



Figure 1 (left). An 11-year-old from the Kemp's Ridley Sea Turtle Project returns to the Gulf of Mexico after laying eggs at Padre Island National Seashore in 1998. Note the living tag on the shell (arrow), on the right side behind the head.

Figure 2 (right, top). National Park Service and U.S. Geological Survey staff release Kemp's ridley sea turtle hatchlings at Padre Island National Seashore. The public and media are encouraged to attend these releases.

Figure 3 (right, bottom). Kemp's ridley sea turtle hatchlings released on the beach at Padre Island National Seashore.

Kemp's ridley sea turtles return to Padre Island National Seashore

By DONNA J. SHAVER AND JOHN E. MILLER

Projects to restore endangered species typically require years of patience and persistence. After two decades of effort, the project to establish a nesting colony of Kemp's ridley sea turtles (*Lepidochelys kempii*) at Padre Island National Seashore (Texas) is showing signs of success. In 1999, 17 confirmed Kemp's ridley nests were located in the United States, including 11 at Padre Island National Seashore. Sixteen of the 17 nests were located in south Texas, constituting the most Kemp's ridley nests documented on the Texas coast in a single year and an increase in the number of Kemp's ridley nests detected on the Texas coast for the fifth consecutive year (Shaver and Caillouet 1998).

Background

Kemp's ridley is the most critically endangered sea turtle in the world, with only about 3,000–5,000 (TEWG 1998) adults remaining in the population. Most Kemp's ridley sea turtles nest near the village of Rancho Nuevo, Tamaulipas, Mexico. In 1978, it was feared that Kemp's ridley would go extinct within a few years unless immediate steps were taken. An experimental, binational project involving the National Park Service (NPS), National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), Texas Parks and Wildlife Department, and Mexico's Instituto Nacional de la Pesca was undertaken

to establish a secondary nesting colony of Kemp's ridley sea turtles at Padre Island National Seashore where nesting had previously been documented (Fletcher 1982; Shaver 1987, 1990, 1992). Scientists and resource managers from a variety of private, state, and federal agencies in the United States and Mexico recognized that establishing a secondary nesting colony would provide a safeguard for the species—if an environmental or political catastrophe were to occur at the primary nesting area in Mexico, an area in the United States would be protected where Kemp's ridleys could nest (Shaver 1990; USFWS and NMFS 1992).

From 1978 through 1988, approximately 2,000 Kemp's ridley eggs were collected each year (totaling 22,507) at Rancho Nuevo and incubated at Padre Island National Seashore. Hatchlings were experimentally imprinted on the beach at the national seashore and then reared in captivity for their first 9–11 months of life (head-started) at the NMFS laboratory in Galveston, Texas. Overall, 13,211 Kemp's ridley turtles from this project were tagged and released into the Gulf of Mexico and adjacent bays as yearlings, in hopes that they would return someday to south Texas to nest. Additionally, 1,097 untagged hatchlings and 300 tagged 2–16 year-old turtles from this project were released.

The first confirmed record of Kemp's ridley nesting in the United States was of an individual that laid eggs at Padre Island

National Seashore in 1948, 15 years before it became a national seashore and 30 years before our project to establish a nesting colony began. From 1948–99, 61 Kemp's ridley nests were documented on the Texas coast (Shaver and Caillouet 1998). Additional nests could not be fully documented, while others certainly went unnoticed or unreported both before and after 1948. All 61 confirmed nests were found in south Texas, including 39 at the national seashore. In fact, during the last 50 years, more confirmed Kemp's ridley nests have been located at Padre Island National Seashore than anywhere else in the United States (Shaver and Caillouet 1998). Only eight Kemp's ridley nests have been found at other U.S. locations outside of Texas. Forty-eight of the 61 confirmed Kemp's ridley nests found in Texas were located from 1995–99. These 61 records resulted from turtles and tracks located by the public and, after 1994, by national seashore turtle patrollers. Although personnel from the seashore have been conducting patrols for nesting sea turtles since 1986, these patrols were not very comprehensive until the last two to five years. Thus, the recent increase in detected nesting may reflect increased nesting, improved detection efforts by national seashore turtle patrollers, increased awareness and reporting by the public, or a combination of all of these factors.



