

Lingcod featuring Donny Arthur and Brittany Blain-Roth

Hey to all fish enthusiasts out there! Whether you're an avid angler you're just curious about fish, we'd like to welcome you to Fish of the Week, your audio almanac of all the fish. It's Monday, January 9 2023. And we're on a week-by-week tour of fish across the country with guests from all walks of life. I'm Katrina Liebich with the US Fish and Wildlife Service in Alaska.

And I'm Guy Eroh. And if you're interested in potentially turning your green eggs and ham into a surf and turf may consider this week's fish the lingcod.

Awesome. And I'm very pleased to welcome our two guests, both with the Alaska Department of Fish and Game. We're happy to have Brittany Blaine back to join us and she's now an area manager with the Prince William Sound and North Gulf Coast and Brittany, we learned a lot from you about pelagic and non-pelagic rockfish here in Alaska in season one. And we're also very happy to have Donny Arthur with us who's also a fish biologist. So very much looking forward to learning more about lingcod and very warm welcome to both of you today.

Thanks for having us.

Yes, we're excited to be here. Thank you. Awesome.

Okay, so we fish for black rockfish a lot out of Homer, out of Seward. And while we're not targeting lingcod per se, we've caught quite a few and some of them have been like freaking huge and fearsome looking. So I was hoping one of you could first help us imagine if we had just caught one. What would we see? What would it be like to have one of these fish like on deck or in our hands?

Yeah, that's great question. So lingcod. The first thing you'll notice about them is their large head, many teeth. That's their diagnostic characteristic right there. They're often referred to as "bucket mouth" and "bucket head" because they do just have such a large head and they kind of have a cod-like body where they have dorsal fins. They're actually not a true cod. But they have giant pectoral fins. They can range from tan to dark brown, so many weird colors, including orange, even blue. And they usually have some sort of patterning, modeling, that I always like to think they look kind of like they have cheetah print, very cool looking.

And that's a adaptation for them the way they look and the way their body form is.

Yeah, so it has a lot to do with where they live. They are often associated with rock piles, rocky pinnacles. And so those pectoral fins help them kind of balanced a deep into those crevices so they can act as an ambush predator and help him versus speed. So this all feeds into their feeding ecology, even their reproductive ecology, and they can grow pretty large.

Yeah. What's the biggest one that's known on record?

Oh, yeah, it Alaska, the largest sport caught lingcod was 82 pounds nine ounces. There have been recorded lingcod that were larger caught commercially. In fact, there was 105 pounder caught in British

Lingcod featuring Donny Arthur and Brittany Blain-Roth

Columbia. They can grow very large in excess of five feet long. Sometimes they're even called Sea Dragons.

that's a cool name. That's cool. I always like to kind of look at the family and genus to see who a fish is related to. And I was really surprised actually, that they're related to greenling because that's another fish we catch. Incidentally, while we're fishing for rockfish. And I guess I was wondering if one of you guys could describe where these fish are positioned within that family and if there's any other close relatives that folks might be familiar with?

Oh,

Absolutely. So, as I mentioned before, lingcod are not a true cod so they are not in the Gadidae family. They're actually in the Hexagrammid. And so they are a cousin of rock greenling that are often caught throughout coastal Alaska. They are the largest member of the greenling family and so much larger than their counterparts and much more voracious than their relatives in the Hexagrammid family.

If you've ever caught a greenling, like the kelp greenling, they don't get very large. You typically see them a much, much smaller size.

They are beautiful.

Yeah.

And they're so tasty.

We had a guy on to talk about scaly head sculpins, which they're not particularly closely related. But I do think I remember from that conversation that Thaddeus was talking about these guys preying on sculpin, and being a major predator for them. So is that true? Or what else? Are these guys eating?

Yeah, so they are largely thought of as a voracious predator. But they are actually more omnivorous than people think. They don't just eat other large fish. Commonly they'll eat black rockfish hence why, Katrina, you probably run into them at the same time fishing. But they'll also eat pretty much anything that comes by. In our port sampling program they have cut open the stomach of a lingcod and seen entire pink or coho salmon in their stomachs. But if a school of sand lances has come by which are pretty small prey, high energy content, they have that big mouth instead of just getting one say rock fish they might get like a big bite of sand lances and end up with eating 30, 40 sand lances at once. So they'll eat smaller prey too. Pacific herring. They'll eat shrimp as well. You don't want to be a fish swimming by a lingcod there's so just aggressive. There's actually a lingcod I believe in Washington that had eaten like a 12, 15-pound yelloweye so it looks like it had this giant basketball in its stomach. So you can see their breath of prey, yeah, anything that can fit in their mouth. They'll even cannibalize. Lingcod can eat another lingcod that's almost it's same size. They have that large of a mouth gap that they can eat pretty large prey.

