

Marine Turtle Newsletter

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A nesting loggerhead with US National Park Service research volunteers at Buck Island Reef National Monument, St. Croix US Virgin Islands - see pp. 13-15 (photo: NPS-BIRNM).

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Editorial: The Continuing Shame of Orissa

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In February 2009 I was an invited speaker at the Dhamra Port Consultative Technical Workshop in Bhubaneswar, Orissa State, at the behest of the International Union for the Conservation of Nature. My topic was how to minimize sea turtle and dredging interactions during the ongoing Dhamra Port construction project in the Dhamra River estuary, on the Bay of Bengal, though I also spoke extensively on the required use of sea turtle excluder devices by shrimp trawlers in the United States. What puzzled me most were comments made by a few well-meaning attendees to the conference. Ostensibly in the spirit of protecting Orissa's famous Gahirmatha-nesting-beach olive ridley sea turtles, they seemed none-the-less to focus on the more insignificant aspects of Dhamra Port construction on sea turtles, such as channel dredging effects. Meanwhile, they overlooked the major ongoing slaughter of these same sea turtles by unsupervised shrimp trawling, and unregulated fishing by coastal gillnetters, in the (supposedly) "protected waters" off Gahirmatha Marine Sanctuary and the Bhitarkanika Sanctuary and National Park. Conservatively, over 100,000 observed, documented, and recorded sea turtle strandings—dead, bloated, rotting sea turtle carcasses—have been counted by Indian scientists on Orissa nesting beaches, including Gahirmatha, over the last 10 years, averaging over 10,000 turtles per year. Mortality rates may be significantly higher—ca. 15,000 per year (B. Mohanty pers. comm., in Shanker et al. 2003).

Unquestionably, the vast majority of these deaths were caused by "accidental" drowning from being caught in coastal gillnets and shrimp trawl nets (Shanker & Choudhury 2006). For example, on February 17, 2002, 205 dead olive ridleys entangled in a single section of gillnet were washed ashore at Gundalba Beach, Orissa (Wright and Mohanty 2002). Gopi et al. (2002) reported that mortality due to mechanized offshore fishing reached an "alarming number" of 14,000 turtles in 1998. During a study of sea turtles in Orissa, Pandav (2000) counted 46,200 stranded adult olive ridleys from 1993 to 1999. In the words of Gopi et al., "These 46,200 turtles were counted only in a stretch of 282 Kms out of the entire 480 Km coastal belt of Orissa. Hence, the actual number of dead turtles would relatively be much higher without any doubt."

But these turtle deaths, past and present, are not accidental. Much of that mortality could and should have been prevented using a two-decades-old existing and proven conservation-fishing technique (using turtle excluder devices—"TEDs") and simply enforcing existing fishing regulations. Years of studies by the U.S. National Marine Fisheries Service prove that TEDs are consistently 97%-98% effective at releasing trawl-caught turtles (J. Mitchell pers. comm.). Studies conducted by the Orissa Government Forest Department and the Wildlife Institute of India off Orissa beaches during high-turtle-density arribada months showed that TEDs worked very effectively there ("The Central Institute of Fisheries Technology - developed TED excluded 100% of turtles") and "catch loss (of shrimp and bycatch) was very minimal" (Gopi et al. 2002).

Ominously, the conservative estimate of 10,000 annual bleached and bloated carcasses on Orissa beaches represent just a fraction of the total number of sea turtles being killed by the shrimp and gillnet fisheries there (and probably elsewhere in India). A stranding study conducted off the United States' East Coast to estimate the quantity of sea turtles affected by the shrimp trawl fishery released dead, marked sea turtles at offshore, shrimp trawling grounds. Only 6 of 22 tagged loggerhead carcasses released at sea turned up as beach strandings (Murphy & Hopkins-Murphy 1989). Another study showed that marked turtles that ultimately stranded made up just 7% to 13% of the total marked turtles released (Epperly et al. 1996). The prevailing ocean currents and winds carried most of the bodies seaward, rather than shoreward where they could be observed and counted. So these, the majority of drowned turtles, are not seen or counted. In other words, those 100,000 observed carcasses on Orissa beaches are likely just the tip of the "mortality iceberg" caused by shrimp trawling and gillnetting. Scientists hate to speculate and surmise, but this is probably a very safe bet—a whole lot more turtles are drowning than are being counted.

