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

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Jennifer Stock: And welcome to another Ocean Currents. This is the first Ocean Currents for 2009 and I'm looking forward to what 2009 holds for all of us and looking forward to sharing lots of ocean-related topics with you the first Monday of every month. My name is Jennifer Stock and I'm the host for Ocean Currents. This is part of the West Marin Matters Series where every Monday at 1, you can hear about a topic relating to our local environment, economy, or community.

On Ocean Currents, we dive into our blue planet and talk about ocean-related natural history, issues, conservation, and policy and what you can do to get involved. We focus closely on our National Marine Sanctuaries off the coast here in California, but also look way beyond the borders to the larger ocean ecosystem as well. So, thanks for tuning in with us today. Today we are focusing on an ancient animal that has been on this planet since the age of the dinosaurs, the leatherback turtle. This animal has a list of superlatives making it an incredibly interesting creature, yet this animal has met its greatest challenge in its lifetime with humans and its future is in our hands.

Right before the holidays, I had a great opportunity to see my two guests today speak at a lecture at the Randall Museum in San Francisco and I gained a much larger appreciation for this animal and the understanding of the issues it faces. I am so pleased today to be able to bring them to the show. So, in the studio with me today, I have Mike Milne, who is a leatherback sea turtle campaigner with the Sea Turtle Restoration Project based out of Forest Knolls and on the phone with us is Scott Benson, welcome Scott.

Scott Benson: Hello!

Jennifer Stock: He is a biologist with the Southwest Fisheries Science Center and the Marine Turtle Research Program, part of NOAA Fisheries, who studies leatherbacks in the Pacific Ocean. You can imagine how hard it must be to study an animal that has potential ranges in all parts of the Pacific Ocean including right off our coast here in Point Reyes. We'll be talking about what's happening on the

Pacific Ocean in relation to leatherback turtles and hear about the research Scott is doing in the Pacific. So, welcome, Scott and Mike, thanks for coming to the show today.

Michael Milne: Thanks for having me.

Scott Benson: Yeah, thank you very much.

Jennifer Stock: This is great. So, first, I just thought we could talk a little bit about the natural history of this amazing animal. There are so many cool factoids about that and Scott, since you're coming on the air through the phone, I thought we'd bring you right in. Why don't you start off telling us a little bit about the leatherback turtle and Mike, you can chime in too with some of your facts. So, Scott, tell us a little bit about leatherbacks.

Scott Benson: Well, as you mentioned, the leatherback turtle is associated with a pretty long list of superlatives. It is the largest turtle in the world, up to two meters and 2,000 pounds in weight. It's capable of diving to incredible depths, over 1,000 meters. It's a trans-oceanic voyager. The turtle here in... that we have here off of our coast comes to us from nesting beaches in the tropics of Indonesia, the area, actually, that experienced the earthquake this weekend. It has a very high growth rate and a very high metabolic rate among reptiles.

It has some unique adaptations that permit it to exist in our very cold waters. It's the only rule that we have here in the California waters. It's a gelatinous zooplankton specialist. It eats jellyfish. So, it achieves this tremendous size through a diet of gelatinous zooplankton.

As you mentioned, it has some relationships or some similarities to the dinosaurs in that it's a gigantotherm, as the dinosaurs were. So, it's metabolic rate is actually similar and between a marine mammal and a turtle. It lays multiple clutches of eggs every two to four years and as you've said, it has been on the planet for, in it's present form, almost 70 million years.

Jennifer Stock: Wow. 70 million years. Are there any other animals that have been around even close to that?

Scott Benson: Perhaps some of the sharks have been around for a long time like that, but you might ask somebody else who would know better.

Jennifer Stock: What did the earth look like, do you think, when leatherbacks were first around and did they come from the land first? How exactly did they involve into a sea turtle?

Scott Benson: Gee, well, I can tell you for certain that the earth looked much different back in those times. As a matter of fact, the nesting beaches that we've identified where the animals are coming from here didn't exist back then. So, they were nesting in other places, most likely in the Indo-Pacific region and the leatherback is descended from Archelon, which was the...there were a couple branches of these large, highly vascularized turtles of which Archelon was the last one and leatherback is the only descendent from that animal, but Archelon was a huge animal, much larger, actually, than the leatherback turtle and again, probably again, about 70 million years ago we have the leatherback turtle that we know today.

