

*Jennifer Stock:* You're listening to Ocean Currents, a podcast brought to you by NOAA's Cordell Bank National Marine Sanctuary. This radio program was originally broadcast on KWMR in Point Reyes Station, California. Thanks for listening!

(Musical Intro)

*Jennifer Stock:* Welcome to another addition of Ocean Currents, I'm your host, Jennifer Stock, and on this show we talk with scientists, educators, explorers, policy makers, harvesters, ocean enthusiasts, authors, advocates, all uncovering and learning about the mysterious and vital part of our planet, the blue ocean.

I bring this show to you monthly on KWMR from NOAA's Cordell Bank's National Marine Sanctuary, one of four national marine sanctuaries in California, all working to protect unique and biologically diverse ecosystems.

So today we're going to dive into the world of seaweed, better known as algae in the marine biologist world, and today we're going to be talking about seaweed. My guest in the studio is Heidi Herman, and Heidi is the co-owner of Strong Arm Farm in Sonoma County. This is a one and a half acre vegetable and herb farm and vends at the local Healdsburg farmers market and some local restaurants, and Heidi expanded her offer to seaweed, which doesn't grow, obviously, at the farm, but harvests it from the wild coasts of Sonoma County.

Heidi has a strong horticultural background with degrees from Cal Poly and Sonoma State, focusing on horticulture, pest management, nursery production, and experimental agriculture education. She has worked internationally with a program called WWOOF, which stands for the World Wide Opportunities on Organic Farms. So welcome Heidi, to ocean currents.

*Heidi Herman:* All right, thank you for having me.

*Jennifer Stock:* So thank you for being here. I have a lot of interest in today's topic because I've been exploring the coast of California, just enjoying the tide pools and just wanting to harvest algae, so I'm just really excited to explore the topic with you today.

First, you have a successful farm going, Strong Arm Farm, what drew you to expanding to seaweed harvesting?

*Heidi Herman* Right. So it's an interest of mine, so it's a hobby turned lucrative. I was vending at the occidental market at the time and would collect seaweed for myself and with friends and I brought a little bit in a bowl that day because it was fresh that day and the next day I was at the market and some customers were like, "Oh, could you get me some? I'd like to come next week and could you bring some more." And it was just customer demand, and I'm like, "Oh yeah, sure. I could bring a little bit." And then thought, "Oh, I need a container for it." So then there's packaging, and a little label, and customers were asking for it, and I was the only one with it. So it was like, "Heck, it's a niche market." And as a farmer you're looking for that, exactly. What unique that will draw customers in and what's not being offered yet in that region or that specific market.

*Jennifer Stock:* So how do you know what species, because I've been exploring the inter tidal there are some real stinky algae, and there are three different colors by the way, there's three different types of algae—there's greens, reds, and browns. And I've just noticed that if red ends up in the back of my car that the car stinks within minutes.

*Heidi Herman:* Yeah, some of 'em do stink more, also when they're cut from the plant and start washing up on shore they start decaying pretty quickly, especially when the sun is out. So definitely cut them from growing plants. There are a lot of kinds and it's like knowing land plants—which ones are ferns and which ones are mosses and oak trees, and just these little identifiers to differentiate their genetics

*Jennifer Stock:* Did you have experience with this or what resources did you use to become knowledgeable about collecting algae?

*Heidi Herman:* Yeah. I started out with some friends who were just running a little macrobiotic food restaurant, and I enjoyed that food. And we went out, it was on the San Luis Obispo coast, And then yeah, when I moved up here to Sonoma I had some friends at the California School of Herbal Studies, and one of them was taking a class a class and was like, "Oh come one out with us, I learned this new skill at our coast side." And I was like, "Oh, great." And this was about 10 years ago, and so I tagged along once and that was totally interesting, and our coastline was stunning and there was so much and so I took a one day course there too it was just an evening lecture, and then you could go out with the instructor that following weekend.

*Jennifer Stock:* So when you collect algae, do you eat it right away? How do you preserve it?

*Heidi Herman* Yeah, part is the processing. This year we tripled our harvesting, due to demand we did about 16 hundred pounds in total between the four or five different varieties that we collect. There are a lot of other varieties out there so it's about knowing which varieties to harvest, and some we don't touch at all. Whether they taste bad, or not bad per se, but if they aren't used in recipes, they have a particular texture in the mouth.