This level of mortality over the long term on a population is simply unsustainable. Bad things are going to happen. We've seen it before (La Escobilla) and we're seeing it elsewhere as well (Terengganu). We all know that sea turtles take many years to reach sexual maturity (olive ridleys may take 10-18 years before they reproduce, according to a recent study (Zug et al. 2006); the range commonly given is 7-15 years), and produce just 110 to 330 eggs per nesting season. It is not known if they nest annually, but the number of "generic" sea turtle hatchlings that reach adulthood has been estimated by sea turtle scientists at about 1 in 500 hatchlings (U.S. Fish and Wildlife Service Web site; R. Mast pers. comm.), though various sea turtle conservation Web site estimates range from 1 in 100 to 1 in 10,000 depending on your source. The 1 in 500 estimate is obliquely supported by the 1990 U.S. National Academy of Sciences' report (Decline of the Sea Turtles: Causes and Prevention) which stated that, for loggerheads, each individual breeder's reproductive value is estimated to be about 584 times greater than that of an egg or hatchling.

Already, warning signs are appearing in the Gahirmatha sea turtle population. The average size of stranded turtles and nesting females turtles has significantly decreased in recent years, according to scientists at the Wildlife Institute of India (S. Kumar pers. comm.) and other researchers (Shanker et al. 2003; Plotkin 2007). Could it be that the largest sea turtle size-class—the one longest exposed to trawlers and gillnet—has already been culled by drowning? (That is not untypical of collapsing fish populations—one of the first signs of trouble is that the larger fish have disappeared; they've all been caught.). As well, the number of dead sea turtles observed stranded on Gahirmatha beaches has been decreasing in each of the last (approximately half-dozen) years according to another noted Indian sea turtle biologist (C.S. Kar pers. comm.) of the Orissa

Government Forest Department—a possible indication that fewer turtles are being impacted by trawlers and gillnetters. This latter observation is chilling, since neither beach monitoring effort nor trawling or gillnetting efforts have decreased. In fact, reports suggest an increase in fishing intensity from less than 1,000 mechanized boats in the late 1980s to more than 4,000 boats by 1996 (Shanker et al. 2003). The conclusion? Fewer turtles are arriving offshore to mate and nest. No arribadas occurred in Gahirmatha in 1997, 1998, or 2002, “which is the highest incidence of failure in the documented history of this rookery” (Shanker et al. 2003), nor was there an arribada in 2008. Happily, it did occur this year, commencing on March 21st, and Orissa Government Forest Department’s official nesting estimates are of 1.7 lakh (170,000 turtles) during the week that followed (B. Bhuta pers. comm.).

Some of the preceding observations may by themselves mean nothing: Arribadas may be cyclical and may be influenced by wind, tide, lunar phase, and other unknowns. Nesting beaches may be significantly affected by beach erosion (and beach accretion), and may wax and wane naturally over time. Certainly the size and availability of a suitable nesting beach plays a role in a sea turtle nesting (or not) at a particular site. Nayak (2003) opined that the primary reason for missed arribadas at Gahirmatha is beach erosion resulting from the geomorphological changes undergone by the Nasi Islands (where most nesting takes place). A study conducted by Prusty et al. (2006) to assess the factors leading to the non-occurrence of arribadas at the Gahirmatha site indicates that the nesting beaches in Gahirmatha are eroding at a faster rate over the years. A study by Choudhury et al. (2008) based on monitoring the changes in the Gahirmatha nesting beach profile from November 2007 to May 2008 reveals the changes in the beach profile as a very strong reason why arribadas may not be taking place there. Meanwhile, without evidence and because it is an easy target, some no-doubt-well-meaning conservationist fingers are being pointed at Dhamra Port dredging as the reason for Gahirmatha’s beach erosion and reduced nesting, disregarding the fact that the dredging is a relatively recent phenomenon (it commenced in November 2007) and erosion of the Nasi Islands had been occurring for years before dredging commenced. Will dredging have some effect on erosion rates at Gahirmatha? Maybe. Probably it will affect the nearby mangroves. Will actual dredging kill turtles? Very few. The complete truth about dredging effects on the Gahirmatha rookery will be elusive and may be forever obscured in accusations and counter-charges, and even well-designed studies may prove inconclusive—but let’s not disregard the basic known fact: A huge turtle toll is being continuously taken by local fisheries. This alone should loudly sound the alarm bells for Gahirmatha.

Shanker et al. (2003) concluded in 2002 that Gahirmatha has had no drastic decline in the nesting population over the last 25 years, but that the Orissa population is “clearly of imminent conservation concern.” That conclusion is seven years old—seven years of unrelenting, day-in, day-out, fishing pressure on Gahirmatha’s olive ridleys. Approximately 70,000 to 700,000 turtles have been drowned by Orissa fishers since then. To put it another way, that’s about 30 to 300 turtles a day, every day, since 2002, using the irrefutable, minimum number of 10,000 known, observed strandings per year.

