

MEXUS-Gulf Sea Turtle Research, 1977-85

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Introduction

The Sea Turtle Working Group of MEXUS-Gulf has been a dynamic force since 1977. The Mexican delegation is headed by Rene Marquez. The United States delegation was initially led by Peter Pritchard and later by F. H. Berry. Several organizations have collaborated in these efforts in addition to the Southeast Fisheries Center of the National Marine Fisheries Service (NMFS) and the Instituto Nacional de Pesca (INP), notably the U.S. Fish and Wildlife Service and the U.S. National Park Service on Kemp's ridley and the Intergovernmental Oceanographic Commission Association for the Caribbean and Adjacent Regions for WATS. This research summary is reported in three sections: Kemp's ridley, *Lepidochelys kempii*; TED (Turtle Excluder Device); and WATS (Western Atlantic Turtle Symposium).

Kemp's Ridley Research

The Kemp's ridley sea turtle is reduced to a single nesting population along the beach around Rancho Nuevo, Tamaulipas, Mexico. The subadults and nonnesting adults forage along the eastern coasts of Mexico and the United States and intrude into the eastern Atlantic, with an estimated two-thirds of this population in U.S. waters. This is considered the most endangered of the seven species of sea turtles. From an estimated 70,000 nesting females in

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1947, less than 600 females now nest annually.

The nesting and the egg incubation-hatching have been monitored and reported annually since 1968 by an international group headed by the INP, which is reporting those activities.

The Kemp's Ridley Research and Management Plan developed by NMFS in 1984 would have added significantly to knowledge of Kemp's ridley problems by surveying for the first time the species in the water off the nesting beach during the nesting season and by short and long-term tracking of these animals. However, the plans have been cancelled the past 2 years for administrative reasons.

Incubation and "Imprinting" Research

Yearly, since 1978, about 20 clutches of Kemp's ridley sea turtle eggs have been collected from the nesting beach at Rancho Nuevo, Mexico, packed separately in styrofoam boxes containing Padre Island sand, flown to Padre Island National Seashore, incubated, hatched, and hypothetically imprinted to Padre Island. Afterward, the hatchlings have been transported to the NMFS Galveston Laboratory, in Texas to participate in the Head-start Project.

This program has produced an 8-year hatching success of 76.5 percent for the 17,447 eggs incubated at Padre Island (Table 1). This success has resulted in the contribution of 11,893 hatchlings to the Head-start Project. Yearly hatching success has consistently remained above 75 percent (Table 1) except for the 1983 year-class whose catastrophic failure was the result of fungal infection. Hatchlings death and hatchling escape

during imprinting are responsible for the discrepancy between the yearly number of hatchlings produced and the number of hatchlings transported to NMFS in Table 1.

Head-start Research

Hatchlings received at the Galveston Laboratory are reared in captivity for 10-11 months. Healthy survivors in good condition are tagged and released into the Gulf of Mexico with the hypothesis that some will survive and instinctively return to their natal beach (either Padre Island or Rancho Nuevo) to nest as adults. Through 1985, 9,258 Kemp's ridleys representing the 1978-84 year-classes have been reared, tagged, and released into the Gulf of Mexico. Another 249 have been distributed to other facilities for extended head-starting and captive breeding, and an additional 15 of the 1984 year-class are being held for transfer to Cayman Turtle Farm Ltd., Grand Cayman, British West Indies.

Prior to release, all head-start turtles are tagged with an individually numbered metal flipper tag. Most of the tagged turtles have been released off the

Table 1.—Total number of eggs, hatching success, and the number of hatchlings contributed to the NMFS Head-start Project from Padre Island National Seashore for each year from 1978 through 1985.

Year	Total number of eggs	Percent of eggs hatched	No. of hatchlings to NMFS
1978	2,191	88.1	1,829
1979	2,053	86.2	1,661
1980	2,976	84.1	1,614
1981	2,279	83.3	1,868
1982	2,017	77.6	1,524
1983	2,006	12.1	230
1984	1,976	90.7	1,544
1985	1,978	84.1	1,623
Total	17,476	76.5	11,893

coast of the Padre Island National Seashore. Some were released off the west coast and southern tip of Florida, the upper coast of Texas, and in the Bay of Campeche. Of those tagged and released, 394 have been recovered. About 65 percent have been recovered alive and returned to the environment. Recoveries reported from the Gulf of Mexico, from the east coast of the United States, and from the European Atlantic coast demonstrate that head-started turtles survive, grow, and migrate in the wild. On a limited basis, radio tracking of head-started Kemp's ridleys has been tested using transmitters attached to the yearling turtles. These studies show that tagged released turtles quickly become adapted and oriented, and then begin their natural foraging and migrations.