But yeah, once you harvest, the process of collecting it is, you cut it from the plant on low tide days, and putting it in bags and then hauling it out of the ocean, it's quite an effort, because they're heavy it's like carrying water. So you know, backpacks, we use outer frame backpacks because it's really drippy as well so that kind of keeps it off your body as well. So it's lugging it up a cliff and out a bluff, maybe a mile or so and then up to the cars and then the drive back home. And then we have a walk-in cooler that our farm uses for vegetables, so it's stored there around 40 degrees, and try to process it as quick as possible, because it does age readily, and it does break down, and start smelling and it gets even more slimy, and it just breaks down the nutritional quality. So we try to do within 24 hours, within the day, or the next day it our solid goal to process all of it.

And that process is...you know it has sands and critters that tagged along, the seaweed is vital for them for food and hiding source when the tide is out. So we rinse it in different basins, a triple rinse, and we use white basins so you can tell if there is still sand coming out and what discoloration. So triple rinse and then we put it on screens in this secluded part of the garden where nothing else will get dusty on it, and then the sun dries it really quickly. It's May and June, and the sun is at kind of optimal height in the sky, and it's usually around a nice heat wave, and it dries within three to four hours. It's really impressive, and then it's 85 percent water, and so it really dries down to this... and it blackens as it dries, so all the seaweeds turn this dark colors. It's unfortunate, because to maintain those beautiful colors, as they were, and iridescence as they were, would be lovely.

*Jennifer Stock:* So do you mainly only harvest in May and June when you have those hot temperatures for drying?

- Heidi Herman:* Um, yes and no. We do only harvest in those months, but the reason is that's when the low tides are, and our style of harvesting is only from the shore, so we just go when the tide is fully receded. And the section of coast we do, it's, I don't know, about a quarter mile of coastline that gets exposed in that time, so I don't know, it's a lot, it's packed and every surface has algae on it. And so it's really identifying where the algae's we're interested in are in that tidal zone. And so we'll start out at the very furthest at the water line, and then as tide is moving in we'll collect different varieties as it's coming in. And you always have to look over your shoulder, because there is a hazard, you know, with creeper waves, and...it's dangerous too, you know? You have sheers in your hand and it's slippery and you have this heavy sack of algae.
- Jennifer Stock:* You got to be on your toes.
- Heidi Herman:* Yeah, it's true, but there's giggling, and it's fun, you know? It's a stunning time of the day and the sun is just coming up over the hills behind you and there's a lot of critters out and a lot of other sea creatures that get trapped in these tide pools, and so it's a chance to see a different octopus or an abalone.
- Jennifer Stock:* It's such an interesting place, because it really is a transition from land to sea and there is so much in that little zone. I was going to ask you, what are some interesting critters that you've seen? You mentioned abalones, and octopus, have you ever been surprised and been like, "What is this?"
- Heidi Herman:* Um, maybe more with trash and things that show up, different shaped metal things, or things that look dangerous, or glass things. But yeah, certainly a lot of the sea creatures are curious. The nudibranch, and the sea cucumbers they're gigantic, and you just wonder, "What is it?" I don't have all the answers, and I brought a little laminate that nature centers pass out, that say what these things are that you see when you go tide pooling.
- Jennifer Stock:* Nice, have you ever had any accidents out there?
- Heidi Herman:* Hmm, I've gotten wet leg, yeah, that's pretty common. You know, you just slip in. Because, "yeah, the best seaweed is just across this pool." And I'm going in, and it's fine its just par for the course.
- Jennifer Stock:* So let's talk about seaweeds, do you have some that you're going for?

*Heidi Herman* Yeah we do. I collect five varieties and those are historically used by different cultures in different recipes and they have nutritional qualities and nice textures in the mouth. The five kinds we collect, people are definitely familiar with **nori**, we call that the gateway seaweed, because it is so mild and one people are familiar with for sushi, it come in those flat sheets. So the is real common, and that one is highest in protein actually, which is great. So if someone is vegan or vegetarian this is a great protein source.

*Jennifer Stock:* So, when that is on the rocks, I think I know this species this is, and it seems to grow in the spring and it's really light and lettucey? On the rocks, is that the one? Or is it thicker?

*Heidi Herman:* Well yes, it's on the rocks it's right near the sand on the tidal area, it's very iridescent, it's extremely thin, it's one cell thick, which is really astounding for an algae to have that much mass and cohesion around their cells. It's not green, it's...gosh, I guess more in the brown range. There is one called sea lettuce?

*Jennifer Stock:* Maybe that's the one I'm thinking about.