The scientific method is good: To our credit, most scientists adhere/cling scrupulously to it. We are prudent and cautious,

analytical and measured. No one will ever accuse us of jumping to conclusions: It’s what sets us apart. It’s necessary to remain dispassionate, objective, unjaundiced, skeptical: Scientists generally cannot/should not get emotional, outraged, incensed, or vitriolic, for risk of appearing less-than-objective. However, sometimes our aloofness works to our detriment. Sometimes it’s good—even necessary—to get mad, indignant, horrified, outraged. Certainly the carnage at Gahirmatha merits that reaction. It’s time to blow the horn loudly for Orissa’s sea turtles, but let’s focus our anger and concern at the main threats, not the red herrings.

In the face of uncertain times and warning signs, even the public—the most common fellow on the street—is instinctively conservative. So where is our (the sea turtle scientific community) collective sense of outrage? Where is the Indian Government’s (and State of Orissa’s) sense of caution, prudence, conservatism, and responsibility? Where is law enforcement of existing TED regulations? There’s a large military presence and Defense base (of the Indian Defense Research and Development Organization) on Outer Wheeler Island, just minutes away by boat from Gahirmatha Sanctuary and Bhitarkanika Sanctuary and National Park. There is also a Coast Guard Base at Paradip at the southern end of Gahirmatha. Can’t the Defense Organization/Coast Guard patrol for TED compliance, and to keep gillnetters out of Sanctuary waters? Can the solution be so simple?

Someone in authority (i.e., State and Federal Government ministries) has got to get some courage and step to the plate. Maybe the United States and other signatories to international sea turtle conservation agreements should get together and apply diplomatic pressure. Meanwhile, a smart-looking, seaworthy patrol/research vessel of the Orissa Government Forest Department—aptly named Olive Ridley—lies mostly idle, tied up at its Dhamara Fishing Harbour mooring, while TED-less trawlers daily motor out past it, heading out to sea, where they continue to drown staggering numbers of sea turtles yearly. It simply cannot go on, biologically or morally. Sea turtles in India supposedly enjoy a “Schedule 1” protected status, the highest status/level of protection given by the Wild Life (Protection) Act of 1991. Where is public outcry? Surely, the situation is egregious, outrageous, and shameful. It smells, literally, of rotting sea turtles.

The Indian Government, at both a Federal and State level, can and must attempt to make significant progress towards halting the largely preventable slaughter of olive ridley sea turtles in Gahirmatha and other Orissa coastal waters. This should be done before India hosts the 30th Annual International Sea Turtle Symposium in Goa next February. That, more than anything, would truly send an international message of sea turtle conservation. To do otherwise would appear very irresponsible and two-faced, at least to the present writer, and perhaps to the world.

¹The opinions presented herein are my own and not necessarily those of my employer.

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Editorial: A Little Learning ... The Price of Ignoring Politics and History

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"A little learning is a dangerous thing; drink deep, or taste not the Pierian spring: there shallow draughts intoxicate the brain, and drinking largely sobers us again" – Alexander Pope

"The opposite of good is good intention" – Kurt Tucholsky

We would like to begin by acknowledging that Hawk's opinion piece (Hawk, this issue), though remarkably ill-informed, limited and naïve in its understanding of the issue of turtle conservation in Orissa, appears well intentioned. Hawk's facts about the ecology of sea turtles in Orissa are correct and indeed alarming, though ironically, he shores up his argument by extensively quoting the very individuals (many of them MTSG members) who have been opposed to the IUCN and MTSG's involvement in the Dhamra Port project. Mainly, however, Hawk appears to have very little idea of the history of conservation and its socio-political context in Orissa.

Science and technology are just tools whose efficacy is determined by the end-users. It has long been recognised the world

over that social change (or altering human behaviour) is the engine that powers successful conservation, which requires understanding of history, society and politics. Therefore, we provide below a brief primer for his benefit.

History of sea turtle conservation in Orissa: Sea turtle conservation in Orissa has a storied past (see Shanker & Kutty 2005). From extensive egg collection to the take of adults, the population has been threatened by anthropogenic impacts before, and conservation measures have responded to these threats. First, the collection of eggs was prohibited in the 1970s. Following the introduction of mechanised boats, targeted take of turtles in offshore waters increased dramatically, and it is estimated that 50,000 to 80,000 turtles were taken each year in the late 1970s (Das 1985). The Government of Orissa enforced The Wild Life (Protection) Act with assistance from the Coast Guard, and over a few years in the early 1980s, this trade in turtles disappeared. Subsequently, the threat from incidental catch increased through the 1990s and numerous attempts have been made to address it, as we will detail below.

