

New Riddle in the Kemp's Ridley Saga

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They said that it was “peculiar,” “evil-natured,” even “mad” and that its heart would break if you put it on its back. They called it the “ridley.”

The history of Kemp's ridley turtles is rich in folklore, unexpected and extraordinary biology, and an inspiring and ongoing story of what it takes to save a species. Kemp's ridleys evaded the notice of scientists until the late 1800s. Once discovered, scientists took nearly 100 years to find out where and how they reproduce. Archie Carr, the historic dean of sea turtle biology, spent decades studying what he called “the riddle of the ridley.” Just as the riddle came to light, scientists discovered that Kemp's ridleys were heading toward extinction. Intensive efforts set them on an exponential path to recovery that lasted for more than two decades. But in the past five years, an unexplained precipitous population decline has scientists scrambling to solve yet another riddle, one that will determine if the future of this critically endangered species is again in jeopardy.

The story starts in the late 1800s in Key West, Florida, which is the former center of the sea turtle industry in the United States. Most of the world's sea turtles had already been identified, but the Kemp's ridley had eluded scientists. Richard Kemp was a businessman and avid naturalist. He had grown up in The Bahamas, where sea turtles were a part of his everyday life. After moving to Key West, just a few blocks from where sea turtles were landed on a daily basis, he became fascinated by a “peculiar” species of sea turtle that did not occur in Bahamian waters but was abundant in the Florida Keys. He sent

descriptions and specimens of this new creature to the Harvard Museum of Comparative Zoology, and in 1880 the species was named in his honor because of “the great interest Mr. Kemp takes in the matters pertaining to natural history.”

The species now had a name, but the mystery of its biology was just beginning. Kemp noted that it was commonly called the bastard turtle and was thought to be a hybrid between a green and a loggerhead. This belief would stand for the next 58 years, until this peculiar turtle caught the attention of the most famous of sea turtle biologists, Archie Carr.

Archie Carr had just finished his PhD studying Florida reptiles when he was contacted by a colleague who ran a shark fishing business in the Keys. As noted in Archie's 1956 book *The Windward Road*, this colleague reported that there was an “evil-natured” sea turtle that was flat and gray with a big head and that it would tear up their fishing nets when captured. The locals called it the “ridley,” but no one seemed to know the origin of the name. Archie traveled to the Keys in 1938 and saw his first Kemp's ridley with a local turtle fisherman who told him, “We don't know where they lay... Some say these ridleys is cross-breeds... They are made when a loggerhead pairs with a green.” He also said that “ridleys is always mad... You can't keep a ridley on its back... They're crazy; they break their hearts.”



Archie noted, “That is how I got to know the Atlantic ridley.... That is how the great ridley mystery started for me.”

Unwilling to blindly accept the folklore and notion of a hybrid turtle, Archie spent another two decades unsuccessfully searching for the Kemp’s ridley’s nesting grounds throughout Florida, The Bahamas, the northern Gulf of Mexico, and the Caribbean. Archie considered the Kemp’s ridley to be one of the most mysterious animals in North America, and his eloquent writings set the scene for others who would contribute to the ridley story.

In his book *Tales from the Thebaide*, Peter Pritchard, a former student of Archie Carr, notes that Archie worried that the great ridley mystery might not end with a bang, but rather with a series of widespread individual nesting reports. In reality, he worried in vain, because the ridley’s biology was far more interesting than anyone had ever anticipated.

Solving the riddle of the ridley would require two more individuals. The first was Andrés Herrera, a rancher and businessman from Tampico, Mexico. He was an outdoorsman who enjoyed fishing and hunting, a pilot with his own small airplane, and an amateur 16-millimeter movie photographer. He often flew to fishing sites along the Gulf coast, and during trips to Barra del Tordo (located about 100 kilometers, or 62 miles, north of Tampico), he repeatedly heard that on certain days in the spring, sea turtles would nest by the thousands during the daytime.

Herrera became fascinated with the idea of documenting this amazing biological phenomenon on film. He flew a total of 33 surveys to the area over a two-year period. On June 18, 1947, he hit the jackpot by stumbling upon a large mass nesting event (*arribada*) in progress, just north of the small town of Rancho Nuevo. He landed his plane on the beach and recorded the famous Herrera film, which not only provides the earliest documentation of the location of the Kemp’s ridley nesting beach, but also represents the first documentation of *arribada* nesting in sea turtles.