*Heidi Herman:* So another one we collect is kambu, and that's the one I cook with most at home, it's most abundant as well on our shores, and luckily that's one that's popular with a lot of buyers, and then bladder rack, and that's a peculiar name fucus, isn't much better. But bladder rack is sought out by the herbalists, it has a lot of iodine, it's real strong and has a high impact on a meal, on a dish. So I would add just a little bit, or people tincture it or put it in capsules so it kind of bypasses your taste buds. And another variety we collect is wakeme; it's commonly used in seaweed salads, with toasted sesame oil. There is a different variety that's used in Japan for seaweed salads; this one is a different species but the same genus. And then the last one is sea palm, it's very delicious, it's great raw, or fresh dried. You needn't add it to a dish. Some people call it sea ribbons, and it's the one that's restricted actually, by non-carrying licensed harvesters. So those are the five kinds—nori, kambu, fucus, wakame, and sea palm.

*Jennifer Stock:* So you mentioned some uses for each of them. Some of them are tasty just to eat on their own, and some of them are used more as an additional thing to a dish. What are some of the things that something like bladder rack might bring to a dish? And what types of dishes are we talking about, like soup? Beans? I heard it helps break down the fiber in beans?

*Heidi Herman:* Yeah, the kambu specifically is know to add to a plate of beans when you begin cooking, it makes them more digestible, which inhibits the gas effect and break that down, and it also has a rally neat quality, the kambu, it's mucilaginous quality, which isn't that sexy of a word, but it goes out in the sauce and makes it instead of watery it makes it more congealed.

*Jennifer Stock:* Oh, I need this in my tomato sauce then. Because my homemade tomato sauce is very watery.

*Heidi Herman:* Um, yes? I mean I don't really have specific seaweed recipes, I continue coking the way I have, but adding it to every dinner in some fashion. Definitely the Komb goes into all soups and stews, it goes into chilis, curries, chicken soup, tomato soup. So that's the kombu, it's easy to add.

The nori I toast, and that takes out the last bit of moisture, and that creates this really fine black tissue paper that just shatters in to a fine flake, and that is really easy to add to dishes. Scatter on top, or dissolve readily into grain, and it's real mild, so I have a little bowl of that in the kitchen that I have just to add to dishes, because some of the forms as it comes out of the ocean are just difficult to work with, they are bigger piece and they need to get chopped up or soaked a little bit.

*Jennifer Stock:* Wow, I think I've seen it in gomasio, some sesame seeds, and some of the nori.

*Heidi Herman:* Yeah, correct. Some of the nori, and it adds a neat flavor the nori changes color to kind of a deep deep green, it's more tasty after you toast it, and then yeah it crumples down into a fine flake and then you can add whatever, I've heard people add cayenne and nettle to the mix.

*Jennifer Stock:* So one thing that's interesting about nori is that I see it sold in Trader Joes and other store in crazy amounts of plastic packaging, but when you open up the package it's always just a little bit. And I'm like, "I can't buy this, it's just way too much packaging." So this is exciting to heart you can just get this locally and dry it on your own, but how would you add that special seasoning that makes it so good? Would you dry it first, or put it with some sesame oil first and then dry it? How would you do that?

*Heidi Herman:* Yeah, making those sheets of paper, I wish it would come out of the ocean just like that. It looks quite different, it's quite like a crumpled up pile of tissue paper, but making those sheets is like when you were a kid making tissue paper, there's macerating it, and then sometimes, unfortunately, that tasty element that's added is MSG, and it even say on some of the packaging, "This is addictive." So just be mindful what else has been added to those nori sheets. But they are delicious and it's a great way, you know a lot of kids are asking for seaweed, they request it and want to bring it to school, it's a hot item on the school yard for trading. And I did not see this coming, it's unheard of. It's really cool that kids are getting that nutrition and are familiar with it, it's cool, and seaweed becomes a hip thing.

*Jennifer Stock:* That awesome. For folks just tuning in, you're listening to Ocean Currents, and my guest in the studio today is Heidi Herman, and she is a co-owner of Strong Arm Farm, and we are talking about the seaweed harvesting that she brings to her vegetable farm, throughout the year.

So obviously you have a license to harvest commercially, and it said on your website that you are the only permit holder in Sonoma county, I'm surprised actually, is there a limit to the amount of permits that they give out? Is this the Department of Fish and Wildlife that you get a permit from?

*Heidi Herman:* Yes, there are some other holders of a license in our county, but I am the only one that sells it commercially. I think there's like three or four, I asked the folks at fish and wildlife. Mendocino has a lot more; I mean our coastlines are quite similar, since the temperature of the water, and the variety of plants. There seems to be much more industry up there, so there's a lot more competition, and struggle to whose beaches are what, and there's some dispute.

*Jennifer Stock:* In Mendocino?

