Ryan Okano: This is only an audio recording, not a video recording.

Madyson Miller: Yes. It is only going to be audio. I will not release this. I am clearly [laughter] in my jacket right now. [laughter]

RO: Just clarifying. Yes.

MM: Awesome. So, good morning, Ryan. Before we get started, I just want to remind you of how this interview is going to go. So, that you do not get any surprises, but we are pretty much just going to start at the beginning. So, childhood all the way through your life right now and talk about all kinds of things regarding the ocean, coral reefs, your career, your family, Hawaii, all kinds of stuff hopefully. But I just want to make sure that that sounds good before we get started.

RO: Yes.

MM: Awesome. So, I am going to slate now and then I will pass it over to you. So, I am Madyson Miller, the Knauss fellow for NOAA's Coral Reef Conservation Program. Today is Tuesday, June 21st, 2022 at 1:00 p.m. Eastern Standard Time. Could you please state your name and the location that you are calling from?

RO: My name is Ryan Okano. I am calling from Mililani on the island of Oahu in the state of Hawaii. [laughter]

MM: Awesome. I am jealous. I wish I was there right now. [laughter] So, we will just jump right in then. Like I said, I like to start at the beginning. So, the first thing I am going to ask you is could you tell me where and when you were born and a little bit about your family?

RO: Where I was born? I was born in Hilo Hospital on the island of Hawaii on March 29, 1972. I grew up in the Plantation Village community of Pepeekeo. Pepeekeo was the site of a sugar mill plantation. It also had a garage where they kind of fixed king trucks. That was my dad's job. Back then my dad was a mechanic fixing the king trucks. when I was born, it was a kind of a brand-new community subsidized by the plantation. So, the plantation workers could get cheap housing and it wasn't rented. They got to purchase the house and the land and stuff like that at a discount rate that was subsidized by the plantation. Like I said, it was a newer community. Both my mom and my dad, prior to moving to Pepeekeo, they grew up in another plantation village that was just north of Pepeekeo. It was Honomū. I mentioned Honomū because it's kind of kidding but kind of true that my family is related to half the people in Honomū. So, I got to bring up that community also because I have strong ties to that area. So, yes, growing up, we frequented those areas whether it be down at the – I wouldn't really say beach because in that area there's no real sandy beaches. But we would go down to more like the *muliwai* we call it, or the estuaries where the river met the ocean. There's a lot of parks. Not a lot, but there's some parks in some other places that we'd go to hang out and yes, swim and play in the water. I am the eldest of five children. So, my parents had three boys, two girls. Yes. I don't know how much you need because I can keep on going. [laughter] I don't know. So, the question was my youth, I guess you said. When you say youth, how youth is youth?

MM: Yes. Tell me everything. Anything you want, just keep as descriptive as you want it.

RO: Yes. So, I'll break it down. I guess youth is eighteen. When I think of youth is up to eighteen years old. So, yes, almost every summer when I was growing up – we live on the east side of Hawaii island, and the east side is lush green, but rainy. It's exposed to the trade winds, so the water is usually rough. So, actually, a lot of my early days in the ocean, like I said, when I was growing up, we'd spend time in the streams and the estuaries a lot when we were younger, on my side. I guess I jumped in all about this but what we'll do on our side is as far as aquatic resources, some of the first things I got involved with was the stream stuff. We have these prongs that was introduced to Hawaii and we spear them and catch them. They had pretty good size. But some of the native species would also consume on our side in the streams was the *hihiwai*. It's a snail and the *opae* which is a shrimp. Even the *'o'opu'*, it's these endemic gobies that we have in Hawaii. Most of it was endemic, but one of them is indigenous found in Guam too. But yes, so those are the aquatic resources from my area that I got introduced to early on. But like I was saying, every summer we'd go camping on the west side of Hawaii island, we'd go to Spencer Park in Kawaihae. That was where to get white sand beaches and coral reefs and stuff like that. That's where I got that experience early in my life. One of my favorite ways to fish is spear fishing. The first thing that I speared wasn't a fish, it was a (prop?) on the freshwater side. But the first fish I speared wasn't on the east side where I grew up. It was on the west side on those camping trips at Kawaihae. I remember it was a pirate fish, probably it was undersized. I don't know, it was kind of small at the time. That was the first thing I speared ever. But I remember it because it was the first fish that I speared. I cleaned it and I cooked it all on my own at a very young age, of course, under supervision. But I always remember that. On our side, like I said, the waters are usually rough, so we used to surf a lot. I still surf now over here. Over here, the surf is really good. I surf a lot on the north shore of Oahu. When I was growing up, it was like a dream, this area. But when I was young, I used to surf a lot. That is how I really got my relationship started. I mean, not started, but kind of really got tightened with the ocean, I guess you could say. Because I always just spend time in the water, but it really got tight as in a sense that we would go down every day. Just being aware of the conditions of the ocean in a daily timescale and knowing if it's windy and rough. Fishing and spearing became like a plan B option. The goal was always to go down into the ocean, and to this day still, relieve stress and makes me feel better. Whenever I get out of the ocean, I'm always happier after than before when I got in. It always makes me feel good. But that relationship grew, and fishing was secondary because surfing was primary. Then when the waves were down, we still want to get in the waters. That's when we grabbed our spears and really started getting into fishing. It was funny because growing up I thought the stuff we did was just everyday stuff. Everybody knew about the kind of stuff we did. Everybody had that knowledge. Everybody had that skillset. That's what I thought, because that's what was surrounded by me everybody did that I interacted with. It was common. Everybody did it. But as I grew up and matured, I realized that no, that's not the case. What I knew and what my community was practicing is more different, almost like it's more unique. That made me feel special, made me feel special about my community. What's even sadder is, in my mind, that style of growing up or that way of life, I guess you could say, is becoming more and more rare. Yes. I get sadder when I think about it because I get emotional a lot too when I start talking about things that are important to me. That gives me motivation to make that way of life still a

possibility. I'm not saying people got to live that way. I'm not saying I want people to live that way, but I want people to have that option of living that way. It's a good way to live. It's a really good way to live. When you closely depend on the natural resources and you care for it. We need that. We need more care for a natural environment. I think I'll stop now because I'm getting emotional and off maybe, so I'll pause. [laughter]

MM: That was wonderful intro to this interview. Thank you, Ryan. I want to talk about some of those activities that you got to do growing up. Surfing, fishing, swimming, you got to do everything, camping. You mentioned that when you are surfing it gives you sort of a good feeling and that is a healing relationship. Can you explain why you feel that way or how water creates those healing properties? I think this is a big topic, water is healing. I think it is interesting to hear how people build that relationship with water.

