Conservation and research aspects of hatchery practices

Conference Paper · January 2001

CITATIONS
8

READS
222

2 authors:

Eyup Başkale
Pamukkale University
161 PUBLICATIONS **466** CITATIONS
SEE PROFILE

Yakup Kaska
Pamukkale University
193 PUBLICATIONS **3,563** CITATIONS
SEE PROFILE

PROCEEDINGS OF THE FIRST MEDITERRANEAN CONFERENCE ON MARINE TURTLES

Rome, 24-28 October 2001

Editors:
Dimitris Margaritoulis
Andreas Demetropoulos

ICRAM
Istituto Centrale per la Ricerca scientifica e tecnologica Applicata al Mare

IUCN/SSC Marine Turtle Specialist Group
Mediterranean Region

CONSERVATION AND RESEARCH ASPECTS OF HATCHERY PRACTICES

Eyup BASKALE and Yakup KASKA

Pamukkale University, Faculty of Science and Arts, Dept. of Biology, Denizli, Turkey

INTRODUCTION

Hatcheries are popular tools for sea turtle conservation. Both beach hatcheries and artificial hatcheries have proven useful for protecting sea turtle nests from predators and natural catastrophes. Another technique (transplantation) has recently been tested, with promising results. A thorough discussion of the advantages and disadvantages of hatchery and transplantation techniques is presented by Stancyk et al. (1980).

Despite criticisms, the relocation of sea turtle nests to protected corrals remains a commonly used strategy around the world (e.g., Blanck and Sawyer 1981, Wyneken et al. 1988). Eggs are removed from the natural nest either during or shortly after oviposition, placed in buckets or bags, and transported to a protected corral on the beach for incubation (Wyneken et al. 1988). Transplantation of nests to sites, which are less conspicuous to predators is another commonly used method of nest protection (Stancyk et al. 1980). Hatchlings are released soon after emergence at a variety of locations along the beach so as not to attract an excess of predators to one area. Many nesting beaches have extremely high rates of egg mortality (Stancyk et al. 1980, Erk'akan 1993). On certain beaches the level of egg mortality may even reach 100% (Blanck and Sawyer 1981).

Dalyan, one of the most important nesting areas for *C. caretta*, was declared as the first Specially Protected Area in Turkey in 1988. Predator removal; use of deterrents: chemical repellents or aversion conditioning, and nest protection were considered against heavy predation but not removal of eggs to other natural sites or hatcheries. Dalyan beach is a 4.6 km long, curved sand dune connected to the mainland at its eastern extreme. The western side of the beach consists of sparsely vegetated sand dunes, behind which the Dalyan river estuary forms a large wetland lake system. Heavy fox predation was reported in the last decade on the sea turtle nests (i.e., Erk'akan 1993, Yerli et al. 1997).

In this work we attempted to set up a hatchery design for the nests under risk of predation or inundation at Dalyan Beach.

MATERIALS AND METHODS

Eggs were collected on the night of laying (within 24 hours) from the nests. Eggs were

handled with care so that they are kept in an upright position at all times so as to minimise membrane disruption and resulting embryo death. When all the eggs have been removed from the nest, both the number of eggs removed and the depth of the nest - as distance from the sand surface to base of the egg chamber were recorded. It is important to avoid any damage to eggs whilst transporting them. Eggs were transported in a plastic bucket.

The artificial nest was opened as closely as possible, in terms of depth, diameter, and shape (flask shaped) as the natural nest. The walls of the egg chamber were smooth enough to allow the hatchling easy access to the surface. Two nests were located at least 0.75 m apart to prevent any interaction between adjacent clutches (disease contamination or the transferral of metabolic heat).

Eggs were relocated into the new nest as quickly as possible. Eggs were handled carefully and placed individually in the egg chamber, not dropped into the nest from the surface. In a natural nest the egg chamber will contain little sand. Therefore, we kept the eggs as clean of sand as possible.

The hatchlings were kept in a box around the nest and this box was checked every hour during the night. Hatchlings were released at different places on the beach during the night as soon as possible at the night of emergence during the hourly control of a nest.

The hatchery site was selected in the zone where the majority of the nests would be. The hatchery location was selected so as not to be liable to flooding during the nesting season. In this area a 10x10 m zone was fenced. The design and type of fencing were designed to prevent people walking through the enclosure and disturbing the nests and to prevent the entry of predators. To prevent the burrowing predators, fencing was extended to a depth of about 0.5 m below.

RESULTS

This study was done on Dalyan beach between 26 June 2001 and 15 September 2001. The sea turtle nests are transferred to a fenced area, against predator animals and the risk of inundation. During the breeding season, eggs are collected from the natural nests and transferred to the hatchery site. A total of 2,489 eggs from 37 nests were collected and 2,111 of them hatched from their eggs. 217 eggs were found dead in shells and 161 eggs were unfertilised. The average hatching success was 85% in all these nests. No predation event was detected on the relocated nests.

Five nests after partial predation at the same night, one partly predated nest after 30 days of incubation and another 6 of the nests found very close to the sea, were relocated to the hatchery site. 15 nests from different parts of the beach were relocated.

