

## Fundy's Phalaropes -

**By Christine Callaghan** (Freeport House Bed and Breakfast [www.valleyweb.com/freeporthouse](http://www.valleyweb.com/freeporthouse))

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***Whales and High Tides - they're probably the most visible evidence that the Bay of Fundy is one of the world's truly unique places. Tourists by the thousands come to see for themselves the mighty surge of the water, and the majestic creatures that journey here every year. But one of the vital links in the chain that makes up the whole Bay of Fundy ecosystem isn't quite so readily apparent. To see it you would have to look closer. a lot closer. And that's what a group of scientists who spent a week here (Freeport, Long Island, Digby County) in late August were doing. They had come in search of a tiny creature called *Calanus finmarchicus*. Never heard of it, you say? We'll let head scientist John Chardine, of the Canadian Wildlife Service, describe it:***

"It's a large copepod, it's not the biggest one, but it's large. It's about three millimeters long. And it's energy rich; it's got a big oil sac in it. It's the main source of food for Right Whales. Herring eat it, lots of different fish species, important commercial species, eat *Calanus finmarchicus*. It is almost the most important animal in the system, in one sense, because it's so abundant and so many things feed on it." Among the many animals that depend on this little beast is a kind of bird called the phalarope. And it's phalaropes that are the focus of Chardine's current work. He took time during his stay to explain the project to us. "It's been known for a long time that phalaropes move through the outer Bay of Fundy area on migration to South America and Africa to overwinter. So they start in the Canadian Arctic, they finish their breeding, and they take this long journey south, and they stop off at good feeding spots. And one of the good feeding spots for the eastern flyway, essentially, for phalaropes is the outer Bay of Fundy. It's been known for a long time that they have been using the area around Deer Island, Campobello Island, and off Brier and Long Islands, this general area here. And the general wisdom is that it's because the strong tides here create very good feeding conditions for the birds. The birds need an energy rich supply of food, the right size because they can't take too large a prey, at the surface. And that's not easy to get. A lot of seabirds have solved that problem by being able to dive down into the water and get prey below, but phalaropes can't do that, so they've got to have things absolutely at the surface. So it's thought that the tides in these two areas bring up food to the surface and allow the birds to feed, put on weight and then continue south. "We knew the birds were using the Deer Island - Campobello Island area in 1981-82. And the estimate there was approximately one million birds moving through the area during the course of the migration period which is late July to about early September. And we knew further that they were mainly Red-necked (also known as Northern) Phalaropes (*Phalaropus lobatus*). In other words, there's two species; Red-necked Phalaropes were mainly found over there, although there were (some) Red Phalaropes (*Phalaropus fulicaria*), the other species. And the situation over there is two islands with quite narrow passages between the islands, and the tidal movement through these passageways creating turbulence when it runs around the islands, pushing water to the surface and bringing the animals to the surface. I'll also say that these animals (*Calanus finmarchicus*) don't want to be at the surface during the day. They want to be at depth and out of the light, and they come up at night to feed, but the tide pushes them up during the day, when they're then visible to the phalaropes. And that's why the areas are so important. "So in 1981-82 there were lots of birds

over there, and studies here showed that there were fewer birds here at any one time. So about a hundred thousand (on the New Brunswick side) versus about ten thousand on this side.

But starting in about '86 the numbers were clearly lower on the Deer Island-Campobello Island side. And every year from '86 to '90 they declined by about an order of magnitude. So you drop a zero off the number, and by the end of it there were none left, in 1990. None were showing up in that area. Either species. And as far as we know, that hasn't changed. There are just no reports of the birds showing up. A few may show up, but not in numbers. So the



immediate thought was, well they're here for the food, so the food must have changed, somehow. Some tows, plankton tows at the surface, were completed back then, in about 1990-91, to see what had happened to the food. All we had from those tows was some anecdotal information that it looks like *Calanus* was quite a bit lower than what they were used to seeing in previous years. But we've got no numbers, we don't have the samples to go back to or anything. So it's a bit of a problem to