Jennifer Stock: What do you mean when you say vascularized?

Scott Benson: It's the, for instance, the bones are vascularized even so that it makes it very difficult for us to age the animals. They had counter-current heat exchangers in the flippers where warm blood can go out to the flippers, cold blood goes back into the heart. This is one of the adaptations that makes it possible for leatherback turtles to exist in our cold waters and this high vascularization also contributes to its incredibly quick growth rate. Leatherback turtles reach sexual maturity, we believe, somewhere between 10 to 20 years of age and during that time, they grow from something that's smaller than the palm of your hand to an animal that weighs 700 to 1,000 pounds.

Jennifer Stock: Eating jellyfish.

Scott Benson: Eating jellyfish.

Jennifer Stock: So, what's the nutritional value of jellyfish? I have seen jellyfish marketed in Chinatown in packets of plastic. So, some people eat them as well, but do you know a little bit about the nutritional value of jellies? Must be something in there.

Scott Benson: We are learning more about it. The jellyfish is a much-ignored component of our ecosystem, but it is a very large component of the ecosystem. All jellyfish are not the same. That's one thing we know. We have some students at Moss Landing marine labs that are doing this kind of work to understand more about the nutritional aspects of jellyfish and as you mentioned, there are

some rather large fisheries around the world that go after jellyfish for human consumption.

So, apparently, they're plenty nutritious, enough for a leatherback turtle, although, the turtles here seem to be focused on a particular species, the brown sea nettle, which, by the way, according to the research by Tanya Graham, that is actually the animal that has the highest carbon content and would probably be the most nutritious of all the jellyfish that we have in our waters here.

Jennifer Stock: So, jellyfish exist in all oceans or all around the ocean and on our planet. What make the jellyfish on the California coast so important that the sea turtles would migrate all the way across the Pacific Ocean from Indonesia to feed here?

Scott Benson: Well, the jellyfish that we have here occur in just incredible densities. I like to use the term "Biblical proportions," and they occur here during the summer and fall months, really, when we're doing aerial surveys, we say, "If you fell out of the plane, you wouldn't even hit the water," and these aggregations go on for square kilometers along the coast and so, these animals, these jellyfish are very abundant and are predictable, both in time and space, meaning that they're going to be here during that time of the year in these large aggregations and exist in a non-random fashion. They're not found everywhere along the coast, but in particular spots, particularly between Bodega Bay and Monterey Bay and it's quite...it's surely likely that these aggregations of jellyfish have been on our coast like that for a long time, otherwise we wouldn't see a trans-Pacific migration by these leatherbacks. They're coming over here because it's been good here for a long time.

Jennifer Stock: Now, one thing you mentioned at the lecture back in December was that turtles can be also found up in the Bering Sea? Are there jellies up there as well or what are they up there for?

Scott Benson: Yes, there's another large aggregation, actually, off of the coast of Oregon and Washington. They're also likely eating the brown sea nettle, but as you mentioned, they can be found as far north as the Gulf of Alaska and there are other species of jellyfish that the leatherbacks eat in some of these places, particularly the lion's mane jellyfish, which is, apparently, quite abundant in the areas further north of the Oregon-Washington coast. So, we don't have that species here in high density. So, in other places, they're using these other large jellyfish species again, similar to the brown sea nettle that we have here.

Jennifer Stock: So, would you say it's safe to say that turtles have an ecological role in regards to keeping jelly populations in check?

Scott Benson: Yes. I would think so. There are not many jellyfish consumers; leatherback turtle is one of the more notable animals. The ocean sunfish, the mola mola, is another and there are some other fish species that will consume jellyfish, but probably not in the quantities that leatherback turtles do. Now, it's kind of hard for me, as a biologist, to imagine a vertebrate controlling a population of an invertebrate like a jellyfish that's able to reproduce at extreme proportions and very quickly.

However, having watched these animals along the coast here for about the last eight years, it's really quite remarkable when you get into an area where there are leatherbacks, the destruction of jellyfish that we see at the surface, the turtles are not eating the whole jellyfish, as a matter of fact, they don't consume the bell very often, and when we're in a place where there's leatherbacks and these jellyfish, we see numerous languid bells floating dead at the surface where leatherbacks have been as if they're leaving a calling card.