The average nest depth was 49.8 (min. 43, max. 56) cm. The average incubation period was 48.3 (43-53) days. This was from the day of laying to the first emergence of hatchlings. Hatching was completed 3-5 days later. Some of these results are presented in Fig. 1.

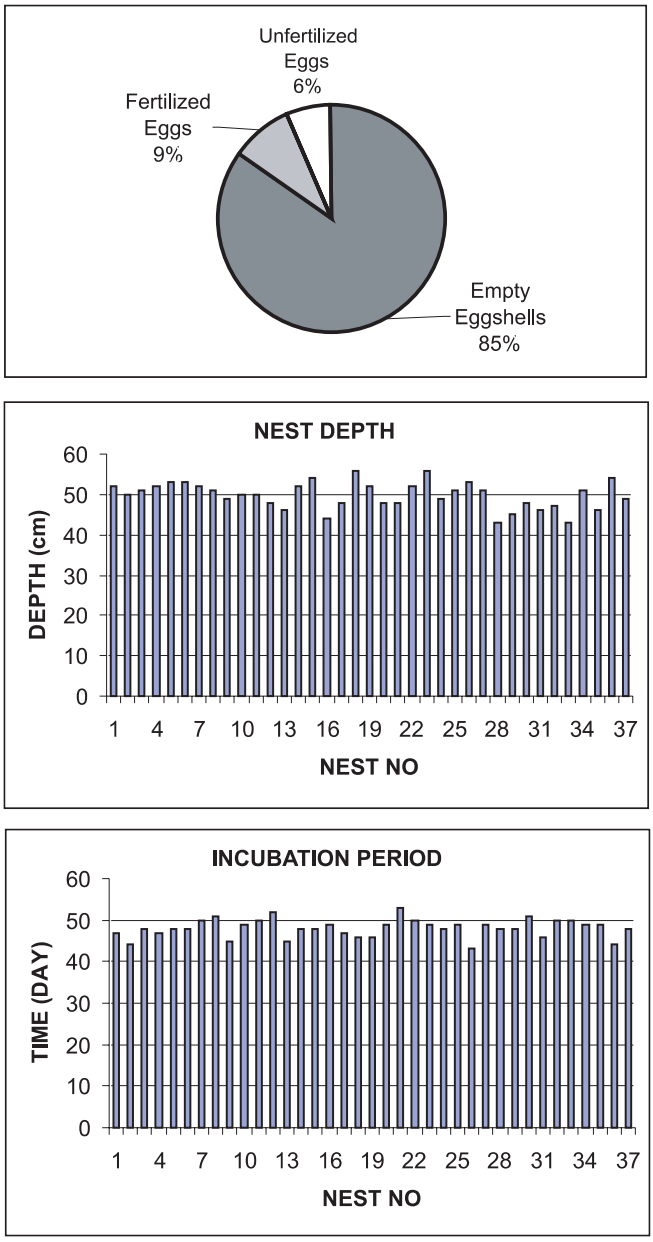

Fig. 1. The hatching success, nest depths and the incubation periods of the relocated nests to a hatchery site on Dalyan Beach during the nesting season of 2000.

DISCUSSION

Fox predation on loggerhead turtles at Dalyan Beach was extremely high (Erk'akan 1993) mesh grids were also used against predation (Yerli et al. 1997). Setting up a hatchery would be a very useful tool (Grand and Beissinger 1997) to increase the hatching success for the nests under risk of predation and inundation.

ACKNOWLEDGEMENTS

Thanks to the Organising Committee and Regional Activity Centre for Specially Protected Areas (RAC/SPA) and Secretariat of the Convention on Conservation of Migratory Species (CMS) for financial support to attend the Conference.

REFERENCES

Blanck C.E., and R.H. Sawyer. 1981. Hatchery practices in relation to early embryology of the loggerhead sea turtle. J. of Exp. Mar. Biol. and Ecology 49: 163.

Erk'akan F. 1993. Nesting biology of loggerhead turtles *Caretta caretta* L. on Dalyan Beach, Mugla-Turkey. Biological Conservation 66: 1-4.

Grand, J., and S.R. Beissinger. 1997. When relocation of loggerhead sea turtle (*Caretta caretta*) nests becomes a useful strategy. Journal of Herpetology 31: 428-434.

Stancyk S.E., O.R. Talbert, and J.M. Dean. 1980. Nesting activity of the Loggerhead Turtle *Caretta caretta* in South Carolina, II. Protection of nests from raccoon predation by transplantation. Biological Conservation 18: 289-298.

Yerli S., A.F. Canbolat, L.J. Brown, and D.W. Macdonald. 1997. Mesh grids protect Loggerhead Turtle *Caretta caretta* nests from red fox *Vulpes vulpes* predation. Biological Conservation 82: 109-111.

Wyneken J., T.J. Burke, M. Salmon, and D.K. Peterson. 1988. Egg failure in natural and relocated sea turtle nests. Journal of Herpetology 22: 88.