Interviewee\_Interviewee\_Interviewee

Interviewee, let me explain. First of all, thank you for taking your time off to be with us this morning. Let me explain that the program, what we're doing today, is collecting oral histories from people who have some kind of relationship with the sea, whether through fishing, or like you, who are a scientist, but the son of a fisherman. And we want information about how climate change has affected it. What species do fishermen catch? What are the conditions of the seabed? If you have an idea, your experience with fishing. How have hurricanes affected it? You know that Puerto Rico, the frame of reference, at least for me, was Hurricane Maria. From then on, everything changed for us, Puerto Ricans, and Puerto Rican women. I've just briefly explained it to you. There's a document that, at the end, is the consent. All of this is being recorded.

No problem.

And in the end, you decide if you want this to be included on a platform where all the interviews can be heard, so we can get the information out. If you agree, when we're done, you sign it, and we move forward.

Perfect.

Let's start with the questions. How old are you, Nico?

I am 29.

29 years old.

They tell me I'm young, but I'm already feeling that there are young people who are younger than me, who need to be guarded, but no, they still call me the young man.

You're the youngest in the group, there's no other way, you have to get used to continuing to be that way.

And.

Tell me. Did you live here? Have you lived in María, in Culebra, your whole life?

I lived here from birth until I was four, then I spent two years in Spain because my parents moved there trying to find better jobs. My mom worked as a craftswoman and as a caretaker at the Alegría school. Yes, they moved there for two years. I studied for two years in Spain. I tried to complete the first year of elementary school there, and then I spent six months in the Dominican Republic, specifically in Bayahíbe, while my dad tried to find work as a sailor there. It didn't work out very well, and we returned to Culebra. That was when I was seven, and I've lived here ever since, except for the university period.

Where did you study?

At the University of Puerto Rico, Río Piedra campus with great pride.

What did you study there?

Environmental sciences.

Do you have a bachelor's degree in environmental science?

Correct.

And plans to continue a master's degree?

[00:03:02]

Then, after my bachelor's degree in environmental sciences, Hurricanes Irma and Maria hit, and a lot changed. I felt I had to return to Culebra, and I volunteered at the marine reserve for quite a few years, but I had a lot of concerns, so I went to... I decided to continue my graduate studies, and I was able to get a scholarship to Oregon State University. I completed my master's degree there during the pandemic, so I was there for a year and a half. Then I came back again.

What are you doing right now here in Culebra?

Here in Culebra, there are two things primarily. Since I returned, I've been facilitating the organizing process of the fishing community, co-founding the Culebra Fishing Association with a commercial fisherman. And I currently have another project, through which I earn my living, which is an applied research project with the community-based organization of island women to understand whether oyster farming is a real possibility, a viability, in Puerto Rico. So—

Has that project already started?

That project has already started.

Is that project on land or at sea?

It's mostly at sea. We're testing the farming of two other native species in two locations: inside the bay and outside the bay, more open sea. We also have a social component: how engaged our community is, how interested they are in making this part of their commercial fishing activities, and whether there's a market, if there's the possibility of creating a market for this at-sea farming.

And how is the process going so far?

To date, it's on track. It's been an arduous process to obtain environmental permits. In terms of growth, it's been slow, but survival is quite high for oysters in both locations, and there's a lot of interest from the community, something that surprised me. I thought there would be a little more reluctance. We've held several meetings in the fishing village to explain the project and receive input, and we've hired fishermen who have also become divers from the project. We have that challenge of constant acclimatization. In fact, the fishermen have improved the project. We've adapted certain things because they've said, look, maybe we can do it this way, or that way. I believe that the project, despite only being nine months old, is on the right track.

[00:06:12]

That project, if it gives good results, would it grow with the nurseries in the sea? Do you aspire to have more space in use to grow the league in [INAUDIBLE]?

I think perhaps more space is needed—yes, perhaps not horizontally, but vertically, in the water column. That's a challenge due to all the environmental regulations and how we do it without impacting the manatee, turtles, whales, or tangling ropes. And yes, it's possible that none of the locations we're using are viable; we need to utilize other spaces in the sea. But growing into a large industry isn't the goal of the project; the goal is to complement, to see if it's possible to complement, small-scale commercial activities, fishermen and women, and young people who want to work at sea, but with something different.

Right now, how many people do you have working on the project?

We have six.

And are they all fishermen?

No. We have three fishermen, we have two co-scientists who live here in the community. We have a marine biologist who comes from time to time to help with the dives, and we want more. In fact, as the project progresses, there's more work in the water because there are more others. So we have a waiting list of people who want to participate, but it requires them to be certified and have certain diving skills, so we're working on that in parallel as well.

How did you identify where you could put these nurseries?

We had a preliminary project with ropes and pine and berry wood, and we went to different places in Culebra, and we did a homemade artisanal experiment where we put them with a block, a small rope, a small buoy, and we saw places that already naturally attract oyster recruitment and that they grow there, and from that we decided, we need environmental diversity within the bay there are fewer risks, it is easier to grow them, and we already know that the mangrove oyster grows there, yes we are going to try within the bay and then we are going to try in the open ocean where we know that the other species can already be cultivated, which is the Atlantic pearl oyster, in Pincata because it was cultivated before here in Culebra, well, it was collected from the Snapper Farm project cages, and the divers and fishermen collected them from there, and sold them to a restaurant here in Culebra. So that was one of the recommendations from the local fishermen: that it not only be an experiment with the mangrove oyster, but also with this other species. So, to understand these two very different environments, we're in these two places.

