

Welcome to the GRACE Audio Podcast. I'm Dulce Fernandes and you're listening to our weekly series Our Heroes at the Ecocentric Blog. Each Thursday we interview a new hero, someone whose work is making a major change in the world of food, water and energy. Featuring local advocates and national figures, teenage leaders and established experts, neighborhood activists and international visionaries, this podcast series highlights the work and the daily lives of people who have in common an inspiring approach to sustainability.

In today's episode, Robin Madel, a Research and Policy Analyst here at GRACE, talks to Shana Miller, the director of the Tag-A-Giant program, an organization dedicated to protecting bluefin tuna populations in the Atlantic and the Pacific Oceans.

Hi Shana, welcome to the podcast.

Hi Robin, thank you for having me.

Q: Tell me about the Tag-A-Giant program. What is your mission?

Tag-A-Giant is a group that does primarily research on bluefin tuna both in the Atlantic and Pacific. Bluefin tuna are one of the largest fish in the sea and they undertake great migrations across ocean basins; they get up to being 1,500 pounds, so as big as a Volkswagen, a true giant fish. And so we research them and then we take our research data, our results, and we try to get those results incorporated into management and conservation of the fish.

Q: Does Tag-A-Giant do any other species besides bluefin?

No, we do bluefin tuna only, but two species of bluefin tuna: one in the Atlantic and one in the Pacific.

Q: How long have you been collecting data?

The program began in 1994 at Stanford University. Professor Dr. Barbara Block is the chief scientist. And the first electronic tag was deployed in 1996 and the electronic tagging is our primary scientific focus.

Q: What's the life span of a tag?

An electronic tag — we use two different types of tags. One is an archival tag that gets surgically implanted in the body of the fish, and so the fish needs to be recaptured and the tag needs to be returned, for us to get the data back. Those tags — the battery life — will collect data for five plus years, and then after that we, of course, get the recapture point of where that tagged fish had been caught and the tag was recovered. We also use satellite tags, and those tags ride on the back of the fish, and at a time that we program, they release from the fish, float to the surface and transmit their data via satellite. And for the satellite tags we put them out for nine to 12 months, typically; no longer than a year.

Q: What have you done with the data that you've collected so far? And what have you seen from the data?

One of the major findings — bluefin tuna in the Atlantic are managed as two separate stocks: a Western stock that spawns in the Gulf of Mexico and an Eastern stock that spawns in the Mediterranean Sea - and currently they're managed with a line drawn down the middle of the ocean that the western fish don't cross to the eastern side and the eastern fish don't cross to the western side.

Q: I'm sure that the fish respect that line, right?

Yes. Of course, they turn right around when they get to 45 degrees.

Q: Oops, can't go any further.

So one of the things that the tagging data have proven unequivocally is that there's major mixing back and forth across that line, which is not surprising, given that bluefin tuna — we recorded one fish that swam from the Gulf of Maine to Portugal in five weeks; so pretty direct, fast migrations across the ocean — so that's one of the major findings and it's important because of the quota.

And the fishing level in the eastern Atlantic has, in recent history, been an order of magnitude higher than in the western Atlantic. So far-western Atlantic fish are being subjected to the higher fishing mortality in the eastern Atlantic. That is very harmful to the western population and also as overfishing continues in the eastern Atlantic and we get fewer eastern fish migrating to our shores, there will be, for every fish caught, you'll be more likely to catch a western fish, if that makes sense. Because you have fewer eastern fish in our waters and so, all else being equal, you would expect to catch fewer eastern fish. And so it's kind of a double whammy on the western population, which is more severely depleted than the eastern population of Atlantic bluefin.

Q: Tell me about blue fin. You've told me before that they live to be 40 years old, which is amazing.

Yes, bluefin tuna are remarkable, have a remarkable biology for a fish. They can live up to 40 years in the Atlantic, in the western Atlantic. They may not mature until 11 to 15 years old. So they are really on par with human maturity. They are warm-bodied, in that they can maintain their body temperature up to 22 degrees Celsius above the water temperature. So they really have a unique biology that unfortunately makes them susceptible to overfishing. But they can spawn up to 10 million eggs in a single year, so they have the potential to recover very quickly if given the opportunity.

Q: So why are bluefin so important? I know they are at the top of the food chain, but how are they important overall, in terms of ocean ecosystems?

They are, of course, like you said, a top predator. There are very few animals that prey upon them. White sharks and Orcas, killer whales, are really the only fish that will eat an adult bluefin tuna. So of course their position in the food chain is important. They also have a long history of being a part of human civilization. Homer wrote about them in *The Odyssey*. Salvador Dali, more recently, painted them. They are on ancient Roman — featured in ancient Roman works, featured on Roman coins, so they are also part of the human ecosystem. But otherwise, as far as the ocean ecosystem, really their contribution as a top predator is vital.

