



Encyclopedia of Life

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Dolphins Podcast and Scientist Interview

Stenella attenuata and *Stenella longirostris*

You have probably seen cans of tuna in your local supermarket marked “dolphin safe.” That label means the tuna was fished in a way that spares most dolphins from being killed in the tuna fleet’s giant nets. In this podcast, biologist and guest reporter Matt Leslie brings us a story about tuna, the intertwined fate of fisheries and dolphins, and the work of scientists. It’s a story that lies behind the label of every can of tuna. It spans two generations of scientists and a revolution in scientific methods. Matt reports from a dolphin morgue in La Jolla, California, USA.

Transcript

Ari: From the Encyclopedia of Life, this is One Species at a Time. I’m Ari Daniel. In this episode, we’re handing things over to Matthew Leslie – a PhD student at Scripps Institution of Oceanography at UC San Diego in La Jolla, California. He wrote us saying he wanted to do a story about his science, which wouldn’t be possible without a special dolphin morgue. We were intrigued to hear more. Here’s Matt.

Matt: Sometimes an environmental problem is so difficult that it requires multiple generations to solve.

That’s certainly the case when it comes to the story of the two species I study: spotted dolphins, or *Stenella attenuata*, and spinner dolphins, or *Stenella longirostris*.

I’ll get to my work on these species in a minute, which involves that morgue Ari mentioned, but first I need to give you some background.

In the eastern Pacific, thousands of miles from land, spotted and spinner dolphins have a special bond with large tuna – they’re almost always found together. Fishermen have known this for a long time, and they’ve come to rely on the dolphins they see at the surface to find schools of tuna below. For years, they used fishing poles to catch tuna. But all this changed in the 1960s with the advent of large plastic nets.

Bill: I went on a boat back in 1966 and saw the operation.

Matt: This is my research advisor, Bill Perrin. He retired a few weeks ago, after working 46 years as a biologist with the National Oceanic and Atmospheric Administration, or NOAA. Back in the 60s, Perrin was a PhD student researching the fishery.

Bill: I was very impressed by it...Tremendous stresses involved, great winches working in all a big industrial operation.

Matt: Nets a mile long could encircle entire schools of fish. Boats were harvesting more tuna than ever, but countless dolphins were paying the price.

Bill: and of course the dolphins were trapped and many of them didn't make it out.

Matt: Perrin saw over a thousand dolphins die on a single fishing trip. He was deeply troubled. So he started a program to train over a hundred and fifty biologists to be observers on board tuna boats.

The idea was to count how many dolphins were being killed, and collect as many samples as possible to understand the impacts on the dolphins.

In addition to the first estimates of how many dolphins were dying, the effort resulted in the best collection of dolphin tissues in the world, and it resides at NOAA's Southwest Fisheries Science Center, located on the Scripps campus. I call it the morgue. Susan Chivers is the curator, and she offered to show me around.

Susan: It's a very big space.

Matt: The room's the size of a small gymnasium. It's clean and bright with floor-to-ceiling shelves, each one packed with jars containing dolphin body parts.

Susan: Here we have a wall of gonads; banks and banks of ovaries.

Matt: One shelf is packed with jars containing hundreds of jaw bone fragments, each one from a different dolphin. Biologists used the teeth from these jaws to determine the age of the dolphins.

Susan: and I think it is moving for people to see - when you realize that the jaws of over 40,000 dolphins are here on these shelves. It does kind of bring it home to you how many dolphins were...handled by fisheries observers... and how many actually killed.

Matt: Over six million dolphins died as a result of the tuna fishery. And all those dead dolphins didn't go unnoticed.

Wayne: The level of mortality became visible to the American public.

Matt: This is Wayne Perryman, a biologist at NOAA.

Public outcry forced the fishermen to change their nets, and the way they haul them in, which allows the dolphins to escape. The kill is down from hundreds of thousands of animals a year to only a thousand. You'd think that would be a good thing, but Perryman says the spotted... and spinner... dolphins still haven't recovered.

Wayne: We don't know why it's taken so long... Maybe the fishery is having an effect we can't measure. Maybe this is just the nature of populations.

Matt: Populations are just groups of individuals that don't really mix with one another and to recover a species, we have to make sure that all the populations are recovering.

When Bill Perrin measured the dolphin skulls in the morgue, he found three populations of spinner dolphins and two populations of spotted dolphins.

For the last 20 years conservationists have used these population definitions to manage the dolphins. But Perrin suspected early on that his approach was too coarse - that maybe there were even smaller groups, subpopulations, that need special protection.

That's where I come in. I'm using DNA that comes from the morgue to look for these subpopulations. I assumed that because the skulls were different, the genes would be too. But when I looked at 14 different genes - I couldn't see the differences Perrin found. This doesn't mean they're not there, I think I'm just looking in the wrong place.

Now I'm scanning all the DNA of these dolphins - their entire genomes - hoping to find the subtle differences that reveal the smaller populations - so we can get the recovery plan right.

My advisor Bill Perrin had no idea when he was collecting dead dolphins in the 60's, that one day we'd be able to peer inside their cells and read their DNA. And yet, the mission's the same - saving the dolphins - and it makes this 40-year-old morgue as important as ever.

Bill: It's a gold mine. The tuna fisheries continue - we're not 100% sure that what they're doing is fully sustainability. We have data and specimens here that may help us answer that question.

Matt I'm honored to be following in Perrin's footsteps - to solve a problem that my generation inherited from his - and applying the latest tools in science to specimens collected well before I was born.

Ari: That was Matthew Leslie a PhD student at Scripps Institution of Oceanography at UC San Diego, and our guest reporter for this episode.

Our series, One Species at a Time, is produced by Atlantic Public Media in Woods Hole, Massachusetts. Special thanks to the National Science Foundation IGERT Program for support producing this episode. I'm Ari Daniel Shapiro.

Dolphins Podcast: Meet the Scientist

Meet Matthew Leslie, the scientist featured in the Dolphin's podcast



Where do you work?

I'm a PhD Candidate in Marine Biology at Scripps Institution of Oceanography and a researcher in the Marine Mammal and Turtle Division at NOAA's Southwest Fisheries Science Center. Both of these institutions are located in La Jolla, California, USA.

What do you study?

I work to understand and conserve populations of whales and dolphins using pipettes and crossbows.

What are three titles you would give yourself?

Cetologist, Loving dad, Okie.

What do you like to do when you are not working?

Go outside!! This ranges from hurtling down rock-strewn trails at break-neck speeds on a bicycle to following ants across the ground with my daughter.

What do you like most about science?

- 1) Sharing time with these amazing creatures in their environment
- 2) The moment of discovery
- 3) Making great friends along the way

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