New International Leatherback Turtle Research Initiative in Papua New Guinea

Each year the giant leatherback turtles haul themselves up onto the remote beaches of Papua New Guinea (PNG) to lay their eggs, and then disappear mysteriously back into the ocean. Generations of local villagers in Morobe Province have long known about this ancient ritual, which has most likely been going on for millions of years, even before humans existed on this planet. Sea turtle eggs have long been a source of nourishment for local communities, but in recent years there has been an alarming decline in leatherback populations, and this species may be on the brink of extinction in the Pacific. In Malaysia, intensive egg harvest over 30 years eventually led to a sudden and dramatic collapse of the leatherback population in the 1970's; where once thousands of turtles nested each year, sadly fewer than 10 remain. In PNG, community members in Lababia Village remember seeing many more turtles when they were children, some recall as many as 20 or 30 a night on the beaches during the height of the nesting season. Now, one to six a night is more typical. In the last three years, Lababia, with assistance from Village Development Trust (VDT), the PNG Office of Environment and Conservation, and the South Pacific Regional Environment Program (SPREP) has been leading the way with a community effort to protect the leatherbacks in PNG. The community has set aside its land as a wildlife preserve area (Kamiali Wildlife Reserve) and the villagers are involved in monitoring and conservation of the leatherback turtles that nest on their beach. In addition to counting and tagging the turtles each night, they protect nests that are laid along a portion of the beach.

This year, the leatherbacks brought unlikely human visitors with them to Kamiali; a team of scientists from the USA who came to work alongside the PNG Leatherback Team in a new international initiative to save the Pacific leatherback from extinction. The remarkable discovery that the PNG leatherbacks may migrate across the Pacific to spend time at feeding grounds off the North American coast brought the scientists, resource managers and community members together from both sides of the Pacific. Leatherbacks are unique among the reptiles in that they are adapted to survive in cold water, and prefer to feed on the species of large jellyfish found in cooler temperate latitudes. While it is generally known that the

females must migrate from their feeding areas in these temperate regions to tropical beaches to lay their eggs, exactly where they go and how they get there remains a mystery. Dr. Peter Dutton, of the U.S. National Marine Fisheries Service, has been using new molecular genetics techniques to identify the stock origin of the leatherbacks that are found in California waters and other areas of the North Pacific. This is where U.S. and international high-seas fisheries operate, and where leatherbacks are accidentally caught, mainly on swordfish longlines. Dutton made the surprising discovery that almost all of the leatherbacks found in the northeast Pacific were from the nesting populations in the western Pacific, either PNG, Irian Jaya or the Solomon Islands, and not from Mexico or Costa Rica, as was previously thought. In order to further test his theory, Dutton teamed up with Dr. Scott Eckert of the Hubbs Sea World Research Institute, and along with Scott Benson (Moss Landing Marine Laboratory), captured a leatherback at sea for the first time in Monterey Bay, California in September 2000. They attached a satellite transmitter to the turtle, released her and for the next year tracked her as she migrated westward straight across the entire Pacific to the Mariana Trench, just north of Papua (see figure 1). It was then that Dutton got in touch with researchers in PNG to tell them that some of their turtles were probably migrating back and forth to California, and was invited to join the PNG team on the nesting beaches in Kamiali to attach satellite transmitters to the nesting turtles in order to track their post-nesting migrations. The team was also joined by Dr. Thierry Work, a wildlife disease specialist with the U.S. Geological Service who is conducting a health assessment study on leatherback populations throughout the Pacific. Dr. Dutton and Dr. Work each conducted training workshops with the PNG turtle team on turtle necrospy techniques, new tagging techniques for leatherbacks, and telemetry techniques as capacity-building for a long-term research collaboration.