Lingcod featuring Donny Arthur and Brittany Blain-Roth

And yeah, so I just want to key in real quick on something you said there because, you know you're mentioned the variety of prey and that's all well and good. The thing that really stood out was when you said that there was full salmon in their stomach because I recall when I was a volunteer down at the Oregon Coast Aquarium, you know, the lingcod really got people's attention. They see the size of this fish. They tried to recreate this aquarium where it's like you're moving from inshore to offshore. So they had these rock pilings with the rockfish and the lingcods. They'd either be sitting on the rock pylons or sitting up on the glass tunnel that you're going through, and they didn't seem to be particularly active. So it really startled me when you said that they were able to just track down a salmon. So how do you reckon that would occur?

I don't believe that they're actually chasing salmon down. I think it was just the salmon's poor choice is swim by a rock pile lingcod that have been maybe dormant, maybe processing food from previous days years, the unfortunate salmon swimming by he can lunge out and grab you. And there were those 18 teeth that are inward pointing in their mouth. It's hard for a fish to get away so they can capture even a fast prey like a salmon.

Savages.

And one last thing we're talking about how big they get. Does this size preclude them from being the prey of other things? I know we've talked about salmon sharks on the show. I know we got orcas up there. Are there things that can eat lingcod they gotta be on the watch out for?

Yeah, as I mentioned other lingcod. You got to worry about them. But yeah, there has been documented stellar sea lions, seals, orcas. Many large marine mammals feeding on lingcod. Not all that common, but it definitely it does occur. So they do have natural predators as well.

What's the range of these guys? Where can you find them in this specific region where we're at?

Yeah, so they're pretty widespread range along the west coast all the way down to Baja California, out to the Aleutians of Alaska. So pretty large range for West Coast fish.

Okay. I do want to pitch a question here to Brittany just to get her back in the fold. So you're the manager now this area. This is a sport fishery you've said it's also been caught commercially. So what's the management like for this species up there in Alaska?

I always think of our areas, the hierarchy, as people want halibut, then they went lingcod, then they went rockfish. That's the go to. But lingcod are often a bonus fish like rockfish have typically been, but we have some certain rules in place to protect them. We don't allow people to keep lingcod until July 1, we don't allow harvest until they're 35 inches in length. And that's to allow for two reproductive events to happen. The reproductive history is very interesting, because after the eggs are released, the males are actually nest guarders and they guard the eggs. They're super aggressive during that time because they're protecting the eggs. So we are in turn protecting the males in that kind of April, May, June time period when they're guarding the eggs to keep people from harvesting too many because if something comes in front of them, they're very aggressive in protecting their eggs.

Lingcod featuring Donny Arthur and Brittany Blain-Roth

And then once they get removed from the nest, those eggs are going to be vulnerable to predation by other stuff.

Exactly, exactly.

Are they actually doing any kind of construction or is it just like a rock pile or something like a spot they really liked that they've picked out?

Yeah, pretty much any rock crevice a little burrow and a rock pile. If it's easier to guard you're going to keep out the greenling and rockfish and starfish that would eat those eggs.

They a highly fecund fish?

Awesome question. I love talking about fecundity. I did my thesis on yelloweye rockfish fecundity. Katya Berghaus is actually doing a fecundity study on lingcod. But some of the older studies are very outdated not from Alaska or along the west coast, but they saw cutting numbers as high as half a million. So 500,000 eggs in a large female, maybe they don't have 3 million eggs like a yelloweye rockfish can have but you know, half a million is not a drop in the bucket.

That's pretty good.

Once these eggs hatch, what's the rest of the life history of this fish through adulthood and they haven't had like make their living out there on these rock pilings with all these adults and predatory rockfish and stuff like that, or do they find themselves moving along the currents and finding some other more suitable habitat for juvenile fish?

Yeah, they hatch like any other fish are coming out with pretty small eggs basically like a pelagic larvae. And so they do drift with the currents, but they grow incredibly fast in that larval stage. And even in that first year.

And how big within that first year?

I think they can grow almost a foot in that first year.

Whoa!