Jennifer Stock: That's great. So, it's almost a way to look for them? I'm going to look for that the next time I'm out on the ocean for some jellyfish savage zones where they've been....potential for those leatherbacks. Mike, I should invite you in here. Are there some other fabulous acts that you find about turtles, some other natural history facts that you'd like to share?

Michael Milne: Well, Scott has done an excellent job in providing a background on the Pacific leatherback. I like to think of them as a sea turtle's sea turtle. They are classic, Olympic swimmers. They have huge, big broad shoulders, long front limbs with giant paddles, huge pectoral muscles, their form, which is kind of similar to, perhaps, an almond, you know, is designed to have water flow smoothly over their body to minimize turbulence and any suction that that would create.

You know, they are thought to be about three times more energy efficient than any other sea turtle while swimming and one of the things I really like to think about is leatherbacks did survive the asteroid that did lead to the demise of the dinosaurs and not only that, they were the only sea turtle species thought to have actually survived that. So, you know, they are survivors.

Jennifer Stock: This is a survivor here we're talking about. For folks just tuning in, this is Ocean Currents and we're talking with Scott Benson from NOAA Fisheries, a sea turtle biologist and Mike Milne from the Sea Turtle Restoration Project and we're talking about sea turtles, leatherback turtles.

So, obviously, there are so many cool natural history facts. We're talking about an animal that has survived an incredible amount of change on this planet from 70 million years ago and is coming here, obviously, to the west coast because of the productive water here because of the jellies. Scott, what is some of the science that you're focusing on trying to learn about leatherback turtles?

Scott Benson: Well, as you said, I work for the National Oceanic and Atmospheric Administration in the National Marine Fishery Service Program and my job is really to understand where turtles are in time and space and both horizontally and vertically. So, my work focuses on distribution, abundance, and movement of leatherback turtles and this information is primarily utilized to provide to fisheries managers to help fishers, essentially, avoid leatherback turtles.

Jennifer Stock: So, your work informs how to support sustainable fisheries to avoid catching turtles?

Scott Benson: Yes. Exactly.

Jennifer Stock: So, how do you study a leatherback turtle? These are patchy animals, like you said, they are only distributed patchily across the ocean and how do you do this?

Scott Benson: Well, the tools that we use are...there's a multiple array of tools. We use aerial surveys extensively along the coast here counting leatherbacks from the air using line transect techniques that allow us to derive densities. We also use molecular biology, the genetics, to identify the population or stock, in this case, of turtles. We do oceanographic sampling and prey sampling.

We sample the jellyfish and try to understand something about the amount of jellyfish that's available for these animals to be eating and other things, as you mentioned, the nutritional value of some of these jellies, and use satellite telemetry for understanding more about their movements both within the foraging grounds and all the way across the ocean.

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- Jennifer Stock:* How long does it take? I'm assuming you probably have to attach this tag at the nesting site?
- Scott Benson:* Well, actually, we do that at the nesting site in Indonesia and Papua New Guinea and Solomon Islands, but also catch leatherbacks free swimming off the coast here and attach transmitters to them here locally.
- Jennifer Stock:* So, how do you catch a turtle and how do you attach a tag? These are massive animals.
- Scott Benson:* Well, the hard part is actually finding them because they are very low profile in the water, don't make a blow, and don't make a spectacle of themselves in terms of splashing. We use an airplane to help find the animals and literally, the airplane will tell us the turtle is 50 meters on your right and we'll just go 50 meters on our right and find the turtle and then we proceed to capture the animal with a breakaway hoop net.
- We have a very special boat that we use with Moss Landing Marine Labs, who are collaborators with us. They have a unique, small landing craft type of vessel. So, after we actually put this animal in a small net, it becomes a bag because it breaks away from the hoop, we're able to lower a bow door and actually slide the turtle on board to this small landing craft. It's really a sweet arrangement that's just perfect for this kind of work.
- Jennifer Stock:* That's great. So, you don't have to put a lot of impact on to the turtle. They just kind of slide on and slide off?
- Scott Benson:* Right. We put PVC plating on the non-skid deck so the animal just slides on the deck and then have the sides of the boat lined with rubber matting stuff just to minimize and potential injury to the animal.
- Jennifer Stock:* So, through the tracking you've found this migration. How long does it take them to migrate from their breeding site to the California coast? Is that a yearly thing? A bi-yearly thing?
- Scott Benson:* Yeah, it takes an animal, an individual, anywhere from ten to thirteen months to get across the ocean depending on the individual and a turtle will come here and be here on these foraging grounds during any time between...first animals begin arriving in May and will be leaving sometime in late October or November and then after that, they usually go down to some areas in the sub-

tropics near Hawaii and it's kind of over-winter in that area before coming back to the California coast to forage again.

