

IN THIS ISSUE

I feel a special regard for Nicholas Mrosovsky, the founding editor of the Marine Turtle Newsletter, which has served as an inspiration and model for Kachhapa. Through the MTN, he was instrumental in launching two letter writing public awareness campaigns that focused international attention on the situation of olive ridleys in India. He is a former co-chairman of the MTSG and present member. His scientific work on turtles has concerned sea finding orientation, sex ratio, and thermal biology. His books include: *Conserving Sea Turtles* (1983) and *Sustainable Use of Hawksbill Turtles* (2000). It is in the context of the issue of sustainable use that I invited him to share with us his thoughts on the subject. The community of conservationists, particularly those concerned with sea turtles, seem

to be largely reluctant to consider sustainable use and I hope this will stimulate some debate on the issue. Also in the issue, Sali Bache clarifies the details of the WTO case regarding shrimp and turtles, which has suffered from lack of adequate coverage in India. Biswajit Mohanty tells us about success of the wandering minstrels in spreading the word of turtle conservation in Orissa. For the first time, we have contributions from the Forest and Fisheries Department. Finally, in the spirit of the recently concluded MoU on the Indian Ocean and South East Asia (report in this issue), this newsletter hopes to serve to further regional communication and cooperation for the conservation of marine turtles in the Indian ocean region.

Kartik Shanker, Editor

Guest Editorial

The Future of Ridley Arribadas in Orissa: From Triple Waste to Triple Win?

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I am grateful to the editors of Kachhapa for their invitation to give an outside perspective on the arribadas of olive ridley turtles in India. From a distant viewpoint what I see is waste, waste, and waste.

The first waste is that of adults, often in reproductive condition full of eggs, caught in fisherman's gear, some dead already, others killed to disentangle them from nets, carcasses washed ashore, bloated, rotting. These animals might have contributed to augmenting the next generation of turtles.

The second waste is that of eggs and potential hatchlings on the beaches. The reduction of preferred nesting beaches by erosion, combined with the tendency of the turtles to select such beaches, has led to nesting densities so high that large numbers of eggs are destroyed by turtles nesting subsequently; sometimes as many as 70% of the eggs are destroyed in this way (Mohanty-Hejmadi & Sahoo 1994). Sometimes the production of virtually a whole arribada is lost to high seas. Predators are also numerous, digging up eggs and killing hatchlings.

This type of situation is not peculiar to the ridley beaches in Orissa. After arribadas in Costa Rica, sometimes "the stench added eggs and decomposing hatchlings is overpowering (Hughes & Richard 1974)".

The third waste is that of the opportunity to help impoverished people. The rotting carcasses and rotting eggs might otherwise have provided protein for people in need of better nutrition. Around 35% of the population of India is considered "food-insecure", consuming less than 80% of the recommended minimum energy requirement; Nearly 9 out of 10 pregnant women aged 15 – 49 are malnourished; anaemia results in 1 out of 5 babies dying (World Food Programme 2000).

It is only natural then to wonder whether somehow the situation at the turtle beaches in Orissa could be rearranged in a mutually beneficial way. Sea turtles have a high output of eggs, but poor survival to adulthood. Mortality at the early stages of the life cycle is especially high. The arribadas of ridleys are perhaps the most spectacular manifestation of attrition

of eggs and hatchlings. This type of life cycle presents an opportunity for conservation and management: save eggs that would otherwise have been destroyed, allocate some for consumption, and set aside others to augment the output of hatchlings from the beach. This strategy is laid out in general terms in Fig. 1.

It is a conservative strategy in that not all the saved eggs are taken for consumption; some go toward increasing recruitment to the wild population. These eggs might have to be incubated elsewhere than the site of arribadas. With attention to such matters as temperature and sex ratio, it should be possible to solve potential problems associated with ex-situ incubation (see also Mrosovsky 1989). Initially, experiments on a modest scale might be advisable. Appropriate administrative arrangements would be as important as the biological aspects.

This general strategy also has the advantage that at least some of the money needed to pursue it would be generated by the operation itself. It is not assumed that no outside funds would be needed; some input might be required especially at the startup phase, but, nevertheless, there is an important closed loop element evident in Fig. 1. A project with this structure would generate funds from the sale of saved eggs, some of which could go to government organizations running the project. With funds for conservation being limited, this is important. There should also be a boost to the local economy, and this, plus direct involvement of villagers in conservation and harvesting, would enable the people in closest contact with the animals to benefit from their management.