[00:09:48]

Do you fish?

I fish. I used to fish commercially with my father, until I got tired and saw it was a lot of work, and honestly, I got really frustrated and decided to go to college. In fact, I was there the first two years of college, coming every weekend to raise the lobster pots and crates with my father and my godfather. And there were always problems, there were always broken winches, or lost or vandalized pots, and sometimes I made good money and sometimes I didn't, and I got tired of that. I thought it was a lot of work, I still think it's a lot of work. So, nothing. Currently, I do fish. I still use a harpoon and a snare for lobster, and I go to Concilja [ph] from time to time and troll with friends, with other fishermen, commercial fishermen, but I've stopped receiving a share of the money. Now what I do is, I get some of the catch. When I go with commercial fishermen, I select a few fish that I want for myself, and that's my contribution, or my benefit. Aside from spending a good time with them and learning, I have a 13-foot rowboat with 15 horsepower, and on days when I'm not working, or not at sea for other reasons, since I also like to surf, I go fishing with a lariat and speargun, but this is for personal use.

Your inspiration, I can see, is your dad. Right? To fish, because he is.

My dad and my godfather.

Who is your godfather?

My godfather is Flores Soto, from Culebrense, a lifelong fisherman, and my dad knows how to fish very well, but in terms of harpooning and knowing the reefs, Flores Soto is the person who has taught me a lot.

Is he a fisherman from the fishing village?

He is retired, but yes, he was in the fishing village all his life.

Did he retire because of age or did he retire because of-?

Yes, he's 75, but he's still fishing. In fact, he's still fishing. Sometimes he's called to be a yolero, and he stays there guiding the boat while others dive.

You call it yolero to do proel.

Yes, exactly.

But I'm a yolero.

Yes, I'm a yolero. Yes, because he doesn't dive anymore. He had an accident, some bubbles, and he's become very wary of fishing with a tank, and now when it comes to fishing, snorkeling, it's difficult for him.

[00:12:57]

Considering that you must have taken the plunge to see how they were going to place the fish tanks, where they were going to be located, that you come from a family of fishermen, and that you have fished, do you identify any areas along the coast of Culebra that have cultural value for the fishing community?

Yes, definitely. There are many areas, and I can mention a few. For shore fishing, there are several shore fishing spots here in Culebra that continue to be a place where families can spend time, especially at night, and fish with line and pole. We're talking about places like Punta Melones, Punta Soldado, and within the bay there are several places as well. There are also beaches where you can fish at night with line, and there's a really cool family interaction, because you're at night with a line far out on the beach and there are reefs around, and you're interacting as a family there, so I would say it's a tremendous cultural fishing value. And then there's also fishing at Flamenco Beach, specifically in the tank area on the shore. There's a pool, there are some reefs, and big fish come in at night. So these are places where families can come together, and perhaps a father or mother could teach a son or a nephew.

And is it common to see that practice you're mentioning?

I know, that's quite common, and I think it's important to highlight that, that it's fishing that isn't necessarily sold, it's for personal consumption, maybe not in high volume, but it does have value. If we're talking about a maritime-terrestrial zone, the space is public, access must be guaranteed, and yes, there are its little things that need to be improved, so that when the lines break, they don't get tangled up there and end up as trash, but in general, they're quite important places. They're important, because I would say, it's one of the first interactions children have, before they fish; then they get in boats and go fishing, or at least in my case. Cheers.

Thank you.

I remember accompanying my family spearfishing my whole life, but I followed them, snorkeling, and little by little I was able to get a little deeper into fishing, but those shore interactions are important. Other places of cultural value—I wouldn't say so much now, but when I was growing up, I definitely loved Cayo Norte, which is a private key that was given by the Spanish crown to a family from Culebra. Now, I don't know if it's owned by Amazon or something like that, but it's a private key. There was a lot of camping and fishing there.

[00:16:39]

On the key.

On the key, yes. Families from Culebra used to go and camp there, and we used to fish. So those who remember that, which I imagine is the entire generation older than me, still have that affection for that place.

Now you cannot enter the key.

No. Now there's a sign that says you're not allowed in.

And there are people watching?

For a moment, there were people, yes, there's a helipad, and occasionally a helicopter comes. The island used to be private, but it's not the same thing: privately owned by a Culebra family, where everyone uses it, as it is now privately owned by a billionaire who plans to build a marina and a hotel. So these are dynamics that are taking place. Cultural value, definitely the marine reserve, is a space where there was a lot of dialogue and collaboration, and some conflict, but overall, a lot of collaboration to get it designated. It's been 25 years since it was designated as a marine reserve, and the people here, the fishermen, and the community are very supportive of the marine reserve, and there are those ties, we have them with the reserve. We want that space to be a natural nursery, and a place as pristine as possible.

The reserve has a large space.