RO: Yes. I think you've probably heard it all before. But for me, it just feels when you get out of the water, to me one of the best feelings is when we used to surf in some of our areas. I'll just ramble some names off just in case some people know like *Kolekole* and *Hakalau*. These are estuary areas. So, we'd go to surf in the ocean but it's still kind of estuary. It's always a mixture, but more the salty part. We'd surf in the ocean. After we would surf, we would hop in the stream and rinse off. That feeling after you dried out, that feeling you have on your skin after you dry out from a stream water in Hawaii back where I grew up is a unique feeling. It's just your skin and it just feels so good. It just feels so good. That physical feeling just feels so good. It's [indescribable], you just got to feel it yourself. It's subtle, but it's there and it's a unique feeling. I really miss that feeling. Because over here, it's mostly saltwater. There's no streams that I can jump in after I surf. So, there's minimal nice clean streams on Oahu relative to where I grew up too. So, I really miss the streams. That feeling you get when you come out of the stream and just like natural dry, not towel dry, it's air dry. It's a unique feeling and I love that feeling. Just being in the water, you have that weightlessness. It's not flying but it's more like flying than walking. That feeling in the water just makes my body feel good. You can imagine if you could fly, it probably feels cooler, but that feeling also. To me, nowadays more so because nowadays, work is just so – I love what I do, don't get me wrong. I love my work. It's just the volume, it's just too much. The volume is too much. It's a lot of things going on. Like I said, but I love what I do. So, there's a lot of things on my mind every time, every day and all through the day thinking about work stuff. When I go in the water, whether it be surfing or diving, you got to be present in the moment and focused. In that moment, you're only thinking about one thing, whether it'd catching the wave or getting over that set because you don't want to get pounded or finding the fish or aiming for the fish or spearing the fish. You are focused and you're not thinking about anything else, like all that other work stuff. I think it's really healing for me. Even though I'm not doing it at the time, like say I'm at work and I'm really just kidding a lull or just not feeling motivated, then what I'll do is pull up pictures of maybe some past catches or some surfing pictures. I'll look at those, and that will help re-invigorate me to keep going. Because then it gives me that appreciation for the ocean again. Reminds me, I guess you could say, and keeps me going at work to help take care of the ocean. Yes, I think so. I like the sun. I like the salt. I like the sand. I like all that being in there. The ocean is healing. For example, I have a friend who does more traditional healing. He would always say, "It's weird when you're sick, they tell you stay at home. But when you're sick, the best place to go is to the beach." Because when you go to the beach, it cleanses you. A lot of times when you're sick, it's

phlegm and all that kind of stuff. Every time, when you go to the beach, you notice that you start to flow. You get all that yucky stuff out. So, it's literally healing too. I believe that because I do feel better after I go to the beach when I'm sick.

MM: Yes, I agree. That is awesome though. Going to the beach when you are sick is the best. [laughter] So, with surfing and swimming, you also fish. I am wondering what is your favorite fish to eat, to catch? Then I have another question later on about an article I found about a funny fish that you kind of found washed ashore, but [laughter] we will get to that one. First, I want to hear about your favorite foods, your favorite fish.

RO: Yes. My favorite fish is a little reef fish. It's called the Kole, I think. So, *Ctenochaetus strigosus* or something like that. It's considered endemic to Hawaii, I think. So, we find it in Johnston Atoll or another set of islands that is real close to Hawaii, but it's considered endemic. Relatively endemic to Hawaii. It's also called the yellow-eyed kole, K-O-L-E. It's popular in the aquarium trade. Well, it was popular in the aquarium trade until we shut down the aquarium trade in Hawaii. Not "we" as in DAR, but it was like the aquarium trade shutdown because the judges or the courts shut it down. So, prior, it was the second most popular fish we exported for the aquarium trade is the kole or the yellow-eyed tang. This fish doesn't get that big, maybe nine inches is some really big one. But chaca size, we call them. The size of a chaca is about the minimum size that we harvest for that fish. Yes, it's a sliding rule because when you're younger, your chaca is smaller. But we give you some slack because you're younger and you're learning. So, that's a sliding rule. That's a little thing we like to use. Pono practices or responsible fishing or sustainable fishing, just rules that we develop in our community is like chaca size. The smaller your chaca, you better be trained on back. That usually refers to smaller fish like kole. This tang that I'm talking about and some of the other smaller fish that we like to spear. But chaca size wouldn't apply for stuff like pirate fish or some of the larger *naso unicornis* and stuff like that. In general, chaca size is the smallest fish you can harvest, but not all fish you can harvest at that size. But anyway, the kole, it's the yellow-eyed kole, that's my favorite fish. Where I grew up, it's relatively abundant when it comes to target fish. But over here where I fish, like I said, I spend most of my time on the north shore. Wintertime is surfing and summertime, it's diving. It's usually what it is, diving for fish. There's not much kole on this side, so that's sad for me. But there's other fish I like to eat like aholehole which is the flag tail, I guess. <u>*Aweoweo*</u> is another one. *Menpachi* or (*`ū`ū?)*, soldierfishes is another one. Not every fish, but a lot of fish I like to eat live in holes and cracks and crevices. The method I usually use is a more low-tech method. It's a three-pronged spear. We call it the three-pronged spear. It's a sling spear powered by basically a surgical tubing, a rod and a tip with three prongs. I use a six-footer, which is on a shorter end for those spears. I like to use a small spear because it's maneuverable in the holes and in cracks and crevices. You can move it along. The longer it is, it gets caught in the rocks as you move it around, so you have less flexibility or less maneuverability, I guess you could say, with the longer spears. The kole is sufficient, does not live in a hole. It is out on the reef a little bit, but a lot of other fishes, I use that. I like to go fishing with my bodyboard fins. That's how I surf, I use a bodyboard, not surfboard standup, but bodyboard, the light kind. I like to use my bodyboard fins because that's the fins that I'm most comfortable with. It's also really maneuverable. Some people use those super long fins. Then you can imagine if you're in the reef trying to go in cracks and crevices, you cannot turn around and move around because that makes you much more longer. So, I like to use these short fins,