A few years ago, we wrote that the unpredictability in size and timing of arribadas, decline in size and huge mortality, was indicative of an impending decline in olive ridley populations in Orissa (Shanker et al. 2003). During this time, it has however, become clear that while changes in the geomorphology have led to the decline in nesting at Gahirmatha (Prusty & Dash 2006), nesting in Rushikulya appears to be increasing (Tripathy et al. 2008), and mass-nesting in the Devi region has completely stopped for more than a decade. The effects of loss of habitat at Gahirmatha are already evident; the failure of arribada in 2008 may be attributed to fragmentation of nesting beaches at Gahirmatha (Prusty & Dash 2006). Thus, any impact on this population should be governed by the precautionary principle. The Dhamra Port Project coming up in close proximity to the nesting beaches constitutes one such significant threat.

Second, it makes little conservation sense to compare threats such as direct mortality and loss of habitat. Mortality constitutes a somewhat reversible threat. Populations can recover, as they have done in La Escobilla (Marquez et al. 2002). However, loss of habitat is often permanent, and great caution (the basis of the Precautionary Principle) needs to be exercised when undertaking activities that could lead to the permanent loss of these nesting beaches. Hawk's suggestions and solutions focus only on threats and mortality due to fisheries which no doubt should be addressed. In fact, he downplays and trivializes the ports impacts, calling them "insignificant aspects of Dhamra Port construction on sea turtles, such as channel dredging effects." The issues of long term and perhaps permanent impacts such as erosion/shoreline changes on turtle nesting habitat (or the coastline in general) that the port can cause are ignored. Of course, this should have been addressed in the original Environment Impact Assessment (EIA). However, it is considered that the scientific and legal validity of the EIA and environment clearance for Dhamra port are highly questionable, given the change in scale and location of the project (Rodriguez & Sridhar). None of this is mentioned or addressed by Hawk or IUCN/MTSG.

Socio-political issues and recent conservation efforts: In the 1990s, the USA extended its domestic law requiring shrimp trawlers to use Turtle Excluder Devices, to all its trading partner countries. Following extensive protest and deliberation at the WTO (in which India was one of the complainants), the US position was upheld (Bache & Frazier 2006). In 1996, NOAA conducted a workshop in Orissa to promote the use of TEDs and a few years later, this was mandated through law in Orissa (Sridhar et al. 2005). However, few trawler owners were inclined to use it for a variety of reasons that have been detailed before (Shanker & Kutty 2005). As elsewhere, including the US, trawler owners protested that only one of the causes of turtle mortality was being targeted (Tucker et al. 1997). Ironically, Hawk's suggestion that one should ignore the threats of development and dredging as being "insignificant", while focusing on trawling justifies and mirrors the trawl owners complaints, i.e. that fishing is being restricted while other threats (development, pollution, etc.) are being encouraged or ignored.

A few years later, Operation Kachhapa began their conservation efforts, which included funding the Forest Department to hire a boat and patrol offshore waters, providing legal advice, and conducting education & outreach programmes (Shanker & Mohanty 1999). Over a few years, a large number of trawlers were apprehended,

and some were tried in a court of law (Wright & Mohanty 2006). The targeting of trawlers created a vitiated atmosphere, in which most fishermen perceived conservation as anti-people (Shanker & Kutty 2005). During this time, laws have been passed restricting fishing, and the issue has been taken up by other agencies such as WWF and Greenpeace. All of these agencies, together with the State, have worked towards enforcing no-fishing zones (in Gahirmatha and to a lesser extent, Devi River mouth), while some of them such as WWF did and continue to promote the use of TEDs. Large sums of money have been spent in the last decade on doing exactly the things that Mr. Hawk suggests. They may be good suggestions, but in practice, they have largely failed.

Recognising the impasse between fishing communities and turtle conservation, in 2004, local and national conservation organizations and individuals, community organisations, and fishworker support organisations came together under the umbrella of the Orissa Marine Conservation Consortium (www.omcc.org). This group has been attempting to promote the conservation of marine biodiversity, including turtles, along with the livelihoods of the poor artisanal fishermen. The laws are conducive to this as they mainly seek to prohibit mechanised fishing in nearshore waters, which is beneficial to turtles and traditional fishermen.

