

## CHARACTERIZATION OF AN INSHORE POPULATION OF THE KEMP'S RIDLEY SEA TURTLE IN THE NORTHEASTERN GULF OF MEXICO

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The Atlantic or Kemp's Ridley sea turtle, *Lepidochelys kempi*, is considered to be the most endangered of all sea turtles and among the most critically endangered of any species on earth. The survival of the species is threatened by increasing human activity throughout the species range, particularly including commercial trawl fishing, recreational boating, plastic and petroleum pollution (Teas and Martinez, 1989). In particular, efforts to mitigate losses to commercial fishing by requiring Turtle Excluder Devices on trawlers have generated enormous controversy.

Efforts to restore its populations are seriously hindered by our lack of ecological knowledge of the species in non-breeding beach environments. As part of an effort to better understand the occurrence of Kemp's ridleys in inshore waters, the present study was undertaken. The goal was to capture, tag and release Kemp's ridley sea turtles, *Lepidochelys kempi*, from the waters of Franklin and Wakulla Counties, Florida, to generate fishery independent data on seasonality, frequency of occurrence and habitat preference of this endangered species in the northeastern Gulf of Mexico. Such information will contribute both to our basic knowledge of the species and provide information relevant to the needs of fisheries managers. It is a continuation of prior tagging efforts in the same area from 1984-1988 that produced 106 tagged animals (Rudloe, Rudloe, and Ogren, 1991).

Our current knowledge of the biology of the species is reviewed in the 1990 National Academy of Science report, "Decline of the Sea Turtles: Causes and Prevention." The species is concentrated in the Gulf of Mexico (Hildebrand, 1982). Ogren (1989) reported that the species feeds mainly on crustaceans. Byles (1989) reported that blue crabs, *Callinectes sapidus*, are their major diet and that crabs are taken by turtles primarily in shallow coastal grass beds. Shallow coastal grass beds are reported to be critical foraging areas for young Kemp's ridleys by Ogren (pers. comm.). Ogren (1989) has summarized juvenile and adult habitat distribution and relative abundance of ridleys in the northern Gulf of Mexico. Henwood and Ogren (1987) examined seasonal distribution, size and movements of Kemp's ridley in the coastal waters of the US and found mostly subadult animals. Zug and Kalb (1989) provide growth rate estimates.

### METHODS

Trawl sampling was done monthly from June, 1990 through May, 1991 for 12 hours a month with a 40 foot trawl at Alligator Point, Franklin County, Florida.

The procedure for net sampling involved approximately 12 hours per week of sampling with a 300 yard, 15 "mesh" nylon turtle net at several different sites in the vicinity of Panacea/Piney Island and Shell Point Reef in Wakulla County waters (Figure 1). Net sampling began in May, 1990 and continued through November, 1990. It was discontinued for 3 months of December, 1990 and January-February, 1991 due to poor weather and the seasonal movement of macrofauna out of the shallow bays where sampling was being done. Net sampling resumed in March, 1991 and continued through August, 1991. A total of 8 sites were sampled. Two, Levy Bay and Dickerson Bay, which were the only one where turtles could be taken repeatedly, became the primary net sampling locations.



## RESULTS

Turtles were taken from 6 locations in Wakulla and Franklin County waters; 10 from Dickerson bay, 7 from Levy Bay, 9 from Alligator Point, 5 from Shell Point Reef/ Piney Island, and 2 from Wilson Beach. They were taken in all months except December, January and February. All were ridleys except for 1 adult loggerhead and 1 juvenile green turtle. All the ridleys were subadult. Straight line carapace lengths of the ridleys ranged from 56.9 cm to 23.8 cm. The mean was 33.8 cm.

Including both turtle net and trawl sampling and incidental take, a total of 33 turtles were taken in 36 separate captures. Eighteen turtles were taken during the course of project sampling while 13 were taken incidentally to other collecting operations. (Table 1).

During net sampling, seven ridleys were taken in Levy Bay and 7 in Dickerson Bay. In addition to the sampling effort, Dickerson Bay yielded 3 ridleys taken incidentally for a total of 10. Of other sites that yielded a netted turtle, Shell Point Reef proved to be too exposed for safe net operations. Piney Island yielded one. Of the 17 captures made during net sampling, 8 were taken on a rising tide, 8 on a falling tide and one on slack tide. This involved 16 individual animals. Catch per unit effort in turtles per hour ranged from .02 to .10. Values for Levy Bay and Dickerson Bay were .06(L) and .03(D). For net sampling, 17 captures were made in 543 hours of fishing for a CPUE of .03.

Three ridleys and one loggerhead were taken during trawl sampling. Of these, one had been dead several days prior to capture and one (a mature loggerhead) died within hours of capture despite a 30 minute tow. A subsequent autopsy (see attached report) indicated pneumonia. The other 2 were healthy and released routinely. In addition, 5 more turtles were taken incidentally at Alligator Point for a total of 9.