Once in a while, we'll go out and we're just can't keep these small lingcod off and we'll see these massive recruitments of just these eight to 16 inch lingcod. And that's them just coming through a recruitment wave after growing so fast in that first year.

in terms of their reproduction, like when are they reaching maturity and then how long do these fish live? We know that the rockfish as you mentioned in that previous episode can live a very long time. Are these fish kind of comparable or what's their story there?

Lingcod featuring Donny Arthur and Brittany Blain-Roth

So they're not nearly as long lived as rockfish which are just an extreme case in regards to life history, but lingcod live have up to 25 years, so not necessarily short lived. They're fairly fast growing in that time. Females mature somewhere between three and five years old at about 24 to 30 inches, and the males mature a little bit earlier around two years.

So you mentioned managing based on inches and kind of using that as a proxy for the age of the fish. Is that related to the growth of the male or the female there?

It tends to be a little more directed at the female. So they are typically about the same size roughly at any given age, but males do mature about a year earlier. And that's just probably relates to the energetic demand it takes to produce eggs versus milk in testes.

Yeah. Is there any difference in how the males and the females look?

it's really hard to tell. Nothing morphologically, none of...you know no fin size coloration really even size. You can tell the difference between a male's reproductive parts and a female. You can tell one's more adapted for depositing eggs and one's more elongated to get milt onto the eggs that are deposited into crevices and cracks and rock piles. So that'd be about the only way and that that even takes an expert eye.

Yeah, for sure. It may not be sexual dichromatism like we have in the greenlings. But it seems like there is a lot of color variation in the lingcod. Do you know what causes that?

I suspect it has a lot to do with just blending into their habitat. If you're lingcod that's...maybe your residence is near a kelp bed, your color might help you blend into that environment. Whereas if you're in a dark rock pile, you might be a little darker. So I suspect some of it has to just do with blending into your environment...Camouflage to benefit you as a predator.

Yeah, while we're talking color, I got to ask about the blue meat. And Guy and I chatted about this ahead of time.

I argue that it's green. But that splitting hairs there.

What's up? Yeah, I guess you with your green eggs and ham I'm sorry. Your joke. Your blue eggs and ham. But what's up with the what's up with the flesh coloration? Is that kind of across the board across the range? Are there specific areas where that's more common?

Or is it just a rare occurrence?

Great questions. Yeah. So like one of the most bizarre facts about lingcod and actually all Hexagrammids. All greenlings can have a blue meat as well. There's no certain answer as to why the meats blue and when you see it, it's almost alarming. It aquamarine blue to like greenish teal, the thought is that is linked to diet. And there's a regional differences. In some of the southern populations

Lingcod featuring Donny Arthur and Brittany Blain-Roth

20 plus percent of lingcod have blue meat. There was a recent paper published by Aaron Galloway et al. just last year, and they looked at it across regions, and they saw in southeast Alaska, about 13% of lingcod have this bluish-green meat, but they did find that actually it's more prevalent in females throughout their entire range.

Is there a correlation between the external pigmentation of the fish and the color of the musculature? Or is it completely unrelated?

I think I've caught one myself here in Alaska, but California more commonly is where I've caught them and seen them and yeah, you'll see when you pull them up, they have that little bit of a blue hue and the meat's got that little blue to it as well.

I have one more color question I'll keep on the same so we grew a bunch of like purple cauliflower this summer. And when I cook that it's like beautiful purple and then I cook it and it turns like gray. Does the meat stay blue when you cook it or does it turn white?

So when you do cook it you can have this nice big aquamarine colored fillet when you cook it, it does go back to you know traditional white flesh lingcod meat.

Okay, so you got a dye afterwards.

haha dye it green for Guy. In terms of fishing, do you guys have any tips or strategies for anglers it seems like when we go fishing, I mean we're targeting black rockfish. There's a lot of them in the water column and it seems like nothing really gets to anything else except for very occasionally. How do you target a lingcod specifically?

way? Well first, I want to ask you, have you ever had a lingcod attack your rockfish?

Oh we've had them follow them up.

It's one of my favorite things is you're really in a rockfish and this lingcod will just followed it up and just hang out on the surface and just watch like waiting for it to pop off or something. I've had where I'm reeling in a rockfish and all of a sudden I get a secondary slam and you've got a lingcod that just attacked your rockfish and sometimes they'll come up.

So what do you like to fish for in so you've said what's down south in California or what have you caught them on before?

