CAPTIVE BREEDING OF THE GREEN SEA TURTLE (*Chelonia mydas*) AT SEA LIFE PARK, HAWAII

(An Experiment that Worked)

by

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Sea Life Park has kept Green Sea Turtles since 1963. During the period 1963-1973 eggs were laid in the water on four occasions and unsuccessful attempts were made to hatch them.

In July 1974 a special turtle exhibit was constructed in hopes of initiating a successful breeding program. No nesting was observed until 6 July 1976 when a clutch of eggs was laid in the water. Sixteen more clutches were deposited in several locations. A total of 1163 eggs (455 of which were fertile) were laid and resulted in 398 hatchlings, most of which were later released.

Numerous errors in exhibit design, incubation of eggs and rearing and release of hatchlings were made in 1976, most of which have been corrected for the 1977 season. These errors along with suggestions for designing a similar exhibit are discussed.

CAPTIVE PROPAGATION OF GREEN SEA TURTLES

AT SEA LIFE PARK

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Because of the depleted stocks of marine turtles and their high economic value, there have been several attempts to raise them commercially. To this date none have been economically successful and all have had to depend significantly on wild caught turtles and in incubation of wild gathered eggs.

Green sea turtles (Chelonia mydas) at Sea Life Park have always played a secondary role and prior to 1973 we had made no significant effort to display them properly or to see if we could breed them successfully.

Because of State and pending Federal legislation and a growing protectionist movement, we felt it would be appropriate to attempt tp breed and raise our own turtles. Our financial situation at the time made it necessary for us to make this a low budget attempt. An already existing free form pool (7m x 17m x 1.5m) was utilized. It was modified by the addition of a sloping 2m wide ramp and a beach holding 20 cubic meters of crushed coral sand. It was painted with a vinyl base copper antifouling paint so that it would not have to be drained and cleaned. Twelve turtles (5 male, 7 female) were added and their activities monitored.

During the next 23 months attempted copulations were occasionally observed, but they was no nesting activity. We had resigned ourselves to believe that while we had made a nice turtle display, we had failed at our attempt to successfully breed them.

On 18 June 1976, a summer of bedlam began. Three large female turtles began nightly excursions. Not just to the beach we had provided for them, but throughout our Park. At least three times each week we received calls from the security guards that there was a turtle on the loose. While a 300 lb. turtle is not particularly dangerous nor is it likely to escape, it is difficult to put back into the pool at 3:00 a.m. with only the help of a security guard who is afraid of it.

The first clutch of eggs of the 1976 season was laid in the water 6 July. On 12 July a clutch of eggs was deposited in a nest on the beach and subsequently moved to an incubation chest. A total of 17 clutches were laid (three in a pond). Six were incubated artificially, eight were left in the beach we had constructed and one had been laid unbeknowest to us, in a pile of sand more than 50 meters away.

Artificial incubation methods were modified from those given by Simon (1975). Eggs were placed in a styrofoam ice chest on a 5cm layer of damp silicone sand. Holes had been placed in the bottom of the ice chest to prevent buildup of excess water. Up to 64 eggs were placed in each chest and these were covered with damp paper towels. Towels were moistened periodically to prevent desiccation. The chests were stored at ambient temperature (25° - 29° C). Eggs were not moved or rotated.

Hatching began on 20 September and continued until 19 December Turtles from naturally incubated clutches usually reached the surface from 9 p.m. - midnight and appeared to crawl to the brightest light source and were often discovered clustered around a footpath light. There were many frantic searches for hatchling turtles in the middle of the night. Hatchlings from naturally incubated clutches were immediately gathered and taken to a holding area. Artificially incubated hatchlings were kept in a clean incubation chest for 3-5 days until their yolk was completely absorbed.

Of the 1163 eggs laid, 455 were considered fertile. From these we obtained 343 live hatchlings. Mortality was caused by predation (mongooses), human error and other undetermined causes.

The majority of the hatchlings were released at nearby beaches shortly after emergence. Twenty four were kept and released on 29 April near the island of Lanai. These turtles were large enough (15cm) to wear a tag. There have been no tag returns.

Sea Life Park has retained three of these turtles and has given ten to other aquaria. The largest of last year's hatchlings is now 30cm and weighs 3.52kg.

SUGGESTIONS FOR IMPROVEMENTS

There were several parts of our breeding program that could be improved. We made some serious mistakes (insufficient protection from predation) and we did not do as good a job as we could have in other areas.

In order to improve our exhibit we have lengthened and deepened the beach. We are developing methods of better containing the adult turtles and have attempted to develop a baby turtle trap. In the near future we intend to widen the ramp that provides access to the beach.

In designing another turtle breeding pond, I would consider several factors important:

1. The pool should be sufficiently large and deep to enable the turtles to move freely about and copulate.

2. It should have a broad (at least 4m wide) gently sloping access to the beach extending well beneath the water surface. This ramp should have a gentle enough slope so that turtles can rest on it if they desire.

3. The beach should be as large as possible and extend as far from the water as possible. Our turtles usually laid their eggs as far from the water as possible. It would be nice to be able to erect a barricade to protect nests once the eggs are laid.

4. The young turtles should be given adequate protection from predators.

5. The area should be escape proof.

LITERATURE CITED

Simon, 1975. "The Green Sea Turtle, Chelonia mydas. Collecting, Hatching and Incubation of Eggs." Journal of Zoology, London, V177 Part 3, pp. 411, V176, pag. 38 - 48.