*Heidi Herman:* Yes, but gosh. I've never come across someone harvesting seaweed on our coastline. I give a lot of classes and workshops and so yeah, the people with that skill go to so many beaches.

*Jennifer Stock:* Well it's also a really rough coastline for the most part.

*Heidi Herman:* Yes, access is difficult, that is true, and that is perhaps why our coast isn't as prolific with harvesters, but the quantities and qualities are there. The different varieties are in high abundance,

and that's part of harvesting, is keeping an eye on what impact I am making here. Is this still a good choice and I'm totally open to not harvesting one of these varieties if populations are declining. There are newsletters and I keep up, and updates from fish and wildlife that let you know if there are shifts in some of the populations, but the license allows me to harvest two-thousand pounds a day, which is extreme, I don't even harvest that in an entire year, but that quantity generally refers to larger vessel harvesting that's done on different parts of our coastline and different parts of the world in general, that haul in and harvest. I mean I know it's happening outside of Monterey area.

*Jennifer Stock:* I'm not sure about Monterey, but I know in southern California, I used to live on Catalina island, and I remember hearing about these boats, Kelko, and they basically lawn mow the top of a kelp forest, and use the giant brown kelps for alginates, they'll take out the alginates that are used in a lot of different products that we use every day, but it seems to me a little more destructive because of the life that is in there. But I don't know a ton more about it, so that's another commercial permit I guess.

*Heidi Herman:* Yeah, it's the same permit; it's the collection of edible kelp. So it's \$140 a year approximately, and you sign up for a calendar year, and I report every month how much I harvest and pay \$0.0002 on every pound I harvest, which comes to like \$2 or something.

*Jennifer Stock:* That's amazing. So you've visited certain sites year after year, and maybe even season after season. How do you go about harvesting, do you try to select different areas at a beach, do you select certain sea palms and cut them all there? How do you spread it out while collecting to minimize your impact?

*Heidi Herman:* Right. So it's certainly something I've noted and observed. I usually bring some helpers and we decide what everyone on the crew is doing, who is picking what... what kind of impact are we making? Will the plants regenerate? And not just for my personal interest, you know are they going to be here next year for harvest, but also, "Is this the only genetic species on this beach? Yes? Then I am not going to harvest from this." But it's a personal decision; there isn't enough regulation on how much or how to harvest. There is kind of a gap there. So it is kind of assessing, you know? Different beaches have different populations, uniquely. And I have notes, I name different beaches, because they are just kind of pull outs on Highway 1, and within each of those some do have higher

populations of say Nori, like that will be our whole nori supply for the year, and it will shift from year to year.

So, like you said, sea palm is unique and that one isn't as plentiful on our coastline, and it's restricted, and it's actually hard to get to because it's in the high impact wave impact zone. So it usually takes some scrambling and there's some risk and how to harvest is so crucial, and that's actually why it's become extinct, or had a declining population, it's due to cutting at the **stipe**, and that kills the plant. So it's a very...precise site where it gets cut, so that those **marystem** and it can grow again.

We do go to some beaches and it's amazing to see how much they grow within one tide cycle, or like one low tide. You know, we go 28 days apart and there will be inches of growth and it's really fantastic to see the plants can rebound in that one season. And they are really large plants, they're perennials, and they shoot out fifteen, ten branches, of long arms that go into tide pool and not to clear cut that shrub. I view it like landscaping, so just cutting the tips of many of them and leaving more than half still on the plant for them to still spore that year and perhaps it does have unique genetic figures and we don't want to eliminate that diversity in a crowd.

*Jennifer Stock:* Interesting, you mentioned two words, "stipe" and "marystem" and those are two parts of the algae. And the stipe as I understand is the part that attaches to the base, and then brings up the fruiting body and then where are the spores, are they on the leaf?

*Heidi Herman:* They are on the leafs, and a lot of the leafs have this ballast, like a balloon that hold air, and that keeps them up in the water profile as the water rises above the tide pool. It keeps them up in the higher level so they can absorb that sunlight and photosynthesize, so there's a real purpose to those bubbles that people stomp on and make sounds.

*Jennifer Stock:* Yeah, I wonder if anyone has done any research into the cementing property of the part that holds onto the rock, because they really hold onto the rock with such tremendous wave action and forth most part can really hold onto those rocks. There must be some really interesting properties to that.

And the marystem, what is that?

*Heidi Herman:* Land plants have it as well, it's kind of like the center of cell division, like it decide if it makes more leafs or shoots, it's kind of like this center. And there's a lot of marystem around the plant, it's a type of cell that can reproduce itself.

