

Interviewee Name: Toby Stephenson

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Interviewer(s) Name(s) and Affiliation: Galen Koch (The First Coast)

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Interview Description:

Toby Stephenson, a boat captain for College of the Atlantic who lives in Ellsworth, ME, talks about his current role as well as the research he has conducted with students to determine the diets of whales in the Gulf of Maine and to compare the current population distribution and abundance of herring gulls compared with historical levels.

Collection Description:

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Transcribed By: Molly Graham

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[0:24:45]

GK: Galen Koch
BB: Toby Stephenson

[0:00:00.0]

GK: Just for formality's sake, I'll have you say your first and last name and spell it for me.

TS: Toby Stephenson. It's T-O-B-Y S-T-E-P-H-E-N-S-O-N.

GK: Toby, can you tell me where you live and what you do?

TS: I live in Ellsworth, but I captain the *Osprey* for the College of the Atlantic. That's their research boat.

GK: How did you get involved with that? What's your history?

TS: Well, my history—I'm a graduate of the college and I've always been involved since the college in marine mammals, large whale researches and sciences and education. I did a lot of work on whale watch boats, where I ended up getting my captain's license. Then I ran the Bar Harbor Whale Museum for eight years. Then, I applied for the captain's job at the College of the Atlantic when I learned they were getting rid of the *Indigo* and having a Wesmac built.

GK: What's the *Indigo*?

TS: The *Indigo* was the old boat (laughs) that nobody wanted to drive (laughs).

[0:01:08.8]

GK: You wanted to be on the bright and shiny new boat.

TS: It was a great opportunity because I have a lot of familiarity with the islands that we bring students out to, the research that we do with Allied Whale and with seabirds. I had a lot of boat experience over those years and a lot of anatomy in marine mammals, because as a student and thereafter and while I was curating the Bar Harbor Whale Museum, I was involved in a lot of large marine mammal necropsies and following the skeletal articulations. I've really had a lot of different work careers over the years. Love working with students and an opportunity to work closely with them on the water for the College of the Atlantic was just a lot more appealing than what I was looking toward.

GK: Yeah, that's pretty amazing.

TS: It's fun.

GK: Would it be helpful to look at a map and see some of these places that you're going for this research?

TS: This chart I can show you.

GK: Which one? Let me grab the big one.

TS: Yeah, yeah.

GK: That one.

TS: The 13-3-12. Actually, we can keep the whole—the whole Gulf of Maine would be good because we actually cover a lot of areas and recently have been doing stuff up at Grand Manan, actually. You may as well just leave this one here.

[0:02:45.1]

GK: Great. You can come on this side so you're facing the right way. Careful of this flap. It's hard to get around there. We've been doing this thing where we've been—let me pause.

[Tape paused.]

GK: If you want to tell me a little bit about the research, but also you can use that as a reference.

TS: There's two primary projects that happen on an ongoing basis with the College of the Atlantic: one is our seabird studies and one is our marine mammals and oceanographic studies. The seabirds work focuses out at Great Duck Island, which is about eighteen miles out of Bar Harbor. We have faculty, John Anderson, and a handful of students—up to six students, five or six students that go out there in early June right after graduation. They stay out there until the end of the nesting season, which is at the end of July. Right around July, August is when they wrap things up.

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During that time students out at Great Duck Island are monitoring wildlife, not necessarily only birds, because there's a lot of other wildlife that they can study, and botany. They work on various projects. There are some ongoing projects, such as gull nesting and the movements of gull nesting sites on the island, the gull development and behavioral studies that happen. There's also a large colony of the Leach's storm petrels that nest out there, and perhaps one of the largest colonies on the eastern seaboard of the United States. It's a significant island for a lot of reasons. We've also got some other seabirds showing up, puffins things like that, but there's also a guillemot colony that nests there. They are some eider ducks that nest as well. We also then have students out at Mount Desert Rock, which is the most remote lighthouse on the Eastern Seaboard, and we've been putting students out there as far as back as the 1970s, but consistently since the late 1990s when we took the island over along with Great Duck.