makes you more maneuverable. But there's trade-offs of course, longer fins are better for open water and swimming further, I guess. But that's the style I like to fish. My favorite fish is the kole, the reef fishes. I love to eat goatfishes too, *Kūmūs* and stuff like that, *moana kali*, *munu*. All those goatfishes are delicious too. Yes. So, most of the stuff I do is more nearshore reef fishing. I do enjoy eating all kind fish though in Hawaii. I like to eat poke, which is usually ahi or tuna. I love that too, and *mahi*. One of my favorites, I guess it's a pelagic, is the opah. Oh, that fish is really good. The moonfish, I guess what it's called, that one is a treat. I really love the opah too. I like more the strong rich fatty fishes, I guess you could say.

MM: That all sound super delicious.

RO: [laughter]

MM: I guess I am a little curious. So, you free dive then for the fish, right?

RO: I free dive now. That's an interesting question because when you're growing up, you got your phases in fishing. When you're young, you just want to be the guy who catches a lot of fish. [laughter] You want to be known as a guy that kind of like stuff. Then as you get older you realize that it's not all about catching a lot of fish. It's more about sustaining. It's about catching fish when you want. It's about providing fish to your family and stuff like that. But I lost track. What is the question again? [laughter]

MM: No worries. I said, you are free diving then for the fishing. [laughter]

RO: Yes. I think so where I was going is that one time I would scuba spear. I would scuba spear with my friend guys. In the community, we had an uncle with a boat and I had this other friend that kind of moved to my community. Me and him used to scuba spear. So, I used to scuba spear before. I haven't scuba speared for maybe almost fifteen years actually already. Maybe I still would do it again. I'm not saying that I wouldn't, but I haven't for fifteen years. Yes, if you're going scuba spear, you can catch a lot of fish. [laughter] You can catch a lot of fish with scuba spear if you know what you're doing. To me, when you're going out in a boat and you're scuba spearing, you're just upping the game. You just, what you call that, the overhead I guess you could say in a business sense. It's so much more. The expectations is so much more that it's a different vibe. I wouldn't say it's not as fun. It's just a different vibe. The expectations is so much more. I guess like when you're just flapping on your [bodyboard] fins and with your three prong and just swimming from shore. You're just out there to make sure you get eight pieces. At least eight pieces is what I look for, and that's enough for my house. If I get a little bit more, I put them in my freezer. People say, "No, don't put in your freezer." I catch a little bit sometimes extra, so I put them in my freezer. To tell the truth, I only have the freezer space that I have. In my house I have a single unit refrigerator freezer. So, my freezer space is super limited. So, that's my limit. A lot of people in Hawaii, they get chest freezers and the whole thing freezer and they load that stuff up. So, I'm not doing that kind. I just have the freezer that is in my house, the same freezer that I put my ice cream and frozen pizza in, that's the same freezer I use. So, I have a lot of limits. You can imagine, my wife might say, "Hey, you got too much fish in the freezer." So, I'm limited on how much space I have in the freezer. Now the funny thing is, one of my hobbies is aquarium fish. I have a lot of fish food in my freezer too, so

I'm limited in my freezer space. Another limit I place on myself is when I dive on Oahu, I literally have a mesh bag. The mesh bag isn't that big. That's my bag limit. Literally, that's my bag limit. If I fill up that bag, that's enough. It's too much already. I try not to fill it up. I literally put a bag limit on myself on Oahu when I dive. When I dive on Hawaii island back home in Hilo side, I don't have a bag. I use a *kui* or a stringer. That one you can carry a lot more fish. So, different practices, different places, yes. It's three prong spear fishing. That's what we grew up doing. It's the most affordable thing. A lot of the things I learned early on. We wasn't rich in plantation, so a lot of times it's just getting by. So, the more economic ways is what we'll go with. The three-prong is more economical. I have spear gun. I haven't used it since I moved back to Oahu. So, maybe I've been here maybe like four or five years back to Oahu or back in Hawaii and I haven't used it since. So, I have those, but I don't use them. I have longer spears, but I always take my six-footer out.

MM: Yes. Thanks for sharing. I also free dive. So, I was really curious about your experience doing that in Hawaii. I think it is time to give the listeners what they want and talk about this unusual fish that washed up on the shore that I found this article with this picture of you on the beach. [laughter] I was wondering if you could tell me a little bit about what that experience is like finding this fish that I will let you talk about.

RO: Yes. I just kind of setting the stage. I grew up in Hawaii. Hawaii is my home, but I moved to the island of Saipan for seven years. Then I moved back to Hawaii and worked for the Division of Aquatic Resources. It was in that early stage when I moved back to Hawaii that this incident happened. What happened was a *Mola mola* or a sunfish ended up in one of the lagoons, these artificial lagoons in Ko Olina. It was beached there. We got this call and one of my coworkers was, "Hey Ryan, you get shorts." Because we were at the office, I was in office clothes. I wore shirt, slacks and shoes. "You get your shorts, you get (Tommys?)." I usually would have it. You should have it in your desk, swim shorts or whatever just in case. He said, "Sunfish trapped in Ko Olina lagoon. You want to come check it out?" I said, "Shoots, let's go check it out." So, I went down there. This other guy, he wasn't dressed up. I don't know, he never like it in the water as much, but it was there, it was kind of beached itself, kind of lying on the sand and sideways, because this thing is tall. The thing was like four feet tall, you know how the fins are. It's like that, stretched top to bottom, it's tall. It was just lying siders on a beach and just like listing and stuff like that. So, I was like, "I feel sad for it." I could tell you one other story after this one. That kind of shaped my life too. So, what happened was a remora got stuck in one of its gill holes. Because it doesn't have a gill plate, it has a gill hole like puffer fish has a hole. A remora was stuck in there. I figured I wouldn't like something stuck there. I wonder if this is it, this is the reason. So, I yanked on the remora. It took a long time to pull him out because the remora, I don't think it even got scales. It's super slick. It's super slick and I kept on yanking and just irritating the remora. Just irritating it, just making it feel not comfortable there. Eventually, it just swam out. Then after that, the fish kind of started to feel better. It seemed more lively, a lot more lively, at least I could tell. So, we just gave it some time. The lagoon has a channel that you got to swim out. So, I kind of escorted it out the channel kind of (righting?) it up, escort out the channel, just watching it. It got better. It kind of recovered. It was swimming upright and stuff like that, and just pushed it on its way. I will say, I love fishing. I kill fish and get to eat fish but there's such a special feeling when you release an animal like that. I've done it for other reasons and stuff like that. But that feeling you get when you release an animal, you