So, they're different than marine mammals or whale than most folks might be knowledgeable about in that they don't go back and forth between a foraging ground and a nesting beach every year. They require several years at a foraging area before they're in proper condition to go back to the nesting beach and lay eggs, which is a fairly expensive thing to do.

Jennifer Stock: So, this animal, they're not really localized. They're all over, moving across the Pacific and there's a lot of threats in between and we've seen the last thirty years or so, a huge decrease in leatherback turtles and, Mike, I think we're going to talk quite a bit about this in the second half here. Does NOAA fisheries study the populations of turtles and what have you see as far as populations go in the last few years?

Scott Benson: Yes, we do do this. Now, this is unique because we don't have leatherbacks nesting on our beaches here. The way turtles are normally counted is at the nesting beach. That's where we count all of the reproductive females and to do that, we've been providing training and resources and we had the budget to do so to the people who live at those beaches in Indonesia, Papua New Guinea, and the Solomon Islands and their data, at this point, which is just nesting data, shows that there has been a decline in this population that originates from the western Pacific.

It hasn't declined in a steep fashion that we're aware of with the population that utilizes Costa Rica and Mexico as nesting beaches, nevertheless, the local people there do tell us stories about many more turtles being present when they were younger and their nesting data do show a decline over the last fifteen years.

Jennifer Stock: Now, these are communities that have historically also harvested turtle eggs. Is that still a practice that happens at these sites or are they turning more towards embracing turtles as a way to help bring in eco-tourism money to the communities.

Scott Benson: Well, the largest nesting beaches where the most animals would be using, they are not harvesting eggs any further, nor are they harvesting the adults. However, leatherback turtles won't use just a single beach. If the individual lays ten clutches of eggs, two of those clutches could end up in someplace outside what we would call the protected beach and in those areas, yes, local people in

some of these other places will harvest eggs and actually harvest whole adults, slaughter adults on the beach.

So, in places where we've been working with where the largest animals are nesting, nobody is using the eggs that way and we've been, in the past, providing funding for them to carry out the monitoring work on the beach. Our agency hasn't had as much funding lately. So, we're no longer able to do that, but there are some other avenues where the locals are exploring to try to maintain some level of funding to carry out the bare minimum of monitoring.

As you mentioned, they had used leatherbacks and their eggs for many generations where the younger boys who were going through the rite of manhood would be responsible for collecting all the eggs at the beach and bringing them back to the village every night where they would be divided up amongst the people in the community. The communities in these areas are subsistence cultures. They maintain gardens, they hunt, and their cash economy was only introduced there a few generations ago. There isn't a daily need for money.

There's no store to buy and eat things. So, people don't use money all the time, but they did harvest eggs at one point to provide to a middleman to raise money for their children's school fees. So, at this point, if they're no longer using turtle eggs for children's school fees, it'll be important that we provide some substitute for that, in this case, for their efforts on the beach to monitor and protect the population at these very critically important nesting beaches.

Jennifer Stock:

That probably varies a bit from each of the different communities you're saying, Papua New Guinea and the Solomon Islands, but also the Costa Rican population as well, and how they're dealing with those nesting sites. Do you think, at this point now, since turtles have been heavily hit with long-line fishing as bycatch, that the harvesting of eggs is a significant part of the decline at this point? I mean, they're getting hit from many different angles in regards to threats, but how significant do you think the local communities...it sounds like it's decreased quite a bit, but do you think it's...a viable cause for the decline?

Scott Benson:

Yes, I do. I mean, the issue here is that all the reproductively fit females are going to use those beaches. So, it's not just a part of the population, but every reproductively fit female is going to use that beach. If one of those animals is slaughtered for its meat, then all

the nests associated with that individual for the remainder of its lifetime are going to be lost.

Likewise, the harvesting of eggs and folks can be very efficient at harvesting eggs, I mean, every egg on a beach can be taken off the beach if somebody wants to do so and that means no recruitment to the population. So, when we have the combined effects of the what happens on the nesting beaches with fishery by catch, you kind of have a perfect storm, if you will, where you're losing reproductively fit females and not having any recruitment into that population any more and certainly, that's the cause of the decline of the leatherback in the Pacific.