[0:05:16.2]

There's a lot of seabirds that nest out at Mount Desert Rock as well, primarily herring gulls and black-backed gulls, but some eider ducks as well. We also pay attention to the gull population and trends out at Mount Desert Rock as well. That's our seabird work.

GK: Can you show me where those are?

TS: Bar Harbor is right here up by the Porcupine Islands and Great Duck Island is, if I can see through the—

GK: Sorry. It's hard to see that.

TS: —through the mylar here is right over here. It's this guy right there. Okay? Then, Mount Desert Rock is right here. We basically come out around the Porcupine Islands, come out around Baker Island and then head out to Great Duck Island.

[0:06:17.3]

During the summer we go out once a week for supply. We also make a run out to Mount Desert Rock and then we head back. That's my basic, most common track for the *Osprey*. We bring supplies to the islands and service with equipment, materials, foods, people, personnel, etc. But we also will—well, we don't do a whole lot on Great Duck Island for research. When we go out to Mount Desert Rock, what we do is conduct surveys with the humpback and finback whales. We've done a variety of things over the years, from running actual marked-out survey routes to, more recently, we're engaging in some biopsy work where we collect skin and tissue samples from the humpback and finback whales and minke whales if we had an opportunity, although that's pretty rare. We're interested in looking at the—in the skin we're interested at looking at the carbon and the nitrogen isotopes. What that does is it tells us where in the trophic scale or trophic level these different whale species had been feeding and where they've been feeding proximally to the coast line.

[0:07:48.0]

Are they feeding more coastally or more pelagically? We conducted this very same study. It was run by Sean Todd, who's one of the professors at the college, back in the 1990s. We ran this study for six years. The conclusion was that humpback whales tended to feed a little higher in the trophic scale, feeding on primarily fish, but comfortable feeding on krill, which most observers of marine mammals are familiar with. Finback whales have the same preferences or the same feeding range, but they prefer to feed lower on the trophic scale on the krill, but they will feed on fish. They can be planktivorous. They can both be planktivorous or piscivorous, but humpbacks prefer piscivory and finback whales prefer planktivory. That was an interesting study.

[0:08:57.7]

We're redoing that very same study again 10 years later, more than 10 years later, but we're doing so now in light of changing sea temperatures in the Gulf of Maine. As people are aware, the Gulf of Maine has been one of the fastest warming bodies of water on the planet. Sean's interest is looking at this very same study and seeing if things have changed, and if so, perhaps it's a result of climate change; either there is more of one food or less of another. We don't necessarily know what we're going to see. We have added one extra component to it, and that is the drone. I purchased a drone with funds for the *Osprey* and acquired my drone pilot's license so we can then, when we're out biopsying the whales, we can fly the drone over at certain elevations and get what we call a BMI or a body mass index.

[0:10:04.1]

What that will help us see is where the whales fit in a health range. Are they plump and round and healthy or are they very narrow, skinny and bony looking? We do know already from looking at right whales in the North Atlantic and comparing them to right whales from the southern oceans, particularly around South America, off the coast of Argentina, that the humpbacks in the North Atlantic are really quite emaciated in comparison to the nice healthy round right whales of the southern ocean. They have a lot more biomass to feed on, copepods specifically, than we have here in the North Atlantic or it appears to be the case that we have more of a dwindling food source for them. By looking at the carbon and nitrogen isotopes in the skin, we're going to repeat this study, but we're going to overlay it with some climate changes and some visual body mass observations.

[0:11:20.7]

GK: The copepods, is that recent? Are they starting to dwindle more? Is that what you're noticing, compared to that study ten years ago?