Oh gosh, I always say like if you have nothing else whether you're going for halibut or lingcod a jig head with a white tail or something that's mimicking a fish because they do just nail fish so often and I mean I pulled out about a 16 inch lingcod out of a lingcod once on one that I caught. Something looks kinda like a squid jig or a jig head with the white tail those are my go to is always.

Big rubber salmon [laughs].

Lingcod featuring Donny Arthur and Brittany Blain-Roth

They see those tails and they you know if it's just right on that rock pile, right, you know?

How many ounce jig heads?

That always depends on the conditions. You know, and the tide and how deep you're going down go to is always at 12-16 ounce at least unless you've got dead calm slack water. You know, you could fish a four ounce, but that's pretty rare.

Those tides can be rippin' pretty good, and it's sometimes hard to get your bait will just go. Yeah, if you don't have the right amount of weight on there, so yeah, definitely, I think depending on what part of the cycle it's in.

Yeah, yeah, Donnie, what's your favorite?

One of my favorite it's called a hex bar. It's really simple jig like a hexagon. It's just a long silver bar usually has a little red piece of plastic at the bottom to add some action. And that is a classic lingcod jig. It's super simple, it's heavy and it gets down quick and they usually will smack that the minute hits the bottom because it's so heavy and so streamline it gets right through that school black rockfish.

Are you keying into any kind of features on the ocean floor or depth or anything like that?

I love fishing lingcod shallow, you can catch lingcod from 20 feet to 500. But I really liked fishing lingcod shallow, I think there's a lot of prey going by the top of these pinnacles that are shallower. 20 to 60 feet. Plus, when you hook them with that much water, they'll hit and you might reel him up super easy to surface and then all of a sudden they get a burst of energy and they'll take you right back to the bottom and try to wrap you up in a rock pile or something. So I really do I enjoy fishing shallow for them.

if you are fishing around these rock piles, are you having to worry about them cutting your line on something sharp and jagged. And what kind of pound test are you having to use?

Donnie and I spend...I've spent a lot of time...we've done a lot of rockfish studies out in the sound over the years and our go to is really like that braided line.

You know, it can still fray on rocks, but it tends to be a lot stronger, lower diameter. So I like braid and usually running anywhere 40 to 80 pound test braid.

What kind of information are you guys still trying to determine about lingcod? Like, what are some of the studies going on right now about them?

Oh, gosh, Donnie mentioned Katya's study, which is a lot of the reproduction stuff. There's not a good stock assessment out there on lingcod. So really anything that can give us a better handle on how the stock is doing, you know, we see these different age classes coming in. So one season, we might catch all 10 to 12 inch size fish. And then the next season we're catching like 16 to 20 inch fish. And so we

Lingcod featuring Donny Arthur and Brittany Blain-Roth

can see this, but it's this side data is not a study associated with but it's just good information that we get. Yeah, observations that we get from anglers or from our own work to kind of get a handle on what the recruitments like to the fishery because lingcod data we get from our port sampling program. And that's for legal sized fish, right. So we get data, age length sex data on fish that are over 35 inches, but we don't have a good handle on sub legal fish. So any information we can get is super valuable. We get an idea of angler interviews, we get information, how many they caught, how many they released, we get a handle on it that way. But stock assessment data is always lacking a lot of marine fisheries. If only we could count every single fish out there to know what's an ok number to harvest. That's always a tough side of being a manager.

Is this sense that these guys are doing pretty well? Or do we have an idea just overall kind of health of the populations at least in Alaska and maybe beyond? If you know that?

Yeah, we're doing fine. We had back in, I think it was 2018, we actually reduced the bag and possession limit for lingcod pretty significantly, basically cut it in half. And that was in part because we don't have a good level of information. It's important for us to be able to maintain the population and we want people to be able to fish for these fish and keep them if they want to keep them down the road. We always hope for better stock assessment information, whatever we can get.

What was the bag limit? And what is it now?

So it was two and four. And this is in Prince William Sound, it varies by area. Now it's one and one. Okay. Yeah, so pretty good change? Yeah. one on ones right, isn't it, Donnie?

Yes. He made a face.

Oh, I just wanted to clarify when Brittany says like two and four, one and one that is bag, like bag and possession limit Exactly.

That you can keep to one day and to the next day if you can't get all four in one day.

Yeah, exactly. Like process right. bagged up? And yeah,

That change didn't have like a huge reduction. It's not common for people to catch a lot of lingcod. So when we go out, for instance, and you might only catch one that's legal.