The summary results of the head-start research at the NMFS Galveston Laboratory are listed in Table 2. The Galveston head-start research project has been very successful in developing a reliable method of rearing Kemp's ridleys and in extensive research on diseases and pathological conditions and their resolutions. The overall project costs are high, averaging more than \$100.00 per yearling turtle released.

Habitat Search

The low population numbers and the relatively elusive habits of the Kemp's ridley sea turtle have hindered understanding of the real nature and severity of threats to the species. The Kemp's Ridley Research and Management Plan produced the Kemp's Ridley Habitat Search Project to seek and record all possible occurrences of Kemp's ridley, concentrated in the U.S. section of the Gulf of Mexico and extending up the Atlantic seaboard. A cadre of network participants has been developed, and their reports will significantly improve

Table 2.—Kemp's ridley sea turtle head-start research project summary by year-class¹.

Year-class	Hatchlings received				Tagged turtles released		Recoveries		
	Inclusive dates	Weight (g)	No. alive	No. dead	Total number	Number	Percent ²	Number	Percent ³
1978	6 July-11 August	16.9	3,080	1	3,081	2,019	65.6	75	3.7
1979	26 June-23 August	18.1	1,843	3	1,846	1,345	73.0	17	1.3
1980	24 June-14 July	16.2	1,815	7	1,822	1,723	94.9	85	4.9
1981	12 July-22 August	20.6	1,864	1	1,865	1,639	87.9	46	2.8
1982	6 July-16 August	19.2	1,524	0	1,524	1,325	86.9	149	11.2
1983	8 July-12 August	15.0	250	0	250	190	76.0	8	4.2
1984	24 July-27 July	16.4	1,441	106	1,547	1,017	70.6	5	0.5
1985	9 July-7 August		1,684	8	1,692				
Totals			13,501	126	13,627	9,258		385	4.1

¹As of 18 September 1985.

²Based on number received alive; overall survival is 82.2 percent.

³Based on number released.

our knowledge of occurrences and habits of Kemp's ridleys in U.S. waters. Meanwhile, the Sea Turtle Stranding and Salvage Network for the Gulf and Atlantic Coasts of the United States, activated in 1980, continues to record strandings, alive and dead, and some incidental captures of Kemp's ridleys.

TED

Shrimp trawling has been implicated as a significant cause of sea turtle mortality through incidental catch of sea turtles while trawling and dragging the turtles long enough and with sufficient stress to kill them. An estimated 843 Kemp's ridleys were so caught and an estimated 275 subsequently killed per year for the 1980-82 period in U.S. shrimp trawling areas of the Gulf and Atlantic. The numbers of Kemp's ridleys caught and killed by shrimp trawling in the waters of Mexico are unknown despite efforts by the Sea Turtle Working Group to investigate this. It has been estimated that the total annual kill of Kemp's ridleys by human causes is twice as large in Mexican waters as in the U.S. waters.

The invention and improvement of the TED (Turtle Excluder Device) in 1984-

85 by the NMFS Pascagoula Laboratory has given fishery managers the capacity to reduce sea turtle incidental catch and kill by shrimp trawling by an estimated 97 percent. Through 1985, the TED had been demonstrated to most shrimpers around the United States, and two limited demonstrations had been made in Mexico. Actual use of the TED in the United States and Mexico was very limited through 1986.

WATS II

The Sea Turtle Working Group has supported the objectives and data collections of the Western Atlantic Turtle Symposium (WATS) since its inception in 1979. Group members participated in preparation of the National Report for the United States and for Mexico that were presented to the Symposium (July 1983) and published in the Proceedings. They prompted and supported the sea turtle nesting beach aerial surveys from Cape Hatteras through Quintana Roo. They serve as cadre of WATS II in continuing to solicit sea turtle data collection from all 38 of the WATS area countries, and will participate in the Second Symposium, 12-16 October 1987, in Mayaguez, Puerto Rico.