help an animal, the feeling is awesome. I love that feeling. What is funny about that is – I'm not trying to discredit NOAA, but then these NOAA guys came down. [laughter] Then they wanted to collect the fish. They were going to take it for like specimens. I was like, "Too bad, we let it go." [laughter] That was funny. But I know you never asked this, but I got to tell you this one story. This one story kind of shaped me. To this day, I always think about it. When I was young, we used to go to this place called the (Isles?). It was down in Hilo town area adjacent to Liliuokalani Gardens. My dad guys, they'd go down there to fish, but they'll go down mostly for just drink beer, like fishing and drink beer. So, I would go down there and I would fish. I was too young to drink beer, but I would fish. It's just a place to hang out with fishermen and see what's going on, a lot of fishing going on. In Hilo Bay, it's a popping area for hammerhead sharks. So, a lot of times we would have baby hammerheads coming around and stuff like that. It was considered as a pest often by fishermen because stealing their bait and reeling it in. But I never had that feeling about sharks. I always felt sharks were special. All these megafaunas, they're special to me. Everything in the ocean is special but these charismatic megafaunas, I guess you call it, of the ocean. Even sharks I always loved them. Then I remember this one night, this man, he caught the hammerhead shark, reeling his line he caught a hammerhead shark and he was mad about it. He was mad about it. He proceeded to get the hammerhead shark and throw it on the ground. Just super disrespectful, really trying to kill it I think so. He probably did, I don't know. But I remember I felt so sad for that shark, so sad for the shark. I was young. At that time, the man had gone off. He was all mad. I asked my dad if I would go down and grab the shark and put it back in the ocean. Yes, I did that. I just keep on remembering that in my life. I was at such a young age, and I always think about that. The feeling I got. I don't know if this is true, but I like to think, "I helped out a shark one time. So, when I go fishing in the water, they're not going to eat me." I try to think like that, but I don't know if that's true. But I feel so proud that I did that at a young age. It's something that I always think about too. I think about a lot of stuff and getting back and releasing the animal stuff and that feeling. I experienced that with that shark at a very young age. It could have died. I don't know. I hope that it lived.

MM: Thanks for sharing that. I think for sure you are immune to shark attacks now.

RO: [laughter]

MM: [laughter] I guess I want to keep on this ocean trend. We have talked about fish and sharks now. Now, I want to turn our focus to coral reefs, which they all come together. You have even talked about reef fish. So, I am wondering if you can recall, what was the first time you ever saw coral reef and what was that experience like?

RO: I know I've seen corals when I was young, but I never understand the value of coral until I was older, I guess you could say. When I was growing up in a context, corals was sometimes bad. I don't throw net, but to a throw netter someone like the [inaudible], that's bad. It's going to break your net. [laughter] It's bad. Your net is going to get stuck all in that, maybe those [inaudible] porites. It's not that bad because your net is not going to get stuck in there. But usually, in shallow water, use your net and sometimes you get being dried over there. But I didn't realize how important corals were until later in my life. I remember times in my life where I was just blown away by coral, and a lot of it was in West Hawaii. When we were camping, we'd go off to some smaller beach and just the colors of the reef. The colors is what really got

my attention, I guess when it came to corals. It was later that I understood that these things are growing, they're alive. I always knew they're growing and alive. But what I never know is, I guess how fragile they were and how you're going to take care of them. You got to be aware of them, I guess, on the actions that we take on land. You got to be aware of how they can impact the corals and the importance of the corals. It's funny to me because corals are so important. We have corals where I grew up, but the base structure of the reef that the one farming, I guess, the macro habitat is boulders. So, when we go diving on our side, East Hawaii, we just look for big boulders. Big boulders make big holes and then big holes get big fish. I may be oversimplifying it but something like that. But it's more later that I found it is corals. To me, a coral reef, you need it all. In a sense, you need coral living and growing, but you need coral dying also. You need that happening. I'll say this because I've been to places in Hawaii with a hundred percent coral cover. I've been to reefs a hundred percent coral cover, really a hundred percent coral cover [unintelligible], and never have that much fish over there. Never have that much fish. Then you go to another reef, and these are deeper reefs off of Maui, and you go to another reef. It got the same coral species that was meeting up, and that reef was dying a little bit. It was loaded with fish loaded, loaded. Think of Porites lobata, Porites lobata has a nice, healthy, strong, it's not going to have holes. It's going to be solid on the outside. It's going to be solid, all growing, all healthy. It's the dying lobota. As it dies, it creates all these holes and cracks and crevices in it, bio erosion starts to happen. That's the good habitat right there. But don't get me wrong, because to have dying coral, we need living coral too. So, we need it all. For me, it's like you need it all on a healthy reef. A hundred percent coral cover, no more that much fish. You need the diversity in there. Coral growing, coral super healthy, but some coral dying, bio erosions, the coral and cross algae coming in and solidifying that eroding coral and maintaining that structure and holes in the reef. You need all that and you need the fish there too to control the algae. But you need the algae to feed the fish. I think, when it comes to coral reef management, we don't know nothing. It's so complicated, so dynamic, so much stuff going on that maybe we can guess. I believe herbivory is important to reefs, don't get me wrong. But I also believe water quality is important to reefs. But there's a lot more going on. [laughter] A lot more going on, there's a lot more going on. Invasive species too, that's another thing. People disease is another thing, another big thing, all that stuff. But in my mind, I think, the two big things that I'm fairly confident about is water quality and herbivory. One of the reasons why is I've done experiments and I've seen it for myself. So, I guess that's my take on coral reefs. I've experienced a bunch of coral reefs. I've done Florida. When I was in grad school, we'd go down Florida and check out the Halimeda tuna, do some experiences with Halimeda tuna, off of Key Largo and barrel sponges and the sea ferns. Awesome, love the barrel sponges. The huge brain corals, I remember that huge, I don't know, horse conch. That was awesome. Then I spent a lot of time on Hawaii pretty much every island in Hawaii, I dove all the way up to the Northwestern Hawaiian Islands of Papahanaumokuakea, pretty much dove all those islands. Like I said, I spent some seven years on Saipan, dove pretty much all of the Mariana Islands maybe except one I never dive. I'm talking all about the northern islands too, all up through [unintelligible] down to Guam, all those islands too. So, this was the only dive I paid for, but was in Palau went on a charter dive in Palau and that was awesome too. Every place is different. I wouldn't say one place is better than the other, but every place is different. I love them all. I've even dove in Kelp. By academic training, I'm a psychologist, so I'm algae person or [inaudible] *limu* person. So, at one time I even dove Kelp forests off of Monterey, that was cold, [laughter] but I'm glad I did it. Coral reefs, they're important. Those other stories of those the shark story and some of

