonal place, so it's not like I was in front of somebody's house all year round. And then the buddy in the co-op helped helped with me getting gear and helped with the setup. We worked together, so we were sort of partner farmers.

Q: [14:21] So it sounds like you sort of linked with the co-op from the beginning, or how did that relationship –

A: [14:28] Well, I linked with this particular farmer from the beginning, and he was part of the co-op. They were just starting the co-op at that time. So I kind of joined in with that, and we worked together for three or four years. And then we kind of needed to – he needed to work on his own stuff. He was expanding his own farm and business into some other things, and I needed to get back to tending my own farm.

Q: [14:54] But it sounds like the co-op was a really helpful – well, I guess that particular relationship with the co-op was really a helpful starting place to start a farm.

A: [15:01] Yeah, definitely. And he was really an invaluable resource to me for helping me get started and helping me and connecting me to the industry. And then I just started – I'm just a people person, so I started going to all the events and meeting all the people and volunteering at different things and helping other people on their farms just to learn more.

Q: [15:22] Could you say a little bit about how the structure of the co-op works? It sounds like you sell your oysters, or many of them, to the co-op as the dealer for your oysters.

A: [15:32] So the way it works is we're all in this co-op together. We pay dues, and it pays our rent. And we're located over at the Sea Meadows Marina at – it's called the Boat Yard in Yarmouth. We have a space there. We have a refrigerated container there. And we have a dealership license.

[15:50] I have my harvester license, so basically the steps are I go out to whatever farm I'm harvesting from – now, technically my harvester license, I can harvest on somebody else's farm if they allow me. So I harvest the oysters, put my tag on it with my harvester number on it, I transport them to the dealership, and then when I check them into the dealership – I do this myself – we have to fill out a log, record the temperature and the time of check-in and the date.

[16:19] And then I switch the tag. I take my harvester tag off and file that, put a dealership tag on, and then they can be stored in the dealership. So if I need to store them there for a little bit – maybe I've harvested 1,000 oysters, but I only have to deliver 100 today. But over the course of the next week and a half, I'm going to deliver the rest of those. Otherwise, I just switch the tags, and then I sign them out, and I take them and deliver to wherever they're going to go.

[16:44] And having the dealership, it offers me – as just an LPA holder, I can only sell to a dealership or an enhanced retailer, which is basically a retailer like SoPo Seafood who also has a dealership license. But I can't sell directly to a restaurant unless they're an enhanced retailer. This dealership allows me to do that. So I can sell – now, I can go directly to a restaurant and say here are my oysters. Would you like to buy them? If they'd like to buy them, I bring it to them with the dealership tag on it. And what we do is we pay a small amount per oyster into the dealership.

Q: [17:24] And that allows you all to own the infrastructure and – yeah, that seems really –

A: [17:31] Yeah. So the dues that we pay help for the rent and the electricity at the location. And then every oyster that goes through, we pay a small amount into the kitty, and that helps to pay the bills for the dealership.

Q: [17:43] Can you say a little bit about – like how many members and how someone becomes a member?

A: [17:49] I think we're about 11 members now. And it's fairly easy to become a member. You just tell somebody you would like to join us, and we'll invite you to a meeting. We'll tell you how we work. And there's a buy-in fee and then there's a yearly fee and there's – the gear share is mostly – I mean, there a couple of farmers that are slightly bigger, and they have some gear available. So if you're just starting out, they're very happy to loan you or sell you gear at a discount – stuff they might be getting rid of or loan it to help you get started. And the wealth of experience in this group of people and the knowledge in this group of people is really invaluable.

[18:30] And then some people have better boats than others. We have a small floating dock with a tumbler, so everyone can sign up to use the tumbler. We have that dealership and the cold storage. And most everyone has their own boat, but if you need a bigger boat or if you need a boat to help you pull your cages up, for example, at the end of the winter – pull them up if you store them at the bottom – usually you can get one of the other farmers to help you do that. And we sort of trade off helping each other on farms, especially with the kelp. There are a couple of us that were farming kelp. So we sort of all work together harvesting all the kelp on the different farms.

Q: [19:13] Because it's sort of an intensive amount of work in a short period of time, right? And then a lot of waiting.

A: [19:17] Yes.

Q: [19:19] Could you say a little bit about how you got started with kelp? You mentioned kind of how you got into the oysters.

A: [19:23] Yeah, same guy. Kelp was just starting then. I don't remember exactly how he got started. But we got some seed from – I can't remember where we got our seed the first year. But the first year, we sold to an entity called – the first two, maybe even three years, we sold to an entity called The Crop Project, which unfortunately no longer exists. But the first year, they bought our kelp straight off – just on the line. So that was super-easy. We'd pull it out of the water, ropes and all, into big fish totes, and then they'd pick it up at the dock and it was gone, and we got some decent money for that. The second year, we had to cut it off the lines, but we didn't have to be super-careful about it. It wasn't necessarily food-grade, so it was still a little bit messy. The third year was more strict. They were processing it,

and they were wanting food grade. So we had to be very careful about seed string getting in there. Didn't want any holdfast in there, any sort of biofouling or snail sets. So we had to be careful about time of year that we were harvesting as well.