Step 1 in Fig. 1 is the identification of sources of mortality on a particular beach. Sometimes these are obvious, but there may often also be a need for experiments and quantification. An example of an intelligent investigation in this category is the work of von Mutius (2000). Studying olive ridleys at La Flor, Nicaragua, she found that in double clutches (i.e. one nest laid on top of and disturbing a previous nest) the mortality was 63.6 % compared to 41.3% in single clutches. The idea that hatch rates of ridleys may be better when nest density is less has been around for some time (Cornelius & Robinson 1982). In India, it has been noted that at Rushikulya, a beach with relatively sparse arribada nesting, hatch rates (74.3%) are much higher than those at the more densely packed Gahirmatha (Pandav 2001). For step 1 (Fig. 1), data specific to particular circumstances are needed,

but application to Orissa of step 1 should not be too hard.

Step 2, the reduction of mortality should also be feasible. There may be difficulties, for instance when losses result from unpredictable storms. Nevertheless, doubtless there are ways to save at least some of the eggs and hatchlings that are likely to suffer mortality on arribada beaches. The possibility that eggs that do not hatch might end up in some important part of the food chain should be kept in mind.

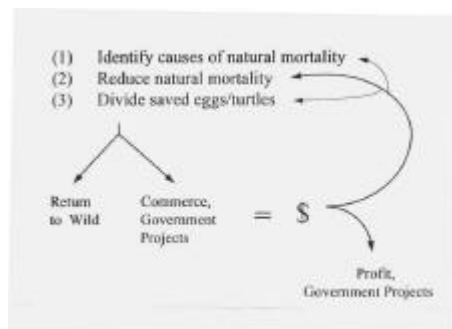
Step 3 might be more of a challenge, requiring ingenuity and creativity to get eggs from remote locations to markets. Pickling or other preservatives could be tried, or locally making eggs into some kind of cake or item that would last longer. Powdered egg might be considered. Doubtless people will laugh at such suggestions. These are not advocated as the best or even necessarily feasible methods, but offered simply to indicate that problems of transport could probably be solved by entertaining a variety of ideas.

People can always find arguments why something might not work. The history of science is full of cases of people being told things were impossible. Preservationists are adept in finding arguments against experimental projects for sustainable use of resources. The IUCN Marine Turtle Specialist Group (MTSG), while paying lip service to sustainable use, has a dismal record in terms of actually helping and fostering creative investigation of such options (cf Campbell submitted). In the past, it failed to get involved in the very conservative egg harvesting system at Ostional, Costa Rica. More recently, it has set up a sustainable use task force that is virtually non-functional. If people in India wish to try new approaches in Orissa, they should not look to the present MTSG for help. Their efforts would have to be powered by their own conviction that something new needs trying, and that by using their own expertise it is possible to achieve something better than the present waste.

The reasons for conservation need to be thought about. Is the aim to preserve arribadas for their own sake only, or to preserve the resource so that it can be used, or both? If use of the resource is part of the aim, the present wastage of eggs on the beach shows that some use is already possible. And of course some use is currently being made of this resource. But this is largely haphazard, illegal, and not well monitored,

very different from the kind of controlled and conservative use outlined in Fig. 1 here.

Fig. 1. A general strategy for utilisation of sea turtles (Mrosofsky 1997).



The alternatives also need to be assessed realistically, as well as idealistically. Despite progress and hopeful signs (Wright et al. 2001), enforcement of wildlife laws is likely to be partial, because with unemployment, the need for better health care, infra structure maintenance, and numerous other demands, there are often higher priorities for governments. Moreover, suppose enforcement were totally effective and that fishing boats and gill nets were eliminated from the area. That would not address the waste on the beaches of eggs, those neat packages of protein conveniently delivered to the shore.

I grew up in the war. As children we were taught that waste was one of the worst most sinful offenses. For some people on the margins of existence, it is always wartime for survival. The present juxtaposition of need and waste is disturbing.

The phenomenon of these massive arribadas is so striking, that even from a distance some of the main biological aspects stand out clearly. Various details cannot be discerned and the human social factors appear nebulous, complex. No detailed prescriptions are offered. It is only asked that all types of option for the ridley arribadas be seriously considered, that undoctinaire and open-minded discussion occur, that people ask themselves if they are comfortable with the present situation and if there is any way in which triple waste can be transformed into triple gain.

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