TS: Dwindling, not necessarily in numbers, population-wise. Obviously, we can't count all of those little copepods because they're only a millimeter or so long, but biomass, what it appears—there's two things of interest or fear or concern. One is that the copepods here in the Gulf of Maine, because of potentially climate interruptions, are not as rich as they used to be. They carry these little pockets of oil. It's a little bit like a yolk sac for an egg. The oil is their nutrition. We're seeing copepods in the North Atlantic don't have quite as much. More specifically, copepods in the Gulf of Maine don't appear to be as rich and nutrient. They're smaller than the ones that you may get up around north of Nova Scotia in the Gas Bay and the Saint Lawrence River, which it turns out, right whales appear to have not entirely abandoned, but are spending more time north of Nova Scotia in the Canadian Maritimes around Gas Bay.

[0:12:52.3]

That's where we're seeing the hot spot for right whales, North Atlantic right whales, during the summer. They appear to be leaving because the food here isn't as rich; it's not as abundant. But there's another interesting and equally frightening study by Barney Balch out of the Bigelow Labs that has been indicating that the phytoplankton productivity is on decline as well, because of particulates in the Gulf of Maine from erosion and run-off coming out of rivers. Those

particulates are occluding light penetration in the water column and preventing light from getting down deep and light is what's essential to phytoplankton, the plant plankton, for it to grow, which is the food for the zooplankton or the copepods and krill. It could be temperatures are changing, the productivity of the copepods, but it may also be literally their access to food as well. If there's less plant plankton in the water, there's less for them to eat. They won't die, they're just not going to be as big and rich as they could be.

[0:14:11.5]

GK: Right. Pause it for a sec.

[Tape paused.]

GK: You were saying the right whales—I just want to clarify. Were right whales very prevalent in this part of the—?

TS: Right whales were much more abundant. We would, every year, always see right whales at some point, usually in the beginning of the year and at the beginning of the summer in the early spring, early summer—late spring, early summer, or towards the late fall. We always saw right whales passing through. The Bay of Fundy has always been a real hot spot for right whales. It was reliable to go up there and find ten, twenty, thirty right whales in a big group, what they'd call a SAG or a sexually active group or even just feeding. That has trimmed down significantly over the years. They're just not seeing as much. The right whales appear to be, like I said, not entirely abandoning the Gulf of Maine, but it's not as productive as feeding grounds further to the north. They'll still come into the Gulf of Maine, but they don't appear to be spending nearly as much time. That's just seen by a lack of observations. We just don't see them as frequently.

[0:15:32.6]

GK: I was curious when you were speaking about some of the bird studies out here. I'm curious what the activity of birds speaks to about our environment in general and what that means.

TS: Right. The birds, their nesting habits and their foraging habits is a very dynamic function. Depending on what they feed on if they're very specific, as in the case of terns, where they rely very much on small schooling fish, like hake or haddock, up near the surface where they can access, because they're not deep-diving birds. If that schooling fish is abandoning the surface for cooler waters below, then they are out of reach of the terns. They can be affected. They can still fly around. They're quite effective long-distance flyers, so they can search, but there are years where there is very little food and the colonies collapse because there isn't enough to feed the chicks. Or they're feeding them fish that they are able to get, warm water species such as butter fish, which are the shape of a silver dollar and almost that size, which you just simply can't get down the gullet of a chick.

[0:17:09.1]

So, they're bringing food that the chicks can't do anything with. In some cases, they're actually feeding them insects, ants and other bugs that they can get. The terns are going to be pretty sensitive species to disruptions in the food chain. That's going to change their habitat. They're going to move and fly around different areas looking for food. Puffins may not be so troubled because they can dive deeper and maybe perhaps get down to the colder, where all those fish are evacuating to, to get into colder waters. But if they're only able to find butter fish, they can't get that down the gullet of their chicks either. Sometimes there are years where they're both suffering. Other times there's a year where maybe the tern is the one that's suffering over the puffins. Then you've got the herring gulls, which are really pretty omnivorous birds and they feed on a whole variety of things. They'll feed in dump sites. They'll feed in fish factories. They'll be predators. They'll feed in intertidal. They can feed on fish offshore. They can take chicks out of nests. They're really adaptive predators. Finding food is a lot easier for them, but they still will have to move around if food access changes.

