HEADSTARTING KEMPS RIDLEYS, 1982

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Headstart

Kemp's ridley sea turtles (*Lepidochelys kempi*) are reared in captivity at the Galveston Laboratory under the Sea Turtle Headstart Research Project of the National Marine Fisheries Service (NMFS), Southeast Fisheries Center's (SEFC) Endangered Species Program. The growth and survival of the 1981 year class of Kemp's ridley turtles were very good. Disease problems were few, thereby accounting for the exceptionally good survival and growth. Of the 1,864 live[1] hatchlings received in 1981, 88.0 percent survived, and 1,639 in good condition[2] were tagged and released into the Gulf of Mexico as follows: (1) 1,521 turtles, averaging 649.8 g, were released off the Texas Coast on June 2, 1982, in the vicinity of the Padre Island National Seashore (PINS), with the intention of reinforcing their initial imprinting on that beach, and (2) 118 turtles, averaging 1,170.0 g, were released on July 14, 1982, off Galveston, Texas. For the first release, tagged yearling turtles were transported via U.S. Coast Guard aircraft from Galveston to Corpus Christi in approximately 200 specially padded and partitioned boxes. The tagged yearlings were released off PINS from the U.S. Coast Guard cutter *Point Baker*. The second release represented turtles retained for use as a captive brood stock in case no 1982 year class hatchlings were received. These were released off Galveston from the NMFS vessel *OREGON II* when the new hatchlings began to arrive.

[1] One hatchling was received dead, giving a total of 1,865 hatchlings received.

[2] One yearling was poorly developed, so it was not tagged and released, giving a total of 1,640 survivors.

As part of the international conservation program for the Kemp's ridley sea turtle, 6,812 captive-reared Kemp's ridley sea turtles have been tagged and released in the Gulf of Mexico since 1979. Of these, 154 have been recaptured. The recaptures have provided valuable data on the movements and growth of young ridleys (8 to 28 months old) in the wild. Of the recaptured ridleys that were accurately weighed, the majority had at least doubled or tripled in weight during time periods ranging from 244 to 533 days. The growth and movements as indicated by recaptured ridleys showed that they adapted well to life in the wild. Additionally, their growth rates suggested that it would take at least seven years for fast-growing Kemp's ridleys to mature sexually in the wild, and probably two or three times that long for slower-growing individuals.

Through December 8, 1982, 1,460 (95.8%) of the 1,524 Kemp's ridley sea turtles (1982 year class) received from the National Park Service between July 6 and August 16, 1982 had survived. All deaths of headstarted sea turtles were reported to the USFWS (U.S. Fish and Wildlife Service) on a 24-hour basis (except on weekends). All dead sea turtles were submitted to the Sea Turtle Pathology Research Project for necropsy. As of November 15, 1982 the 1982 year class averaged 174.0 g in weight, 9.7 cm in carapace length and 8.8 cm in carapace width, and were in very good condition.

Ten headstarted Kemp's ridley sea turtles of the 1978 year class remain at Sea Arama Marine World in Galveston, for development of a captive broodstock. As of December 1, 1981, these turtles averaged 19.3 kg in weight, 51.2 cm in carapace length, and 47.9 cm in carapace width. These turtles appeared to be in excellent condition and were receiving good care.

During 1982, four Kemp's ridley sea turtles from the sea turtle Head-

start Research Project were transferred to others for research purposes as follows:

(1) One from the 1978 year class (weight, 15.3 kg carapace length, 47.5 cam; carapace width, 46.5 cm) and one from the 1979 year class (weight, 12.0 kg; carapace length, 43.0 cm; carapace width, 38.4 cm) were transferred on September 2, 1982 to Dr. Steve Rablais, University of Texas, Institute of Marine Science, Port Aransas, Texas.

(2) One from the 1981 year class (weight, 462.0 g; carapace length, 12.4 cm; carapace width, 10.9 cm) was transferred on September 14, 1982 to Dr. David Owens, Texas A&M University, College Station, Texas.

(3) One from the 1978 year class (weight, 9.8 kg; carapace length, 38.3 cm; carapace width, 35.2 cm) was transferred on September 14, 1982 to Dr. Jorge Leong, NMFS SEFC Galveston Laboratory, Pathology Research Group.

Pathology

During 1982 the Sea Turtle Pathology Research Project received 65 sick Kemp's ridley hatchlings for clinical care and/or diagnosis and 168 dead hatchlings for necropsy, from the 1981 and 1982 year classes. The number of cases for each major category of disorder and number of turtles cured are shown in Table 1. The numbers and presumptive causes of death of sea turtles received for autopsy are shown in Table 2.

The most frequent illness and cause of death was mycosis (fungal infection). The predominant types of mycosis were those of the lungs, the liver and the yolk-sac, caused by either of two presumptive pathogens: *Scolecobasidium constrictum* and *Paecilomyces* sp. Many kinds of chemotherapy were tested on the various forms of mycosis, but none was effective. Occasionally, the progress of infection in a turtle stricken with scolecobasidial

pneumonia was arrested spontaneously, especially if the turtle was provided immediately with a clean and stable warmwater environment.

Internal mycoses, as with many other kinds of internal ailments in sea turtles, have been difficult to diagnose early or to monitor. Without adequate methods of diagnosis and monitoring, it is not possible to initiate medical treatments at an early stage of the disease nor to accurately evaluate the efficacy of therapy. Research is needed to develop such methods, if prophylaxes and cures for mycoses are to be developed.

