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Clues in a Deadly Mystery

Scientists are getting closer to understanding why California's female sea otter population is diminishing while the males are thriving.

By Marla Cone, Times Staff Writer

MONTEREY, Calif. — Born 11 or 12 years ago, the sea otter known as Pink-White is a senior citizen in Monterey Bay. She spends her days near Lovers Point, diving for crabs, napping and grooming her luxurious fur.

Her muzzle has turned gray, yet she is healthy and fertile, and about to give birth to another pup, one of perhaps as many as nine she has mothered in her lifetime. She is a living landmark, adored by tourists and locals, her movements and eating habits tracked by biologists almost since she was born.

Floating in the kelp off Cannery Row seems a sublime life for a sea otter. But the waters of Monterey Bay are treacherous, even deadly, particularly for older females such as Pink-White, named for the colors of the identification tags attached to her flipper-like hind feet.

For reasons that have eluded scientists for several decades, California's sea otters have been struggling while most otter populations elsewhere have thrived. Now, however, scientists studying Pink-White and her kind believe that they may be closing in on one of the most baffling mysteries involving endangered species in the United States.

The latest clue is in the deaths among females, especially those in the reproductive prime of their lives. Females more than 4 years old have a low survival rate in the heart of their range, between Santa Cruz and Big Sur, while males are doing fine, their populations growing.

Scientists say that female otters, which spend much of their energy raising pups, seem highly susceptible to stress, unable to cope with altered conditions in the ocean off California's midsection, including infectious diseases spread by cat feces, as well as chemical pollutants and insufficient food. A creature of the shoreline, otters live their lives right where the human impact on the sea is the greatest.

California sea otters are the only wild animals with their own act of Congress. Signed by President Reagan, it authorized moving some animals to create separate populations that might protect them from oil spills.

Marine biologists know more about what individual otters eat, when they sleep and where they go than they often know about their own children.

Yet progress in protecting them has been painfully slow since the days a century ago when they were hunted almost to oblivion for their prized fur.

For the last decade, dead otters have washed ashore at the rate of three or four a week. Recently they have been dying in alarming numbers. In one month last year, nearly 50 otter carcasses were found.

All this comes despite extensive efforts by scientists to comprehend why.

On an overcast Monday morning in late September, four wildlife biologists from the U.S. Geological Survey motor past the Monterey Bay Aquarium and the ragtag buildings of Cannery Row in a 20-foot Boston Whaler named Pursuit.

They are on the lookout for 14 otters, 11 of them females, fitted a year earlier with devices that record how often and how deep they dive, as well as their fluctuating body temperatures. The data are used to calculate how much energy the animals expend finding food.

A receiver on the boat beeps almost immediately, indicating that Pink-White is nearby.

Jim Bodkin of the Geological Survey's Alaska Science Center in Anchorage raises his binoculars and takes a look. Locating the otters is easy; capturing them is something else. They look placid, lolling about in the kelp. But sneaking up on an otter is virtually impossible, unless it is napping.

The scientists' work has yielded details about the lives and deaths of California's sea otters. It is a labor-intensive effort, requiring hundreds of people, thousands of man-hours and millions of dollars.

To recapture the tagged otters, scientists must outnumber them. On this day, 10 researchers are in two dive crews and a transport boat, while five spotters are onshore. At the aquarium, a veterinarian and several assistants stand by with a fully equipped operating room, waiting to open up the otters' bellies and retrieve the data devices.

Biologists Dan Monson and Heather Coletti, also from the Geological Survey's Anchorage office, are in diving suits, ready to go. They buckle on weight belts and climb overboard, moving 500 feet toward Pink-White with ultra-quiet, propeller-driven scooters, attached to 3-foot-wide nets. Bodkin watches from the boat with binoculars.

"Our target's moving," he says, disappointed. "Once they start swimming around, there's not much chance."

After 28 minutes in the 57-degree water, Monson and Coletti give up and return to the boat. "I just couldn't see her," Monson says. "I forgot how thick this kelp is."

Half an hour later, the divers try again but return empty-handed. "All I got was a big wad of kelp," Monson says.

Three hours after they motored out, the divers finally catch Pink-White. Entangled, the 46-pound creature frantically rolls and bites at the net. This is Pink-White's third time captured. The scientists know to avoid her teeth, which can rip open clams and chew through crab shells.

Once ashore, she is rolled from the aquarium's freight elevator into its animal health laboratory, where a technician holds her down with a thick mat while veterinarian Michael Murray injects her with a tranquilizer 10 times more powerful than morphine. In minutes, she's out.

They measure her and take a blood sample to check for disease and contaminants. Initial blood work finds nothing unusual, but more detailed results won't be known for months. On the operating table, Murray makes an incision and retrieves the data-collection device, a 3-inch cylinder. He leaves the radio transmitter — the size of a bar of soap — so she can still be located upon her return to the sea. Then he sews her up with careful stitches.