Jennifer Stock: Excellent. I want to fit one more question here before we take a break, but Mike, is Sea Turtle Restoration Project doing anything at these nesting sites with these communities to try to help with this problem?

Michael Milne: Yeah. We definitely are. Traditionally, females have been killed and eggs have been harvested at these sites for sustenance, like Scott has mentioned and so, we have a campaigner working over in Papua New Guinea working on marine conservation deeds. Those are community-driven processes that establish a kind of a legal document and to create a conservation area managed by the local people for the protection of their own natural resources and so, the communities we're working with have agreed not to kill sea turtles nor harvest their eggs for a period of five years and that's a renewable contract and we're working on six, right now.

We just finished our first one. It's really pretty exciting. When the six are finished, we're going to protect approximately 40 kilometers of nesting beaches in Papua New Guinea.

Jennifer Stock: Wow, that's great. I think working with the communities is going to help foster some stewardship from their communities and how they want to bring their children up as well and try not to harvest the eggs.

Michael Milne: Definitely. It's a critical piece of the puzzle and it's really exciting because our campaigner has been taking the conservation deeds, which have typically been used for land-based resources like timber, and applying them to the water, to the ocean. So, it's pretty innovative and really exciting.

Jennifer Stock: Great. Well, it's just about 1:30. We need to take a short break. Scott, please stay with us on the line. Thank you very much for coming on and we will be back in just a moment.

(Music)

Jennifer Stock: ...back. You're tuned into Ocean Currents on KWMR and we're talking about leatherback sea turtles today and we talked a little bit about some of the amazing natural history about these old animals that are still around on our planet after 70 million years, and their adaptations and heard a little bit about some of the science that Scott Benson is talking about, but we are facing an animal that has seen a huge crash in their population in the last 20, 30 years and Mike, I'm wondering if you could talk a little bit about some of the population changes that you're working with and some of the efforts that you're campaigning on in regards to leatherback conservation?

Michael Milne: Sure. My organization, the Sea Turtle Restoration Project, has been working to protect the Pacific leatherback for the last 25 years now, about, and in the last 25 years, sadly, their population has declined by 90 to 95 percent and now they are among the most endangered sea turtle species of any on the planet.

Approximately ten years ago, a scientist released a study in Science Magazine that predicted Pacific leatherbacks could be extinct in as little as 10 to 30 years without major changes and additional scientific data in that time has shown that they have been pretty accurate for 2 of the 3 subpopulations of leatherbacks in the Pacific Ocean. So, this a species that is five percent of the current population that they were in 1980. It's a pretty sad and dramatic decline.

Jennifer Stock: How about the population in the Atlantic? How are they doing?

Michael Milne: Population in the Atlantic is relatively stable. There might be some indications that it could increase in the relative future. It's kind of a...it's a mystery why there's such a dramatic difference in the status of the population, you know? Scott may know more about that than I do, but because there's such an emergency with the Pacific leatherbacks in the Pacific, you know, we really have been focusing all our effort here.

Jennifer Stock: Scott, do you want to talk about that a little bit about that with the Atlantic population? Do you know what type of recovery efforts were in place to help stabilize that population?

Scott Benson:

Yes, I would just say that the recovery efforts in the Atlantic have been ongoing for a much longer time and as...in contrast to that, the things in the Pacific...we just learned recently where the turtles were coming from in California. We thought for a long time that they were also coming from Costa Rica and Mexico. So, there's that aspect that the monitoring conservation efforts are relatively very new in the western Pacific.

Furthermore, I think it also has something to do with the way that people actually utilize the animals. In the western Pacific, we know that people do consume the eggs as they do in the eastern Pacific and likely did in the Caribbean, but also that they consumed the adults and this is actually very unusual. When I started working with leatherback turtles, I was told that nobody eats the adult animals because it doesn't smell good, it doesn't taste very good, but over the course of the last eight years during my travels through the Western Pacific, I realized, no, actually people have eaten leatherback turtles and continue to do so at a much larger amount than anybody really realized prior to that.

Jennifer Stock:

And so, Mike, as far as...it seems...I mean, the big decline we're pointing to is long-line fishing with by catch and the long-line fishing with these long, long miles of nets...or not nets...hooks are taking marine mammals and sharks and turtles. What are the current long-line fishing efforts in the Pacific Ocean that you're aware about that are the biggest issues for leatherbacks?