Okay, so that point you bring up there. I got two questions. Now one, Katrina just said, "Okay, you can process it and put it in the freezer." Is that true? Because I know some places like fish in the freezer count as being possessed. And that you can't keep possessing that. But does the processing get that off of the possession limit?

I can see Donny itching to say it's the actual lingo.

Lingcod featuring Donny Arthur and Brittany Blain-Roth

Yeah, so it's basically it has to be preserved in a manner that it could be consumed two weeks later safely.

You wouldn't leave it. You wouldn't leave it in your cooler for two weeks. There's other means like some people will salt them. That's a means that you know, or some sort of other technique but freezing is the typical one.

Okay, I'm glad I asked about that because I definitely in my head freezing still counts as part of its being possessed. And I know other states, I think that's part of the rule. But you're talking about like the importance of getting this stock assessment to figure out how things really stand and what kind of pressure a fishery can face. If you do get the stock assessment back, and it says that, okay, we got to restrict what we're allowing people to keep it we're already at one daily bag and possession, where do you go from there? How do you lower it more to ensure that you're not over harvesting this species?

Sure, yeah. No, that's a good question. We can always go to an annual limit. That's the next step. So an angler might be only able to keep one or five per year, we have annual limits for other species in other places. So it's not outside the norm. But there's a stair step approach. You do bag and possession limits, you can do season restrictions, so we could shorten the season as well. So yeah, a few different options that we could look into if we ever needed to take management action. And that goes for any fish species, not just lingcod.

Say I catch one. It's undersized or I catch a big one and it's out of season. What are some handling tips like handling these fish efficiently safely for yourself safely for the fish?

We actually one rule that's always been, and it's really for any fish, but it's always been specifically lingcod. Don't gaff it, like you're not allowed to gaff a fish if you're gonna release it. And people have different thoughts on this. If you have a gaff, you throw it through their mouth, and how is it any different than when we use a deep-water release on a rockfish? If you put a hook through a meshy area of their mouth isn't really going to hurt them? Probably not. But if you gaff them in the gut, they're probably not going to live.

And a gaff is like a, I don't know what the dimensions are, probably a centimeter spear that you put through a halibut.

it's a lot bigger than putting a hook in the fish's mouth when you're doing a deep-water release kind of thing. lingcod Donnie mentioned the teeth on of them, right? It's not like salmon or something to hold it by its lip and pull it up, you got to be real careful. And if you can keep it in the water and just pop the hook out carefully, like any fish, keep it on the water as much as you can, don't stick your hands under its gills. And that's another go to people like to do is because their heads are so big. And it's such a good spot to kind of put your hand around. If you could do it carefully, sure, but I sticking your hands that close to their gills, that's not a good method. Some people like to use the gaff to just pop the hook out. That's another method. Donnie got some others. He's got a lot more lingcod than me over the years.

Lingcod featuring Donny Arthur and Brittany Blain-Roth

So yeah, I just think it's anything you're gonna catch and release like trout, even lingcod, which seemed like a pretty hardy fish, I keep them in the water as much as possible is the best way. A lot of people will handle them with basically a set of claws that are open and retract and that allow you to hook onto their mouth and allow you to control them a little bit are often referred to as boga grips. They help you hold on to their mouth, so you don't get stuck by their teeth.

Yeah, exactly. You don't want your fingers getting chomped off by a lingcod. But yeah, and so that will help control them and allow you to pop the hook out in the water. I often use a net, they do go a little crazy once they're in the net, but it's just easier control. I mean, once they settle down, they're just going to lay flat there and then and then you pop the hook out, turn them loose and it's pretty amazing. Once you let them loose, how fast they just with a massive burst of energy just take off.

Yeah, I always try to just will them to throw the hook when they come to the surface.

Shake, shake, shake.

Sometimes they'll shake it loose themselves.

You know, a lot of people they see these lingcod they kind of look like an extended rockfish and they're used to catch in rock fish and having this big barotrauma where it's...they get the expanded swim bladder and it forces the guts out of their mouth. Is that something that you see with rockfishes too? Or no?

Yeah, we do not see barotrauma and lingcod I think partly has to do with just their biology, they're moving up and down in the water column throughout their life, possibly daily. In order to be able to do that you can't have a closed swim bladder like a rockfish does. And so lingcod in fact, actually don't have a swim bladder. And this allows them to just move up and down in the water column. And they probably are expending more energy than say a fish with a swim bladder to do so. But yeah, they just don't have a close swim bladder and so they don't experience Barrow trauma

Guy, what's the fish nerd term for closed swim bladder?

