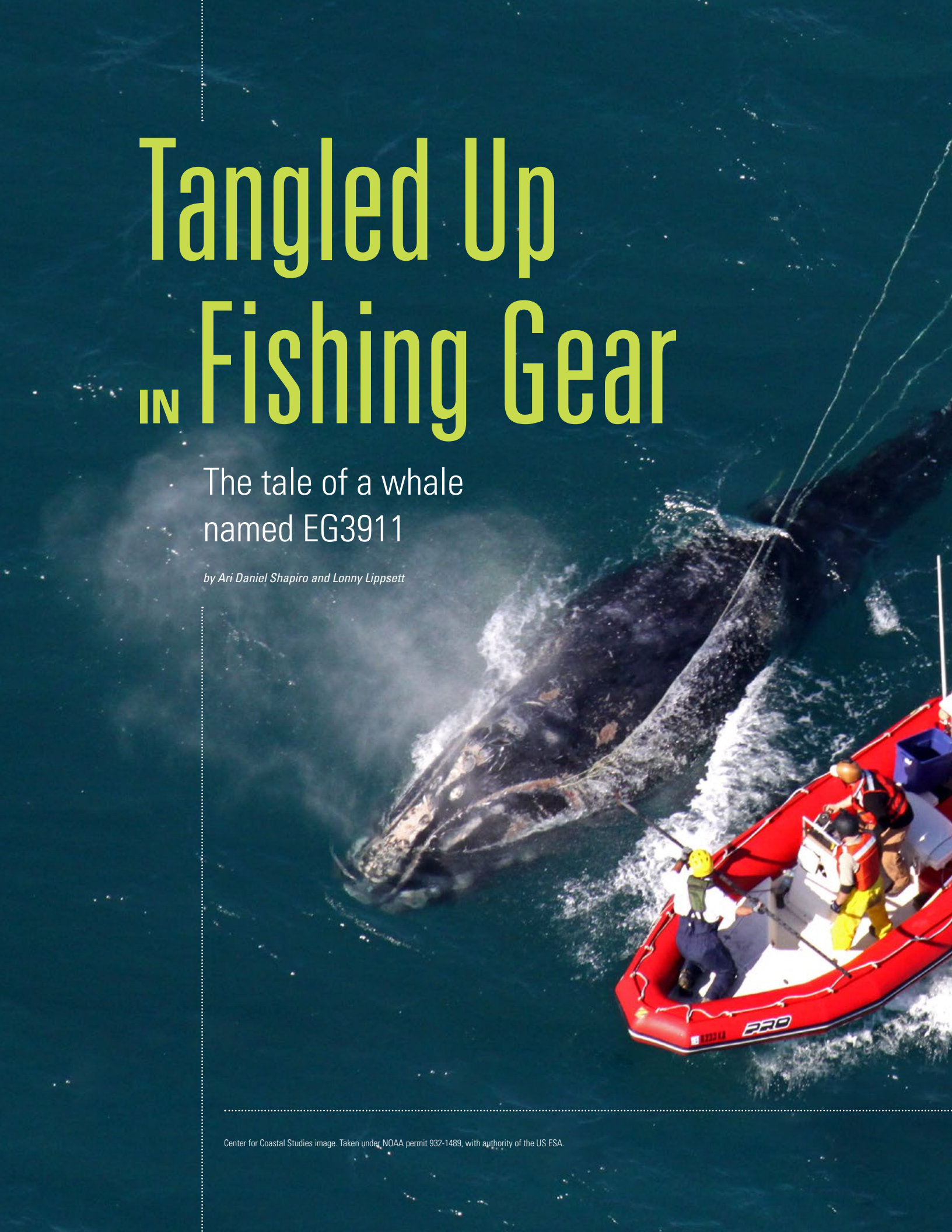
Tangled Up IN Fishing Gear

The tale of a whale named EG3911

by Ari Daniel Shapiro and Lonny Lippsett



Center for Coastal Studies image. Taken under NOAA permit 932-1489, with authority of the US ESA.