[20:40] Let's see. This past year, we have been able, with the help of GreenWave – because our co-op works with GreenWave. This past year, they helped us set up a nursery. I didn't farm this year, but other members of the co-op did, so grew their own seed to put out on the farms, and a lot of it did really well. And then processed also with the help of GreenWave in a funding aspect – helped us to process the seaweed in a commercial dryer. We did that in collaboration with Ocean's Balance to dry that seaweed. So now it's in dry storage and available for sale.

Q: [21:22] Wow. So the help from GreenWave, was it like a grant or –

A: [21:26] Yes, it's both – it's a tech share and actually a physical labor share and some grant money that they helped us to set up the nursery and also to fund the the drying process. And our co-op works really closely with them.

[21:43] They've developed so many amazing programs. As a side note, you should interview somebody from GreenWave. I can give you some context. But they've developed a whole bunch of different programs to support farmers. There's farmer education. There's a farmer exchange program. And now, they're doing this whole marketing program, where they're connecting farmers directly with buyers, because that's a missing piece. There's a missing link in the industry. We know how to farm it. There are some people out there in the universe who are processing – or not processing – using seaweed and creating products. The missing link is the primary processing. When it lands on the dock, I'm done with it. The primary processing, which is processing for storage or processing for transport, that's the part that's kind of missing. So GreenWave is kind of working on that. But for now, they're connecting us directly with buyers who want seaweed to make products.

Q: [22:44] Thank you for saying that. Because I was just thinking that's my understanding is the bottleneck is the processing and to some extent finding who wants to buy it, too, like developing the market relationships. Just so I understand, GreenWave has helped you all. Are you renting a processing facility, or they're sort of connecting you with somebody who's doing it?

A: [23:06] We already knew Ocean's Balance, and Ocean's Balance has been working with GreenWave. I'm sure it's OK that I mentioned their name. They're a known company here in Maine, and we just collaborate with them. So GreenWave has helped us cover the cost of drying the seaweed so that – you know, Ocean's Balance can't do that for free. They have lots of bills to pay. So drying and storing the seaweed – and drying is, in many ways, a better way to store it. It stores for longer. And it also has less of an environmental impact than freezer storage.

[23:43] But the idea is hopefully get the seaweed out of the water, get it processed, and get it to people who need to use it. We don't want to build a stockpile. We

don't want to end up with storing, because it kind of negates the whole idea of this renewable resource and this regenerative resource and it helping the climate. If we're going to then put it in storage, that's going to cost money and resources to manage, because even dry storage has to be managed to some degree – temperature, humidity control, and that.

Q: [24:18] So after it's processed, is the co-op marketing it?

A: [24:26] Yes, to some degree, with GreenWave's help. So they're really helping us. That's part of the thing that we're just kind of getting into. And we're not necessarily doing it specifically in the name of the co-op. We're kind of doing it in the name of individual farmers. But we all still kind of work together. And with GreenWave, we have what's called a cohort here in Maine for the seaweed, and it's mostly our co-op and then a couple of other people who are not necessarily members of the co-op, but are part of this group, this cohort, which is just a working group of seaweed farmers here in Maine.

Q: [25:10] This is really fascinating to me. When we interviewed Libby and we heard about the co-op – are there any other co-ops like this in Maine? I haven't heard of any. Do you know sort of – where'd the idea come from?

A: [25:23] What are they called? New Meadows. I think there's a co-op – the New Meadows River Co-op or something. I'm not exactly sure how they work, like if they share a dealership or if they gear-share or anything like that, but I know there is at least one other sort of aquaculture cooperative in Maine.

[25:46] And I don't know. I think this one particular farmer had the idea, or a couple of farmers who started it had the idea of creating this co-op and just thinking that oyster farming is kind of a big upfront investment, even if you want to be a small farmer. And as in almost everything, there is a tipping point. You have to be a certain size to make any money at it. Otherwise, you're a hobby farmer. So if you don't really care about making any money, then you really just should have one line and just do a very minimal amount of oysters and give them to all your friends. If you want to make any money at it, you have to have a fairly significant-sized farm, but that requires a fairly significant investment. You need to have a boat. You need to get all the gear. You need to find a location. You need to have access to that location. So if you have a boat, but you don't have a mooring and you have to trailer your boat to a point and drive up – it can go on and on. I mean, I'm getting sort of off track here, but you can maybe clean that up a little bit. Sorry.

