“The Polar Bear Necessities” Excerpt Transcript

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IRA FLATOW: This is Science Friday. I’m Ira Flatow. The polar regions of the Earth are warming at a faster rate than any other. In the Arctic, patches of sea ice are getting smaller, and the ice sheet is breaking away in chunks in some places. And while the ultimate consequences of the rapid melt to wildlife is still unknown, one of the animals that is already being affected is the polar bear– the iconic polar bear.

There are 19 distinct populations of polar bears living in the Arctic, and monitoring how these bears are holding up– you can imagine what a challenge that is. How do they survive on the barren ice? And how do you get up close to look at them and find out?

Well, that’s the subject of our latest video that’s part of our breakthrough Portraits of Women in Science series. And here to talk about it are our video producer, Luke Groskin. Hi, Luke.

LUKE GROSKIN: Hi, Ira.

IRA FLATOW: And Karyn Rode, a wildlife biologist with the US Geological Survey. She’s based out in Portland. Welcome to Science Friday.

KARYN RODE: Thanks for having me.

IRA FLATOW: You’re welcome. Karyn, you and Luke went out to the Chukchi Sea. Did I get that right? Which is a rem–

KARYN RODE: That’s correct.

IRA FLATOW: It’s a remote part of Alaska. Can you describe this area? What does it look like out there?

KARYN RODE: Well, so the Chukchi Sea is an area between northwest coast of Alaska and the eastern coast of Russia. And the time of year that Luke and I went out is March and April, and at that time of year, it’s mostly covered with sea ice.

And sea ice isn’t really a flat pancake. There’s currents and winds that create openings in the ice. So there are some areas of open water, and there’s also areas that the ice comes

together that form pressure ridges, so kind of rumbly ice. So it's actually a pretty dynamic landscape.

KARYN RODE: Yeah so– yeah. You're hovering over the bear. The bear is moving, and so you're moving forward with the bear, and trying to get directly above it so that you shoot the tranquilizer straight down into the muscle.

IRA FLATOW: How close, Luke? You must have been a little weirded out by how close you are to a bear?

LUKE GROSKIN: I mean, if you were riding the bear, you could probably grab onto the helicopter. We were really low.

IRA FLATOW: It was that close?

LUKE GROSKIN: Yeah, it was. They're right above the bear. They have to do that, in order to get the dart right on it and put it in the right position. It's pretty dramatic.

IRA FLATOW: And then, once the bear– then you must land, right, Dr. Rodes? You land, and then what do you do?

KARYN RODE: Yeah. So usually, it takes about five minutes for the bear to go to sleep. And then you land, and the very first thing we do is check the bear and make sure it's in a good position and comfortable. And then we start collecting data, so taking measurements and samples.

IRA FLATOW: Like what? What kind of samples?

KARYN RODE: Blood. Blood can tell you a lot about an animal, about its health. So from blood, we can identify what type of diet it has, whether it's eaten recently, what pathogens it's exposed to and what contaminants it's exposed to.

We collect hair, which gives a lot of the same information, but over a longer or different time period. And we collect a small fat biopsy, which also can tell us information about what the bear's eaten, a bit more specifically than we can get with tissues like blood and hair.

IRA FLATOW: Mm-hmm. i guess the hair can tell you a lot of stuff about the bear.

KARYN RODE: Yeah. Like I said, it gives a longer time frame, and a different time frame, because what's in that hair is primarily when it's grown, and it's grown at a different time of year than when we capture. And so if we want to know what an animal has been exposed to, other than during the really recent time frame before when we caught it, hair is a good tissue to use.

IRA FLATOW: Now, I learned from watching the video that polar bears switch between living on the sea ice and on the land. What are some of the stresses that come with this dual lifestyle?

KARYN RODE: Well, I should clarify a little bit about that. So you mentioned in the introduction that there's 19 populations, and there are populations that have always made that switch. But those are actually a minority. So those are mostly populations in eastern Canada, where the environment becomes completely ice-free in the summertime, and those bears have always come on land.

But all the rest of the polar bear population, so the majority of them, have typically not used land, except for denning. And denning, in polar bears, only occurs by pregnant females, so not all sex and age classes like you see in other bears. So it's really in more recent years that bears have started to summer more on land in a lot of these other populations, than they have in the past.

IRA FLATOW: Mm-hmm. And what are some of the stresses? What is global warming and the melting sea ice doing to the bear population?

KARYN RODE: Well, again, you've got a lot of diversity across the polar bears' range. So it can be challenging at times to generalize what the response is, because some populations have seen dramatic sea ice loss, such as the polar bear population in the Chukchi and the Beaufort seas, but other places have seen very little sea ice loss.

And then you have differences in the ecology of these systems. So there is variability, but some of the general responses across populations are the increased land use. So there are more bears coming onshore than have in the past, and staying there longer. And when they're on shore, they typically are losing weight, because they are eating minimally or not eating at all.

So for example, in the Chukchi Sea, we know from activity sensors and also observations, that 90% of the time, a bear on shore is just resting. So they're not trying to feed on the foods that are on land. There tend to be relatively poor resources on land in Arctic terrestrial environments.

IRA FLATOW: Mm-hmm. You're comparing this Chukchi population of polar bears to a neighboring group in the Beaufort Sea. What differences are you seeing between them?

KARYN RODE: Yeah, it's interesting. So the Beaufort Sea ranges between the north coast of Alaska and western Canada. And that population has experienced declines in body condition, cub survival, and, recently, there's been a pretty significant population decline in abundance.

But the Chukchi Sea bears, so far, comparing condition and cub survival since the 1980s to the current data we're collecting, suggests that the bears there have stayed in pretty good condition. They're still recruiting cubs into the population. So pretty different responses to significant sea ice loss that's occurred in both of those areas.

IRA FLATOW: Mm-hmm. 844-724-8255 is our number. So why don't these Beaufort bears sort of just migrate over to the more productive Chukchi area?

KARYN RODE: Well, that's the question that we're going to look at a bit. And anecdotally, there's definitely bears that are in western Canada that have been shown to go over to Wrangel Island, which is in the Chukchi Sea. But we haven't– there hasn't been a study done, yet, to look at migratory patterns. But certainly some bears may be coming into the Chukchi Sea more than they have in the past.

IRA FLATOW: Mm-hmm. With the sea ice in particular– and you're saying that the loss of the polar bears is not consistent over all areas, and I understand you've said that, but where it is a problem– what is the problem with the polar bears' survival in areas– and I've gotten a few calls and tweets about that– in areas where they cannot survive? What is the problem there?

KARYN RODE: You mean how– what is–

IRA FLATOW: Yeah.

KARYN RODE: –causing the decline in survival?

IRA FLATOW: Exactly.

KARYN RODE: Yeah. So one of the primary mechanisms in which we think polar bears are affected by sea ice loss is that they have to have the sea ice to access their primary prey, which are ice-associated seals. So polar bears have a very specialized diet.

Typically 70% of their diet is composed of one or two seal species. And so when there's less ice, you have less of a platform to hunt for seals.

And in the populations that have declined, we've seen declines in the condition of animals, and we know, in particular, that the condition of females is directly related to the size of the cub she produces, and that the size of a cub is directly related to their survival. So, often, the pattern goes that as female condition declines, you start to see a decline in recruitment of new individuals into the population, and that seems to be the pattern in these areas, where sea ice loss has resulted in population decline.