RESEARCH SUMMARY

TWO-FOR-ONE SEA TURTLE STUDIES

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Nel, R., A.E. Punt & G.R. Hughes. 2013. Are coastal protected areas always effective in achieving population recovery for nesting sea turtles? *PLoS ONE* 8(5): e63525. doi:10.1371/journal.pone.0063525.

Hanafy, M.H. 2012. Nesting of marine turtles on the Egyptian beaches of the Red Sea. *Egyptian Journal of Aquatic Biology and Fisheries* 16: 59-71.

Sea turtle conservation historically has had a biased focus on protecting sea turtles at nesting beaches. This makes logistical sense, as nesting females, their incubating eggs and the emergent hatchlings are much more accessible to conservationists than freely swimming turtles in the ocean. As a result, many sea turtle nesting beaches have received some form of protection, ranging from basic restrictions such as marking of nests containing incubating eggs, to more stringent protections such as limiting, or even banning, human access to the beach, in addition to other conservation measures such as relocating eggs that would otherwise be lost to erosion or removing egg predators. The assumption is that an increasing trend in the number of nests laid on a nesting beach is an index of successful management, and there have been several examples of increasing trends in number of nests linked to protection in the published literature (Garcia *et al.,* 2003; Dutton *et al.,* 2005; Marcovaldi & Chaloupka, 2007). In a recent paper, Nel and colleagues look at trends in nests laid by leatherbacks and loggerheads that share the same nesting area in northeastern South Africa. This is an ideal dataset to analyze, because it is one of the longest running sea turtle monitoring projects in the world, having been established in the 1960s. Nel and colleagues report that while both species receive the same type of protection on the nesting beach, the trends in nest numbers are different: loggerhead nest numbers have increased over time, while leatherback nests have oscillated with a decreasing trend in recent years. The question is why this might be happening. There are several potential reasons, none of them mutually exclusive: leatherbacks are subject to greater mortality away from the nesting beach; loggerhead hatchling sex ratios in this region are more female biased, leading to relatively more females returning to nest; weaker fidelity to the nesting beaches for leatherbacks means that leatherbacks nests may be laid outside of the monitoring area and thus are not counted. While the authors were not able to definitively say which factor(s) are involved in the declining leatherback population trend, they have defined specific research questions that should help answer this question. This in itself is highly valuable.

One of the other things I like about the paper by Nel and colleagues is the simultaneous analysis of two species using the same nesting beach. Although there are many examples of locations where multiple species lay eggs, there are relatively few publications that analyze more than one species at a time. Perhaps this is part of the current culture of scientific publishing, where some researchers feel pressured to divide datasets into smaller units for analysis and write-up, and thus produce more publications. In any case, it is promising to see a study from one nesting beach that is focused on more than one species at a time.

Similarly, a recent publication by Hanafy summarizes the nesting activity of two species (hawksbills and green turtles) along the Red Sea coast of Egypt. While this paper cannot provide similar trends analyses as the South African study, primarily because of the lack of long term monitoring, it does provide an insight into the current status of sea turtle nesting in the area. It also provides summary information about the size of nesting females, numbers of eggs per nest, and hatching success. These data can be highly valuable for meta-analyses or assessments. In addition, Hanafy identifies several threats to nesting sea turtles along the Red Sea coast in Egypt, including coastal development (such as artificial lighting from coastal highways) and increasing

tourism (Big Giftun Island, a primary hawksbill nesting area, receives >100,000 visitors per year). Interestingly, Hanafy reports the average clutch size for green turtles on Ras Bagdadi island was 41 (range: 31-47). This is curious, given that the average clutch size in other areas of the Red Sea coast were more typical (100 eggs/nest.

It is difficult to know whether this small clutch size is natural or artificial (a study in Brazil, by Almeida & Mendes in 2007, revealed that local participants in a sea turtle conservation program were culling eggs from clutches that they helped protect), and it begs further research. Overall, the paper by Hanafy is valuable in that it not only provides basic information about regional populations of sea turtles but also constitutes archival data that will be crucial for future trends analyses, similar to those featured by Nel and colleagues. Plus, it provides another example of the power of presenting data on more than one species in a single publication.

Literature cited

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Garcia, A., G. Ceballos & R. Adaya. 2003. Intensive beach management as an improved sea turtle conservation strategy in Mexico. *Biological Conservation* 111: 253-261.

Marcovaldi, M.A. & M. Chaloupka. 2007. Conservation status of the loggerhead sea turtle in Brazil: an encouraging outlook. *Endangered Species Research* 3: 133-143. ■

PHOTO SUBMISSION

Mr. Jignesh Gohil of the Prakruti Nature Club, Gujarat, India, and a rescued olive ridley turtle.
The juvenile turtle (68cm CCL; 13kg weight) was discovered weak and unable to swim, held in captivity for a few days, then released.
Photo credit: Raju Goswami