[26:58] There's a huge upfront investment. So I think their idea was, hey, if we collaborate, we can share boats, we can share some gear, and we can build together. And then those two farmers became three or four farmers, and they all ended up sort of blowing up on their own. And they are still members of the co-op. They have their own sort of larger-scale farms.

[27:25] But like I said, the biggest benefit of the co-op really is just the support network, the information and experience that they have, and everyone in the co-op

is always willing to help. So if I were to call up and say, oh my God, my boat sunk and I need somebody to pull up my cages, or anything like that, anybody would jump in.

Q: [27:46] That's so great. Yeah, thank you for expanding on that. Going back to you and your farm a little bit more, you mentioned you have four LPAs. Is that correct?

A: [27:54] Yes.

Q: [27:55] Do you hold any other commercial fishing licenses?

A: [27:58] No.

Q: [27:59] And the four LPAs – what's the size of your farm?

A: [28:03] So they're 1 by 400 or – yeah, 400 feet long. And I originally had these round cages that flipped in the tide, but I'll be using – I have to redo my farm. While I'm rethinking it, I need to reapply for LPAs – new LPAs – because I'm going to change the gear completely, and I can't really do that on an amendment. So I just have to get new LPAs, and they'll probably be 2 by 200 feet. So they'll be 200 feet long and maybe two feet wide to accommodate the larger cages that I'll use.

Q: [28:42] And they'll be floating cages that you'll flip and sink in the winter.

A: [28:45] Floating cages, yes.

Q: [28:49] And could you describe – so in your work, do you have experience beyond harvesting? It sounds like the co-op handles the marketing side, but like bookkeeping, gear preparation. Have you done any kind of shucking or anything like that?

A: [29:06] Yeah, I've done a little bit of shucking. Not really professionally. I shucked as a kid. So the way our co-op works, we don't really do – I mean, we have a treasurer who does the books just for the co-op, just manages that money – the income of the dues and then the income per oyster that goes through and then paying all the bills. But every individual farmer handles their own sort of business. And I have experience with that – with business. And yeah, we've done some – I created some nets for kelp harvest a few weeks ago, and I've helped put together some oyster bags, things like that, and replacing the floats on the oyster bags. So yeah, a little bit of that stuff.

Q: [29:58] Yeah. And then it sounds like at the outset – we have a question of do you have any experience with advocacy or community-based organizations related to fisheries? It seemed like the ambassador program would maybe fit under that.

A: [30:07] Yes. There are a few of us who are in this group, and we received some support and some training – like media training, how to speak to groups, how to

talk about what we do and why we love it so much, just as a way to have some experienced people in the community. Because it seemed like there's a lot of talk about aquaculture in the community, and there is some misinformation out there. And I think there are several people out there who know a little bit and then say a lot.

[30:48] So the idea was just to get some actual people with boots on the ground – or boots in the water, actually, is a better phrase – people with experience who could really talk to what it means to be in aquaculture and what it means to be part of the working waterfront and how important that is to Maine's economy and Maine's history, and also that there are more out there than lobstermen and commercial fishermen. We're all part of the same industry, and we should all get along. And we do great. I have lots of friends who are lobstermen down at Falmouth Town Landing. That's our little home port. And it's great to know everybody down there – the clammers that come in early in the morning and the lobstermen – they come in and – it's a great community. I love being a part of the working waterfront.

Q: [31:41] And then just carrying on with these kinds of questions about experience – do you have any experience in extension related to fisheries and aquaculture? Extension would be like Sea Grant, sort of –

A: [31:55] No, not really. Maybe my work with the Aquaculture Innovation Center. And in that capacity, I've just been going to different events, especially career fairs at schools and colleges, and also some other events like Pemaquid Oyster Festival, and I'll set up a table and just promote the education program. They have this whole initiative called Dive into Aquaculture, and it's promoting the education programs that are available through Maine's community colleges, some free and highly discounted for Mainers. So many different levels of opportunity from workshops to one-on-ones to bootcamps, which are sort of intensive programs, apprenticeship programs, and then full-on degree programs. There's something for just about every level.

[32:49] And it's all very inclusive. I mean, I started this when I was like 50 years old. So you don't have to be just coming out of high school and thinking that you want a career in aquaculture. This is also a pivot. You can do this at any time in your life. Maine has all of these opportunities for education available to you, and they all move into career development and give you avenues to get actual jobs from those educations. So it's not you take a class and then you have to figure out – I don't know where to go to get a job. There are jobs available here in Maine, and they have direct avenues to those.

Q: [33:27] That's really great to hear about. I haven't heard about that yet. Thank you for sharing.

A: [33:32] I can hook you up with more information. If you want to know more about that, Anne Langston Noll at the Maine Aquaculture Innovation Center – she's now the director.

Q: [33:42] Thank you. Do you have any experience with research and development in aquaculture?