A Conversation with

Amanda Kowalski

Julie van der Hoop,
MIT-WHOI graduate student

Matthew Barton/WHOI

Michael Moore, director,
WHOI Marine Mammal Center

Using a "patient monitoring" device attached to a whale, scientists revealed how fishing lines hinder whales' ability to dive, eat, and migrate and result in a slow death.

JULIE VAN DER HOOP: Right now we think there are about 450 or 500 North Atlantic right whales, but there used to be a lot more of them. Their population was decimated by whaling, but now their population is still really limited. One of the major causes of death today for those animals is entanglement in fishing gear.

MICHAEL MOORE: The gear wraps around a couple of different body parts in such a way that it's tight. It not only constricts body parts, but you also can get rope or net cutting down into the flesh and to the bone, and very often also impacting whales' ability to feed. You also can

have yards and yards of rope and other gear being dragged *behind* the animal. So in addition to the tissue damage and the presumed pain, there's also a question of drag, and the drag, we believe, is a very significant part of whales' ultimate demise. Quite often we'll be managing animals in Georgia and Florida that are thin, chronically entangled, and going downhill fairly rapidly.

VAN DER HOOP: So let me tell you about a particular right whale that we call EG3911. She was born in the waters off Florida in 2009, and she was first sighted as being entangled in fishing gear on Christmas Day in 2010. She was about 20 percent thinner because of that entanglement. Up to 400 feet of line wrapped around the animal, and then it trailed behind her as she swam. They went out and had two disentanglement attempts that were unsuccessful because she was very evasive, and at that point they asked Michael and his team to administer a light sedative.


Courtesy of Mark Johnson

Former WHOI engineer Mark Johnson co-invented the revolutionary DTAG.

MOORE: Sedation of wildlife in a terrestrial situation has been quite well worked out, but the problem with sedating large whales at sea is twofold. One is that there isn't a hard substrate for them to lie down on when they are no longer conscious; and two, the volumes of drug required, given the size of these large whales, is an order of magnitude larger than they would be even for an elephant. We try and get our best guess as to how heavy the animal is, because obviously if you don't get that right, you run the risk of overdosing or underdosing. So over the past ten years, working with a company called Paxarms NZ, we've developed a dart gun and evolved an approach whereby you can deliver sedatives to a right whale that isn't very approachable—to change its behavior such that it no longer minds being approached by a boat, and then the disentanglement crew can get in to remove the gear. We wanted to know what impact both the sedation and the disentanglement had on the ability of the animal to swim and dive and respire.

VAN DER HOOP: And so we had the idea to attach a DTAG, which is a digital-recording tag developed at Woods Hole Oceanographic Institution.

MOORE: It's a thing about the size of an iPhone, and it's put on with some suction cups.

VAN DER HOOP: And it basically records the movement of the animal as it's swimming, in all three dimensions.

MOORE: We were able to, for the first time, take a DTAG, use it as a sort of patient monitor, if you like.

VAN DER HOOP: They attached the tag, administered the sedative, and then removed the fishing gear. About five hours later, the tag was recovered. We were able to then download the information from it and look at it. Immediately after the disentanglement, she was diving faster, she was diving much longer,

Fishing gear lines cut into whale flesh, impede whales' ability to dive and feed, and create frictional drag that exhausts whales' energy supplies.


EcoHealth Alliance under NOAA Fisheries permit #594-1759

and those dives were almost twice as deep as when she was still entangled in the fishing gear. Another thing we've learned was that she was going through almost twice as much energy as she would have when she *wasn't* entangled, and that's why they get skinnier and skinnier. The DTAG really opened up this whole new world of her life under water that we otherwise weren't able to see. The time scale is what's most shocking to me. With entanglement, it's usually about six months to a year that it takes for these animals to slowly die.