Michael Milne:

Sure. Well, just to zoom back a little bit so people have an understanding of what a long line is. It's generally...long-line is a fishing method that is intended...is used to catch the migratory predator fish of the ocean: the tuna, the swordfish. Vessels are deploying about a sixty mile line--that's roughly from Santa Cruz to San Francisco with thousands of baited hooks and each year in the ocean, there's over 1.5 billion hooks set on long-liners.

So, that's about 5 million a day on about 100,000 miles of line and the problem, as you stated, is that it's a non-selective fishing method where about 40 to 50 percent of what is caught is not the target species. So, that's millions of sharks each year, tens of thousands of seabirds, marine mammals, sea turtles, other bill fish and other discards and right now, the US has one long line fishery in the Pacific and that's based out of Hawaii. It's a fishery that is, right now, pretty heavily regulated due to a lawsuit that we filed several years ago that fishing was actually closed for about three years to protect the leatherback sea turtle.

Now, there are plans to introduce additional long-line fisheries including two along the California coast, one from 50 to 200 miles off our coast where long line fishing has never been permitted and it was actually, historically banned by the state legislature and then another one outside of 200 miles on the high seas, which would be a much larger fishery, which would threaten the leatherbacks as well.

Jennifer Stock: So, this is a proposal for opening these fisheries right now?

Michael Milne: Yes, there is. Right now, they are working their way through the system. The proposal to fish within fifty miles of the coast is actually in the late stages of the process and we just heard that the state will not have an opportunity to provide input on that fishery like they did last year. Last year the California Coastal Commission was able to review that permit and reflect the state's perspective, which is the state does not want long-lines off the California coast.

The California State Legislature recently passed a resolution against long-lines off the California Coast. The California Department of Fish and Game has historically been against long-lining and most recently, the California Ocean Protection Council also passed a resolution against this fishery. The high seas fishery, the second fishery that's over two hundred miles off the California coast is something that is going to be reviewed in March. So, that, the process is kind of just beginning and that would be a much larger fishery with up to twenty boats.

Jennifer Stock: Now, from what I understand, this is also a proposal for modified gear.

Michael Milne: Yeah. There have been improvements in the gear, no doubt. In Hawaii, where by catch of leatherbacks has declines, but it's still a very imperfect system. In 2006, after the Hawaii fishery was reopened, it had to be closed in March because they already reached... they have a quota of leatherbacks that they can catch each year and it took them about 3 months to catch them and so, but the scientists, they're continually, kind of, improving their understanding of where the leatherbacks are and why they get caught in the long lines, but personally, I think if every fishing long-line fleet in the entire world had the best available technology that we have today, because there are so few leatherbacks let in the Pacific Ocean, less than 5,000, I still think that long-line fishing

would probably prevent this species from covering from where they are right now, which is spiraling towards extinction.

Jennifer Stock: Scott, how does the science as far as the tracking goes, of course, from the breeding grounds, but also the local foraging use of California's waters. How does your science help inform some of the decision making in regards to allowing or disallowing this fishery?

Scott Benson: Well, our data will be utilized, again, to...as Michael might have mentioned...the area off the coast here has been a swordfish fishing ground for swordfish utilizing drift gill nets for a long time and our data are useful to...in regards to them establishing timed area closures. So, the waters off the California coast and southern Oregon were prohibited from draft gill net fishing from 15 August through 15 November because of our information that leatherbacks are in those waters during that time and then, likewise, again, it's a time and space aspect where people want to know where could we fish and when could we fish there and have the lowest probability of encountering a leatherback turtle and so, that's how our telemetry data are used.

Jennifer Stock: I see. So, what's the current status right now, Michael, with this proposal? Is there anything that concerned citizens can do to speak up about it?

Michael Milne: Yeah, I mean, there's definitely many different ways that you can get involved. I would encourage everyone to check out our website, that's www.seaturtles.org, that's plural sea turtles.org and we have several items that people can take action on. They can contact their representatives or officials at the National Marine Fisheries Service. On a personal level, there are also very tangible and powerful things that you can do.