A: [33:48] No, not outside of the marine biology I took in high school and then one class in college. And looking back, those are the classes I loved the most. I loved marine biology. I loved oceanography. My teacher was a surfer dude, and he was just great. It was such a great class. And it's funny that it never occurred to me to work on the water or work with aquatic organisms or anything like that, even to be a scientist. It just sort of was ingrained in me that I would go to a liberal arts college and I would get some sort of liberal arts degree, and then I didn't really use it. (laughter)

Q: [34:28] Well, it sounds like the work you're doing now with outreach is – like maybe other people know it is an option earlier.

A: [34:34] Yes.

Q: [34:35] And then what about like hatcheries or nurseries? You mentioned you all now have a nursery.

A: [34:40] Well, GreenWave did help us set up – I wasn't too much involved in that. I was away last fall, so I wasn't really able to be involved in that much. But I can give you names of a couple of people if you want.

Q: [34:53] I think we already touched on this, but the last question is do you have any experience with sort of seafood and the sort of customer interface – like shucking, food preparation, restaurant side? But it sounded like maybe not.

A: [35:06] Not really outside of – the most recent restaurant gig I had was last summer. And I do some catering once in a while for a friend. But no, not really specific. No.

Q: [35:19] And I know this is an odd year or an unfortunate year with the mortality event, but when your farm is operational, what would like an average day of work look like for you on the farm?

A: [35:30] Oh, OK. So I still go out. I work with one of the other co-op members' farms up in Freeport. His farm manager – sometimes she and I go out on a little, tiny boat, which is amazing. That the other thing. I have to take a side note here. The variety – so I said that you need to have all this equipment to get started in oyster farming, but it doesn't mean you have to have a big, massive boat or a big, massive barge or anything like that.

[36:00] One of the boats that I go out on is like – it's practically a rowboat. I call it the clown boat. I love it, because it's like a clown car. It's shocking how much gear we get into that boat and still have room for the two of us and are still able to actually work on the boat. I think the thing might be 12 feet long. It might not be

bigger than that. But it's great. And I think I enjoy that the most – working on a little boat like that, where we're just – like we have to be very resourceful. And then the other boat I work on is a little bit bigger, but we still – you know, we're two women, and we have to be very resourceful, and we've found ways to pull these huge, heavy cages up and hook them over the side of the boat.

[36:45] So a typical day – we'll go out in the morning, get the boat from the mooring, and load any gear we need to take out with us. We'll go out to the farm, and we'll just start pulling up cages. So if they're cages or floating bags – it varies depending on which farm I'm going out on, but let's say the cages – pull them up to the boat, pull the bags out, and decide – most of the time, we're going out to sort and maybe clean or tumble a little bit. On one farm, we do tumble on a regular basis. On the other farm, we don't have access to a tumbler, so we don't tumble. But that location gets a lot more wave action, so they get sort of tumbled themselves in the bags, and we pack the bags a little bit lighter so that they can move around.

[37:32] So we'll just kind of dump the bags into a basket and sort through them, sort them out by size. And that we do by hand. When you use a tumbler, it sort of sorts them – the tumbler has different-sized holes in it, so it'll kind of sort them for you – tumble them and sort at the same time. But when we're doing it by hand, just into different buckets, and then we'll take those buckets and put them into fresh bags according to size. So then we always know when we pull up, OK, these are market size, these are ready for sale, these have another few months, or these have another few years. We try to keep them same size together. But they'll grow at different rates, so you have to do that sorting on a regular basis.

[38:15] And then we'll pack them up again and put the cages back in the water if the cages have been flipped up for defouling, which if you've seen oyster cages on the water – so if you have the cages, they sit on pontoons, and the bags are inside there. So we'll sometimes flip them up, and that will dry out any of the fouling that's growing on the cages. And then we'll have to go back and flip them over, so of course the oysters get the water and the stuff they eat. If you're working with bags, you just flip them over, so one side is up and one side is down.

Q: [38:51] And how do you feel your background or identity shapes your work in the fisheries and aquaculture sector, including how others may perceive or treat you?

A: [39:01] OK, I think I know what you mean by that question. Hmm, that's a tough one. I might need a second to figure that out. I've been pretty well accepted in the industry, I think. I'm a pretty quick study, and I think I'm a hard worker. And I think that's what matters the most when you get on the boat with somebody else – that you can take instruction. If you're not the boss of the boat, then you just shut your mouth. But if you need clarification, you say I need clarification. And I'm not afraid to ask questions.

[39:48] I think once people get to know me a little bit and realize that I kind of grew up on the water a bit and then – but I'm enthusiastic and willing to learn. And

like I said, I'm not afraid of hard work. I can lift heavy things. I'm not afraid to get dirty. So just because I don't come from a fishing family, per se, or have a degree in aquaculture or marine science or anything like that, or have specific professional fishing experience, I don't think it's really hindered me. Maybe at first, people were like, what's this little girl doing on the water? Who does she think she is? But I think I've fairly well proved myself when I get out there.

