PRESS ARTICLE
6 January 2004

Creating Hope for the Survival of Pacific Sea Turtles

On the remote Papua Indonesia beach of Jarmurbsa-Medi, Cruesa (Tetha) Hitipeuw of World Wide Fund for Nature (WWF) Indonesia is pleased to see that her turtle conservation work with the 2 clans who own the beach is showing good results. The villagers' night patrols have reduced predation on the turtles' eggs by feral pigs and monitor lizards and egg harvesting and beach disturbance by the villages themselves is down. The patrols also monitor the number of nesting females on the beach. This beach, 6 hours by speed boat to the nearest town, and others along the same coast, is home to the largest remaining nesting population of leatherback turtles in the whole Pacific. The nesting populations of the critically endangered Pacific leatherbacks have crashed over the last decade. Despite good progress in protecting these leatherbacks, Tetha does not rest easy. A logging company has just begun work in the hinterland of the beach and wants to create log-ponds near the beach. So far the community have managed to block this threat to the turtle nests. Last month, Peter Dutton, one of the world's foremost sea turtle experts and a scientist with the US National Marine Fisheries Service laboratory in San Diego, California, had a team working with Tetha and her local hosts, tagging the 600kg leatherback females as they lumbered ashore to dig their nests and lay their eggs and taking genetic samples from them. The tags and the genetic studies are starting to show that the Jarmurbsa-Medi giants are not just local turtles – they roam the whole Pacific, and commonly tread the Pacific migratory corridor from the island of New Guinea all the way to coastal California.

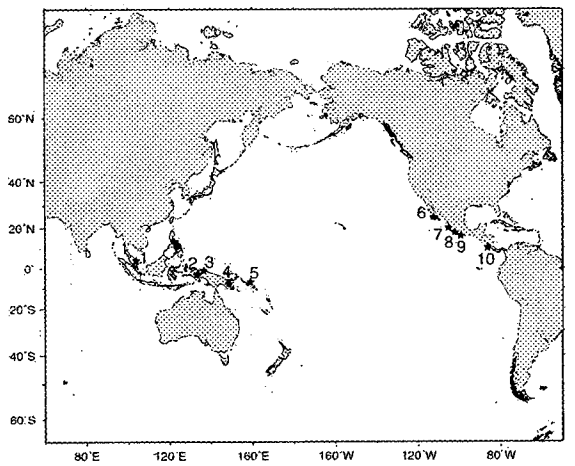
The Pacific Ocean is home to 6 species of sea turtles, including the leatherback. They lay their eggs in nests on tropical beaches such as the Jarmursba-Medi, always return to the same beaches and make extraordinary migrations that can cover the whole vast Pacific Ocean. Turtle meat and eggs are eaten by many coastal peoples throughout the Pacific islands, along the west coast of the Americas and throughout east Asia and eastern Australia. Ornaments are made from the distinctive tortoise shell of the hawksbill turtle and sea turtles are important in the cultural and social identity of many traditional societies.

The lifestyle of the turtles and their value to humans make them vulnerable to egg collecting, coastal tourism development, and accidental catch by many types of fishing gears as well as vulnerable to marine pollution. Consequently, 6 of the 7 species are now classified on the Red List as endangered or, worse, critically endangered. Now, only urgent and coordinated actions, aimed at critical interventions, can possibly restore the sea turtle populations.

From 17-22 November 2003, a group of 26 experts met at the Bellagio Conference Center in Italy to create a blueprint for the conservation of sea turtles in the Pacific Ocean.

Dr Peter Dutton, a senior scientist from NOAA (National Oceanic and Atmospheric Administration) in the US and one of the world's foremost turtle experts in sea turtle tracking and genetics, summarized the main findings of the conference as "a four point blueprint for urgent action. We concluded the Pacific sea turtles will only be rescued from the brink of extinction if all nesting beaches are protected, turtle take in at-sea and coastal fisheries is greatly reduced, the existing Pacific conservation and fisheries treaties and agreements are strengthened and coordinated and the traditional use of sea turtles is encouraged to become sustainable".