Q: And I know that one of their major breeding grounds or spawning grounds, I guess is what you'd say, is down in the Gulf of Mexico. What effect has the oil spill had on them? Has it been quantified yet?

That is the million dollar question, and some of our scientific partners are working to answer that right now. It's still unclear what effects in 2010, as well as — the bluefin spawn in the Gulf of Mexico — the major spawning months are April and May — and so with the oil spill happening last year, April 20th, it was at the peak of the spawning time in one of their peak spawning areas. So, one would guess that that would have had an effect. Whether there's any contamination affecting the bluefin that are spawning in the Gulf right now, the jury is still out on that. And we're looking into that with some of our tagging data as well as some research in the laboratory. But the current thought is, based on studies of other fish, that it's the larvae that would be most vulnerable to the oil spill versus the adults that were there to spawn.

Q: So how is the bluefin population doing in terms of numbers and percentages?

Well, in the western Atlantic — the population that spawns in the Gulf of Mexico — there has been about an 80 percent decline in the population from its unfished levels. And bluefin in the western Atlantic have only been fished for 50 years or so. So a relatively rapid decline when you consider generation time of a bluefin.

In the eastern Atlantic, the population has always been much bigger than in the western Atlantic and the decline has not been as steep percentagewise. It's more on the order of a 70 percent decline. But still, a significant decline over the last, say, 40 years.

In the eastern Atlantic, in particular, the decline has happened mostly in the last 10 or 15 years in association with the farming that goes on in the Mediterranean Sea where fish are caught from the wild, put into pens, fattened and then sold at market. And there is a lot of room for loopholes as far as regulating the farming activity. And so there have been instances where the quota has been exceeded by more than double in illegal fishing activity affiliated with the farms. Thankfully in recent years the compliance has increased a lot, but there are still reports of illegal fish being sold out of the farms.

Q: So you're essentially a one-woman operation, but you interact with researchers all around the world, basically.

For the Tag-A-Giant program that we have as a nonprofit affiliated with the Ocean Foundation, yes, it's true I'm the only fulltime employee, but it takes a village. And the lead scientist, as I mentioned in the beginning, is a professor at Stanford. She has a large laboratory of scientists there as well as web communications people, etc. etc., so all those people are part of the core team. We also have scientists we work with anywhere from Japan to Canada, to Europe, and many different institutions within the U.S. as well. So while it's only me on paper, it's a big team.

Q: And what are your days like?

My days, well I have a home office, because renting an office, for one, wouldn't make much sense. And I spend a lot of my time supporting the science, be it fundraising for the science or supporting the logistics that go into tagging in the field. There are a lot of permitting requirements. And in dealing with animals you have animal care protocols. And many different logistics that go into the tagging as well as just making the arrangements for the scientists to be there and have all the equipment that they need. So I do that component. I also do some website and outreach work: our newsletter, we have a free quarterly newsletter, if anyone's interested. Our website is www.tagagiant.org. And we also have a blog. So I work on those things and then I also do some policy and conservation work. I'm on a couple of advisory panels to the U.S. Government about bluefin tuna management, so I participate in those meetings and commenting on various fishery management proposals, etc. etc. So I am kind of a jack-of-all trades, I have the benefit of always having a different day.

Q: Do you ever go out on any research vessels? Do you get to go out in the field very much?

I did my graduate degree at Stanford with Dr. Block and so I did tagging then, but I am sad to say that I have not been out on one of the tagging expeditions since that time, which would have been 10 years ago. But now that my young children are a bit older, I'm hoping that that will change as I'm not as stuck on shore as I have been the last several years.

Q: Did you have any crazy instances when you were out on the boat?

Yes, I don't think your podcast has enough time for me to go into all of them.

Q: Okay, pick like the one that was the most fun, how about that?

The one that was most fun. Well the one that was the most eye opening was that I was on a longliner in the Gulf of Mexico, and so we were at sea for ten days and just to be that far out at sea for that long of a period of time fishing and catching fish, the deeper water fish that looked like sea serpents and just amazing species that the normal person would never encounter, and being on the water for an extended period of time was just really a treat, a gift, to be able to be that close to the ocean environment.

Q: That's great. What are your degrees in? I know you said you went to Stanford.

Yes, I have my Bachelor's degree in biology from Cornell, and then a Masters degree in marine biology from Stanford.

Q: So did you always want to do marine stuff? Or how did you transition into this?