The reserve is the Luis Peña Channel, between the coast of Pico de Culebra Island and Luis Peña Cay. I don't remember the exact measurements right now, but no, it's relatively small, like two or three square miles, something like that, but it does have a lot of marine life, seagrass, coral reefs, so it provides diversity for the rest of the area. There's been talk of expanding different reserve-type conservation measures to other places, such as the peninsula and Flamenco Bay. In fact, the logo of the fishing association right now has a dashed line on the map that's in the logo. It has a line that you can visually see on the map, which is the Luis Peña Channel and the reserve, and then it has a dashed line that represents the idea of ​​eventually protecting Flamenco Bay, perhaps from fishing, perhaps from tourism that comes to that area, because it's a place of great cultural value. Flamenco was one of the first settlements on Culebra, and all those families were forcibly removed from that area.

[00:19:53]

You spoke to me.

By the navy.

What year was the navy there?

From 1909 to 1975.

What year were you born?

I was born in 94.

You didn't see.

No, I remember hearing about the bombing of Vieques.

When you jumped into the sea, did you see the impact of the damage the navy may have caused?

Yes, craters are seen in several places, Flamenco, Carlos Rosario, missile hulls are seen, we don't know if- We know there are unexploded bombs underwater; when we see one, we don't know if it's live or not, because cleanup and monitoring in the water is still very, very behind. And all the time, they keep appearing, after storm surges, possible unexploded bombs appear, and units come here to clean them up. Protocols are not always followed. For example, one was found on Flamenco Beach, and yes, the beach was closed, the entire special team came, and that was very good. One was found on Tamarindo Beach a couple of years ago, and that same day, without notifying anyone, the Puerto Rican police came, and they didn't coordinate with the Corps of Engineers, or any of the other people, or the municipality, and they detonated it there.

On the beach?

Above the reef, next to the beach, and there's a video showing that. The beach wasn't closed; there wasn't a clearly established protocol.

And the reef?

It suffered an impact, yes. So it happens all the time, and they don't invest what they're supposed to in security, in prevention, in a detonation, or in a cleanup that's done properly, that doesn't cause more damage. And obviously Vieques has a much larger volume, and a much larger impact, but we can't forget that Culebra too, although a lot of time has passed, they're still there; that's not something that goes away.

Do you think that the damage that was suffered around Culebra, it's all inside the water, right?

No, there is also damage on land, but it is easier to monitor, and multiple projects have been done to clean up land areas, but there is a lot of impact on the water that simply has not been- EmBlue Marlinaron with the land, and now they are going to the marine, but the marine is going slower, and more complicated, and we will see.

[00:22:55]

You're working directly in the fishing village. You've already told me about the traditions that have been passed down from one generation to the next.

Yes. I told you a little about the campsites. I think going to make arepas, and eating fried fish, and sierra wheels, on the beach, that's something that's maintained, and it's quite special, especially when you have to escape from all the tourists during Holy Week.

What is the impact of tourism on marine ecosystems?

This is quite evident in several projects. Tourists, aside from the typical overloading of garbage and the landfill, and the trash left on the beach, cigarette butts, etc., have a direct impact on seagrass and coral reefs when they're snorkeling. They stir up sediment, step on coral, and this even affects those who come with tour guides, catamarans packed with 50 people. Those who come from towns on the large island of Ceiba Fajardo, come with 50 people, already bring alcohol, are allowed to snorkel freely, and they cause an impact. And we have all of that, documented reports.

And does it affect the fisherman in any way?

Yes, it affects fishing. We are degrading coastal habitats, which are the breeding grounds. It has multiple impacts, and the recreational impact of tourism is significant. In fact, we have a study comparing reef health in Flamenco, the coastal reefs, the flats, versus the more distant flats, and correlating that with the number of visitors, among other variables, and we see that yes, they are much more degraded. And there are many studies within the marine reserve that also show this type of impact.

But the marine reserve, people are going to-

Yes, because there is no control, because they are supposed to have permission from the DNRA, and there is supposed to be a capacity, but no-

There is no surveillance.

There's no oversight, and it's every man for himself. All these companies want to make money and go wherever it suits them best that day.

You told me about important places, and you told me about Punta Melones, Punta Soldado. What other areas are very important for fishing here in Culebra?

[00:26:04]

There are reefs to the southeast, such as Los Corchos, Bajos Grampus, Jurassic Park, all of that. These are shallows that are very important for target fishing; they're relatively flat. There are also many places for line fishing in the north, because there are some changes in depth, and historically there are places for sea bass and sea bream. And the entire Vieques Sound is excellent for pot fishing and diving, because we're talking about sandy areas, places with seagrass as well. So pot fishing and diving, which remains important, mostly take place in the Vieques Sound.

The probe.

The Vieques Sound. Basically, the stretch of the Ferin [ph], which was going here, all that water between Culebra and Vieques, are areas of 60, 90 feet depth, where you can still fish with a tank, although there's the issue of bubbles, and that area, yes, is very important for conch fishing, lobster fishing, and pots too.

Have you been able to identify the most fished species in Culebra?

Yes. I'm going to emBlue Marlinar by saying what surprisingly isn't being caught. I'm going to differentiate between what fishermen from Culebra are currently fishing for, versus fishermen who come from other towns, who fish here. Culebra fishermen don't fish for conch in such a large volume and as, how do you say it? Focused, as fishermen from other towns. Here, conch fishing hasn't been valued as much, and it's not something that can be said that there's a Culebra fisherman who is only a conch fisherman, but there are fishermen from outside who come to fish a lot for conch in Culebra waters, because there are good, healthy ecosystems for conch. But there is a lot of lobster, sea bass, sea bass, and then during certain seasons, also tuna, dorado, and perdos [ph].