Pink-White gets one more injection, this one to wake her up, and is released back into the bay. One surgeon compares the otter's ordeal to having an appendectomy and then playing a game of water polo.

In eight hours that day, the team captures and releases five otters.

Sea otters were abundant in California in the 1800s, numbering about 16,000. By 1900, they were thought to be extinct, but about 50 managed to survive in a remote cove off Big Sur. In 1977, they were declared a federally protected endangered species. Today, about 2,800 California otters exist — all descendants of those 50 survivors.

Scientists say if California's otters were thriving like their cousins elsewhere, in Washington, British Columbia and southeast Alaska, their numbers should have rebounded by now to their original 16,000. Populations elsewhere have grown by 17% to 20% per year. But in California, the growth rate was just 5% until the mid-1990's. Then their numbers began to decline.

In only one other area, Alaska's Aleutian Islands, are otters faring poorly. The culprit there appears to be killer whales, which are eating otters because their usual prey of sea lions and seals have mysteriously vanished.

In California, all scientists know for certain is that the problem "has something to do with a change in their environment", said Jim Estes, a Geological Survey scientist in Santa Cruz. A leading authority on sea otters, Estes began researching the California population 35 years ago.

Perhaps California's 25-fold increase in human population has made modern life "incompatible" with otters, Estes said. "I think it's a whole bunch of stuff nibbling away at the population," he said: disease, pollution, conflicts with fishermen and boaters.

A declining otter population could throw Monterey Bay's whole ecosystem out of kilter. Without enough otters to eat sea urchins, the urchins would proliferate and devour the kelp beds. And without kelp, fish populations would plummet.

"The effect of [removing] otters is very much the same as clear-cutting a forest," Estes said.

In an October report to the federal government, Estes, Tim Tinker of UC Santa Cruz and four other scientists warned that "sea otters may be more vulnerable to [human] activities than most other species, and as such may be bellwethers of the health of California's coastal oceans."

For the last two years, California's otter population has increased, raising optimism among scientists. But Tinker found that only males were increasing in number. Females continue to struggle. This phenomenon may be worse than no increase at all because the stronger males tend to crowd out the females and pups that sustain the population.

California's otters seem to be waging a classic battle of the sexes over food, and the males are winning, Tinker said.

"Males travel much farther than females and thus have access to better food resources, which likely improves their survival," said Katharine Ralls, a senior scientist with the Department of Conservation Biology at the Smithsonian's National Zoological Park. Males are expanding their range southward toward Santa Barbara, where food is more abundant, while the females stay largely around Monterey, where they are "trapped" in an area with low survival rates, Tinker said.

Michelle Staedler, a researcher at the Monterey Bay Aquarium, said that when sick otters come ashore, it's usually the females that are emaciated and die quickly.

Melissa Miller, a wildlife pathologist at UC Davis, has performed necropsies on almost every dead otter recovered. She found that only about 60 of the more than 200 carcasses found over the last two years were in good enough condition to attempt a diagnosis.

Among those, about 40% died of parasites or disease, particularly toxoplasmosis that comes from cat feces, said David Jessup, senior wildlife veterinarian with the California Department of Fish and Game.

Experts say the frequency and variety of diseases striking otters are unusual for wild animals. Otters are contaminated with several toxic chemicals, including polychlorinated biphenyls and a compound from boat paint called tributyltin, but so far there is no clear evidence that the chemicals are hurting the otters. A few otters are lost each year to shootings or injuries inflicted by boats.

Wildlife biologists, the Monterey Bay Aquarium and conservation groups have formed a federal recovery team to try to restore the health of California's otters, even though they acknowledge that they don't completely understand the threats.

"We don't have a smoking gun out there. I wish we did because then we could take action more affirmatively," said Michael Sutton, director of the aquarium's new Center for the Future of the Oceans.

Some conservationists insist that enough is already known to justify some action.

"While it is certainly true that we need to learn more about sea otters, there is a tremendous amount that we already know and can act on," said Steve Shimek, executive director of the Otter Project. Jim Curland of the Defenders of Wildlife said steps that can be taken now include controlling urban and farm runoff that carries chemicals and bacteria into the ocean and educating people to stop flushing cat litter and chemicals down toilets and into storm drains.

"If we chip away at the things we can control," Curland said, "maybe we can make a difference." Federal funds for otter research will run out this year. Though more money might help unravel the mystery, it would not necessarily stop otters from dying anytime soon.

"These animals are better studied than any other marine species," Jessup said. "But when you're dumping all sorts of things ... into the ocean, it's hard to sort out which ones are the bad guys."