The experts believe that a massive mobilization is needed to protect all 10 remaining leatherback turtle nesting sites around the Pacific from human take predation and habitat destruction (see Figure 1). Key beaches for other turtle species must also be protected. The goal is to protect every nest possible so that hatchlings can be produced to begin rebuilding the severely depleted populations. Protecting nesting beaches has been proven to work in restoring sea turtle populations. Dr. Larry Crowder, a sea turtle population biologist at Duke University, pointed out that a good example is that of Kemp's ridley turtle in the Gulf of Mexico where nesting beach protection was effective at halting the extinction of the Kemp's ridley, once the most critically endangered sea turtle in the world. A massive effort was mobilized in the 1970's to protect the last remaining nesting beach by moving all the nests to the safety of a beach hatchery each season. By the late 1980's the population began showing signs of recovery, and this recovery accelerated in the 1990's after additional measures were later taken to protect ridleys from coastal fishery mortality by using turtle excluder devices (TEDs) in shrimp trawls. A similar success was shown for leatherbacks nesting on the beach at St Croix in the Caribbean.



The 10 key leatherback nesting beaches remaining in the Pacific

1. Terrenganu, Malaysia
2. War Mon, Papua-Indonesia
3. Jamursba-Medi, Papua-Indonesia
4. Papua New Guinea
5. Solomon Islands
6. Baja California, Mexico
7. Michoacan, Mexico
8. Guerrero, Mexico
9. Oaxaca, Mexico
10. Las Baulas, Costa Rica

Figure 1. Key leatherback nesting beaches remaining in the Pacific

Turtle eggs, laid in shallow nests excavated on sandy beaches, are very vulnerable to collection by humans and to being dug up and eaten by pigs, lizards and other wild animals. On many beaches, waves can wash away some nests but it is possible to save many eggs by moving them higher up the beach to safer nests. Where beaches are being developed, e.g. through removing shade trees, careful artificial incubation of the eggs or artificial shading of nests has proven successful in providing the correct hatching conditions for the temperature-sensitive turtle eggs. Fortunately, good scientific knowledge is now available to help create the correct hatching conditions and to protect the sex ratios of the turtles.

Why protect all beaches? Dr. Alberto Abreu, a sea turtle biologist at the Universidad Nacional Autonoma de Mexico, explained that, for a start, for turtle populations that are at a dangerously low level such as leatherback's, all eggs are needed to replenish the stocks. In addition, genetic studies had revealed that each beach hosts unique sea turtle stocks due to the turtle's tendency to nest back only on the beach from which they hatched. One beach lost is one stock lost. Scientists believe that most nesting beaches have now been identified and that these should all be monitored and protected. In Mexico for example, all leatherback beaches were known but only half were protected.

The experts reviewed studies around the Pacific that have shown that protecting nesting beaches works best, and indeed may only be effective, when local communities, experts such as biologists, volunteers, law enforcement, and others in conservation are involved and funds are available to promote the protection. Tetha's beach in Papua Indonesia and Kamiali in neighboring Papua New Guinea where Dr Dutton and his team are working, are good examples of these combined efforts.

The Bellagio blueprint stresses that funds are needed to support beach protection. Depending on the circumstances, these funds would be used for land purchase (e.g., a suitable leatherback nesting beach could be purchased in Costa Rica), community development/retraining (ecotourism), co-management support costs (Mexico, Papua New Guinea), and purchase of logging and other land use concessions and long-term leases. These costs could be financed in part by offsets to mitigate mortality from industry and developed nations (e.g. logging, high seas fisheries), and other mechanisms, e.g. by creating a Global Trust Fund. Many beach protection plans have not been implemented due to lack of funds. For example, several proposals remain unfunded for Guatemala, Nicaragua and Papua.