these other stories. I mentioned the parrotfish story I've been catching. I don't have a clear memory of coral reefs like that. I guess the appreciation from the coral reefs come from those, like the parrotfish story. Because now I know the parrotfish cannot exist without the coral reef and parrotfish benefit coral reefs too. So, that's where that appreciation of coral reefs come from is more from that appreciation of the fish and those resources that is more tangible to me that we eat, for example. I don't eat coral. Well, I guess if we're used to chew betel nut, then we used to eat coral too. [laughter] It's just a joke. But yes, we don't really eat coral.

MM: I guess maybe indirectly if you are eating the parrotfish, and the parrotfish was eating the algae and then accidentally took some coral with it. [laughter]

RO: [laughter]

MM: But, no thanks for that. I wanted to go back. You mentioned that you knew herbivory and water quality were key features to a healthy coral reef because of experiments you have done. I know we could talk forever about those experiments. But is there a brief summary or explanation you can provide on some of those types of experiments that you maybe do in your professional career?

RO: Yes. So, that experiment that I'm referring to was carried out at Kealakekua Bay. All my academic studies when I was in grad school was all on Hawaii Island. UH Manoa is on Oahu, but all my studies was on Hawaii island. So, this one was at Kealakekua Bay, on the west side, corner side, west side of Hawaii island. Beautiful place, awesome place, Kealakekua Bay. It's a MLCD, so in general, you cannot fish there. It's a healthy reef. But I put out these settlement tiles. It's basically PVC plates and put it out on a rack and see what's settled on it. But I put these tiles under different conditions because the control is just out there on a rack. But then I also utilized cages to prevent fish from interacting with the tiles. The cage hole wasn't that big. So, some stuff can get in. That was getting at herbivory because a lot of the fishes over there is herbivores. Then, I put some tiles under nutrients. So, nutrients is getting at water quality. I looked at the tiles and how they grew under these different conditions. Some of the tiles was under nutrients and cage. So, I guess that's the worst scenario, no herbivory and poor water quality. So, I did that multifactorial experiment and I learned from it. What I learned was, yes, fertilizers is bad for the reef, [laughter] bad for coral, good for big algae. Cages preventing herbivores fish from interacting with the substrate is bad for the reef too, because then the other algae grows. It all depends what you want on the reef. If you want a lot of big algae then shoots, bad water quality and no fish is great. But if you want coral reefs, then you need good water quality and herbivores to promote the coral and the CCA too. Sorry, I always got to bring up CCA because I am a psychologist by training. To tell the truth, I'll say this to anybody, I think CCA, coralline crustose algae is just as important if not more important than corals on our reefs. Corals settle on it and it creates structure just like coral does. It also reinforces dying coral structure. I've seen many algae heads just covered with CCA and the structure is still there. It's still serving that structure, but the coral is gone, it's dead. The CCA is maintaining it. So, that's where I see that that was important. I also did this other experiment. This was a fun one. I know you never asked about this one, but this was a fun one. What I did was I had a big tank and I caught a bunch of fish. We call them manini acanthurus triostegus. It's pretty convict tang, pretty popular, common, I think so, at least in the Pacific. Seen it all over in the Pacific and I

caught that one. Nenue was another one. It's a Kyphosus. It's a rudderfish. They're pretty common too throughout the Pacific. I caught these fish and I put them in tanks and I offered them a variety of different algae. It's almost thirteen or fourteen different algae at one time. I did this numerous times and just to see their preference. What is interesting is some of the introduced algae, the fish eat them. So, a lot of alien introduced algae is a problem in Hawaii. Yes, fish eat them too. Not all of them, but these experiments, like I said, all of my dissertation experiments were conducted on Hawaii island. This experiment was conducted in Hilo side. They have a fisheries research station. On that side, we had only two introduced algae, Gracilaria salicornia and Acanthophora spicifera. So, those were the ones I used, and the fish would eat them. Some of them were preferred over natives, which is also interesting.

MM: That is really interesting. Keeping on this trend. So, you have talked about how we need a reef that is healthy to not a hundred percent coral cover, but that experiences mortality and experiences predation and herbivory and good water quality, et cetera. But then you also mentioned that runoff and fertilizers are really bad for the reefs. So, when I went to Hawaii, I went to Hilo and Kona and I noticed that there are tons of agriculture in Hawaii. So, I am wondering alongside runoff and fertilizers, what changes have you seen over time in Hawaii that have maybe been impacting coral reefs in a negative way?