Eight turtles were recovered multiple times. Of these, 5 were headstarted NMFS turtles from Galveston or Padre Island, Texas. Times at large ranged from 19 to 72 weeks. Growth rates ranged from .043 cm/week to .237 cm/week (Table 2).

Of the 13 incidental turtles, 9 were taken in trawls, 2 in gill nets, 2 by hook and line off the Gulf Specimen Marine Laboratory dock, and 2 were observed and reported by other individuals without being returned to shore.

## DISCUSSION

We have tagged and released 32 ridleys and one green turtle and documented the repeated movement, rates of travel and growth rates of headstarted specimens from Texas coast into the waters of north Florida. The headstarted animals appeared to be integrating themselves into the wild population and growing vigorously. They represented 16% of all ridleys taken during this study.

Efficient netting requires detailed local knowledge of the bottom topography and the movement patterns of the target species.

While turtles may be present throughout an area, they are not equally vulnerable to net capture at all points. Rather, a locality in which Kemp's ridley turtles can be repeatedly caught by a turtle net as well as sighted appears to require an embayment with limited points of entry and exit on rising and falling tides. A tidal channel passing through shallow intertidal flats seems to be most effective. The turtles appear to move in and out of the shallows along tidal channels and can be intercepted and caught if the net is placed across the tidal channel. In other areas, turtles are taken rather more haphazardly if they should happen to swim into a net, presumably while foraging. Tidal currents were strong on spring tides and kept the net taut at times, probably reducing its fishing efficiency considerably.

Figure Legend: Localities from which turtles were collected: 1. Shell Point Reef; 2. Piney Island; 3. Bottoms Fishery; 4. Dickerson Bay; 5. Levy Bay; 6. Panacea Channel; 7. Elmore Cove; 8. Alligator Harbor; 9. Wilson Beach; 10. Alligator Point



As a research tool for determining the inshore distribution of Kemp's ridleys, trawl sampling was found to be relatively ineffective, at least at the level of effort (12 hours per month) employed in this study. The species is clearly vulnerable to incidental trawl catches, however, with 9 taken that way.

The use of blue plastic tags on headstarted turtles rather than metal ones resulted in 3 cases out of four of massive barnacle fouling and ugly festering wounds as the heavy mass slowly pulled through the flesh of the flipper. In addition to the damage to the animal, the eventual loss of the tag was inevitable. Plastic and fiberglass materials are often highly attractive to barnacles in our experience. The use of these blue plastic tags is, based on our observations, highly undesirable.

#### LITERATURE CITED

- Byles, R.A. 1989. Satellite telemetry of Kemp's ridley sea turtles, *Lepidochelys kemp*i in the Gulf of Mexico. pp. 25-26. Proc. 9th Annual Workshop on sea Turtle conservation and biology. Feb. 7-11, 1989. Jekyll Island, Georgia.
- Henwood, T.A. and L.H. Ogren. 1987. Distribution and migrations of immature Kemp's ridley turtles (*Lepidochelys kemp*i) and green turtles (*Chelonia mydas*) off Florida, Georgia, and South Carolina. Northeast Gulf Science 9(2):153-159.
- Hildebrand, H.H. 1982. A historical review of the status of sea turtle populations in the Western Gulf of Mexico. pp. 447-453. In: K.A. Bjorndal, Ed. Biology & Conservation of sea turtles. Smithsonian Institution Press. Washington D.C.
- National Academy of Science Committee on Sea Turtle conservation, 1990. Decline of the Sea Turtles: Causes & Prevention. National Academy Press. Washington, D.C. pp. 15-20.
- Ogren, L. 1989. Distribution of juvenile and subadult Kemp's ridley turtles; Preliminary results from 1984-1987 surveys. pp. 116-123. In: Caillouet, C.W., Jr., and A.M. Landry, Jr. (eds.), Proceedings of the First International Symposium on Kemp's Ridley Sea Turtle Biology, Conservation and Management. Texas A&M University Sea Grant college Program. TAMU-SG-89-105.
- Rudloe, A., J. Rudloe, and L. Ogren. 1992. Occurrence of immature Kemp's ridley turtles, *Lepidochelys kemp*i, in coastal waters of Northwest Florida. Northeast Gulf Science 12(1): 49-53.
- Teas, W.G. & A. Martinez. 1989. 1988 Annual report of the sea turtle strandings & salvage network, Atlantic & Gulf Coasts of the United States. Jan-Dec. 1988. cont No. CRD 88/89-19 Miami, Fla. National Marine Fisheries Service.
- Zug, G.R. and H.J. Kalb. 1989. Skeletochronological age estimates for juvenile *Lepidochelys kemp*i from the Atlantic coast of North America. Ninth Annual Workshop on Sea Turtle Conservation and Biology. February 7-11, 1989, Jekyll Island, Georgia. (Abstract).