The second main point of the Bellagio blueprint recognizes that all forms of mortality for Pacific sea turtles will need to be drastically reduced, not just egg losses on nesting beaches. Turtles suffer significant but poorly measured death rates in many different coastal and oceanic fisheries.

Pacific sea turtles are all highly migratory, weaving their way across the Pacific Ocean, in and out of Exclusive Economic Zones and the high seas. Their breeding grounds can lie in one nation and their juvenile and foraging grounds in another nation's waters or on the high seas, where little control can be exercised. In their journey, turtles must run a gauntlet of fishing fleets on both the high seas and in coastal waters. Sea turtles can be accidentally caught by longline hooks strung out on the high seas, and beach seines, gillnets and shrimp and fish trawl nets in coastal waters. If not handled quickly, many turtles will die, most frequently through drowning because the turtles cannot reach the surface to breathe after being hooked or entangled.

However, fishers and fisheries scientists have found that new types of fishing gear or ways of fishing can significantly reduce the catch of turtles and the death rate from fishing. Over the last decade, great advances have been made in making certain types of fishing more turtle-friendly. Proven new technologies such as turtle excluder devices (TEDS) on trawl nets and certain baits on longlines have cut death rates from these two types of fishing gear in many parts of the world such as the United States, Australia and parts of southeast Asia.

Technology standards, when combined with other types of turtle protection such as nesting site protection, can contribute greatly to recovery of sea turtle populations. Dr Dale Squires, a fisheries economist with NOAA in the US said that, "a quick inspection is often all that is required to check that fishers are complying with technology standards and so, in contrast to many types of regulations, technology standards are easier to enforce."

"New technologies to reduce sea turtle take from fishing also permit the creativity of fishers to have full play", said Dr Squires. "When consistently applied, they also have the potential to restructure the incentives for countries in such a way that both compliance and participation in this conservation initiative increase. The potential for increased participation (and hence less free riding) in the conservation initiative, along with increased compliance, could even lead to reductions in sea turtle mortality that outweigh other conservation approaches that on paper may appear to be more effective". Adoption of technology standards does not preclude adoption of other conservation initiatives, and in addition, research and extension programs can continue to refine and implement these technology standards.

In coastal shrimp fisheries, turtle excluder devices or "TEDS" are a grid and trapdoor arrangement installed inside a trawling net that allows shrimp to pass to the back of the net, while directing sea turtles out of the net, thereby reducing the capture of sea turtles by up to 97 percent. In longline fisheries, promising findings based on a year long research set (2001-2002) undertaken through a program by NOAA Fisheries and U.S. industry on gear and fishing methods in the Atlantic Ocean have found that using 18/0 circle hooks and mackerel as bait can significantly reduce both the loggerhead and leatherback turtle take when compared to the industry standard J hooks and squid bait. In addition, circle hooks were found to have significantly reduced the rate of hook ingestion by the loggerheads, thereby reducing the numbers of turtles that eventually die after being hooked. While the exciting new developments ignite optimism in bycatch reduction, experts emphasized the need for more research and policy work to confirm these initial findings. In good evidence of a win-win outcome, mackerel bait was found to be better for catching swordfish than squid bait, and circle hooks were more efficient for tuna than J hooks. In addition, many turtles can be released even after being hooked in longline gear by line cutters that set the turtle free to swim away rather than bringing it on board the fishing boat and increasing the chance of mortality or injury.

The experts at the conference, however, warned that we still need a much better understanding of the links between turtles and fisheries in the Pacific. This would allow the design of new conservation initiatives to reduce sea turtle mortality where it is most severe, for example, through designing fishing gear, methods and seasons that reduce the catching and incidental killing of sea turtles.