RO: First I got to start off with something positive because this is something that a lot of people don't understand in Hawaii. So, in Hawaii, at one time sugar was king. That's why I'm in Hawaii because my ancestors came here to work the sugar plantation. I'm Japanese, Portuguese, Filipino, all those people came over to work on a plantation. That's me, that's who I represent, plantation workers. When I think to myself, that's who I think about. During those days when sugar cane was king, all the water was brown. I remember when they'd harvest the cane, it was just bare and exposed and there's slope. Hawaii is slopes. Then on the east side where I live, rains a lot or back there used to rain a lot more. So, they harvest the cane, big rain, all the dirt go in the ocean. Oh my god, people's cars used to be so brown because the cane trucks would be on the road. I remember somebody that live in our community that never worked for the plantation. They wrote an editorial to the newspaper grumbling about how brown their car would get from driving on the road after rain time. But since then, no more cane already. So, the story on our side, big picture wise, water quality has improved. People don't understand that. People forget that. But that's in the rural areas. But when we talk about Oahu, where I live, Oahu went through that cane phase and it curtailed that fast. Now it's more in the industry and residence and stuff like that. Even agriculture until this day is still going on. Especially North Shore side, you get the pineapples aumakua or (upland?) pineapples. To this day, you look at those geomaps or whatever, there's spatial photos or images, you can see the dirt coming out. To me, that's a big problem. When people think about water quality, I think, they just think about the dirt and the nutrients, which is huge. Don't get me wrong, dirt and nutrients is huge sedimentation and nutrients going into the stuff, that sedimentation is going to kill, coral nutrients is going to promote algal growth. Even the nutrients in the dirt can promote some different algae cyanobacteria and stuff like it to grow. The answer is we got to take it to land. I'll call upon an experience in Saipan where we did this restoration project in LauLau, I enjoyed it. Planting trees to make sure that we hold the soil. So, that was good to reduce sedimentation. Another thing that we used to do in Saipan is we used to [unintelligible], walk through the rivers. The reason why we walk through the rivers is to detect illicit discharge. All what was funny is, I remember

this when I was growing up in Hawaii is when people used to build their pig pens right next to the stream and let out a pig waste go right in the stream. In Hawaii, that got phased out when I was young. But when I was on Saipan, they were still doing that stuff. Yes, it's illegal, but people are still doing it. So, those are the things we were looking at. So, that was another way to get sustainable land-based practices. I think, the challenges in Hawaii and a lot of tropical places, the land value is so high that we have these ideas. We have these ideas of BMPs such as settlement basins. Before the water enter the ocean, get this pond and slows down the water so the sediments can drop and go out into the ocean and cleaner the water. Those kinds of solutions take a lot of land. You know how much land costs in Hawaii, it's super expensive. So, as a person, are you going to build a settlement basin, which is not going to make you much money right next to the ocean? Or are you going to build like a hotel or whatever that you can make boo koo bucks on? So, those are the challenges and it's real-life challenges. Another thing that I want to mention is some of the things we support in He‘eia, we support the Kāko'o 'Ōiwi and it's in He‘eia and He‘eia is a place where a lot of action is going on as far as restoration. When I say restoration, it is ecological restoration, but it's social cultural restoration also. So, over there we got rid of all the mangroves. [laughter] In Hawaii, mangroves is introduced an alien and we take them out. [laughter] This is crazy because a lot of things we do it in Hawaii, see it's cutting edge because nobody else does it in the world. We're taking out mangroves. Then what we do is replace them with native plants and the mangrove. I don't know if this is true, but I heard in He‘eia, there was the hugest mangroves trees in the world, a hundred feet tall mangroves kind. These mangroves are huge, huge. If I exaggerated by a hundred feet, but really tall ones. [laughter] But on a biomass they produce, out of leaf litter, it's all bad for water quality. We don't have those animals that eat the leaf litter. I guess in mangrove forest, animals eat the leaves and stuff like that, but we don't have that. So, they all contributed to sediment and debris and all that stuff. So, we helped out. I want to say this project that we did in He‘eia, we're not the lead, we are helping people out. We're supporting communities, supporting them doing the work. So, we're there to support, but like I said, we are not the leaders. So, I'm not trying to take full credit, but I'll take a little bit because we help out. But yes, we help them take out the mangroves and we're helping them put in native plants. What was amazing is when they took out the mangroves – and I don't know how long the mangroves was there. I don't like to exaggerate, but long time, like in decades, maybe fifty years or a hundred years. I don't know how long these mangroves are here. But when they took out the mangroves, there was still a native seed bank there and the native plants came back. It was crazy, it came back. I'm not saying it's that easy, but it takes maintenance. It takes weeding and stuff like that. We got up, they're planting native plants too. But I never expect a native plant seed bank to exist and persist and be viable. It was crazy. [laughter] So, that's the stuff we do. In He‘eia mangrove removal, which is a little bit upland in the Kāko'o 'Ōiwi property or area they take care is loi. Loi is tarot patches. Loi is almost like settlement basins. Their stream comes down. They take some water from the stream and it goes into the loi or taro patches. In these taro patches, the water slows down, the settlement comes out and the water goes back to the stream cleaner and it goes back to the ocean. So, that's another thing in Hawaii. I'm not going to say everything they did in the past was awesome and good, but there are a lot of good things. I always say that. That's an interesting one because at the same time these loi, they create habitat for *Oopu*, our native fish and our native birds that are endangered. A lot of our endangered wetland birds create habitat too. So, these loi is awesome and they produce food for our people. [laughter] There's another, yes. Water quality. Yes, water quality tangent, I guess. Yes.

MM: No. I thought [inaudible] are the best.

RO: Yes. I'm not finished. Actually, the main point I wanted to make when I was starting, I know I talk plenty, is the struggle with water quantity. When I say water quantity, it's fresh water. Quantity means the amount of fresh water. I'm not talking about water quality. I know water quantity, fresh water going into the ocean. A lot of people feel that especially the taking of groundwater has massively restructured our nearshore ecosystems. This groundwater seeps. They are perceived as a place of *hanau* or the place of birth where life begins, where life is generated, where it's super abundant. These areas in the ocean where freshwater comes out. That is all being taken by development and people, everybody got to drink water and agriculture, golf courses and hotel grounds. Don't get me wrong, we need water. We got to use water. But I think, we could be more responsible. I don't know if you ever heard of Red Hill, though. That's a big deal. You heard about Red Hill?

MM: Yes, but explain it if you would.