Q: [40:37] That's great to hear. And then how does your work in the aquaculture sector balance or not with any family or caregiving responsibilities you have?

A: [40:48] Yeah, I mean, it's the usual work/life balance. The tricky thing – the last couple years, my husband has had a job that takes him to Holland in the wintertime. So growing the seaweed in the winter is tricky if I'm not here. So I kind of handed that over to some of my co-op farmers to handle those seaweed lines, because I wasn't around. I've also had to be away a little bit to care for my mother down in Virginia.

[41:22] But in the summertime, we're here. We live full time on the island, so it's close and convenient. And the oysters are a summer product. We're there May to October, and oysters are kind of June to October, so that works out. So once I get that farm up and running again, it should suit really well with with our lifestyle and where we're living.

[41:46] And it also suits really well with – or fits really well with my husband and son doing these bay tours. They can come to our own farm, and we can get oysters from our own farm and – yeah, and I intend to at some point also do working farm tours. They do the kind of fancy boat tours where people will have the champagne and not really get dirty from the oysters. But I'll have on the skiff – the reason I got my captain's license is so that I could take people out for sort of working tours and take you out on a day – this is what it looks like to work on an oyster farm and get you dirty and let you see what it smells like and teach you how to shuck an oyster.

Q: [42:28] That's great. It seems like there'd be a lot of interest in that.

A: [42:30] Oh, yeah. There are several farmers already doing it, so I'm definitely not inventing this. It's all the rage now. I mean, it's another source of revenue. You're going out there anyway, so you might as well take people who are willing to pay to sit on your boat and watch you do the work or even help with the work.

Q: [42:50] Now, shifting a little bit to any environmental changes you've noticed in your time working on the water and how they kind of affect your work, if at all, can you describe any changes you've noticed in the marine environment in your time on the water?

A: [43:06] Let's see. I think I noticed that a bit in the kelp more so than the oysters, because the first couple of years – let's see. We started the kelp in the winter of – set it out in the fall of 2019, I believe, and harvested in the – no, in the fall of 2020 and harvested in the spring of 2021. And we had a pretty good harvest, and the

next year was a pretty good harvest, too. The third year, the harvest was not as good. Two of my lines were a little bit closer to the island, and their growth was not very good at all. I think it was due to the water being a little bit shallower, so it gets warmer more easily. And I found that we got snail sets earlier. The weather was warmer earlier.

[44:13] This year was a very weird year, because they were harvesting all the way until the end of May. I think they just finished last week harvesting. And we usually need to be finished by the first week of May – starting mid-April, first week of May. But this year has been quite cold very late into the spring. So they could stretch it, which was a good thing, because it gave them the opportunity to maybe harvest a couple of times. They could harvest some in March and then again in May, and then also just get more growth before things like snail sets started setting in or hydroids. Last year, I had a lot of seaweed that ended up with hydroids, because it got warmer a little bit earlier. And by the end of the first week in May, I went out to get it, and it was covered in hydroids. So it's now fertilizer. (laughter)

Q: [45:00] I was going to ask that.

A: [45:01] Which is OK. That's really the beauty of seaweed, because at the end of the day, yes, you'll get less money for it, but it's never a full loss if you can either use it yourself or if we can find somebody – again, the bottleneck of the processor there – if we can find somebody who can pay for it and make fertilizer out of it, or if you can make fertilizer out of it yourself to sell, the seaweed is never completely ruined. It's never completely lost. And the verdict is still out on the whole carbon capture and dropping it to the bottom of the ocean and what happens to it then thing. But even if you drop it to the bottom, it's going to degrade and disintegrate. It's not going to poison the water. It's not going to do anything bad to the environment. It's not going to clog anything up.

[45:55] That's the beauty of seaweed. It can be this high-dollar-value fresh food product all the way down to practically like manure that you throw in your garden. But as far as – otherwise, climate change – I haven't noticed a lot. On one of the farms I work on, there was a very significant barnacle set on the oyster cages last year, and she said that was the first year she had noticed that. She's been doing it as long as I have. And that was the first year she noticed this significant barnacle set. It may be due to the warming waters that they're able to set. They were on there when she pulled the cages up at the end of winter. Well, she was a little late. I don't think she got them up until mid-June. But I think the water had warmed enough that even at the bottom, the barnacles covered the cages and the oysters.