No, actually my focus was primates, primatology, monkeys, chimpanzees, in undergrad. And then I started fishing one summer in Martha's Vineyard because I didn't have enough money to buy food for myself so I had to catch my own food, and then really was captivated by the ocean environment. And of course, there's many fewer people passionate about bluefin tuna as compared to a chimpanzee. So that's when I made the switch and the electronic tagging research that Dr. Block does is really second to none, and just hooked me. No pun intended.

Ah, or maybe every pun intended, right?

Q: Do you get to spend much time on the water now?

I do. I live on Long Island and have a boat and go fishing with my family. I've not been fishing offshore for a couple of years, but hopefully this summer we'll get back out.

Q: Do your kids like being out on the water?

They do. They love it.

Q: Nice. Do you go to sushi restaurants and seafood restaurants, and if you do, what do you order typically when you go there?

I do definitely go to sushi restaurants. Sushi is one of my favorites. I think a lot of fish researchers get into researching fish from catching fish because it's a way to actually getting connected to the animals and really want to work with them more. When I go to sushi restaurants I typically order yellowfin tuna. Oftentimes restaurants do not know whether it's a bluefin or a yellowfin or a bigeye. In those cases I like yellowtail as well. That's oftentimes farmed, but also in the wild, a healthier population than bluefin tuna certainly. I also love fresh salmon at sushi restaurants, but of course, getting wild, fresh salmon in a sushi restaurant is difficult.

Q: That's true. That's true. Salmon has its own issues going on right now.

Many. So unfortunately that's not typically an option.

Q: So where do you — actually, let me ask you another question about buying seafood. We were talking before about how difficult it is to find out the source of your seafood. How can people know where their fish is coming from? What kind of questions should people ask?

Well, I think it's important — even though I go to the same sushi restaurants all the time, I continually ask them what species of tuna, for instance, that they're serving and where it came from and how it was caught. And oftentimes, as I mentioned before, sometimes someone will say that it's a blueeye tuna, which — there's bigeye tuna and there's bluefin tuna, but there's no blueeye tuna — so, of course I know that they got their information

wrong. But I think it's important for consumers to ask wait staff what the fish is, where it's from, just to increase the awareness among restaurant owners and wait staff that people are paying attention to these things and that they should know try to know the answers to those questions. And, of course, supermarkets have gotten much better because of new laws about seafood labeling: where it was from, whether it was farmed or wild caught. Stores like Whole Foods have taken it a step further and feature the fishermen who actually caught the fish. And so just for consumers to continually express interest in knowing where their food is from, how it was caught, whether it was from a sustainable population. With bluefin, there is a product called [Kindai tuna](#) and those are tuna that are farmed in Japan, and not farmed as in that they were taken from the wild and then fattened in a farm, as we see in the Mediterranean Sea, but actually farmed from captivity — reared egg to market size in captivity. And so it's a much more sustainable product than a wild bluefin tuna. So there are situations like that, that if you know what you're eating, you know, you can do so and feel good about it.

Q: It helps to ask questions and look for the source. So what's next for Tag-A-Giant? Where are you headed with the organization?

Well our big, big focus right now, as you asked about earlier, is actually the oil spill and trying to get a handle on what the effects were on bluefin tuna. We continue to do the electronic tagging. It gives us — because we now have, gosh, it will be 15 years worth of tagging this year — and so it gives us a time-series of whether things are changing; whether in response to climate change bluefin tuna are migrating further north, questions like that. As well as questions in eastern versus western bluefin; whether the percentages are changing in the western Atlantic, as in there are fewer Eastern fish because of overfishing in the eastern Atlantic. So we continue to do the electronic tagging.

We're also working on a genetics technique that could ID a fish, whether it was an eastern or western fish with a rapid assay that could be done. We're also developing a new stock assessment model, as I mention, that currently we have the line down the

middle of the ocean, so that doesn't apply just for management of fishing regulations, but also we assess the fish that way, that any fish on the western side is western, any fish on the eastern side is eastern. And so, of course that messes up the counts and therefore messes up the projections of where the populations will be under various management scenarios. So we're developing a new stock assessment model that takes the mixing into account, and better characterizes how many bluefin are left and how the population will rebuild under various quota and management regimes.

Q: You have a lot on your plate — all of it fish.

Yes. Exactly. There are a lot of scientists working towards answering the questions that are important for management of bluefin.

That's great. Thank you for joining me on the podcast.

Thank you for having me Robin.

You are listening to Robin Madel, a Research and Policy Analyst here at GRACE, talking to Shana Miller, the director of the Tag-a-Giant program. And that was this week's episode of the GRACE audio podcast. You can leave your comments at ecocentricblog.org where you can also download this episode and subscribe to this podcast series. I'm Dulce Fernandes. Thank you for listening.