RO: Yes, Red Hill. So, the military had these massive underground jet fuel containers or yes, big metal structures, huge metal structures, underground of jet fuel. That was since, I guess World War II days or even before that, Pearl Harbor back then days. They started to leak about a year ago. They leaked into the groundwater, the drinking water. This water went into people's houses, tainted water and it made people sick. Now, they're wasting our water. This is our fresh water. We're already limited and now we cannot use that water. So, don't get me wrong. I will tell another story after, though. But the military is important, but I blame the military for that. They mismanaged the natural resources. They dirtied the water, and now they had water. That was their water that they polluted. Now they're taking our water. Now, on the news, they're telling me to conserve water. I'm like, "Why? I got to conserve water because you guys waste your water and now you're taking ours?" I don't have an expansive garden, but I get some plants over here that I grow to eat and stuff like that. Have some taro and some other stuff over here that I grow to eat, and I water them. You're telling me now I can't water my taro? No, I will still take care of my plants. Because this is my food too. But that's Red Hill, and it's a constant battle. People in Hawaii, they don't like the United States and they don't like the nation and stuff like that. But I'll tell you a story on a positive note. I remember one time I was at Saipan for this Western Pacific Fisheries Management Council, Kitty Simonds, she runs the show. It was down there on Saipan. This was after I left Saipan. So, it was great to go back, see my old friends, went to Saipan. When I was there, I had on typhoon, that was my second typhoon. I was there for Saipan early, I had on typhoon. When I was living there, I had typhoon, that was crazy. At this meeting, I had on typhoon. So, the meeting got shut down. But, I guess, in the National Registry or whatever, it said a meeting's supposed to happen on Guam. Kitty, she got to make that meeting happen on Guam because we said we're going to make them happen. [laughter] So, this is a couple days after the typhoon. She worked out a deal with the Coast Guard. So, the Coast Guard came and pick us up. So, when I was on the tarmac and I saw that Coast Guard plane come to pick us up, I was never so proud to be an American citizen in my life. That was the most proudest I was to be an American. I was like, yes, USA. [laughter] So, I got to say that because that other story painted the military in a bad light. But I wanted to tell a story of painting the military in a good light also. There's balance in everything. There's good and bad to

a lot of stuff.

MM: I think both of those stories are great examples of struggles in the military and especially in the communities of Hawaii. I am wondering if problems like Red Hill and maybe other things that have happened since Hawaii became a state, if those have put a strain on the relationship local community members have with government officials or the U.S. government in general. Could you explain that a little?

RO: Yes, no doubt. As I said earlier, I'm Japanese, Portuguese, Filipino, so I'm not Hawaiian. But I have spent a lot of time learning about the Hawaiian culture. I took many semesters learning about the Hawaiian language, spent many hours hanging out with my Hawaiian friends and learning about their culture and what is important to them. I learned a lot about Hawaiian history, modern Hawaiian history, ancient Hawaiian history. I consider them living legends, people like Walter Ritte and Uncle Emmett. We just collaborate with these people. These guys are the leaders in the Hawaiian renaissance. I respect Hawaiian culture very much. These guys have a reason to be pissed off big time. These guys have a reason, a legit reason to be angry with the U.S. government. I, myself, come from the plantation era and we weren't treated that good as plantation workers. I know that. We were indentured. Our people came over, they made deals with us and they kept us working for them forever with that broken promises to everybody. So, I know the Hawaiians didn't suffer, but my people did suffer too. We still suffer. Yes, it's something serious. This stuff like Red Hill, that kind stuff just makes people angry and just reaggravates all those injuries, all that sores that they have, all these emotional trauma, literally emotional trauma that people went through. So, yes, that stuff is bad. For me personally, promises were made to my people. My people came over. We got a house. So, that was nice. My parents had a house, that was nice. But imagine you come over and generations working for this industry, and then one time, everybody in your community loses their job because the sugar mill closes down. That's my community. That's what happened to my community. Everybody lost their job. It was hard, super hard, super stressful in my household. Everybody's under high tension. I'm not trying to embarrass my parents and stuff like that. I credit my mom to the max. They understood the value of education and they supported my education indentures. But it is a stressful time in our household. I remember arguments, and this was when I was in undergrad. So, maybe a freshman in college or sophomore in college. This went on and it wasn't a good time. Like I said, I got four other brothers and sisters and they were still in school too. I was going to college, so there was bills coming in. My mom was working as a teacher's aide. My dad, he just lost his job. He was the breadwinner. So, we even suffered too. The plantation workers. But when I look back at that kind stuff, I see my community as resilient. This was during those times that those networks that people talk about and those bonds of a community was tested and proven. I'm so proud because we persisted. A lot of the families are still there in Pepeekeo. My brothers, everybody, all of my siblings except me still bought property over there in Pepeekeo. They have houses, they're raising their kids in that area. My brother, his house is in Puna, but he got an [unintelligible] in Pepeekeo, and he's probably going to build a house there too now. My two sisters, they get their property there. This is something that I'm not proud of, but I'll say it because people got to hear this kind of stuff. I'm getting choked up right now because there's a good reason. When we talk about social pressures, people die in my community, people die because of drug use. People die because of bad drug deals, stuff like that. That was happening in my community. My brother, he was on drug dealer and he had any drugs

and he got overdosed on ice, and he died. He died almost twenty years ago. We buried him. That was during that time. I think, right when I started grad school. All those social pressures, it hits us hard, but we came back. Sorry, I got to pause a little bit. I feel proud about myself because I came from that. I accomplished a lot. I'm not finished yet, but I accomplished a lot. I got my Ph.D. That was huge for me and my community. So, I always like to tell kids about it. It's not like I'm trying to brag to them, but I just like to let them know where I came from and what I accomplished to let them know that they can do it too. So, I'm sorry for losing it, but that's the truth. Like I said, I'm proud but I'm angry at the same time. This all started with the U.S. government and stuff like that and the people in power. They brought us here to Hawaii and all that stuff happened. I don't know. I love being in Hawaii, though. If it wasn't for the people in power, maybe I wouldn't be in Hawaii, probably wouldn't be. But it's just interesting how things work out. Just on a positive note to end that sad story. After my brother died, in four years, my parents got five grandsons after that. So, right now my parents got seven grandsons. No granddaughters, my mom is upset about that. No granddaughter, but seven grandsons. So, it's weird how things work out. My son was the first one. I was the first one to have a child. I'm the oldest. He just graduated high school, going to college, Oregon State. Then after this, next year, we're going to have one more. One of my nephews going to graduate next year, the following year another nephew is going to graduate. Then next year after that, we're going to have my son and another of my nephew who will graduate, and that's five in four years. I'm excited, I'm proud. I'm happy to see these young boys turning to men and doing positive stuff. They're all good boys. Sorry, I got deep there, but that's what it's about. This kind of stuff, I guess. yes,

MM: No. Thank you so much for opening up and sharing your story with me. That was a great story about resilient communities, and I appreciate it very much. I know we are getting close to the end of our time. I know you like to end things on a lighter note with your little positive stories at the end. Do you want to maybe end this one with one more story about a [laughter] recipe that I found of this fern that you also said was something that is important in your community?