Our dinner plates are one of the most tangible ways that we're connected to the ocean. Part of this issue is that we are putting too many hooks in the ocean. We are just simply overfishing and by reducing your consumption of tuna that's caught on long-lines and by stop eating swordfish. Every time you have a swordfish dinner, you end up eating a side helping of endangered sea turtles, you know? You are commissioning the fishermen to go out there and, at this point, other than perhaps some harpooning that takes place in Southern California, we don't have a bycatch-free way to catch swordfish.

Jennifer Stock: As far as the fishery goes, what I'm seeing is that they want to promote a fishery here in the United States because they know how it's being fished and they can regulate closely and that would help, maybe, reduce imports from other countries where they can't see as closely how swordfish is caught in the by catch there.

So, I can see the devil's advocate role here with the federal government here in the United States wanting to promote a fishery that is based on science and modified gear and observation, but how does that play in regards to your viewpoint here, Michael, with imports of swordfish from other countries where we have no idea how these animals are caught and how many animals are killed.

Michael Milne: Right, well, you know, that's a really good point. I'm glad you brought that up. That is something that they're claiming that we can fish in cleaner ways and we can reduce our reliance on imports and unfortunately, the National Marine Fisheries Service have had several tools to reduce our reliance on imports that haven't been utilized in the last ten years or twenty years even. They have provisions of the marine mammal protection act that they could have used to reduce the imports of swordfish or compel foreign nations to adopt US standards.

New provisions of the reauthorized Magnuson Stevens Fisheries Conservation Act basically require nations who import seafood products to have a regulatory program to reduce by catch that's comparable to the US within five years. So, we do have a lot of other regulatory tools. We have the legal authority to make...to have clean imports. Additionally, honestly, I haven't seen any proof that if we have a US fishery that less boats are going to go out fishing for swordfish overseas.

So, we could end up just increasing fishing effort and compounding the problem and if we do have more locally supplied swordfish and, let's say we do, and prices decline, what are we doing to demand? Are we stimulating more demand and how does that feed back into the system? So, you know, it's kind of something that kind of is a little seductive, but I don't really think it holds much weight once you have some careful analysis of that point.

Jennifer Stock: Interesting. Scott and Michael, what are the most important things, you think, what are the most important aspects of saving this animal that you think we should be doing? Sea turtles are being hit with long-line fishing, we didn't even really talk about climate

change all that much, although that's going to be a huge issue coming up on the horizon for this animal, but also, the nesting grounds.

What do you think we should focus most of our efforts on as a world trying to save these turtles with all the different countries involved and economic interests? Scott, we'll start with you.

Scott Benson:

Well, it's hard to isolate one thing. Certainly, it's a combination of both what happens at the nesting beach and what happens where the animal spends 95 percent of its life, in the water. Clearly the nesting beaches are very critical. If there isn't a place for animals to lay eggs and have them hatch and get back into the water, then none of the things that we do in the water are going to make any difference whatsoever.

So, we definitely need to show some solidarity and back up our colleagues and our friends over there in the areas like I mentioned that were just hit recently with this earthquake during the weekend. Those are the places, we learned our colleagues were ok. They survived that earthquake, but I imagine that the small villages there were probably devastated by that 7.6 and 7.3 earthquake just 24 hours ago.

So, we have to show some solidarity with those folks in that regard and likewise, as Michael said, the demand for swordfish is very high. I'm in the business of leatherback recovery. I look at it and say, "Well, if there's going to be this kind of demand for this product, then we have to think of safe ways to extract that product without continuing to endanger other marine species or ecosystems."

And so, that will mean continuing this kind of work in terms of learning where these animals are and further gear development to have clean fisheries and export those technologies to other nations. It won't be enough just to be able to do that with US fisheries, but as we've talked already, these kinds of technologies need to be made available all around the world.

Jennifer Stock:

Michael, do you want to add to that?

Michael Milne:

You know, I'll definitely echo Scott's comments. The protections at the nesting beaches are critical and that's something that needs to be said that we will need a multi-pronged approach, especially with the specter of global warming and the consequences that will have for the leatherback sea turtles and that's why Sea Turtle

Restoration Project is also working in Papua New Guinea, the nesting beaches, but I think it's also instructive to point out a little of the history of Pacific leatherbacks.

There are 3 subpopulations in the Pacific Ocean. There was one in Malaysia that's now extinct, effectively extinct, one in Mexico that's been reduced to less than one percent, and then we have this population in Indonesia that we don't really have long term trend data on and it's really a great opportunity to save this species and, but at the other two sites, in Malaysia and Mexico, they had a prohibition on egg collection.