Is there a lot of fishing?

Some fish it, but it's not like—I think Blue Marlina is becoming more commercialized than it was before, but traditionally the hogfish, in fact, even the featherfish, reef fish, traditionally reef fish; there's a lot of flat reef around Culebra.

[00:29:16]

And those fish are sold in the fishing village, do people consume them?

Yes, people consume them. They've always had less value, for example, pejepuerco, yes, a lot of cultural value, very tasty, but the price isn't what-

How much does a pound sell for, roughly?

It's now at 4.25 if I'm not mistaken, but it was much lower and could be higher if you consider the value of how delicious it is and how much people love it. Yes, I think it's something. We're working to see how we compensate the prices of the fishmonger, of the fishing village, because there's a whole dynamic where—we don't have to go into that, but yes, prices are important. They have to reflect the cultural value, but also the ecological value, and often that doesn't happen.

Have the places where all these species go to fish changed over time?

Yes, they're getting deeper, even the reef itself, the flatter crown, and the flatter part of the reef wall is already dead, and even though they have some coral, you don't see the same life. I'm the youngest, but I've seen it anyway, and now it's deeper. And I've also seen that there are now commercial fishermen in Culebra who catch more snapper and more cartridges, which wasn't possible here before. And in part, yes, there's better technology, but also in part, it's that that's what makes money. Now, yes, we're talking about fishing further out and deeper.

But divers don't do that, it has to be con-

No, that's with winches, and in terms of uses, well, yes, also, deeper, I don't know if further for the divers, but certainly deeper. And there are several cases of bubbles from making repeated dives at very deep depths, 90, 100, 110 feet, where you might be able to do one or two dives, but not four or five, and since they're not used to that difference, I mean, five feet at those depths is a very big change; you literally accumulate like that, and those impacts are being seen.

There are young fishermen, I imagine.

Yes. There are also veteran fishermen who practice the same behavior, and we don't want them to continue passing it on to younger ones. Look, right now in Culebra, there's only one young fisherman fishing with a tank.

[00:32:32]

Everyone else is freediving.

Everyone else is freediving, and that's been pretty cool because there's been that continuity. This is a challenge, this is a more selective approach, this is now a way for me to stay healthy, and that appeals to me too. I freediving. I don't fish with a tank; I dive, but not to fish. And those who fish with a tank right now are people. I think the youngest, aside from that guy who does it occasionally, is about 47 years old.

I was thinking you were going to tell me about a 19-year-old boy.

No.

There are a lot of young people fishing. There's that generational shift, right? From the older ones to the younger ones?

Not as much as I'd like. In recent years, we've encouraged, through the educational program on fishing life, to pass on that baton. We've offered some theoretical courses for children, but also paired teenagers with commercial fishermen. Look, come fish with us, even if you're just looking at the first few days, but I don't see it as enough to keep everything going. I won't say the industry, but the knowledge.

And the girls don't arrive either?

There are some girls who are fishing, and I think, I would like to think that now there is more inclusivity in fishing life, so that they can, but you would have to ask them, because it is still a space, that fishing is considered to be only for men, or that men are the only ones who fish, but we have to try to give that-

And when these women arrive at the fishing village, I imagine you have some fisherwomen.

And.

Do these women see them differently, do they treat them differently, or do they see them as equals, one on one?

I think they see them as peers, yes, but not the girls. They treat the girls as if—although, for example, this girl who works with her family in water taxi, line fishing, recently became certified in diving, and she handles herself very well in the water, but, there are always some who I think are overprotective of a person who knows what they're doing, and you don't see that with young people. In fact, with young people it's like pulling them to take more risks, but that's cultural. Unfortunately, you have to understand that they have a lot of skill and it's a matter of support. But in general, to answer the question, no, there aren't enough young people, and it's something that worries me a lot, and worries us all, because, for example, line fishing, of which there are still some, is being lost, and when Indio, for example, is no longer fit to continue line fishing, well, who will continue it? They are memories, of those stocks that I told you there are north of Culebra, that were aligned with the hills, and that the moons are very well known, that that type of fishing in Culebra is being lost, I'm not going to say it doesn't exist, because there are some, but it is being lost, because that knowledge is not being passed on.

[00:36:26]

There is no generational pass.

Specifically in line fishing, such as bottom line fishing, sea bass fishing, and sea bass fishing, it happens less, yes.

Do these huge vessels, many of them longliners, pass through this area?

You see them from time to time, yes, in fact, we saw one recently, which was anchored for some reason, but what you see more than anything, are cruise ships, luxury mini-cruise ships. When I say mini, it's still a 300-foot boat that even has a garage and dinghies, which are boats bigger than ours. I would say that more than longliners and industrial fishing that comes close to Culebra waters, it's luxury yachts that come from Puerto Rico, from other islands.

And do they make an impact?

They definitely have a lot of impact. The biggest impact they have is anchoring wherever they want, especially in—look, I think the use of these modern GPS systems that show you where there are reefs has meant they don't drop anchor so much in reefs anymore, but they definitely do drop anchor in seagrass meadows, and they do that right away. And there's evidence everywhere: in the bay, in Culebrita, in the reserve. We have dozens of documented cases of this, and it continues to happen. We've called some people's attention, and others have. But we're talking about people with a lot of money, with paid captains who don't care, and the government continues to encourage them to come here without any guidance on how to do things right.