*Jennifer Stock:* I see, so it's kind of like a sensor taking into account what's going on? I'm thinking of my garden, when I don't water enough things start to slow down, or shrink up a little bit, and the marystem is kind of taking in all this information and then responding. Interesting.

So this is great, I am loving being in this conversation, because seaweed is just so fascinating habitat and species to visit on the coast, and there are just so many food elements we can enjoy from harvesting it. I think we're going to take a short break here in a minute.

For those tuning in, this is Ocean Currents and my guest is Heidi Herman, and we've been talking about seaweed harvesting, and we're going to take a short musical break and we'll be back in just a moment to continue the conversation.

(Musical interlude)

*Jennifer Stock:* OK, and we're back. You're listening to Ocean Currents, and you're tuned to KWMR, here on Point Reyes station, and Bolinas. And I have a guest in the studio today, Heidi Herman, and we've been talking about seaweed harvesting and the food properties and the collection and the different tins and outs of collection algae.

I want just go back to a couple things before asking how I can go out and collect seaweed, but you were taking about where to go and there might be some jurisdictional boundaries. So, we are located here at Point Reyes national seashore, are they're any issues collecting here?

*Heidi Herman:* Since it is a federal park you cannot take anything. So you can't take anything from the shore once it has washed up, but that jurisdiction changes at the high tide line. So, if you go on a low tide, you can technically harvest from the shore rocks when the tide is out, and cutting it from the plants and taking it back to land is OK. But those things that wash up, you couldn't take those, and you wouldn't want to. You wouldn't want to eat it and wouldn't want to take them even for your garden. On other beaches you can take things from the shore, but not on federal or state beaches.

*Jennifer Stock:* That's good to know. You are collecting on the Sonoma coast, and there is a lot of Sonoma coast state beach, so do you have to stay below that line?

*Heidi Herman:* Correct, and that is when we go out. So the lowest tides in the year are in May and June, they are equally in December but there are a couple reasons why we don't harvest in December, first, they happen in the dark, usually, and it's icy cold, colder than in June, and then the drying of it. We dry outside, we let the sun do that, and so that would be prohibitive in December. And the plants too, they have their life cycle and when they'll regrow and when they're looking their healthiest and that's in June when they receive the most light and they're responding to that time of year, and they still have a chance to regenerate, and it's before they spore.

*Jennifer Stock:* Interesting, and also, there's been a lot of processes in the state, especially locally, the state put in a marine protected areas and those just went into effect a couple years ago, and that includes the Sonoma coast stretch. Are you aware or involved in that process, and that would definitely restrict access.

*Heidi Herman:* True, within our county I believe there are two marine protected areas, and one is around the Bodega head, and the second is around the mouth of the Russian river, I think there's another up in Fort Ross area.

*Jennifer Stock:* Stewarts point, I think.

*Heidi Herman:* Yes. Salt point region. So you cannot collect seaweed in those regions, they are intended to re-habituate, and not to have any extraction of abalone, fish or algae. So it's being mindful of where those borders are, and the beaches I go to are between that. Most of the beaches are accessible and that I would go to aren't in these zones. The ones around Bodega head, those beaches are totally inaccessible, so it's a great spot to have a protected area, that's naturally protected from humans.

*Jennifer Stock:* So, good placement.

*Heidi Herman:* Yeah, and those maps are online, easily found on the fish and wildlife site.

*Jennifer Stock:* Yeah, I can just Google them and find them.

So, how about for everyday people? You have a permit because you sell your product that you collect, but can anybody collect? Do we need a license?

*Heidi Herman:* Right. Regular citizens can collect 10 pounds a day with no license, with no paperwork at all. And 10 pounds is pretty sizeable; it's about the size of a grocery bag full it may be enough for the years supply. If you want to get more then you need to apply for this annual permit, which I said is \$140 from Fish and Wildlife, and then report monthly what your take is.

*Jennifer Stock:* And this is something I should have asked earlier, when you harvest a plant, are you using the whole thing, or do you have to trim off certain parts?

*Heidi Herman:* We only take what we are going to need at home, double handling is more work, and it's also wasteful, you know? Leave that in the ocean, or leave it on the plant, preferably. So it's just harvest what you need usually, just the tips, sometimes there's a little tattered part of the tip, or a secondary algae that's kind of taken hold on a frond of a Kombu, so we'll cut that off, and I prefer to leave that to get reabsorbed, because that's going to be food for somebody else.

*Jennifer Stock:* So we don't need a license to collect up to 10 pounds a day, but we probably need some about what we're collecting. Are there resources online, or classes? I know you teach locally, so that people can learn about harvesting.