They had parks. In Mexico, the sea turtle biologists were working with the Mexican army to protect the nesting beaches, literally, and still, the scientists at both those sites ultimately concluded that international fisheries were still causing a decline in the species. So, we can have all those protections that are so necessary at the nesting beaches and still not save these species as recent history has shown us.

So, you know, we really do need to reign in long-line fishing, just the amount of it we're doing and I think the US definitely has more responsibility to play a leadership role, to do whatever we can to strengthen international fishery management and to restrict our imports of unsustainable seafood, especially swordfish, as I mentioned earlier and ultimately, the long term solution may be establishing a Pacific-wide network of marine protected areas for the leatherbacks along their migration corridors and if that's going to work, then we may have to stop long-line fishing. So...

Jennifer Stock:

Lots and lots of change to come about in 2009 and I know with a new appointment for the head of NOAA, there could be some change coming within NOAA as well. Jane Lubchenko is a very well known marine ecologist and conservationist coming to the head of NOAA. So, we'll see. There should be some interesting changes ahead and we look forward to that, but I want to thank Scott and Michael for coming on the show today to talk about leatherbacks. Thank you, Scott, for calling in from Monterey...

Scott Benson:

Well, thank you for having me on this program. I think it's a great thing that you're doing. It's a great service to make people more aware about the ocean ecosystem.

Jennifer Stock:

Thank you. I wanted to ask you before I let you go, is there a website you would want to point out with NOAA? I was at your presentation and saw a turtle cam, which, too bad we can't

broadcast on the radio, but it was so cool. Is there a website that you'd want to point people to to see images and video from your work?

Scott Benson: We have our website at SWSFC for Southwest Fisheries Science Center dot NOAA dot G-O-V, and you can navigate your way through that to find some information about the sea turtle population assessment program and likewise, you can get some other information from an effort we were working with in collaboration with others called the great turtle race at greatturtlerace.org and there's lots of, really, very good links there to provide more information about leatherback turtles in the Pacific.

Jennifer Stock: Excellent, thanks so much, Scott. Michael how about you? Any last websites? Thanks for joining us today.

Michael Milne: Well, thanks so much. I had a really great time. It's great to get the word out on the species that very few people still know about...the bigfoot of the California Ocean, if you will, and so, I would encourage people to go to our website, the Sea Turtle Restoration Project at www.seaturtles.org and we've got a lot of information and a lot of ways that you can take action to help save the species from extinction.

Most recently, we're going to, in a couple days, we're going to have an action item where people can express their support for our swordfish import petition. The National Marine Fisheries Service has just decided that they are going to review whether to restrict the imports of swordfish until foreign nations prove that their fishing practices don't harm or kill marine mammals and sea turtles too and in excess of our own US standards. So, I would encourage people, again, to visit our site. That's www.seaturtles.org.

Jennifer Stock: Wonderful.

Michael Milne: Thanks so much. I had a great time.

Jennifer Stock: Thank you. We are just about to wrap it up here on Ocean Currents, but I just thought I would share this last piece here that I actually pulled off of your website, Michael, that just rang to me about all of this because the turtle issues are way beyond just one thing. There are so many things and it proves how things...how we are all very connected and I'll just read it straight out from what I've read.

"The most important and fundamental lesson of ecology is all things are connected. The survival of humans and sea turtles are intricately interwoven in the need to have functioning and healthy ecosystems. This means clean water and air, clean fishing policies that do not eliminate marine biodiversity, especially top predator marine species, and recognizing that there are limits to growth. As we all work towards these goals, we can create an earth that will support current and future generations of humans and turtles."

I think that really just summed it up so nicely in regards to how we all need to live together on this planet. We definitely want to eat fish. It's a part of our diet, but we need to keep things in check and keep things in balance, which, I think starting off the new year is a good thing to think about is keeping things in check and balance. So, we're just about at the end of the hour here for Ocean Currents.

Thanks for tuning in today. As always, you can tune in on our podcast, the Cordell Bank National Marine Sanctuary saves this show as a podcast and you can go to cordellbank.noaa.gov to catch past shows of Ocean Currents hosted here on KWMR and hear about future shows coming up as well. So, thank you so much for tuning in today and we'll be back at the beginning of February with another show of which is still to be determined. So, stay tuned. Thanks again for joining us on KWMR.

(Music)

Jennifer Stock:

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