What do you think can be done?

I think there needs to be a structured approach. The community should be providing guidance to the captains. Reports of this happening shouldn't just be posted on social media, but also through the press. There may even be a bit of activism. I've organized a bunch of times. I went out in a kayak, tying myself up to the chain until someone realizes this is wrong, because it happens a lot. But all of these are like calls for what needs to happen next: the need for security guards to be vigilant, for fines to be enforced, because the law is there.

Is there a security force here?

[00:39:28]

Yes. Three new security guards came in about a year and a half ago. Before that, there were no guards. Culebra had been left without guards, and things have improved. They're doing their job on land, not as much as they're supposed to because every time there's massive deforestation, we call them and they intervene. But they're not issuing fines for not having a CES plan for erosion sedimentation or for cutting down mangroves. But they are active on land, issuing fines, this and that. Where there's no presence at all is at sea. And I've spoken with the guards, who don't have a boat for the Culebra guards. So there's a lack of infrastructure, but there are a lot of lifeguard boats in the port of Ceiba, which are broken, and what they need is a little repair and some engines, and those can be used. But Ceiba is Ceiba, and Culebra is Culebra, and the Department of Natural Resources is like an octopus, a black hole, where you don't know where the kids are, and they don't manage well. In fact, Culebra gives the department a lot of money through all the tourism it generates, and the concessions and so on. But that money goes to a central fund, and then it's not distributed to the Culebra reserve. For example, it always depends on federal funds and grants to do conservation work that's supposed to be sustainable through the DNRA. What are we going to do now in the fishing industry? Through all these funds that are coming in for environmental justice and all that, we are putting together a proposal to have our own mooring buoys in Culebra. Of the 300 or so mooring buoys that the department is supposed to have in Culebra, less than 30 remain, the screws remain there, but the rope goes away, the buoy goes away, mini-cruise ships come and try to tie up to those buoys and they tear them out, or if they see that they are not maintained, well they have been there for more than 20 years without maintenance and-

Are there illegal buoys?

There are illegal buoys, yes, but I prefer an illegal buoy to no buoy at all, because you're not anchoring and causing environmental impact. What we want is to install a well-designed murin[ph] fields, with a permit, and with a collection and maintenance system, where local people, in this case, people hired by the fishing association, can provide those services, because the department doesn't have the capacity to do so. The good step is that at least they've recognized it and they're going to give us a letter of support for emBlue Marlinar with a small mooring buoy pilot here within the bay, but it's something that-

[00:42:40]

Do you also pass that on through the engineering corps?

Also, yes. Yes, it goes through the Corps of Engineers, but those who manage mooring buoys in Puerto Rico use only sand buoys, in terms of those who have a program to do so, and I think that's something they have to recognize they don't have the capacity to do.

EmBlue Marlinamos to talk about Hurricane Maria.

Yes, I'm still talking.

It's fantastic, that's what we're here for. Tell me, what was the impact of Fiona, María, and Hugo—if you were born for those hurricanes—on the island's marine fisheries ecosystems?

I can't speak for Hugo; he wasn't alive yet, but I've heard a lot about him. Maria and Irma created a lot of sedimentation because it rained a lot here. I saw it firsthand. All the mud settled on top of the reefs, specifically in Flamenco, because they had deforested at the time. Mr. Víctor González Barahona, and Puerto Rico Land and Fruit, his company, and Windmart, the entire forest on the Resaca Peninsula with Flamenco, had deforested all of that without any kind of control. A network of roads, and all that mud ended up on the reefs. I saw how all the rain from Irma and Maria, and the swells that came later that season, sedimented everything. That had a huge impact on the corals. I can't say it changed fishing, but it definitely affected those nurseries. This same sedimentation problem occurs throughout Culebra. There's now a gigantic layer of mud in the bay, where it's killed all the thalassia, and the little that settles there is the invasive weed, the halophile, and anyway, that affects a lot there. I remember before, we used to swim from the shore to the boats anchored in the bay, we jumped off, we snorkeled, I don't know how much, and there were always a lot of big fish there, and now I don't see them, and I'm diving there for the oyster project. I don't see them because the visibility is poor; I don't know if they're there. If I were a blue marlin, I wouldn't want to be there. There's a lot of turbidity in the bay that wasn't there before.

And that, these are Maria's?

Those are, mangrove areas, seagrass areas, and coral areas, and yes, all of that has worsened after Maria, because after Maria, all environmental regulations were relaxed, and the environmental quality board, the DRNA, was consolidated, and the doors were opened to development that was supposedly going to save the country, and that has been felt a lot here in Culebra, because it has caused land to be sold at tremendous prices, and a lot of illegal coastal development, not only causing environmental impact because it is not done correctly, a lot of sedimentation, and the mangroves are chopped down and so on, but also it is illegal, and yes, that has accelerated after Irma, Maria.

[00:46:41]

There is a lot of mortality around the island, on the reefs.

Yes, we have seen the impact here. I have seen them firsthand, diving, volunteering with biologists, with what I call skittler, this microdisulosesis [ph], bleaching in multiple years. I think it was 2019, this year, right now the corals are bleached.

And do you think this is a consequence of coral bleaching? Do you think it's a consequence of hurricanes, a consequence of boats, a consequence of climate change?