An unusual and fatal urinary tract disorder occurred in the ridleys of the 1982 year class. Crystals, identified as ammonium magnesium phosphate, were found inside the urine collecting system. As of December 10, 1982, at least 9 (and perhaps 10) ridleys had died with urinary caculi. All were from the same rearing tank and the same clutch of 94 hatchlings from one female. Thus, the possibility of either genetic disease or microbial infection must be considered. This problem is being investigated jointly with the University of Texas Medical Branch in Galveston.

Another unusual disorder in the 1982 year class of Kemp's ridley hatchlings was the apparent non-absorption of the yolk-sac. Twenty-five hatchlings died with the yolk-sac still present in the body, along with other internal complications. No effective treatment or prophylaxis is known. However, one working hypothesis is that the condition may have been caused by feeding the animals too soon after hatching. It has been suggested that hatchlings need not be fed until after they are three to five days old. Further research is needed to confirm or reject this hypothesis.

The Sea Turtle Pathology Research Project continued to monitor a contract with the University of Rhode Island, the purpose of which is to determine the causes of death in stranded sea turtles.

On September 1, 1982, a total of 471 carcasses of Kemp's ridley hatchlings were shipped to Dr. Jack Frazier, Smithsonian Institution, Washington, D.C. The carcasses represented the remains from autopsied turtles that died between 1979 and 1982.

The following manuscripts are in various stages of preparation, review, and revision:

(1) The growth and movements of captive-reared Kemp's ridley sea turtles, Lepidochelys kempi, following their release in the Gulf of Mexico, by J.P. McVey and T. Wibbels.

(2) Disease studies aid Kemp's ridley sea turtle headstart project, by J.C. Clary III and J.K. Leong.

(3) The culture of young Kemp's ridley sea turtles (Lepidochelys kempi), by J.P. McVey, R.S. Wheeler, J.K. Leong, and R.M. Harris.

The following paper has been published:

(1) Radiologic evaluation of the differential absorption of diatrizoate in marine turtles, by G.L. McLellan and J.K. Leong. NOAA Tech. Memo. NMFS-SEFC-93, 15 p. May 1982.

Table 1. Turtle disorders and numbers cured.

Presumptive Diagnosis	Year Class 1981		1982	
	No. Admitted	No. Cured	No. Admitted	No.Cured
Mycosis	23	5	1	1[b]
Various types of surface body lesions	33	33	-	
Morphological malformation	3	2[a]	-	
Slight emaciation	2	2	-	
Hypertrophic optic gland	1	0	-	
Internal hemorrhage	1	0	-	
Alimentary canal disorder	1	0	-	
	64	42	1[c]	1[b]

a/ Turtles survived but remained deformed.
b/ Still under experimental medication as of 12/10/82.
c/ Beginning in October 1982, the treatment of sick or injured turtles was conducted by the Sea Turtle Headstart Research Project. The Sea Turtle Pathology Research Project continues to conduct diagnosis and autopsy, to recommend therapy and prophylaxis as requested, and to conduct research on diseases, injuries, and improvements in therapy and prophylaxis.

Table 2. Number of turtles and presumptive causes of death.

Presumptive Cause of Death	Year Class 1981	1982
	No.	No.
Mycosis	74	6
Alimentary canal disorders	8	9
Lung/kidney hemorrhage	7	6
Liver disorder	4	-
Bacterial infection	5	-
Circulatory disorder	1	-
Urinary tract disorder	-	9
Emaciation/stunted growth	-	6
Non-absorption of yolk sac	-	25
Morphological malformation	-	1
Undetermined	3	4
	102	66

Discussion
Yuki Morris, Leader

Witham:
Have you seen viral infections recently?

Leong:
No. One time we did some electron microscopy work on lesions in Kemp's ridley turtles, but did not find any viruses.

Cornelius:
Why was SeaArama in Galveston so successful in raising sea turtles?

Klima:
At Seaquarium the animals were overfed and the animals were kept together. In Galveston they were kept separately. I don't know what happened at the Cayman Islands.

Owens:
There are considerable and important differences in rearing requirements for the different species.

Klima:
You cannot rear these animals together.

Leong:
Young Kemp's ridleys bite each other, but older animals don't seem to have these problems, as shown at Seaquarium where many three-year-old ridleys were reared together in large tanks.

Klima:
In one instance a ridley attacked a nurse shark.

Cornelius:
Olive ridleys in Costa Rica are very docile.

Owens:
It's the same with the olive ridley in Mexico.

Carr:
They also react to humans.

Márquez:
The ridley does not snap at feet. They may snap in tanks because they think they are being fed.

Witham:
If they get crowded, they are aggressive. True also for green turtles.

Morris:
We have testosterone radioimmunoassay data that pertains to the sex ratio question. We tested 30 to 35 turtles and found a slight bias towards males. This observation supports the temperature determined sex idea, in

that with lower temperatures we get more males.

Klima:
Could you discuss the sex ratio at SeaArama?

Morris:
We found a statistical difference in the sex ratios for *L. kempi* at SeaArama from those at Seaquarium. Perhaps the ones at Seaquarium were larger and older and may have experienced cooler temperatures during incubation.

Owens:
The temperature may only need to vary a degree or half a degree in order to cause an effect.