Program payoff

In 1996, the first two confirmed returnees from the project nested at Padre Island National Seashore. Through 1999, nine returnees were found nesting in south Texas (Shaver 1996a, 1996b, 1997; Shaver and Caillouet 1998). The returnees were identified by *living tags*, which were used to mark some individuals of the 1982 year-class (year hatched) and all individuals of the 1983–1988 year-classes. Living tags (figure 1) are tissue transplants of a small piece of light-colored plastron (bottom shell) implanted into the darker carapace (top shell). At 10–15 years of age, these turtles found their way back to south Texas, mated, nested at or in proximity to the beach where they were imprinted as hatchlings, and produced clutches containing viable offspring. These returns represented the first confirmed records of sea turtles experimentally imprinted on an area that returned to that area to nest; they are also the first confirmed records of head-started sea turtles nesting outside of captivity (Shaver 1996a, 1996b, 1997).

Before 1985, no turtles from the experimental imprinting and head-starting project that resided outside of captivity would have been mature and able to nest. Thirteen of the 52 confirmed Kemp's ridley nests found on the Texas coast from 1985–1999 were conclusively linked to the project. Although we can not prove it, some of the other 39 nests found from 1985–99 may have originated from the project. This is possible because: (1) Kemp's ridleys from the earliest year-classes were released without living tags and would not have been identifiable as being from the project after just a few years of age, due to shedding of the metal identification tags placed on their flippers; (2) some nesting Kemp's ridleys were observed by beach visitors but were not examined for tags by trained biologists; and (3) some

Kemp's ridley nesting observations were detected only from tracks left in the sand by the nesting females, whereas the species was confirmed by examination of the hatchlings.

The species' future

Although the Kemp's ridley population is now showing very promising signs of recovery on Mexican nesting beaches, the numbers are still far below former levels and levels at which the species could be down-listed or delisted (USFWS and NMFS 1992; TEWG 1998). Protection at the nesting beaches and in the marine environment must be continued to ensure that recovery continues. The Kemp's ridleys currently nesting in south Texas are probably a mixture of both returnees and turtles from the wild stock, with some individuals nesting both in Mexico and south Texas. As the Kemp's ridley population continues to increase and more turtles from the experimental project mature, we expect that nesting in south Texas will increase if the turtles survive after they arrive in the area.

Unfortunately, more adult Kemp's ridleys are found washed ashore (stranded) in Texas than in any other U.S. state (Shaver 1999), even though they forage in, and migrate through, near-shore waters of several other U.S. states. From 1995–99, when increased Kemp's ridley nesting was detected on the Texas coast, 88 adult Kemp's ridleys were found stranded on Gulf of Mexico beaches in south Texas; roughly half of these were located within the national seashore. All were found dead or dying; most were likely the victims of accidental capture during fishing activities. Much of this mortality occurred during the Kemp's ridley mating and nesting seasons, and the deaths of adults of the species in south Texas waters likely reduced nesting in this region these years (Shaver 1999).

The National Park Service and the U.S. Geological Survey (USGS) do not have jurisdiction over the waters in which the mortality is occurring but are coordinating

with other entities to try to reduce these deaths. For example, during 1997 and 1999 we satellite-tracked the movements of 12 adult females that nested in south Texas to delineate areas in which they would be vulnerable to various threats in the marine environment and to help locate subsequent nesting sites.

Because only about one in 200 Kemp's ridley hatchlings survives to adulthood (TEWG 1998) and mortality of adults in south Texas is now relatively high, we must maximize survivorship of eggs laid in south Texas to help ensure the continuation of nesting here. Since beach visitors detect many of the Kemp's ridleys that nest in south Texas, we actively attempt to educate the public about our program through media interviews, educational programs, posters, brochures, and roving beach contacts. One of the most effective means is a semimonthly newspaper column that we write to provide information to locals about various aspects of the turtle program, such as hatchling release dates and other updates. Also, each summer NPS and USGS staff and volunteers search the 80-mile length of North Padre Island (including the 68-mile length of Padre Island National Seashore) via all-terrain vehicles to look for



and protect nesting Kemp's ridley sea turtles and their eggs. Virtually all Kemp's ridley eggs detected on the south Texas coast are collected and incubated in a hatchery at the national seashore, and most emerging hatchlings are also released at the seashore (Shaver 1990, 1997 [figures 2 and 3]). Hun-

dreds of visitors and numerous media personnel visit the park to view our hatchling releases each year.

We hope that increasing numbers of critically endangered Kemp's ridley sea turtles will nest at Padre Island National Seashore in the future, helping to ensure the survival of the species. If this occurs, more people will enjoy the opportunity to safely view these rare turtles. Additionally, the project to establish a nesting colony of Kemp's ridley sea turtles at Padre Island National Sea-

At 10–15 years of age, these turtles found their way back to south Texas, mated, nested..., and produced... viable offspring

"Ridleys" cont'd in right column on page 39

shore could someday become one of the most successful endangered species restoration projects ever conducted by the National Park Service and its partners. **PS**

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