A good example of a recent advance was the research finding in the US that the depth at which longline gear is set and the length of leaders for individual hook lines from the main line affect both the takes and death rates of sea turtles. Ms Kitty Simonds, Executive Director of the US Western Pacific Regional Fisheries Management Council said that their studies had shown that "shallower set longline gear is more likely to catch turtles, since turtles are more often swimming higher in the water column. Longer leaders can reduce sea turtle mortality once a turtle has been hooked or entangled in a leader, since the turtle can reach the surface to breathe." Ms Simonds pointed out that Hawaiian-based longline fishers were keen to help train other Pacific fishers in more turtle-friendly practices based on their own experimental results.

At Wongara Beach marine park in Australia, seasonal fisheries closures are successful in protecting nesting loggerhead turtles. By knowing the months and locations of loggerhead nesting sites, Australia was able to establish seasonal fisheries closures for the Wongara Beach marine park. This prohibition of fishing in the nesting season and waters off nesting beaches prevented the takes and any subsequent fisheries-related deaths of loggerhead sea turtles.

Scientists still know too little about sea turtle deaths in coastal fisheries and so they are not able to offer advice on how to cut the death rate. This is especially the case in developing countries where most of the Pacific sea turtle nesting and living space is found. What limited evidence is available suggests that coastal fisheries are a major source of sea turtle deaths.

One of the new suggestions of the turtle conference was that fisheries and conservation authorities should think very broadly on how to promote a broad set of sea turtle conservation initiatives to mitigate all sources of fisheries-related turtle mortality. A few cases that showed the possibilities were emerging. For example, some USA Pacific coast fishermen have adopted a beach to protect nesting sites. Longline fishermen, working with a conservation group Asumatoma are in the process of adopting a nesting beach for leatherback sea turtles in Baja California, Mexico. Fishermen are providing funding to allow the conservation group, working in conjunction with Mexican authorities and local communities, to secure the eggs and nesting female leatherbacks from poachers and animal predators and to protect and improve nesting habitat, thereby increasing the success and survivor rate of egg laying and hatchings. These kinds of mitigation initiatives show great promise.

The fact that sea turtles range the seas and coasts of the Pacific underlines the critical importance of an integrated Pan-Pacific framework for conservation policies. The Bellagio blueprint proposes that existing regional and international agreements in the Pacific must be strengthened and coordinated to better reflect the urgent needs for sea turtle conservation. After a thorough review of the existing agreements, the experts concluded that the Pacific already has a number of existing agreements that possess or have the potential to carry out many of the conservation and management programs and activities that are considered vital to achieving the agreed recovery objectives. Especially, this emphasizes the critical need to further strengthen the Inter-American Convention for the Protection and Conservation of Sea Turtles and perhaps expand the coverage of the Indian Ocean and South East Asia Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats measures where dedicated sea turtle conservation and protection agreements have been incorporated.
In addition, valuable potential exists within Pacific regional fisheries management

organizations such as the Inter-American Tropical Tuna Commission and Western and Central Pacific Fisheries Commission to develop the capacity and facilitate the advancement of effective conservation programs. Getting the cooperation of fisheries organizations and fishers will be essential to further progress on reducing fisheries mortality. A US regional fisheries management body, the Western Pacific Fisheries Management Council, was a key sponsor and participant in the Bellagio conference.

The blueprint does not envisage the need for totally new conventions and treaties but it does stress that new coordination arrangements among the regional organizations and agreements should be instituted. The memberships of some of the regional organizations should consider establishing a formal, functional and charter- or MOU-based body that can exchange information, coordinate activities, and discuss priorities based on the model of the Council of Regional Organizations in the Pacific.

The blueprint also stresses that, right now, we need new bi-lateral and multi-lateral agreements on sea turtle conservation and bycatch between the countries that are part of the existing agreements and those that are not, including countries from other regions fishing in the Pacific, such as those from the European Union.