*Heidi Herman* Right, so that's the real clincher. So, it's accessible and fun to go out, but how to harvest, specifically. And identification of which species are what. And how do I not kill this plant?

So I teach a class through a group called Daily Acts, I believe their website is [www.dailyacts.org](http://www.dailyacts.org) and they teach a lot of sustainability acts, and it's an evening lecture, and a Saturday foray where we go out and harvest together. That's usually in May or June of each year.

There's a couple other locations that have this very similar class, one that's California School of Herbal Studies, that has the same model, lecture evening, that answers a lot of questions, and then the go out as a group together. Another group is the RDI, there right here in Marin County, in Bolinas. They are the Regenerative Design Institute, and they teach this kind of combination lecture

foray. I'm going to be doing a new one this year at the Fort Ross Center, it's up on the north end of Sonoma counties coast, and they sell my seaweed in the visitor's center and we're going to go out and visit some new sites.

*Jennifer Stock:* So that's cool. These classes keep you busy in addition to maintaining a farm back in Healdsburg, and going out to the ocean too.

So what would be the most important tool in terms of how to harvest species? What do you collect with? Is it a basic knife?

*Heidi Herman:* Right, you can certainly just use scissors along, it's nice to have hands free when you're traveling the coast. You know it's quite slippery it's nice to have both hands available if you need to brace yourself if you fall. I like to have a little holster. So I commonly use Felco. It's this red handled shears that gardeners use. That's what I use all day at the farm and it's just always at my hip, so that's handy. You can just put the shear away or brace yourself as you're moving through that tidal zone. So it's just something that's sharp that you can put away.

Um, you can use a regular knife that has a sheath on it, plastic or leather. But just some scissors, yeah, it's easy to cut through it's like plant material, it's like cutting a tomato branch.

*Jennifer Stock:* Yeah, pretty soft. Cool. How about some of the herbal properties, you mentioned that a couple times and I understand there's different nutritional values, a lot of protein, some vitamins, but how about some of the herbal properties of some of these species. And how did we learn this, you mentioned some traditional cultures, so I imagine this is early cultures and values that've been passed down that continued to be used, but how do we use algae with herbal tinctures and vitamins.

*Heidi Herman:* Right. There is a lot of national and international traditions that notes different ways seaweed can be used. I've tried to gather as much information as I can about how our local Indians have used it. The Pomo tribe has long history, and certain tribes would go at different times of the year and gain access and train with that, it's a real nutrient source to bring inland, but they also used the seaweed in places in Denmark, and they use it as thatch for the roofs, which is really peculiar. It's about a foot thick and when it starts to rain it swells up and that's what creates the seal on the house, which is

really clever, and I guess you work with what you have in your region.

But in Ireland there also a lot of seaweed use, nutritionally they have spas over there, they warm it and you can immerse yourself into this seaweed broth of sorts. The Asian cultures are huge, and still have massive consumption of it. There're farms, similar to the oyster farms we have in our bay here, of these racks that kind of suspending the ocean and they rely on the tides going in and out, that kind of seed these racks and they're kind of able to seed a lot more, from creating more surface area for this algae to grow upon.

But nutritionally? Iodine is a real high nutrient that's hard to acquire in other species and food sources. Some people with thyroid challenges are encouraged to consume more iodine, but it's a nutrient we process through and need a steady supply of. The bladder rack is particularly high in that, although they are all pretty similar, they're just a couple percentage points off from the others. So the bladder rack is sought by herbalists who will just tincture it out and just for thyroid maintenance particularly. But they have a lot of calcium, and niacin, and thiamin.

*Jennifer Stock:* Nutrients that are hard to get in other vegetables?

*Heidi Herman:* True, especially in land plants. As our soil is becoming more depleted in mainstream agriculture, and not as enriched, the food will reflect that as well. And this is a great source and it's tasty, and especially in small quantities to a dish will really boost the nutritional content and capacity of that dish.

*Jennifer Stock:* Well thank you by the way for bringing in this bag of Kombu, I'll be really excited to the soups coming up in the next few weeks and I'm going to try it out and...

*Heidi Herman:* Yeah, I sell it in little one-ounce packets like this, in plastic, unfortunately, but it's sealed so it doesn't absorb moisture from its environment, and usually this lasts a few months, this supply in a kitchen. But it will also last 10 years; it's in its most stable form, which is interesting. What else has that capacity, its there are elements in the periodic table that are not degrading any further.

*Jennifer Stock:* No preservatives needed,

*Heidi Herman:* No, they've already got their own salts.