Q: [46:58] So with seaweed, you were mentioning you've had experiences with biofouling, and it sort of just changes how you're marketing it. Like you went for fertilizer rather than –

A: [47:09] Yeah, I just pulled it up onto my property and put it in barrels and let it ferment. And now, I'm building out my garden on the property, so I'm hoping that I can – my plan is to just dump it all over the ground, let it soak into the ground,

and maybe it will be something good. Maybe I'll bottle some of it and see. I need to do some testing and see what see what the levels are in it. It may be complete crap, but that's all right. I'll still dump it on the ground, and it'll just be soil filler. Like I said, it's never going to be damaging to the environment. So that's the benefit of that. I suppose technically oysters are the same thing. You could take all the dead oysters and throw them in your driveway. There are places that have large areas covered with broken oyster shells. That's the beauty of that is it's not damaging to the environment, and it could actually rebuild beaches and things.

Q: [48:14] And then you mentioned a friend's farm having the barnacle sets. Have you had any changes in biofouling or challenges of biofouling on your oyster farm?

A: [48:23] No, not really. Not that I noticed. But I didn't have – yeah, my oysters, I had the farm in for – last year would have been the third year. So it was last summer that I pulled them up and they were all dead. So I kind of took that summer off and was going to restart this summer, but I had some other things go on – some family things go on – so it's put that off a little bit.

Q: [48:49] And you said that massive mortality event was more about the site than –

A: [48:54] It was more about the site where they went down. I didn't realize how muddy it was at the bottom. I actually had somebody else drop them for me, because I was taking care of my mother at the time. So when they put them down, I think they just weren't aware of how muddy it was at the bottom. That area gets a lot of action, and the cages kind of went from laying flat on their bottoms to sort of standing up on a side. So all the bags were standing up, and the oysters sort of all fell to the bottom and were congregated there and then slowly sunk into that mud. And instead of being a silty bottom which is kind of thin, and oysters can breathe in that – silty or sand – it was thick mud. They were extremely heavy when we pulled them out, and it was thick, thick mud that basically had to be power-washed off to find dead oysters inside.

[49:52] You're working with a natural environment, and it's very different from working with land farming, because you can't always see what you're working with. You can't always see into the water, and you can't always see what's at the bottom. And then you don't know – winter storms come up, and they can change the bottom. So it's kind of a guessing game. You try it once in this site. Oh, well, that's not a good site to lay them down for the winter. Maybe we need to find another option or be able to transport them somewhere else to put them down for the winter.

Q: [50:27] Have the winter storms in recent years impacted you on your farm at all?

A: [50:32] I think that winter storm last year – I think that was one of the reasons that these cages – because they also weren't very – so bottom cages usually have – they could look kind of like the floating cages, but they don't have the pontoons on the bottom. These particular ones I use, they don't have pontoons on the bottom. They just have wooden slats, and then there's a space to sort of give space between the

bottom of the ocean floor or the bay floor and the bags, and then there are weights inside there to hold it down. I think the weights just weren't quite heavy enough, and those surges were so much that it just pushed the cages up on their back end. So all those bags were standing upright instead of laying flat.

Q: [51:16] So it sounds like you're going to kind of change your gear.

A: [51:20] Yes. So I have to sort of rethink that. And also the placement of the lines and the direction that they face.

Q: [51:29] Do you feel like you've been able to make the changes or adaptations you'd like to in response to some of these challenges, or are there some things you'd like to try that you haven't been able to?

A: [51:39] I wouldn't say I haven't been able to. I just haven't gotten quite there yet. Like I said, I have to figure out exactly what gear I plan to use now and then reapply for new LPAs – get rid of my other LPAs, apply for new LPAs with all new gear and a whole new setup. So far, it hasn't been an issue yet. It's not going to be an issue. It's not going to be an issue. The DMR is going to be great, and it's all going to work out.

Q: [52:09] That's great. And what is your biggest concern about the marine environment for the future of Maine's coastal fisheries and aquaculture industries?

A: [52:17] Let's see. That's an excellent and somewhat loaded question. My biggest concern about the marine environment – well, runoff from the land, of course, boating of all sorts, recreational and commercial and everything – people, industries, entities who are not careful about about the kind of equipment they use, things falling off the boat. There's this whole program that's picking up ghost gear – not just lobster gear, but all kinds of gear – and the stuff that's coming up from the bottom is just unbelievable, all the trash that's down there. So that's my concern.

[53:04] A really big message that I would like to get out is that I love the water and the marine environment, not just because I can potentially make a living off of it, but because I also recreate there, and I want everyone else to be able to experience that, too. And I want my children to experience it, my children's children, and everybody else's children to experience it. So it's very important to me.

[53:34] And in my practice, when I'm out on the water, when I'm working, I'm careful about not losing things like zip ties into the water. Any of our trash, I'm careful to keep that into the boat, careful with all of our gasoline and things like that – that it doesn't spill in the boat or out of the boat, because it's eventually going to get washed. I'm careful and considerate about what I use in my garden on the island, because that's going to wash directly into the bay. I'm right on the waterfront.