Figure Legend: Localities from which turtles were collected: 1. Shell Point Reef; 2. Piney Island; 3. Bottoms Fishery; 4. Dickerson Bay; 5. Levy Bay; 6. Panacea Channel; 7. Elmour Cove; 8. Alligator Harbor; 9. Wilson Beach; 10. Alligator Point







PROCEEDINGS OF 9th  
ANNUAL WORKSHOP (1989)POPULATIONS OF ATLANTIC RIDLEY SEA TURTLES (*LEPIDOCHELYS KEMPI*) IN  
APALACHEE BAY, FLORIDA, COASTAL WATERS

TABLE 1: Summary of turtles collected by locality.

LOCALITY	# FROM PROJECT SAMPLING	# TAKEN INCIDENTLY	TOTAL
DICKERSON BAY	7	3	10
LEVY BAY	7	0	7
ALLIGATOR POINT	4	5	9
SHELL POINT REEF	1	1	2
WILSON BEACH	0	2	2
PINEY ISLAND	1	2	3
TOTAL	20	13	33

TABLE 2: Multiple recoveries.

TURTLE	1ST RELEASE	LAST RELEASE	WEEKS AT LARGE	CL GROWTH	GROWTH RATE	LAST CL
BBC112	08/16/90	03/01/91	30	1.3 cm	.043 cm/wk	32.8 cm
*BBC101	05/05/89	09/22/90	72	12.9 cm	.179 cm/wk	29.7 cm
PPJ963	04/04/90	08/10/90	19	3.3 cm	.174 cm/wk	33.0 cm
*QQA576	05/25/89	10/30/90	75	9.2 cm	.123 cm/wk	26.9 cm
*PPJ976	08/15/90	06/07/91	44	6.7 cm	.152 cm/wk	24.1 cm
*PPJ977	08/15/90	04/28/91	38	9.0 cm	.237 cm/wk	26.2 cm
*QQF409	08/15/90	05/02/91	40	-	-	-
PPJ978	08/24/90	05/19/91	41	2.8 cm	.068 cm/wk	34.3 cm

\* Headstarted animals released by NMFS from Galveston or Padre Island, Texas

QQF409 was taken and released by a local resident and reported later



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## POPULATIONS OF ATLANTIC RIDLEY SEA TURTLES (LEPIDOCHELYS KEMPI) IN APALACHEE BAY, FLORIDA, COASTAL WATERS

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A total of 106 Kemp's ridley sea turtles, (Lepidochelys kempi), was captured, measured, tagged, and released from 1984-1988 in Wakulla and Franklin counties, Florida. Turtles ranged from 20.3 to 57.9 cm straight line carapace length (mean 36.4 cm), and weights ranged from 635 grams to 13.7 kg. All turtles were immature and were captured in all months of the year. Turtles taken in winter were significantly larger than those taken in summer. Carapace epibionts and mud stains suggested that two individuals had over-wintered. Turtles were taken over sand, mud, and seagrass habitats and at depths ranging from 30 cm to 32 m. A significant length-depth relationship was observed. The smallest turtles were taken from depths < 9 m. Four recoveries were made, three of which returned to their point of capture upon release. Offshore occurrences during winter months to depths > 30 m for three individuals were observed.

Independent data on abundance, frequency of occurrence and habitat preferences in the northeastern Gulf of Mexico. Such information will contribute both to our basic knowledge of the species and provide information relevant to the needs of fisheries managers. It is a continuation of prior tagging efforts in the same area from 1984-1988 that produced 106 tagged animals (Rudloe, Rudloe, and Ogren, 1991).

Our current knowledge of the biology of the species is reviewed in the 1990 National Academy of Science report, "Decline of the Sea Turtles: Causes and Prevention." The species is concentrated in the Gulf of Mexico (Hildebrand, 1962). Ogren (1989) reported that the species feeds mainly on crustaceans. Byles (1989) reported that blue crabs, Callinectes sapidus, are their major diet and that crabs are taken by turtles primarily in shallow, marshy grass beds. Shellfish, coastal grass beds are reported to be critical foraging areas for young Leptochelys by Ogren (pers. comm.). Ogren (1989) has summarized juvenile and adult habitat distribution and relative abundance of ridleys in the western Gulf of Mexico. Howard and Ogren (1987) examined seasonal distribution, size and movements of Kemp's ridley in the coastal waters of the US and found mostly subadult animals. Zug and Korb (1987) provide growth rate estimates.

### METHODS

Tagging sampling was done monthly from June, 1990 through May, 1991 for 12 hours a month with a 40 foot trawl at Alligator Point, Franklin County, Florida.

The procedures for net sampling involved approximately 12 hours per week of sampling with a 300 yard, 15 "mesh" trawl with two or several different sites in the vicinity of Panama/Pony Island and Shell Point Reef in Wakulla County waters (Figure 1). Net sampling began in May, 1990 and continued through November, 1990. It was discontinued for 3 months of December, 1990 and January-February, 1991 due to poor weather and the extensive movement of marshlands out of the shallow bays where sampling was being done. Net sampling resumed in March, 1991 and continued through August, 1991. A total of 8 sites were sampled. Two, Levy Bay and Walker Bay, which were the only ones where turtles could be taken repeatedly, became the primary net sampling locations.