[0:18:46.1]

They're suffering differently though because the eagle populations are increasing and appear to be impacting the gull populations because the eagles, which historically most people think of as fish hawks, and they do in many environments feed primarily on fish, here in the Gulf of Maine they feed primarily on birds, and gulls are a great opportunity for them. So, they hunt. They're putting a lot of pressure on the gulls. We're seeing the gulls respond to that by moving further offshore, or it appears to be that they're trying to get away from the eagles. It's a lot more complex than that because there are some islands that are inshore, like Egg Rock for example, where the gull populations are really quite strong. Many of the other locations, the distributed locations, we're seeing diminishing numbers, but Mount Desert Rock for example, the population's doubled over the last ten years easily.

[0:19:55.2]

Everything's being disrupted by multiple sources. We tend to have a desire to find smoking guns and figure out what the problem was, but really what's going on is in many ways—I don't want to say death by a thousand cuts, but it's impact by a thousand disruptions. We're seeing it play out in many different ways. Maybe with the gulls that's okay, because after the turn of the 1900s, the gull populations were skyrocketing to abnormal levels and they were taking out or out-competing many of the other nesting seabirds and really growing exponentially. Now maybe it's a natural recoil of their population. The eagles are coming back to perhaps amore historical population level and are just correcting some of the herring gull growths that were perhaps abnormal over the twentieth century.

[0:21:05.9]

But the historical data is hard to come by, comprehensive historical data of how many gulls were there and where were they a hundred years ago. We just don't have clear data. There's small stories and—I don't want to say anecdotal either, but much of it is anecdotal information about what things were a hundred years ago.

GK: Yeah. You're building that now in the hopes that people will have it in a hundred years.

TS: Yeah.

GK: Is a herring gull the same as a seagull or are they different?

TS: Seagulls don't exist. There's no such thing as a seagull (laughs).

GK: That's what I was thinking. I knew that was going to be your answer. I just wanted to confirm.

TS: (Laughs.) They're all gulls. Gulls are gulls.

GK: A herring gull, that would be—?

TS: Your typical—it's got a light gray back. White body, white head. Bigger than a crow. Then, the black-back gull looks identical, except it's bigger and it's got a black back, from wing tip to wing tip there's a black stripe that goes straight across, as wide as the wings.

GK: They're all like rats in the sense that they'll eat whatever. Scavengers.

TS: They're opportunistic and they're very successful. They have a lot of good skills (laughs).

[0:22:28.7]

GK: Probably necessary.

TS: They're really adaptive. It's funny because yeah, things like starlings, people hate starlings because they're very successful at what they do. I don't actually anthropomorphize or hold emotions around the animals like that. I'm glad I'm human because humans, even though we're not always nice to each other, we can actively be nice to each other. When you watch gulls, when you watch sparrows, when you watch squirrels—any lovey creature you can find, when you actually watch them in the wild, they're nasty little buggers (laughs). They all stab each other in the back if they have an opportunity (laughs). Hummingbirds, right, are terrible. They are just the meanest little things.

GK: Oh my god.

TS: But it's life.

GK: Yeah, it's life. Well, I know we have another interview coming in. I would love to spend a lot more time talking about this, but I wonder if you could just say—tell me, with this and all the work you're doing with students, what's something that you're hopeful about in the midst of all this?

[0:23:43.4]

TS: Well, hope springs eternal, so we're always—and that's the great thing about students, they come in, they're fresh, they're inspired, and they're looking for solutions. They're looking for answers. The mortar between the old bricks keeps falling out and the wall will fall apart, but thank god, fresh mortar comes in every year to keep the wall, the bricks together because otherwise things really would fall apart. Hope is a really important thing to have and students bring that. Working with students is really wonderful for that. My inspiration is them and that we continue to work with them and they will just continue to come up with positive solutions and outlooks on things.

GK: That's great. Thank you.

TS: You're welcome.

GK: I would honestly love to have—

[0:24:45.1]