[54:05] So my biggest concern is people – just people not paying attention and people not really considering the impact that we all have on the water. And we have control over that. We don't have a lot of control over climate change. I'm hopeful that there are things that we can do, and if we put things into practice that can maybe stave it off or slow it down, but we're not going back. We can't really fix a lot of what's already been done. But if we can be better for the future, maybe we can slow it down a bit. But it's evolutionary. The climate is going to change. There's nothing to be really done about that. But if we're better as individuals, and we take care of ourselves and the surrounding area and we leave no footprints or very minimal footprints – bare footprints – then I think that's the most important thing.

Q: [55:04] I just want to be conscious of your time. I have a few more questions. Following up on that, if you could tell policymakers in Maine what the biggest priority should be to help people kind of adapt to the changes or challenges in the marine environment, what would you tell them?

A: [55:23] Outlaw things like Roundup. (laughter) Oh my gosh. What kind of policies?

Q: [55:35] Or just what the biggest priorities are. They can figure out what the policies should look like.

A: [55:39] Yeah. I mean, the biggest priorities are are really thinking about what things people are allowed to use on their land properties, because it all eventually washes into the ocean. And also what kind of gear – maybe there shouldn't be policy around that. Let's take that back. Erase that. Not around gear.

[56:07] Gosh, anything that would help to give the public – just the overall public, commercial people, recreational people, anybody – some sort of guidelines or some sort of framework to understand the impact that they have on the marine environment. Also, the land environment, because eventually the land environment comes into the marine environment, and it's all connected. So any sort of policies or programs or regulations, whatever, that would give people some sort of framework that they can work within to help protect that. I don't know how else to word that. You're going to have to do some serious editing here. I'm sorry.

Q: [56:54] Have you participated in your capacity in the aquaculture industry in any climate resilience or adaptation trainings?

A: [57:02] No, nothing specific.

Q: [57:06] And do you have any sense of what strategies would be effective to kind of help aquaculturists build resilience against kind of climate-related impacts?

A: [57:15] Yeah, I would love for there to be some sort of trainings and more discussion along these lines amongst farmers and more sort of tech-share or info-share about what's happening in the bay down here versus what's happening up in

maybe Deer Isle area or just all along the bay, so we can compare notes – getting together, comparing notes about what's happening to your gear up there or to your crops, what's happening down in the Kittery, Kennebunk area.

[57:50] And also measurements from the entities that are doing the water measurements. Not just the pollution levels in the water, but also temperature levels. Having that information readily accessible and easily interpreted for people like me who are not super-scientist-minded, and getting together and talking about it like, OK, here's the data we've collected. Here's the anecdotal information we've collected from farmers. This is what's happening year to year. And maybe encouraging farmers to keep logs, doing surveys once a year. I don't know what entity would handle that. But if somebody could send out a survey once a year – what does your farm look like this year? What were the changes? I've filled out a couple of those surveys, but I think they were for specific studies. That might be something to do on a regular, ongoing basis and be able to gather all that information.

Q: [58:49] Yeah, those are some great ideas. So we've asked about environmental changes. Are there any other types of changes that are not environmental that are impacting your work on the farm that you'd like to tell us about?

A: [59:05] Yes. Regulation changes within the DMR – things like having to name your assistants. It's not a brand-new regulation, but it's being more enforced now. You have to name your assistants when you reapply. We reapply for our leases at the end of every year, sort of November, December-ish. But a lot of us use interns. So our co-op has an intern, and we share him. It's a him right now. I say him, because it's a him right now. We don't know that person's name – that intern in November. We don't know that. So I can't put that person as an assistant on my farm in November when I'm reapplying for my for my LPA application, because I don't know who that is until May. So a regulation like that kind of – it makes things tricky for us. The way we've worked around it is by saying assistant to be named. (laughter)

[1:00:09] All these programs that Maine is offering that are career development programs also – like the apprenticeship program, internship programs, things like that – those only work if they can get farmers to use those people. And it's hard for us to use those people if we don't know who they are until the end of the year, but we have to put their names on at the beginning of the season. So that's tricky.

[1:00:32] And also just the bottlenecks at DMR. They're not doing a bad job. They're great, the people who are there. There's just not enough of them. There are a lot of people doing amendments and applying for new licenses, and there's just a lot of work, a lot of bureaucracy, and not enough people to handle it.

