Rescuers race against time to salvage sick sea turtles

Mysterious growths are destroying the hapless creatures

By Linda Gottwald
Special for USA TODAY

MARATHON, Fla. — Something weirdly sinister is plaguing the world's sea turtles.

Beneath the glimmering turquoise waters of the Florida Keys and other tropical reefs, gray, cauliflowerlike masses are smothering the gentle giants to death in record numbers. But Richie Moretti thinks he knows why, and he's devoting his life to saving the endangered species.

Moretti is a retired auto mechanic who runs the Turtle Hospital in Marathon, Fla. Here, Moretti and a team of vets and volunteers slice away tumors and then nurse and rehabilitate green, Kemps ridley and loggerhead turtles until they can return to their ocean home.

Those that are permanently disabled by tumors or other injuries have a nursing home for life in a swimming pool filled with 100,000 gallons of saltwater. And life for these ancient species can be up to 100 years, if they can escape the deadly tumors.

The growths, called fibropapillomas, are linked to a virus similar to the one that causes herpes simplex in humans. Unlike malignant tumors that have the capacity to metastasize, the tumors are considered benign, similar to human warts.

But the hideous growths can be deadly, creeping over a turtle's eyes, nose and vital organs and dooming the reptile to a slow death by suffocation, drowning or starvation.

Researchers around the world shudder when they see white spots on the soft tissues of a turtle that mark the beginning of the disease. Within a year, the spots develop into full-blown tumors, and death is likely within a few years unless surgery successfully removes the growths.

Photos by Andrew Itkoff for USA TODAY

To the rescue: Richie Moretti of Marathon, Fla., holds a juvenile loggerhead sea turtle. Behind him is the Turtle Hospital ambulance.

When Moretti first noted the growths on a turtle in 1986, he notified wildlife agencies, but he soon grew frustrated. "Nobody was interested at that time," Moretti says. "They considered it a cosmetic disease. I was shocked to see no research was being done, so I decided to start doing it myself, along with a research team from the University of Florida."

Since the mid-1980s, the disease has reached epizootic proportions, worrying the Florida legislature enough to pass a resolution this year recognizing the fibropapillomas as a serious threat to the state's endangered turtles.

"It's difficult to predict the toll that the disease has taken on the sea turtle population because of the migratory nature of the reptiles," says Elliott Jacobson, a clinician from the University of Florida College of Veterinary Medicine in Gainesville, who works with Moretti.

In addition, because the disease seems to strike juveniles and because turtles do not reach sexual maturity until around age 25, the true impact to the population may not be known for decades.

A study by the National Marine Fisheries Service estimates that fibropapillomas were a factor in stranding roughly 80% of the green turtles found on Hawaii's beaches in 1989 and 1990.

Although all species of sea turtles have staged a fragile comeback since being protected by the Endangered Species

Still, the fact that the virus has been found in the tumors does not necessarily mean that it is causing the disease, Jacobson says. "We all may harbor different kinds of viruses in our bodies at any one time. And this virus may be proliferating in the tumors because the immune system has been weakened by disease, but it may be not be the actual cause. The first step in incriminating the virus as the infectious agent would be to isolate it."

That is exactly what Moretti, along with Jacobson, Herbst and researchers around the world are trying to do. Using Koch's postulates, criteria developed by the German bacteriologist who discovered the tuberculosis bacillus, the University of Florida team is striving to demonstrate that the virus is the cause. To do so, they must be able to:

- Recover the virus in a pure culture from a case of fibropapilloma;
- Reproduce the disease in another animal by inoculation; and
- Recover the virus from the experimental animal as a pure culture.

They have reproduced the tumors by inoculation, but efforts to recover or reproduce the microorganism in pure culture form have failed.

Research center

Much of the world's existing research is based on Moretti's turtle patients. His hospital boasts an ambulance, nursery, operating room, imaging equipment and recovery tanks. The medical records of all patients are computerized, and sea-rehabilitated patients are usually found by fishing boats, divers, the Florida Marine Patrol and the Coast Guard.

On a recent day, the hospital census included Hard Head, a 300-pound loggerhead whose head was split open by a boat propeller; April, a green turtle blinded by fibropapillomas; and Bobber, found floating sideways as a result of a hole in the lung.

Moretti refers to the turtles as his babies and claims that each has its own personality. Some are more stubborn than others, he says.

"I've sat with one for four hours trying to force him to eat squid, putting it back in his mouth, then having him spit it up until he finally got the idea that I wasn't going to quit until he ate it."

Alongside the main pool of the hospital is a tank filled with hatchling turtles that were found abandoned or injured at their nests. When they are old enough to eat on their own, Moretti will take them on his yacht, Pizazz, and release them on a weed line 50 miles off the coast of Cuba. That is a thrill like no other, Moretti says. "I get to be Johnny Appleseed, sprinkling turtles into the ocean."