*Jennifer Stock:* Amazing seaweed. So, on your website you have a nice PDF available that talks about the uses and some local varieties. Oh I got it, here are the species names; paifera, lamenaria, these are names I am somewhat familiar with, but you also have some recipes on the back. Can you just give everybody the name of your website so people can find this?

*Heidi Herman* Sure, it's [www.strongarmfarm.com](http://www.strongarmfarm.com) and we have an email, it's [strongarmfarm@gmail.com](mailto:strongarmfarm@gmail.com) if you wish to contact me, if you have more questions. But yeah, it's strong arm, there's a PDF with general nutrition and then it's use in the kitchen, and body care, people use it as for face masks, and there's one variety called Turkish towel that's exfoliating, it has this kind of rough little bumps on it, it has this unique quality that while it absorbs water really quickly, and then you can rub it on your skin and your skin it absorbing those minerals through **germal** absorption, and you're exfoliating at the same time. Or a powder too, is a real nice softener of a skin. And then in the garden too of course. Kelp emulsion is commonly used, and it's fairly cheap in one-gallon jugs. So I use a lot of that fresh from what I harvest from the jugs I use.

It is short in nitrogen, curiously, and that's where the fish emulsion comes in, and that's particularly high in the nitrogen. So the two of those together holds a real balanced meal for your plants.

*Jennifer Stock:* How do you make a kelp emulsion? Is it basically dried that you soak and then chop into bits and pieces, or how do you make that?

*Heidi Herman:* Yeah, there would be some fine blenders involved, or you know, just macerating, I don't really know how they keep it in suspension and keep it from rotting. That's different element.

*Jennifer Stock:* So they probably dry it... I don't know, I just know I've seen the kelp emulsion before in certain products in gardening stores and I wondered what exactly is in there,

So something traditional that I grew up with was eel grass that has washed up on the beach was all brown and dried up at certain beaches, and from my memory I don't remember if these were protected places, because this was long island and there weren't too many protected places...but she would put it in the garden as a mulch. So I'm imagining that's good for water evaporation and also decays into the soil and helps add some nutrients back in there.

*Heidi Herman:* Yeah, right. Sometimes I just add it on top of plants that you hand water, put it in house plants a little bit, I put a little section in a watering can and let that soak overnight and then every time I fill the watering can more minerals come out. When I'm planting a bare root tree I'll put some in the hole, Some people drop it around the neck of a tree, it's kind of a cute aesthetic, and animals, our dog eats it off the ground, so we actually have to bury it, because our dog seeks out the nutrients, and really delights over seaweed.

*Jennifer Stock:* Do you rinse it off to get the salts off before the garden application?

*Heidi Herman:* No, but it's actually low in sodium chloride, the salt that we don't want too much of in our diet, but it's that other set of minerals, the phosphorus, the calcium, that show up as a sort of white crust, but it's not sodium, so it can't get toxic, with that specific mineral, but that whole spectrum of minerals is referred to as, "The salts." Because they have that white, and they have that kind of sensation in our mouths as well.

*Jennifer Stock:* And it would take a lot of it to really damage the roots I guess.

*Heidi Herman:* Yeah, all that rinse water I spoke about earlier, we douse our garden with that and there's been no signs of white crust or toxicity, it's just the opposite, the plants are totally thriving in that section where we dumped a lot of this rinse water out.

*Jennifer Stock:* Well, that's good to know, because I think I've been rinsing mine and wasting water.

*Heidi Herman:* And it dissolves immediately, those are nutrients coming out in that water. So water the houseplants with 'em, and feed the pets,

*Jennifer Stock:* Now I want to make sure I have this clear, because other people are going to run out to the beaches now and start collecting eel grass. So people can't collect seaweed that's washed up on the beach dead in a protected place, either and MPA, or federal land, like a national seashore here, and I'm not familiar with start park regulations.

*Heidi Herman:* No take.

*Jennifer Stock:* No take of seaweeds that's washed up on the beach, but you can go below the high tide line and collect if it's washed up, or collect it even if it's live, except that you said eel grass is a protected species,

*Heidi Herman:* It is, and I'm not totally sure why, it's not that much on our Sonoma coast, and it's a little coarse, it's not something I would be tempted to eat,

*Jennifer Stock:* It's mainly in the estuarine area in Tomales bay, I haven't seen it outside the bay, I've seen surf grass, the phylospadics, outside, but eel grass is an estuarine, in the esteros as well so really vital habitat for species, so that's probably why it's protected,

*Heidi Herman:* And when you're out there. I mean, there's not toxic seaweed, what we recognize as kelp is brown and in the ocean, it's all edible, some might be more coarse in the mouth or more chewy, or slimy, but give it a try, see what flavors work for you, and when they have the salt water on them they are really tasty, I am always snacking as I'm harvesting, I'm trying different kinds. I really like the bladder rack when it's raw, right out of the ocean, but once it dries it really take on a strong harbor flavor.

