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SCIENTIST AT WORK | ALEXANDRA MORTON

# Saving Wild Salmon, in Hopes of Saving the Orca

By CORNELIA DEAN

ECHO BAY, British Columbia — Growing up in Connecticut, Alexandra Hubbard did not want to be Joan of Arc. She wanted to be Jane Goodall. But instead of chimpanzees, her animals would turn out to be killer whales.

In 1984, 26 years old and armed only with a bachelor's degree and enthusiasm for her task, she moved to the Broughton Archipelago, in the Queen Charlotte Strait of British Columbia, where the whales, or orcas, were abundant. She and her husband, Robin Morton, a Canadian filmmaker, lived on a 65-foot sailboat and followed the orcas in an inflatable boat with a shelter in the back, stocked with Legos and books for their son, Jarret.

She came to know the archipelago's long-lived orca clans and the matriarchs who led them. She knew she would find them in Fife Sound at the ebb tide, or moving up Johnson Strait with the incoming tide. Using a hydrophone, an underwater microphone she hung from the boat, she recorded their vocalizations and began to recognize what she called the dialects of the clans.

Her husband drowned in 1986, when Jarret was 4, but Ms. Morton stayed on, supporting her work by writing articles and books, designing T-shirts and working as a deckhand on a fishing boat.

Today, she hardly uses her hydrophone. There's no point, she says, "since my subject is so rare now." These days, when Ms. Morton noses her workboat away from her dock here, she is on a crusade, seeking not orcas, but evidence against the salmon farms she believes drove most of the killer whales away, in part by infecting the wild salmon the whales eat with parasites called sea lice. Her work is a challenge to the salmon farm industry and to the Canadian and British Columbia officials who regulate it.

Once dismissed as an outsider and amateur, Ms. Morton has gradually gained the respect of fisheries experts like Ray Hilborn, a researcher at the University of Washington. "She doesn't come from a science background but she has had a lot of influence in highlighting the issue," he said. Daniel Pauly, director of the Fisheries Center at the University of British Columbia, calls her "a spunky hero."

That may be because she takes the issue personally. The disappearance of the orcas in the Broughton "ruined my life, absolutely," Ms. Morton said one day recently as she headed off to net baby salmon and check them for sea lice. "A lot of people have lost stuff they set out to do but, yeah, it ruined my whole plan."

According to the British Columbia Salmon Farmers Association, salmon farms produce $450 million worth of Atlantic salmon a year in British Columbia. At any given time, 70 to 80 farm sites operate in provincial

waters, perhaps 15 or so in the Broughton, a hardly inhabited area across Queen Charlotte Strait from the north end of Vancouver Island. Typically, each installation has a collection of net pens, usually crossed by metal walkways, floating in a cove or bay. Individual sites typically contain 500,000 to 750,000 penned fish.

As tiny young wild salmon, smolts, pass by these pens on their way to sea, they can pick up so many lice they die, Ms. Morton and other researchers have reported.

Farm operators like Marine Harvest, a Norwegian concern that is a major presence in salmon farming here, concede that penned fish are vulnerable to microbes and parasites but say drugs and pesticides minimize the problem, virtually eliminating the risk to wild fish stocks.

For example, Kelly Osborne, who manages farm sites in the Broughton for Marine Harvest, said penned fish were treated with an antilouse drug called Slice as smolts began their migration to the ocean. The drug is so effective, he said, that perhaps only 1 in 10 penned fish would have a live louse.

Government officials say it would be premature to blame the farms for declines in salmon runs seen here recently, because those numbers fluctuate naturally.

But Ms. Morton and researchers like Martin Krkosek of the University of Alberta and John Volpe of the University of Victoria predict that some local salmon runs will disappear unless the farms are altered or removed. And because salmon loom large in the diets of orcas, bears, eagles and other animals, their disappearance would unravel the region's web of life.

"A lot of wild salmon populations have been on the edge for quite a long time," threatened by logging, dams and "plain old overfishing," said Ellen Pikitch, a fisheries biologist who heads the Institute for Ocean Conservation Science at Stony Brook University in New York. "The sea lice problem could be the nail in the coffin for some of these fish."

(Dr. Pikitch also pointed out what some scientists say is an even bigger problem with salmon farms. It takes more than one pound of fish, processed into pellets, to produce one pound of salmon. Even though farms are working to bring the ration down — some say they have achieved a one-to-one ratio — Dr. Pikitch said the growing need to feed farmed salmon had greatly increased the demand for anchovies, herring and other fish, and "aquaculture is indirectly pulling the rug out from under the ocean ecosystem.")

When Ms. Morton arrived at the Broughton, she was a graceful young woman with dark hair that flowed halfway down her back. "I thought she was another crazy hippie," Billy Proctor, locally acknowledged as the Broughton's master fisherman, said in an interview.