Physoclistous.

Okay, that's what I was thinking.

Yes. And the Physostomous is open.

There you go. Good job.

I assume you've eaten this fish. Both of you guys.

Yeah.

Lingcod featuring Donny Arthur and Brittany Blain-Roth

Can you give us any indication of what it tasted like or how it was prepared or any suggestions for folks out there?

Yeah, lingcod to me, what's different is they're flakier, the meats flakier than say more dense, like a rockfish or a halibut. So my go to with it is typically baking it. If I want to be simple, I'll just do a sweet chili sauce or something on the on top or throw it on the barbecue just like I'm gonna do a chunk of salmon. I have children so I'm big into making the fish nuggets, everything into fish nuggets. And this one I don't really care to do it with though because it just falls apart a lot more. So, baking is my go to.

Okay, Donnie?

yeah, we got lingcod are super tasty. They're actually pretty mild so don't have a strong fishy taste if they're well taken care of when you catch them. And as Brittany said they're kind of flaky so they do make really good tacos. Lingcod tacos are great. But my go to is actually I love for some reason I love putting lingcod in curry. I like putting a big chunk in that it flakes into the curry. That is my go to. I almost use lingcod exclusively for curry save the halibut rockfish for the tacos.

Okay, like I said, I haven't eaten one. But if there anything like greenling. Really missed the pan fish from the lower 48. And that's like the closest thing I've found to bluegill or crappie or anything like that.

Absolutely, I see, I'll see a lot of similarities from the panfish from the lower 48 to the meat of all hexagrammids. It's really tasty, really mild. And the nice thing is, is as opposed to a bluegill or something you can get a pretty large fillet off a lingcod.

You mentioned anglers and providing information. Is there anything folks can do specifically, if they catch a lingcod? How do you receive information? And what information would you like, if anything?

Yeah, that's good. I'm going to take this one Donnie.

Yeah, you please do, that's a great question.

One of the most important things for us, and where we get a lot of information is from our port sampling program. So we have certain ports that when anglers come in, they can bring their fish into get sampled by our samplers that work down in the area. The biological sampling is important. That's actually on the management side that's how we really look at trends of what's going on. We can look at age classes over the years, we can look at the lengths of the fish over the years, and that is what gives us our best stock assessment indicators. You can see certain years show up as dominant when there's been a good reproductive event. And that helps us get a handle on what's going on. So if an angler comes into a port, and our port sampler's there and says, "Hey, did you catch any lingcod today?" it's great if you have the fish with you, or at the very least, the carcass. So if they actually bring the carcass back in with them into port they can take that they can get the odorless from it, they can still get the links they can still get the sex of the fish. The message I guess I would put out to people is if you're ever in any of the ports in Alaska and a port sampler approaches you please provide them the best information you can.

Lingcod featuring Donny Arthur and Brittany Blain-Roth

You brought something up that's interesting about lingcod. The aging structure that is most commonly used.

Oh, yes, thank you, it's not actually the otoliths that we take on those.

What are you using like fin rays or something?

Yeah, the dorsal fin rays between the fourth and 8th ray yeah has been proven to be the most reliable structure to age from. Surprisingly lingcod otoliths are really small for their size. When you look at the otoliths of a cod or even a rockfish they're fairly large but yeah, lingcod are very elongate and small. And so it makes aging via otoliths pretty inconsistent.

And otoliths are like a little bony structure in the head that has rings kind of like a tree.

Exactly. So otoliths meaning ear stone so yeah, exactly. That's piece of calcium carbonate in the ear that lays down annuli like tree rings. Yeah, but those same annuli actually can be viewed in the dorsal fin rays of lingcod.

Our program is the groundfish sampling programs. So it's halibut, lingcod, and rockfish and even sharks if they catch those. So anytime someone can bring in a carcass and if the port sampler isn't there, they can just check it. But if they're there, it's great information for us to have.

Okay. This has been very interesting conversation and really appreciate you guys coming out.

Yeah, for sure. It's been fun.

It's not a ling it's not a cod it's even cooler.

Yeah, exactly.

I hope everyone gets out there and enjoys all the fish, especially the lingcod thanks, you guys.

Thanks for having us. We love talking about fish.