*Jennifer Stock:* Yeah, I remember one that was quite peppery... oh that's right it was a red algae, it was thin. It was in southern California, we used to taste it and it was very peppery. We used to taste it with the kids, I used to teach at a marine science institute and we had all the kids try them.

Well, very cool. Heidi this has been so fascinating, are there any other pieces of information you want to share? Or sources of information?

*Heidi Herman:* There's a limited supply of information online, I think there's a seaweed industry website that has a pretty comprehensive list of all the varieties, and where they exist in the world. Like on the east coast there are different varieties that prefer that climate and that temperature of water over there.

Why is our coastline so rich? Because our water is so cold and cold water is able to hold more oxygen and oxygen is the support for these plants, and so that enables the diversity and the health of these plants, and so perhaps as temperatures shift, there will be a shift in what animals can be supported by different oxygen levels,

and different temperatures. So they're very indigenous or localized due to all these factors.

*Jennifer Stock:* So shift in intertidal species, yeah they've already seen in animal species in intertidal zones different species are coming further north now and I know there's a lot of inner tidal monitoring to see how species that are typically in a lower intertidal are they going to be able to adapt to a higher intertidal level? It will be really interesting to see, but specifically with algae too.

Well fantastic, are you going to post the classes that you're going to be teaching on your website?

*Heidi Herman:* Yes, we usually schedule them around February each year, so yeah, look at any of these locations I mentioned earlier in the May June time.

*Jennifer Stock:* And again, your site is [www.strongarmfarm.com](http://www.strongarmfarm.com)

*Heidi Herman:* Correct.

*Jennifer Stock:* And all the classes will be there and people can go there to download this special information sheet that talk a little bit about the seaweeds that you can collect. The uses the recipes and you too can harvest from the shores, as long as you're not in a National park, or a state park.

Well thanks again Heidi for coming into KWMR.

*Heidi Herman:* Thanks as well.

*Jennifer Stock:* So folks, we're going to take a short, quick musical break and then I'll be back to wrap up the show. But we've been talking with Heidi Herman from Strong Arm Farm and we've been talking about seaweed harvesting here on KWMR on Ocean Currents. Stay with us.

(Musical interlude)

*Jennifer Stock:* Thanks for tuning in today to ocean currents, we've been talking about seaweed harvesting today on the show, really, really, really interesting, and wonderful way to access the sea, and enjoy the inner tidal zone and have some great food, as long as you follow the rules.

First off, this is the last show of 2013, I hope you have a fantastic holidays. Ocean Currents will continue through the New Year, in 2014, the first Monday of every month, between one and two, for the West Marin Matter series. And we have a podcast, and you can catch all the past episodes at the Cordell Bank website, [www.cordellbank.noaa.gov](http://www.cordellbank.noaa.gov) just look under the education tab and you can see all the shows from the very beginning, and listen to them online, or subscribe to the podcast and get them through iTunes.

I love hearing from listeners, so please if you can send me an email a comment, some questions, and future show topics. I'd love to hear from you, My email is [Jennifer.stock@noaa.gov](mailto:Jennifer.stock@noaa.gov) And next month, January 6<sup>h</sup>, I'll have the guest Matt Vieta, of the Underwater Explorers Group, and they have some really interesting, high-tech diving expeditions, and they recently dove off the shores of Cordell Bank, which is pretty rare. They had a successful experience and they've shared some wonderful, wonderful images and video at the sanctuary, which I am slowly posting on our Facebook page, and our website, so you'll see more of those in the future. But that you so much for tuning in today to Ocean Currents, and supporting KWMR, and I wish you all fantastic holidays.

(Musical outro)

*Jennifer Stock:*

Thanks for listening to Ocean Currents. This show is brought to you by NOAA's Cordell Bank National Marine Sanctuary, on West Marin community radio, KWMR. Views expressed by guests you can go to [www.cordellbank.noaa.gov](http://www.cordellbank.noaa.gov) to get all the past episodes on this program may or may not be that of the national Oceanic and Atmospheric Administration, and are meant to be educational in nature. To learn more about Cordell Bank National Marine Sanctuary go to [www.cordellbank.noaa.gov](http://www.cordellbank.noaa.gov)

(Musical outro)