She still moves gracefully but her flowing hair is gray now. And she long ago won Mr. Proctor's admiration for her devotion to the Broughton and its wildlife. When her husband died, Mr. Proctor took Ms. Morton on as a deckhand. They collaborated on a book, "Heart of the Raincoast" (Touchwood Editions, 1998), an account of his life and changing times.

Today, when Mr. Proctor and other fishermen find escaped Atlantic salmon in their nets, they often bring them to her. She cuts them open and records, among other things, whether they have been fed the

chemicals that farms add to feed to color their grayish flesh a more appealing pink. Then she disposes of the bodies, usually by dumping them in the water for crabs and other scavengers to eat.

Meanwhile, in what she calls “partnered science,” she works regularly with experts from several universities. Typically, they design a research plan and Ms. Morton organizes the collection of field samples and other data to help carry it out.

At first, Ms. Morton reported her observations “naively,” Dr. Pauly recalled. “It was simply ‘Hey, look at this, wild salmon are riddled with parasites.’ ” Her opponents attacked her as inadequately credentialed, he said. In the years since, papers Ms. Morton has helped write have appeared in major scientific journals like Science, which in December published a study in which she and her coauthors link fish farms to precipitous declines of pink salmon in the Broughton. Scientists at the University of Alberta, Simon Fraser University and the University of Victoria are sending graduate students to the Salmon Coast Research Station she established here at

Echo Bay, a community of a few families that clings to rocky crags that plunge, beachless, straight down into cold, clear water. There is so little flat land that many people live in float houses — cabins built on rafts or “floats” of foot-thick logs lashed to the shore. There are no roads, no cars and no shops except the few shelves of staples in the post office in Simoom Sound, around a wooded promontory from Ms. Morton’s home, where mail arrives once a week.

The research station occupies a shedlike building on a float. The graduate students and other researchers live in a cluster of houses, their wooden walls untouched by paper or paint, perched on the rock slope inland. One is a former float house that Mr. Proctor lived in as a boy and which Ms. Morton and her son occupied after Mr. Proctor and other neighbors hauled it up onto the rocks, a disaster-filled episode she recounts in her autobiography, “Listening to Whales” (Ballantine Books, 2002). Jarret, who graduated from the University of British Columbia, works as an engineer in Utah now, Ms. Morton said.

Another is a house she built with Eric Nelson, whom she met several years after her husband died and who is the father of her 12-year-old daughter, Clio. Still another is a house she built herself, she said, when it was clear the couple would split up.

The station is supported in part by Sarah Haney, a retired nurse and environmental campaigner from Ontario whose philanthropic resources come from the game Trivial Pursuit — her former husband was one of its inventors and she was an early partner in the venture. One of her major interests is whales, Ms. Haney said in a telephone interview, so she learned about Ms. Morton and her work. When the compound came up for sale, Ms. Haney bought it and paid “a lot of money” for improvements including a new dock, and a laboratory building.

This summer, she deeded the whole place over to Ms. Morton. “This is one of the most important philanthropic ventures I have ever been involved with,” she said.

When Ms. Morton first came to British Columbia, she did not have a traditional academic background. She was a prep school dropout (Milton Academy in Massachusetts) who had worked in California for John Lilly, an eccentric researcher who studied dolphin communication. By then, she had taken enough college courses to earn a bachelor’s degree, she said. She first encountered orcas at Marineland, an oceanarium in

La Jolla, Calif., and decided she had to see them in the wild. She had thoughts of returning to school for a doctorate. Instead, she said, “I met Robin and just fell so crazy in love with him that before I really thought about it I just totally jumped tracks.”

Ms. Morton acknowledges that “the three Ws: widow, whales, wilderness” draw a lot of attention to her work. She embraces it. “The problem with this whole issue is if nobody sees it nothing happens,” she said one day recently as she motored past one of the farming operations. And because most of the fish farmed here end up in trucks heading down I-5 to California, she said, “it can’t just be the Canadian public. It has to be the American public.”

So just as Jane Goodall speaks for chimps, Ms. Morton said, she wants to tell the world about the troubles afflicting the orcas, not as a crusader, but as “a woman cleaning house.”

In September, after decades off the grid, Ms. Morton moved to a small town on Malcolm Island, in the Queen Charlotte Strait, where she will stay until Clio finishes high school.

She will live in a house on the water, a fixer-upper, she called it, and she will visit the research station by boat. Because she won’t have to chop wood or perform other Echo Bay chores, she’ll have time for projects like studying statistics online. And she is looking forward to conversation. In a tiny community like Echo Bay, she said, encountering new people with something new to say is a real treat.

“Billy and I now have a bet,” she said, referring to Mr. Proctor. “He says nobody ever comes back. But I have a research station here. My life is here.”

Meanwhile, she will be putting her hydrophone in the water again, just in case.