Herrera understood the importance of his film as the first documentation of this amazing biological phenomenon, but he did not yet realize its significance in unraveling the Kemp’s ridley mystery. For several years, Herrera tried unsuccessfully to market the film to magazines and movie studios, including *Life Magazine*, Disney, MGM, 20th Century Fox, and RKO. Meanwhile, the answer to the great ridley mystery lay dormant on a closet shelf in Tampico, while scientists continued to search far and wide. Connecting the pieces of this puzzle would require another person who had become fascinated by the great ridley mystery, Henry Hildebrand.

Henry Hildebrand was a college professor specializing in fishery biology at Corpus Christi University in south central Texas. He was a classic field biologist and felt that scientists should learn from nature, not just from books. He was an expert on the biology of the Gulf of Mexico, was fluent in Spanish, and had traveled widely, including many trips to Mexico. His forte as a scientist was his down-home logical approach as he gathered firsthand knowledge from local fishermen about sea turtles and the sea turtle fishery. He had also read Archie Carr’s books and articles and was fully aware of the riddle of the ridley;

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thus he had all the right ingredients to solve the great ridley mystery.

During a field trip to Mexico in 1961, Hildebrand visited the Campo Andrés fishing camp near Barra del Tordo to inquire about sea turtles. The owner of the camp told him that large numbers of sea turtles nested on beaches to the north and mentioned that Andrés Herrera in Tampico had recorded a film of the spectacle. At that point, Hildebrand suspected that the turtles nesting near Rancho Nuevo might be ridleys because they allegedly nested during the day, unlike other sea turtles he knew about. Hildebrand hurriedly wrote a letter to

Herrera asking to view the film. Andrés Herrera was elated that the significance of his film might finally be realized, and he immediately sent the film. Hildebrand watched it in amazement; he had found the fabled Kemp’s ridley nesting beach and simultaneously discovered an amazing biological phenomenon, the *arribada*.

Hildebrand showed the film at a scientific meeting that year in Austin, Texas to a captivated scientific audience that included Archie Carr, who had flown from Florida specifically to see the film. To quote Hildebrand’s interpretation of Carr’s reaction to the film, “He was quite flabbergasted, I’d say for sure.”

The mystery of the nesting beach had been solved. Yet at the same time, unbeknown to scientists, the Kemp’s ridley was facing its greatest challenge in 6 million years: avoiding extinction. While the scientific community was consumed with the search for the nesting beach, the Kemp’s ridley had quickly become the most endangered sea turtle in the world and was on a trajectory toward extinction. The Kemp’s ridley’s limited distribution and single primary nesting beach made it the most vulnerable sea turtle in the world. Exploitation of eggs at Rancho Nuevo had grown exponentially from local subsistence to commercial scale during the 1950s and early 1960s. This threat accompanied a vast expansion in the Gulf shrimping industry that increased incidental capture and mortality of juvenile and adult Kemp’s ridleys.

Fortunately, the Herrera film drew attention to Rancho Nuevo. As scientists visited the beach in the early 1960s, they found that *arribadas* like the one shown in the Herrera film no longer took place. By 1966, the Mexican government was aware of the situation and sent in a team of biologists accompanied by Mexican marines to protect eggs and nesting females. Despite the Mexican government’s best protection efforts at the nesting beaches, the number of nests continued to decline through the 1970s, with the annual number of recorded nests dropping below 1,000 by 1978. The continuing decline sparked intense concern in both Mexico and the United States.

In 1978, multiple U.S. government agencies (U.S. Fish and Wildlife Service, National Park Service, and National Oceanic and Atmospheric Administration [NOAA] Fisheries) and the Mexican federal fisheries institute (Instituto Nacional de Pesca) initiated a binational recovery plan that expanded and enhanced beach protection at Rancho Nuevo. The plan also launched one of the greatest scientific experiments ever: to start a secondary nesting colony by transplanting 10 to 20 nests each year from Rancho Nuevo to Padre Island National Seashore in Texas, and then to “headstart” the hatchlings for approximately nine months before releasing them (see *SWOT Report*, vol. I, 6–7).