Everything. Everything above. We definitely see that temperatures are sky-high, records are broken every year. Right now the water is like soup, and that's what causes the bleaching, but the corals are already stressed from having been hit by an anchor, from having suffered multiple sedimentation events a year, from having been hit many times by a tourist's paddle, from having been hit by a detergent from some yacht that comes and doesn't know the damage it causes and dumps its sewage, or from the soap they're using to clean the yacht, which is toxic. These are synergistic factors that come together; it's as if we ourselves, the immune system, are hit with blow after blow, the drop that-

So, it occurs to me to think, you have-

Fishing too.

I was going to ask you the same thing.

That's part of it, I recognize it 100%, and I'm fortunate that the fishermen and fisherwomen I work with have that awareness, and those who don't have it, we are working so that they have it, especially the young ones, that yes, fishing also affects them, because you are removing, you are altering that retrogression, you are removing herbivores, you are removing carnivores that control the herbivores so that they don't- Fishing is important.

So, given all these terrible impacts, you even told me that another navy might be coming to another area, that's going to have a severe impact.

And

The rush of tourists who arrive starting around Easter, which I imagine continues until after August, do you see any future for fishing here in Culebra?

[00:49:42]

I see a smaller fishery, definitely not an increase in fishing volume, not an increase to a large industry. I think that's unrealistic. I see a future for fishing in two forms: diversified, meaning we're not just putting pressure on reefs, shallow reefs, and reef fishing. I believe pelagic fish have their place, deep-sea fishing for brown sea bass has its place; I believe that offshore farming, whether oysters or lobsters, has its place as well. I believe we need to diversify commercial efforts in the sea so that we're not putting all the pressure on the same old species. So I do see a future, but it has to be a small-scale future. If fishing is more for subsistence and for food and to maintain that nutrition, that cultural value for our people, and we can't offer that kind of sea bass on a plate in a restaurant, but we can have it for an elderly person or a young person from Culebra to eat, I prefer that.

What, if anything, did the fishermen have to offer to the communities after Hurricane Maria?

After Maria.

The pandemic.

After Hurricane Maria, there wasn't such a magnificent response from the fishermen to the community here in Culebra. Many were very hungry, and there was so much sedimentation and so much swell later that winter that little fishing was done. The pandemic, in contrast, was incredible, and it was something that greatly inspired me to work in marine conservation through fishing, and from our people as well, from the community, because the fishermen somehow came together without association, without large NGOs, without any government incentives, to fish, to vacuum-seal, and to give fish to the elderly.

They gave it away.

They gave it away. And that was because there was fish to eat, because food wasn't arriving from the main island via ferry; the grocery stores were empty, so they had to eat, and if they had food to eat, they caught more to give away, and that was something inspiring, and something very beautiful, and something that also continued with Fiona. After Fiona, we were a little more organized as a community, and there was help. We asked for help from all these foundations that now want to help communities after disasters. We said, look, we need 500 pesos to buy fish from fishermen and make broths and dishes in the community kitchen. And we did it on Tuesdays and Thursdays for six months. We made the solidarity fish broth, and on the side, we always made other things like fried fish, but mostly it was the broth. And every Tuesday and Thursday, we had a sharing and we had two or three—

[00:53:26]

Pans.

Giant pots of broth.

And did a lot of people come?

And.

I imagine it was a point then, not only of looking for something to warm your stomach in the face of need, but also a meeting point.

A meeting place, exactly. A place to share, to share recipes, to share how to make different stews and broths.

Do you know how to cook?

I know how to cook, but I'd love to learn more. I can get by, yes, I cook, because we have to eat.

Is there a particular recipe that you make with fish or something that's different from fried fish or something like that, something that you inherited from your dad?

Definitely from my dad. From him, Galician-style octopus, I think, you can't avoid that, he makes it. The little olive oil, and the sweet paprika, and the hot paprika, and the potatoes cooked on the side, but that's from my dad. From the rest of my family, who are like my second parents, Flores Soto and Rosarito, I definitely inherited rice with snails. I love making rice with snails, it's not something-

True bulbous tulips.

Bulgados, yes. It's not something different; we eat a lot of it here in Culebra, but I love it. And snails aren't sold much; they're always for personal consumption, and I love them. I'd love for that to continue, for snails not to be overexploited and for them to remain a cultural food. I was going to say something. There are many recipes I'd love to try, that I haven't tried yet, but funche with fish, a lot of things that were eaten here before out of necessity, and luckily we still have fisherwomen who know how to cook all of that, and we have to continue sharing it in the fishing life to-

But has that culinary and gastronomic tradition passed on to youth, or has it stayed?

It's happening, yes. It's happening, but these gender divisions are passed from mothers to daughters, and I think we would all benefit more if fishermen taught young fisherwomen, and if fishermen and cooks taught people like me how to cook well. I think that's part of what's needed.

That's hitting me hard. Do you feel the government's current fisheries management policies are addressing climate change?

I don't think so. I'm going to return to Puerto Rico's policies and fishing laws, but I'm going to focus on federal laws because they are the ones that are most often adapted to realities. However, they continue to be very strict definitions of specific species populations. And if multispecies and ecosystem base management are now being considered, which consider broader factors, climate change affects much more than marine ecosystems; it affects terrestrial ecosystems as well. I think public policies should be reviewed. Not to mention public policies, but at least regulations should be updated more to see the effects of climate change on land and all those pollutants. Let's explain it more: There are many factors that climate change affects, which fishing regulations aren't considering because they have strict definitions of specific populations. Let me explain: if there is more rain, with more landslides, with more sedimentation in the basins, and that eventually affects marine ecosystems, and eventually fishing populations. But there are also social factors that are making this more intense.