Despite all these efforts, thousands of turtles are still killed on the Orissa coast. What prevents the government from taking the apparently small amount of action required to protect turtles? Is it mere apathy as Hawk and many Indian conservationists suggest? Why have TEDs not been successfully implemented in so many parts of the developing world? How will the adoption of TEDs address the threats from coastal gill nets? Why has it been so hard to enforce the existing legislation on the use of TEDs? These issues are addressed elsewhere (Shanker & Kutty 2006; Bache & Frazier 2006).

It is instructive to examine how long it took a technologically advanced nation such as the US to implement the usage of TEDs. It took two decades in many places, while still being contested in some, and turtles continue to be killed in trawl nets, demonstrating that these problems are not easy to resolve. In developing nations such as India where resources are scarce, coastal livelihoods are risky and marginal and other priorities abound, the task becomes harder. In Orissa (and the rest of India), the lack of coordination between Forest and Fisheries Departments remains a significant obstacle. Additionally, the focus of fisheries and fisheries export departments remains on increasing yield rather than sustaining it, which bodes ill for both sea turtles and fisheries management. These are areas of bureaucratic, economical and political imperatives where conservation organizations have limited influence. Nevertheless, these issues remain on the radar for conservation organisations and individuals.

A little learning..... In summary, sea turtles have faced a variety of threats over the past four decades in Orissa. Most recently, incidental mortality in commercial fishery has posed the greatest direct threat to adult ridleys, while coastal development threatens to destroy most nesting habitat. In response, a variety of conservation measures have been instituted to address these threats, largely through top-down enforcement. In recent years, these efforts in Orissa have largely failed and in fact made the coast vulnerable to development related threats such as ports and related industry. Currently, there are 14 ports being developed/proposed along the Orissa coastline of 480

km, which is a port every 35 km, including ones at the other two important nesting sites near Devi and Rushikulya river mouths. Unfortunately, some conservationists as well as the administration have been using approaches that are isolated from the process of fisher organisation and empowerment, which has been taking place over the last three decades throughout the country.

Thus, we are likely best served by examining why past conservation measures have failed by critically analyzing them, rather than repeating these mistakes. One step forward is to analyse and acknowledge history. We work with and respect local opinions and communities, at every scale. We accept that social change is required and that it is necessarily slow in developing areas. Despite differences in philosophy, a number of local groups, conservationists and larger conservation organisations are in fact attempting to work together towards sea turtle conservation in Orissa, more than at any time in the last few decades. We recognize that conservation approaches need to be enshrined in participatory and consultative mechanisms which are inclusive of fishermen, particularly the traditional fisher sector, for any initiative to be effective. These ongoing attempts include:

- i. Promoting an effective fisheries management plan, which exists on paper as the marine fishing regulations, but needs to be operationalised and implemented effectively. This would include the necessary resources (financial and infrastructural) being made available consistently. Recent reports indicate a per capita decline in fish catch in Orissa's territorial waters. Implementing a fisheries management programme with allied conservation motives, would also benefit turtles significantly.
- ii. Addressing the issue of over-capacity while being sensitive to livelihood needs; additional and alternative income generation programmes need to be developed and implemented in partnership with traditional fisher communities and the mechanized fisheries sector.
- iii. Empowering traditional fisher communities to co-manage marine resources, on the premise that they have a greater stake than any conservationist group in the health of the ecosystem. Since these communities have been marginalised by the state, this needs a substantial development effort in terms of additional income and livelihood measures to offset the impacts of conservation restrictions.
- iv. Encouraging enforcement agencies to use science for fisheries and sea turtle management. For example, years of research have indicated that turtles congregate in small and specific offshore areas, but the management has failed to provide adequate protection to these offshore congregations.

Unfortunately, the IUCN and the MTSG have chosen to ignore this vast constituency, and done more to undermine ridley conservation than any good they may have done by saving a handful of turtles from a few port related threats such as lights and dredgers. This only demonstrates the importance of understanding history, and socio-political contexts, in order to be successful. With consultation and participatory decision making, not just with each other, but with local communities, conservation organisations (international ones in particular) can achieve a great deal more towards long term conservation. While MTSG and IUCN have failed on all these counts, it is still not too late. If the IUCN and MTSG try to understand the position of Indian conservationists and respect their

contribution, a truly consultative dialogue can lead to a collaboration that will reflect the spirit of the international symposium in India.

Epilogue: We are delighted to report that an arribada took place during 21-25 March 2009 at Gahirmatha, Orissa. As sea turtle biologists repeat *ad nauseum*, sea turtles are slow growing, late maturing, long-lived vertebrates, and impacts of current actions will only be seen in a decade or later. Thus, while the recent arribada should give hope that Gahirmatha is still an important nesting beach, it sends a stronger signal than ever that we should protect these beaches and habitats from development related threats.

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