Still, turtles may be dying from the fibropapillomas faster than Moretti and nature can replace them.

Moretti hopes that a vaccine will soon be developed. It is possible, he says, that if a vaccine is found to be successful for the turtles, one could be developed for the herpes simplex virus that affects humans. But his main concern is to protect his reptilian patients.

"They've been around for over 200 million years," Moretti says. "I'm not going to stand by and let these species disappear now."

Act in 1978, their precarious existence is most dramatically demonstrated by the Kemps ridleys, the rarest species of all.

A decline of nesting females at a major nesting beach at Rancho Nuevo, Mexico, is demonstrated in an ongoing study by the St. Catherine's Sea Turtle Conservation Program. Film evidence showed 40,000 Kemps ridley females nesting in a single day in 1947. Since the program's monitoring began in 1978, the number of nests has declined steadily to a current level of less than 1% of the estimated nests in 1947.

Observational data of other species generally conclude slow and steady declines around the world. While fishing nets, boat injuries and pollution have all contributed to the decline, scientists agree that fibropapillomas pose the greatest threat ever.

Scientists baffled

The mysterious virus is teasing researchers with strange clues. The virus seems to strike turtles when they are concentrated in near-shore feeding habitats, yet infected turtles have been in contact with healthy turtles in captivity for years without spreading the disease to them. But efforts to find a catalyst that exists only in the wild have been fruitless. And outbreaks of the disease occurred simultaneously in the 1980s in Hawaii, Florida and Barbados. Most baffling are the rare cases in which afflicted turtles recover spontaneously.

Scientists do know that the prevalence of turtle fibropapillomas is associated with human activity near their habitat. Turtles in the seagrass flats of the Florida Keys have incidence rates of 70%, vs. less than 2% of turtles in found in pristine reefs off Australia. Juvenile turtles seem more prone to the virus, which seems to be accelerated by stress.

What would stress a turtle? Global warming, Moretti says.

"This is a wake-up call from Mother Nature. If you look at historical trends, there have been oceanic temperature spikes in 1900, 1938, 1958 and 1980. These dates correspond exactly with records of increased incidences of fibropapillomas in turtles. Since 1980, the temperature of the ocean has been steadily increasing, and we're seeing a pretty frightening increase in the number of turtles infected, as well as the size and numbers of tumors."

Moretti points to other evidence that heat affects tumor growth: The virus appears dormant in the winter months, and no turtles with fibropapillomas have been found north of the Florida-Georgia border.

Larry Herbst, an assistant professor at Albert Einstein University in New York who has been working with Moretti to isolate the virus, has ruled out many other etiologies of the fibropapillomas, including Metazoan parasites, ultraviolet radiation and chemical carcinogens. Their work also has found the virus in 95% of the turtle tumors, further implicating it as the most likely cause of the fibropapillomas.

Gangway! A juvenile green sea turtle named Barbara is released 12 miles off the Florida coast after two years in the Turtle Hospital. The turtle was covered with fibropapillomas, which were removed.

Turtle tumors

Turtles from seas around the world are appearing with tumors that are like huge human warts. But these growths, called fibropapillomas, kill the animals by growing over their eyes, noses and vital organs. Scientists say the growths are caused by a virus similar to the one that causes herpes simplex in humans.

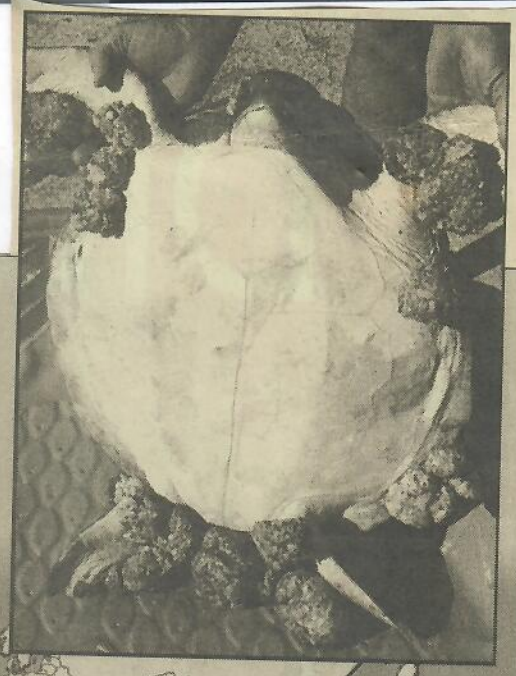

Photo by Andrew Itkoff for USA TODAY; map by Grant Jerding, USA TODAY

Sea legs: Moretti and Sue Schaf tag a juvenile green sea turtle in the surgical room at the Turtle Hospital, where Moretti is the director and Schaf is the director of animal care.