Unfortunately, these collaborative efforts were not enough, and the number of nests at Rancho Nuevo continued to decline. By 1985, only 702 nests were recorded, representing 300 or fewer nesting females. Nesting females and hatchlings were being protected, but not enough ridleys were surviving to adulthood because of the thousands of juvenile and adult sea turtles each year that were ensnared in shrimp trawler nets. NOAA Fisheries was acutely aware of the problem, and they developed a solution: the turtle excluder device, or TED. The Kemp's ridley was the flagship species that served as the driving force for implementing TED regulations in 1989. Once implemented, the nondiscriminating TEDs immediately started saving all species of sea turtles in the Gulf and wherever TEDs were used.

The Kemp's ridley story was shaping up to be the ultimate example of how effective conservation can bring a species back from the brink of extinction. After the implementation of TEDs, the species rebounded at a rapid pace, increasing from 702 nests in 1985 to more than 21,000 nests in the state of Tamaulipas, Mexico, in 2009. Scientists' population models predicted that the exponential growth would continue into the future.

But in 2010, the ridley story once again became a riddle. Nesting numbers dropped precipitously to 13,302 nests in Tamaulipas, a 37 percent decrease from 2009, contrary to what was expected. In 2011 and 2012, the number of nests in Tamaulipas increased to approximately 21,000 nests, suggesting that the population might bounce back to its previous exponential growth rate. Unfortunately, the number of nests per season then exhibited a major downward trend, dropping to approximately 16,000 in 2013 and then to a little over 12,000 in 2014 in Tamaulipas. Had nesting numbers stayed on the exponential trajectory exhibited prior to 2010, nesting numbers would have reached 40,000 nests or more by 2014, a far cry from reality.

The basis of the recent decline is currently speculative, but it is clear that the recovery of the ridley has experienced an unexpected downturn,

sending biologists searching for clues. The most obvious possible culprit is the Deepwater Horizon oil spill in 2010 (see *SWOT Report*, vol. VI, 16). An estimated 210 million gallons of oil and 1.84 million gallons of dispersant were released into the northern Gulf of Mexico, a well-documented migratory corridor, foraging ground, and developmental habitat for Kemp's ridleys. But there are other possible factors, such as the major cold-stunning event in 2010 that spanned from Florida to Tamaulipas.

A significant increase in the number of dead stranded ridleys was recorded in the northern Gulf of Mexico during 2010, as might be expected in response to the oil spill and cold stunning, but those increased levels of strandings have remained relatively high in subsequent years. It has been suggested that the recent decline in nesting may simply represent a natural fluctuation in the population, or that the ridley population may be reaching the carrying capacity of the Gulf of Mexico. However, those latter hypotheses are difficult to reconcile with Hildebrand's estimate of 40,000 nests in a single day, observed in the 1947 Herrera film, which suggests the Gulf of Mexico ecosystem historically supported a large population. The simplest explanation for the recent decline is that a combination of factors such as those mentioned earlier may have affected the population and at least temporarily derailed it from its previous exponential recovery rate. If so, the decline represents the loss of possibly a decade's worth of intense conservation efforts.

The basis for the decline has been the focus of intense discussions at recent Kemp's ridley meetings, and scientists are mobilizing to obtain data that may explain the current situation. In the meantime, the Kemp's ridley story continues with yet with another riddle, one that could simply be a bump in the road to recovery or alternatively could threaten the future survival of this critically endangered sea turtle. It is hoped that the continued dedication of scientists and conservationists will provide the answers and, ultimately, ensure the survival of the Kemp's ridley. ■

A recent Kemp's ridley arribada in Mexico. Populations have recovered to the point that arribadas are happening once again, but an unexpected drop in nesting since 2010 is causing concern among conservationists. © HÉCTOR CHENGE PREVIOUS SPREAD: A Kemp's ridley sea turtle is released following eight months of rehabilitation by New England Aquarium's Marine Animal Rescue Team due to cold stunning; Assateague Island, Maryland, U.S.A. © ESTHER HORVATH