RO: Yes. So, this fern, it's not an aquatic resource, but it grows near the stream. It needs a lot of water like a lot of ferns as it grows. I think, there's two species in Hawaii. One of them was native and I think, this other one was introduced, I'm not going to say, by the Japanese but I think from Asia side got introduced this fern. So, it's not a native fern. The one is more abundant from what I understand. But this fern is delicious and we like to eat it and it grows wild. So, it's something that we grew up depending on a lot. Whenever we get on party, for example, we always go to try and get this fern. So, I love to pick it early in the morning even when it's raining. It's awesome when it's raining when you pick it because it ensures that the fern is soft and moist and it's not hard. This fern is so important to the people of Hawaii. You can tell when something is important in Hawaii because everybody get on name form. So, I grew up knowing it as *warabi*, that's a Japanese name. There's the Hawaiian name is *hapuu* and the Filipino name is *pako*. So, everybody has a name for it. That's how you know it's important. Everybody eats it. How do we make them? We make them plantation style. I think it's Filipino style actually, but with some Japanese stuff inside too. So, you pick the fern, you got to know how to pick them. You cannot pick the bottom part. You got to know how to pick them. It's more the tips. So, maybe about average size is maybe a foot or a little bit longer is the tip. It's the new growth

that coming out. So, normal leaves just the stem, almost like the curl, the fiddle head on top. It can have a little bit of leaves coming out, just young, the young ones, young ferns. You parboil, fast kind, you boil the water super-hot, throw some salt in to even make the water hotter and throw the fern in, less than a minute. Then you drain it and then you ice it, chill it down real fast. You do that because sometimes they can become black, it discolors. It doesn't taste different, but it just doesn't look as good. It turns black, but we like them greener. After that you drain them, cool them down, then you put in the tomato and onion. Tomato and onion is usually the Filipino ingredients. Tomato, onion, everything for Filipinos. But we also put in sesame oil and prepared *kombu*. *Kombu* is this package seaweed from Japan. It's a Japanese part, and *shoyu* soy sauce, another Japanese part. So, here we have a dish that represents me. I got a little bit of Filipino, a little bit of Japanese in there. It's a super popular dish. People in Hawaii, they appreciate it. I remember at one time we used to do field work on Molokai. This fern used to be abundant when rainfall was greater. A lot of places got deforested. So, the rain is not there as much, the ground is not as good. So, Molokai apparently used to have a lot of ferns and the old people remembered it. But nowadays, no more. So, whenever I used to go on a field trip to Molokai, I used to give this to my friends. They never know what it was, but they never know how to prepare them. But they just took them and they took them the *kupuna*, the older generation, and they were stoked. After that, every time I came, they would want it because they never know themselves. But you know how it is, the things flow to the *Kupuna* in communities. That's how things flow. When I go diving, if I get extra fish, it flows to the *Kupuna*. That's how the fish flows, that kind of fish flow. That's how it flows in Hawaiian communities. Things flow to the *Kupuna*. That's how things flow from the young to the old. That's how it flows. But then it was cool for me, because I'll give them fern and they'll give me deer meat. So, I got to bring home deer meat. We had no more deer in Hawaii island. So, that would be a treat for me and my family. That was an awesome trade I had going with the fern and the deer when I was going to Molokai. That was good fun.

MM: I definitely need to go back to Hawaii and find this dish somewhere. [laughter] It sounds great.

RO: I'll tell you other funny story related to the fern. That's how important it is to me and my family. Yes, I have a wife. My wife, I knew her in high school, but we didn't date in high school, but I knew her in high school. We had class like that. But when I was going to grad school, that's when I met her and we hooked up again. At that point in my life, I knew who I was already. I knew what I wanted, I knew how I wanted to live my life and appreciation and living off of the natural resources was important to me because it still is. So, it just so happened on our second date, I had some fern and I had some fish. So, I cooked it up for her. If she never eat them, I wouldn't have stayed with her. That's how important these foods were to me, the fern and the fish. I told myself, "If she is not going to eat this, then she does not appreciate the way I live and the things I appreciated." I don't want to be with her. I want to find somebody who appreciate that stuff because that's how I want to live. I don't want to change. I already set in ways. She ate it. So, then I married her. [laughter]

MM: It is meant to be. [laughter] That is a beautiful story. So, I guess I have one final question for you before we wrap up. That is just are there any other things that I may be forgot to ask you that you would like to talk about or is there anything that you would like the future listeners to

take away from this interview?

RO: Yes. One thing I want to say is – and from more of a professional resource manager, coral reef management type of thing, big picture wise, and I know a lot of people are doing it. I'm not saying this because I don't think some people are doing it. I think a lot of people are doing it. It's just incorporating the people aspect into natural resource management. I think it's vital to success. We have been doing it in Hawaii and it's been paying back dividends. We always talk about lack of funding, lack of resources, lack of capacity coming up on all these "no can" reasons. But the community, the fishermen, they're the solution. In Hawaii, we understand, at the Division of Aquatic Resources, we cannot do it alone. It's just the task is just too great. We cannot do it alone. We got to work with people. We got to work with communities. We got to work with culture to be successful. That's where I want to leave it at.

MM: Awesome. Thank you so much, Ryan. This was a great interview. This is my first one too, so thank you for being my guinea pig. I am going to stop the recording now.

[end of transcript]