MOORE: Wearing my veterinarian's hat, I think about these animals: Were they terrestrial animals, were they dogs in the city of Boston—and had that kind of trauma and that long a timeline for their demise from interactions with an industry in the city of Boston—I find it very hard to believe that that industry would wish to carry on, because its public persona would be less than profitable. That isn't the case for the marine industries that are involved in this situation. Out of sight *is* out of mind.

VAN DER HOOP: A solution to the entanglement problem is really trying to minimize the amount of gear out there.

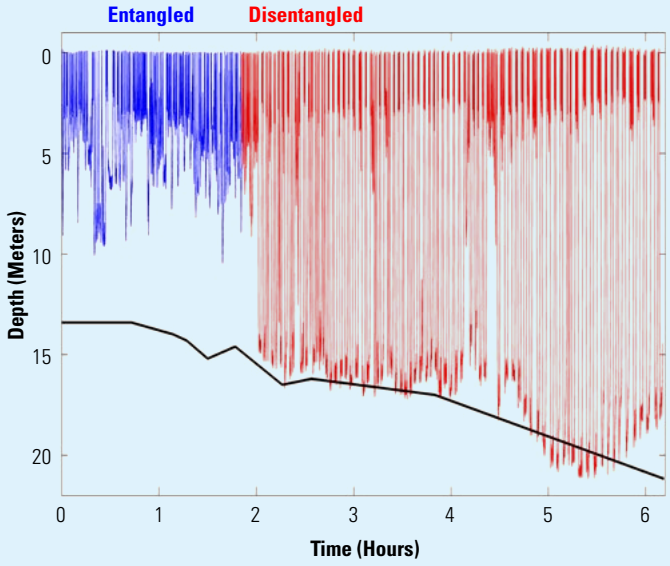
MOORE: No fisherman wants to catch a whale, and I wish no fisherman a hungry day. There needs to be a targeted, focused assessment of how the fishery can still be profitable while deploying less gear, so that you can reduce the risk of marine mammals actually encountering that gear in the first place. The population is slowly recovering, maybe one or two percent a year. There is significant optimism that we are actually doing quite well in terms of managing the recovery of the North Atlantic right whale.

VAN DER HOOP: So on February 1, 2011—I'll never forget this!—Michael walked into my office and said, "They've received a call of a dead North Atlantic right whale off the coast of Florida." And I said, "Is it the one? Is it 3911?" And he said, "We don't know yet, but are you coming?" And sure enough, by the time we got to Florida we heard that this animal *was* 3911. So she didn't make it. When we showed up on the beach that night. I remember walking out there and seeing this huge right whale—or what I thought was huge, but she was only 10 meters; she was only two years old. And I saw all these people around her that had been involved in her life—to learn from her what entanglement had caused. (See photo at right.) ▲

The research on EG3911—by van der Hoop, Moore, and scientists at the Georgia Department of Natural Resources, the Florida Fish and Wildlife Conservation Commission, and NOAA Fisheries—was published online May 21, 2013, in the journal Marine Mammal Science. WHOI scientists have long participated in rescues of stranded, injured, or entangled marine mammals for the Marine Mammal Health and Stranding Response Program, which was established under the Marine Mammal Protection Act. The program is coordinated by NOAA National Marine Fisheries Service and authorized by NOAA/NMFS Permit No. 932-1905-MA-009526.

Top right, researchers take aim to shoot a dart with a sedative to calm the whale EG3911 before they attempted to remove fishing gear entangled around her. At right, researchers perform a necropsy on a dead whale on a beach in Florida to obtain postmortem information on the impacts of fishing gear on whales.

Florida Fish and Wildlife Conservation Commission



van der Hoop et al

The DTAG on EG3911 clearly showed that right after the whale was freed from fishing lines, she could dive much deeper (red) than before (blue).

Florida Fish and Wildlife Conservation Commission