The last point of the Bellagio blueprint urges steps to ensure that traditional uses of sea turtles are sustainable. Sea Turtles are part of the traditional diet and culture of coastal and island communities throughout the central and western Pacific. Gathering of turtle eggs and hunting of sea turtles for meat are an integral part of many local life styles. Hence, regulation or prohibitions on sea turtle harvest or substitution of sea turtles with other forms of food must be seen from the perspective of local food security and sustainable use of resources in addition to conserving sea turtles by reducing sea turtle deaths from high seas fishing. Dr Mahfuz Ahmed, of WorldFish Center headquartered in Penang, said that "to do this, however, it is essential to develop a better understanding of the traditional uses in the central and western Pacific in order to better build the capacity for sustainable use. This will require social and anthropological information as well as biological and fishing information on coastal and island communities dependent on seas turtle harvesting. In some cases, it means linking existing knowledge of turtle biology and use, including that from migration studies, genetics and from fisheries, with knowledge about the communities' uses. Countries will have to document the extent of egg harvest and hunting by local communities and then seek to reduce turtle take from traditional harvests since indiscriminate harvest of eggs and nesting females over generations has contributed to a drastic decline in the population of sea turtles. "

Dr Ahmed added that "the cooperation and support of the communities that depend on sea turtle harvests are keys to conservation and sustainable management of sea turtles. WorldFish work in Asia has demonstrated many management successes through community-based initiatives. Although socio-cultural factors and institutional arrangements surrounding the use of common property resources such as sea turtles and their habitats vary from country to country, and region to region, the Jarmurbsa Medi (Papua, Indonesia) case demonstrated that egg poaching can be eliminated significantly by community beach monitoring."

Community-based management and co-management arrangements for protection and conservation of nesting beach and harvest control must be cast within the legal and institutional environments governing access and use of land and water that are used by sea turtles as their habitats. This may mean that some countries will need to move to

legally recognize customary and communal use rights of coastal beaches and adjacent land and waters. Education and awareness programs on sustainable harvest, and assistance to alternative livelihoods will also be needed for successful conservation programs. Funding and support could come partly from compensation programs, including support from developed countries to offset for by-catch mortality in high sea and coastal fisheries. Some beaches will need to be protected from commercial interests such as tourism and logging impact as well as from predators.

"We came to this meeting seeking a set of workable solutions to reverse the critical decline of the Pacific sea turtles", said Dr Meryl Williams, the Chair of the Bellagio conference. "The four point blueprint we have devised consists of protecting nesting beaches, cutting fishing mortality, strengthening and coordinating international legal arrangements and encouraging traditional uses to become sustainable. Our next steps are to go out and promote the adoption of these actions by the relevant people. The sooner more concerted action starts on a pan-Pacific level, the better chance the turtles will be saved".

CONTACTS:

Dutton, Peter
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
USA
Tel: (1-619) 546-7113
Fax: (1-619) 546-7003
Email: Peter.Dutton@noaa.gov

Squires, Dale
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
USA
Tel: (1-619) 546-7113
Fax: (1-619) 546-7003
Email: Dale.Squires@noaa.gov

Abreu-Grobois, Alberto
Unidad Academica Mazatlan
Instituto de Ciencias del Mar y Limnologia (UNAM)
Mexico
Tel: (52-669) 985-28-45, -46, -47, -48
Fax: (52-669) 982-61-33
Email: abreu@ola.icmyl.unam.mx

Ahmed, Mahfuzuddin
WorldFish Center
Malaysia
Tel: (6-04) 626-1606 ext 420
Fax: (60-4) 626-5530
Email: m.ahmed@cgiar.org

Crowder, Larry
Duke University Marine Laboratory
USA
Tel: (1-252) 504-7637
Fax: (1-252) 504-7638
Email: lcrowder@mail.duke.edu

Williams, Meryl
WorldFish Center
Malaysia
Tel: (60-4) 626-1606 ext 201
Fax: (60-4) 626-5530
Email: m.j.williams@cgiar.org