Q: [1:00:52] Thanks for sharing that. My next question was going to be have you been able to kind of adapt to or cope with those changes? It sounds like to be named as far as the –

A: [1:01:05] Yeah. We don't know right now how that's going to fly with them. But yeah, we've pretty much adapted to changes as needed. Also, sometimes you need to change gear, or you need to change your setup. It could happen in the middle of the season. So to be able to have a little more flexibility in gear – I mean, the way to adapt to that is to pretty much put on your license, your application, every single kind of species that you could possibly ever want to farm there and every single kind of gear that you could possibly ever want to use there, and then on your drawing, make the drawing as detailed as possible with every single way that you might want to do it so that you're covered. But it would be great if there were a bit of leeway or if it were possible to do gear amendments during the season for LPAs without having to reapply for a full LPA. Because I'm talking about – especially like small gear, like if you need to change from floating bags to cages or from this type of floating bag to this type of floating bag – nothing like I'm going to change my farm from this location to that location. That's a whole new lease. I get that.

Q: [1:02:26] Yeah, that makes sense to me. And can you tell me about any positive changes you've experienced in the industry in your time there?

A: [1:02:32] Yeah, there are a lot more groups getting together. There's more conversation. Maine Aquaculture Association developing this ambassador program and these movies that have come out – so Maine Aquaculture Association, again, they just put out a movie called *Tending the Tides*, which was fantastic. And it was all about the apprenticeship program – that one is a GMRI thing that was put together. So GMRI and Maine Aquaculture Association, a couple of other entities, they have the apprentice program, which is, again, one of the many educational opportunities. This one is school learning – classroom learning – and also actual working on an oyster farm. And I believe it's a full-year program, if not longer. So they made a documentary about it. That's a really positive thing to get more information out into the community and also out to us.

[1:03:38] And just more participation in these conferences. We've hosted Seagriculture here a couple of times. We've hosted the – I can't remember which one, what it was called – but we've hosted another North American aquaculture conference here in Maine. So those are really positive things. And the groups in the industry in Maine are branching out and being in contact with larger groups. Sea Grant is amazing. There's always information from them. They're always innovating. They're always making more things happen. I don't know how to word that. (laughter) And Maine Aquaculture Innovation Center – all of these entities are just doing amazing work in helping us get more knowledge, more information. They're doing farmer trade programs, they're doing educational programs, sending people out into the world, all the way to Korea, all the way to New Zealand to get more information to bring it back to Maine so that we can do better here.

Q: [1:04:48] That's so cool.

A: [1:04:49] So those are all amazing things. I hope that you're able to clip that together in a better way, because it was not coherent at all. I'm sorry.

Q: [1:04:57] And what is your hopeful vision for the future of Maine's coastal fisheries?

A: [1:05:01] My hopeful vision is that we just all get along. Yeah, my hopeful vision is – because there's been a lot of contention, especially in certain areas. And I totally understand that. I totally can see both perspectives. I mean, every older generation gets annoyed. I'm starting to get into that zone where we're looking at the younger generation, and we're like, who do these guys think they are, coming in and taking over? How do they know better than us? We've been here longer. So in my regular life, I'm looking at that.

[1:05:34] And Maine is iconically known as the Lobster State, and lobstermen deserve their due. They have in many ways held this state for a very, very long time. But we do need to diversify, and we all need to get along. There's so much opportunity here, and there are so many more people here, and we can really increase and improve Maine's economy by enhancing this working waterfront and utilizing it to the max – utilizing every aspect of the working waterfront for all kinds of fishing, for commercial fishing, lobstering, aquaculture, including finfish culture, which is part of aquaculture. That can bring in a lot of money for the state. It can provide a lot of jobs.

[1:06:28] So my hope for the future is that we all get along and we all embrace this. Of course, we can't be cowboys and just run out and take over the bay willy-nilly and just let anybody do anything. But if we have the right framework and we all work together, it can be a really, really thriving industry. That's my hope. And that more young people will want to do this. They'll want to get out on the water and want to do this and not just make a million dollars on TikTok. (laughter)

Q: [1:07:04] And the very last question is have you noticed any changes in women's presence, participation, or status in the industry over time?

A: [1:07:12] Oh, Lordy, yes. Absolutely. So many women and non-binary – all kinds of different groups out there. We even have a whole group. Do we call ourselves the WNBA?

Q: [1:07:30] That's the acronym I've heard.

A: [1:07:32] Yeah, we kind of call ourselves the WNBA. We're playing around with that name, but yeah, Women and Non-Binary in Aquaculture. But it's really an all-inclusive group. And we have meetings regularly throughout the year to – anyway, yes, so many people in the industry. It's very diverse.

[1:07:57] And it's also diverse in age, which I think is amazing. There are so many young people, older people like me, people who have been in the industry for a really long time, people middle-ish age who are just coming into the industry as sort of a pivot career, and then young people coming right out of high school or right out of college. And I think it's amazing. I think it's fantastic. That's the only

way an industry like this will thrive. You can't have everyone the same age. You have to keep getting an influx of people of all different ages.

Q: [1:08:32] Well, I think that's a great place to end it on that note. Thank you so much.

A: [1:08:35] Thank you. I hope you don't have to do too –

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