[00:58:15]

What do you mean by social?

Well, I was sort of visualizing Puerto Rico, but I think I can go back to Culebra. Culebra is definitely changing its demographics completely, and wealthier people are arriving and developing the coast more. Although that's not a direct consequence of climate change, these are things that make us more vulnerable to climate change. For example, right now, Culebra's septic system, the sewage can't keep up, so there's sewage overflowing everywhere because there are more people, and there are more houses, more hotels, more homes. That could be an indirect way of expressing what I'm trying to say. I probably have another example right now, because I've thought about it quite a bit, but it doesn't come to mind. But I definitely think we have to view climate change within broader, social, and governance factors. Here, the climate change adaptation plan hasn't yet been implemented, even though experts have developed it. And that does consider a lot of factors, not just fishing regulations. And beyond the federal level, federal regulations in the waters where fishing is most prevalent in Puerto Rico, which are Puerto Rican waters, I haven't seen that, first, the laws or fishing regulations are super adequate; and second, I haven't seen them updated, and when they are, it's not a comprehensive analysis. How long has Regulation 7929 been in place? It was last amended around 2014 or something, and there are very good measures to control overfishing, but up to that point, there's nothing about ecosystems, there's no integration between that and the other regulations that are supposed to protect ecosystems, navigation, and the terrestrial zone. It's way behind us, and I don't think anyone, especially the department, wants to open the Pandora's box of updating fishing laws, but they have to be made, the laws and regulations, they have to be made. And it has to be done with the participation of the fishing communities from the outset.

[01:01:21]

Do you think it could be done, given that in Puerto Rico, the Department of Natural Resources is responsible for protecting natural resources, but they can't cope?

Of course.

-They don't have enough staff. Do you think fishermen could be integrated into the role of resource guardians?

Definitely. They already are, but there's no authority. I think they're already the ones in the water almost all the time. They can be watchdogs of many things, of many impacts, and of observations of what's changing, but they don't have that authority, they don't have that structure, and they feel like their knowledge isn't valid, that they feel marginalized because always, look, the other day, I had told you that there are no watchdogs in Culebra who have a-

A boat.

A boat, but lifeguards from Ceiba do come, and instead of issuing tickets to jet skis going 1,000 miles per hour, or to large yachts anchoring in seagrass, they come and stop a fisherman for not having a bugle, and he had a whistle, and it's like, those are minor things, and yes, safety at sea is important, but they've always been like this low-hanging fruit, of going after them, and they have more of a police and bully attitude and less of an environmental watchdog. So I think yes, the fishermen already perform that role informally, but they're reluctant to do it properly. First, they're untrained, and second, why would I get into trouble? Some do, but most don't. But I think so, fishermen being watchdogs for communities and the environment, that's what has inspired me about the struggle of the navies, and everything that's happened. It's always been there, but we need to give it encouragement and support.

Perhaps it occurs to you that, if fishermen are the ones who are, as you say, on the water all day, they are the ones trying to protect, some, that the government pays them, or some organization pays them for that service? Or they are already doing it voluntarily.

Yes, of course. Doing things for the love of it takes you to a certain point. Then, after that, you realize you're working hard, and that you have to eat, and that you have to pay the electricity and water bills, especially the electricity bills, which are very expensive. And yes, that role of surveillance and environmental stewardship by fishermen is very important. It's something that should, I don't want to say, become professionalized, but it's moving in that direction. In the fishing village, we want to have a multipurpose vessel dedicated to technical diving work, to safeguard the marine reserve, to be able to document all these environmental impacts, and to have a platform to address all of this. And not just the environmental impacts of other sectors, but also of fishing. We want to be our own watchdogs, in a way that isn't through shouting, insults, and gunfire, but through dialogue, respect, and a process that isn't one of police bullying. But it's complex, but they're already there, they're already in the water.

[01:05:20]

And are there archaeological sites?

Yes, there are some. On Pirate Cay, it's one that was saved from a lot of Carib sites. Even before the Caribs, they had them. Yes, there was also a Carib settlement in Carlos Rosario.

And are they protected?

No, the truth is, the largest artifacts have been taken to the museum. For example, look at Cerro Balcón, which is the highest point on Culebra, disputed as Monte Resaca by a couple of feet. Various sources will tell you that the highest point is Resaca, the highest point is Cerro Balcón, well, it's one of the highest. That point has an archaeological site, and it has hieroglyphics, and pottery has been collected from there, but it's private land. They're already building a mansion on top of it. They emBlue Marlinaron it many years ago and it stalled, and other people bought it, now they're finishing it. And if there's no control over environmental situations, imagine for the archaeological aspect. That's like something that's never considered, and there are no people monitoring that, unless there's federal funding. If there's federal funding, it's fulfilled. You have to have a technician to monitor the buoys, the sedimentation, and the archaeological aspect. I know this because when the pier repairs here in Culebra, but for private development, it's like, you come with money and want to build a mansion, go for it. And then the CRIM isn't even charged; I don't even know what that's for.