try to figure out exactly what was happening there. So somewhat late in the game I was asked if I could work on this problem and see if we can figure out exactly what's happened. I'm leading it in our region, and in terms of the field work we get a lot of help from Nova Scotia Department of Natural Resources. "We conducted over a hundred tows last year, about eighty over on the Deer Island side and about twenty here. So we didn't have that many tows here, but enough to say something about the food, specifically, and the food has gone. The food, meaning *Calanus finmarchicus*, has declined over on the Deer Island side. So it's very clear that the food that they were coming there to get is not there right now. Just to give you an idea, if you tow a fifty centimeter wide net, twenty centimeters deep, and you tow that for two metres, back then in the early eighties, you'd get about two hundred *Calanus finmarchicus* in areas where birds were feeding. When I towed that same net last year, I got about 16 *Calanus finmarchicus*. So it's a huge difference. We've done tows here (around Long and Brier Islands), this trip and last year, and based on last year's information - because we haven't got this year's analyzed yet, obviously - the food looks like it's present and in good quantities here. And that explains why there's lots of birds here.

**And the question then would be why there is no food left on the New Brunswick side?**

"Right. And that's a whole other avenue of research. Why the food might have disappeared there. So we're going to be looking at that. We've kind of speculated about what it might be, but

at this stage we just don't know. It's possible that *Calanus* is over there in good numbers but the timing is wrong. If *Calanus* are available over there in June, well that's no good because the birds are in the Arctic. So they've got to be available at the time the birds need them, which is late July to early September. And that doesn't appear to be the case right now. The other thing I wanted to mention is that on this side of the Bay, the ratio is reversed, with mainly Red Phalaropes with a few rednecks mixed in. So rednecks over that side, New Brunswick, reds over this side. With some mix. So back in the late seventies on the Brier Island side, for every nine Red Phalaropes, you'd get one Red-necked Phalarope. Nine to one ratio. Last year we had a three to one ratio. Which suggests that the Red-necked Phalarope proportion has come up a bit. This year, we've hardly seen a red phalarope. They're almost all Red-necked Phalaropes, which are the phalaropes that disappeared from the Deer Island side. So it's really interesting to speculate that a good proportion of the birds that would traditionally stop on the New Brunswick side now come here. And maybe elsewhere, as well. And that's another part of the project is trying to figure out where they've gone, basically.

***Both species eat the same food, though?*** We're trying to find that out this year by looking at what individuals are feeding on (by examining their stomach contents), but because there are no Red Phalaropes around this year, we haven't been able to look at reds. We had a permit to collect thirty birds of each species, which will not have an impact on the population. And so far we've got 26 Red-necked Phalaropes and zero Red Phalaropes. Because there are none around, very few. So it's really interesting.

***I was going to ask you why this work is important, but you've already mentioned that this is the main food source for many organisms that live out there.*** Right. There could be lots of *Calanus* around in deeper water, which is no good for phalaropes but would be fine for Right Whales or for herring, for that matter. So it may not indicate a problem for other species, because you've got this issue that they need to be right at the surface. The interesting thing, though, is they're at the surface because of tidal movements, and it really is not possible that the animals are down at depth and not at the surface because the tides are the same as they were. That hasn't changed. The geography of the area hasn't changed. If they were at depth, they would be at the surface. So over on that side of the Bay, it looks like they're not in around those Islands anymore at the time the birds are there. And we need to find out why.

***I'm just wondering, is there any anecdotal evidence that phalarope numbers ebbed and flowed in years gone by?*** We don't know. There could be but it's not a very long history of observation.

***Just fishermen, I suppose, that would have noticed them.*** And early birdwatchers. I think it's been known for roughly a hundred years or more to science. It's obviously been known to local people for a lot longer. So I need to look at that as well. Specifically ask the question, is this something that has happened before, and is there any evidence that it has.

***How long will it take you to analyze the data that you collect this year?*** It takes quite a while because the samples have to be done in quite a specific way, and it takes a long time to get those done. Last year, for example, I collected the samples in September and I didn't have the information until April. I'm hoping to get these done a bit quicker. So I've got last year's

information that I can use and present. This year will be more corroborating or not what I got last year. I want to mention that people may not know the birds as phalaropes. Quite often we'll talk to people about what we're doing, and when we say phalaropes they don't know what we're talking about and so we have to describe the birds. And some people will say "Oh, you mean the sandpipers!" And our response to that normally is well, yes, but not the ones you see along the beach. They're the ones out on the sea. And I think some people at least on the New Brunswick side did call them sandpipers, the ones that they would see at sea. Here, I'm not sure what the local names might be. (*ed: We've heard them called whale birds.*)

***These phalaropes never do come ashore here, they're always seen on the water, right?*** No, they never do come ashore. They're complete seabirds at this time of year.

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