Finally, because this is the end of the interview. If you could give a message to the youth of Culebra—girls, boys, young men, young women—about protecting fishing resources and encouraging them to take up fishing as a source of income, as I imagine there are many young people who remain here without finding anything to do. What would you tell them as a young person, as someone who grew up with a father who worked in fishing, and who is immersed in that world yourself?

I would say fishing is fundamental to staying connected to your roots and being able to see hope in the face of such an uncertain future and so much need. You learn to fish however you want, because there are many ways. You don't have to learn just one, but there are many ways to fish. And you'll have food, and you'll have that connection to maintain an identity of where you come from, of a fishing island. So yes, food and identity are incredible benefits that fishing can bring to young people who might not be as interested in it because there are so many other things in modern life. Aside from that, what I was going to say about hope, it does give you hope because you feel like you can provide for yourself and look for food with your hands. But also, something very special about fishing that I think every young person should experience, at least at least, is that fishing connects you with nature. Above all, you can have a part-time office job, or a tourism job, or a job at the municipality, and that's fine; that gives you a bit of stability. But when another hurricane comes, another pandemic, World War III, or whatever, finding peace in nature is very important, and fishing brings you closer to that. And it's like keeping your feet on the ground. Through fishing, you can keep your feet grounded in reality, because otherwise, I feel like the world is spinning out of orbit. It's not a very eloquent answer, but it keeps you there, it keeps us there.

[01:10:40]

Nico, thank you for your time this morning. We'll stop the interview here. We're more than grateful.

And I think about it a lot in the context of climate change-

Please repeat it to me.

The process that took place to amend the regulation of the cartridge fishing permit and what it is called from outside.

Deep.

Yes, deep down.

And from outside.

It was quite interesting because there was an issue where it had to be updated so that a certain number of commercial fishermen wouldn't be captured and to give the opportunity to new people to enter the fishery, and I understand that it was positive that it was adapted, amended. But it's also interesting because also, if I understand correctly, in the first adaptation, a summer closure was mentioned. Now you have to get the permit, it's free, but you have to be a full-time commercial fisherman and have been fishing, which I think is good. I think it's good that that opportunity is given, that new people can demonstrate that, Drew [ph], for example, came here, if they want to enter, enter that and that they can have the process to obtain the permit, which before was simply even more difficult. But then it was amended again and the closure was removed. I understand that, because it's not known, they know enough about those populations. More cartridge fishing is being done specifically because it has a high economic value, tastes good, has high nutritional value, there is more access to technology, but also the fishing industry is no longer yielding as much, so there is an option to look for fishing further away, deeper.

But at the same time, don't you think this climate change you're referring to is coming to an end? Because there are many shore fishermen here who fish for sustenance and for sale, so their opportunity is being taken away.

Yes, exactly. It's moving more toward semi-industrial, industrial fishing, and we don't know how long it's going to last, because we don't know much about those populations down there. But also, which is what I was thinking, I lost the thread just now. Exactly, we have to tie that to how it—Let me see if I remember. But in some discussions we were having in the fishing village, we tied it to the mangroves, and since the mangroves continue to be illegally cut down, destroyed, more docks are needed now so the big boats can go fishing for shellfish so far out. They need more security, they need somewhere to leave them. There are no ramps, so you build an illegal dock, and that cuts into the mangroves, but then there's no kind of consideration for protecting the mangroves within all of this. There are also people who take tourists shellfish fishing because it's cool, something interesting, but it's not just something they leave for the locals, because locals aren't going to buy shellfish; it's very expensive.

[01:14:47]

Don't even restaurants buy it?

Restaurants can do it, but mostly now they're selling to people—I don't know, maybe [INAUDIBLE] told you something different, but to tourists, and snowbirds and all that. But I don't buy cartridges; they're very expensive. Anyway, the point about climate change got lost, but regulations aren't being adapted to climate change, definitely. That's something I think needs to be given more emphasis.

And finally, where do the fishermen you know sell their catch? They all go to the fishing village, they all teach it to Tomás, or they sell directly to the restaurants you know. How does it work?

After the pandemic, Tomás became the monopolist, and everything has been channeled through him. That has brought many concerns, but we must also recognize that he raised the price to keep up with inflation and so that fishermen could continue fishing even with the rising cost of gasoline and everything else. He moved around looking for a market. So that has occurred throughout the pandemic until basically last year, when some fishermen said, "Let's start with Blue Marlinar and put our product in markets again and sell directly to restaurants and families." But not much. Overall, Tomás has still remained the monopolist. In the last year, we agreed that once the fish market opens, Tomás will stop being a monopolist and become a commercial fisherman like any other, where he sells to the fish market, and everything he's buying from him now—all the fishermen who are selling to him would sell to the community fish market in the fishing village. That was the agreement, and we developed all the rules and prices, and I don't know how much. I hope it happens, because it remains to be seen. Although there are good intentions, it hasn't happened yet. But right now, the freezers and refrigerators in the fishing village are divided into sections for different fishermen, sections for different commercial fishermen who store there, and sell from there, or make deliveries, but that's the storage area because there's a solar installation there.

Fantastic. Is door-to-door sales practiced here? Is there anyone who goes, a van, to different houses?

No, that no longer exists unfortunately.

Are social networks used to promote sales?

[01:17:50]

And.

All fishermen or just Tomás?

No, Thomas, some others, but many already- Yes. Mostly Thomas and two or three more, but not