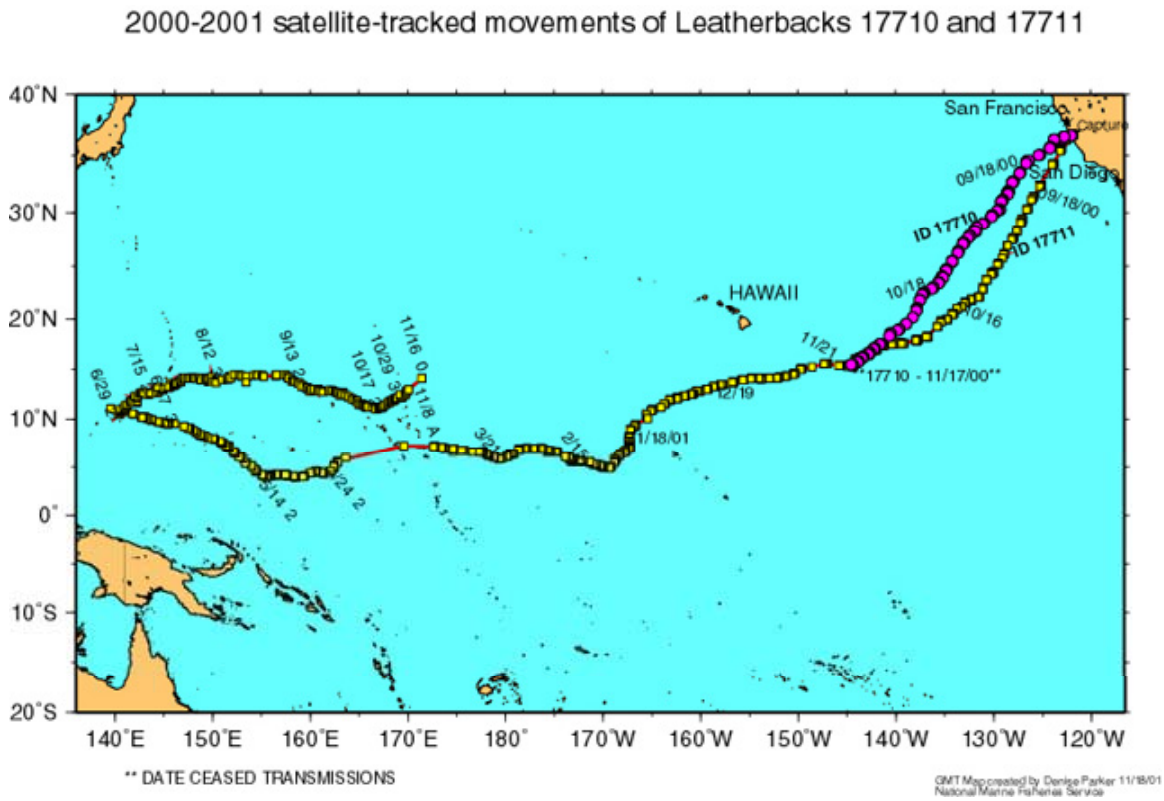

Figure 1. Movement of two leatherback turtles from Monterey Bay, California, USA across the Pacific Ocean

The villagers at Kamiali were intrigued by the notion that the turtles, which they had always considered “theirs”, were in fact travelers from afar. Dr. Dutton and Scott Benson brought an assortment of hi-tech satellite transmitters to attach to the turtles at Kamiali. These small instruments are held on the turtles back, or carapace, with a backpack consisting of light straps that pass over the shoulders and around the waist of the turtle (see Figure 2). When the turtle comes to the surface of the water to breathe, the transmitter sticks out of the water signaling its position to satellites orbiting in space. Some of the transmitters also record how long and how deep the turtle dives, as well as other data, such as water temperature. All this information is processed and relayed each day to Dutton and his colleagues so that they can map the migration and dive behavior of the turtles.

Figure 2. Team of scientists attach satellite transmitter to a nesting leatherback turtle using a backpack system, villagers from Lababia look on.

The team has to work fast and efficiently to attach the equipment while the turtle is nesting. The turtles come up onto the beach to lay their eggs under the cover of darkness. They are large, powerful animals, measuring over 2 meters (6 feet) from head to tail and weighing over 800 kilos (1800 lbs), so it is not feasible to restrain them. The whole ritual of crawling up the beach, choosing a spot, digging, laying, covering, disguising and returning to the water usually takes about 90 minutes; most of the time she is moving around and prone to disturbance. However, once she begins laying her eggs, she goes into a trance-like state, which lasts about 15 minutes, and is not easily disturbed. The team waits until she starts laying and then carefully dig through the sand under her, passing the straps under her belly (plastron) and up around her shoulders then attaching the transmitters to the backpack on her carapace and adjusting it to fit snugly, all while she lays her eggs seemingly oblivious to the activity around her.

She is then left to return undisturbed to the water, slipping under the waves with her new accessories transmitting the valuable information every time she surfaces. The batteries on the transmitters last from 9 months up to almost 2 years, depending on the type of transmitter. The backpack carrying the transmitter is held together with a corrodible link, so that it eventually breaks and falls off the turtle after the batteries run out.

Dutton, Benson, and Work spent the last two weeks in December working long nights alongside villagers from the Kamiali community, staff from VDT, Officers from PNG Office of Environment & Conservation, and SPREP. It was very much a team effort. They successfully deployed satellite transmitters on 10 different turtles and are now tracking the movements of the turtles. So far most of the turtles have stayed close by, and indeed most have returned to Kamiali to lay nests again after 9 or 10 days at sea. Two nested again, but further south of Kamiali, another area which may prove to be important for nesting. One, named “Labax” by the villagers, appears to be moving northeast and is possibly finished nesting for the season. Dutton will monitor the data and send updates by email so that the team in PNG can track the movements with their US colleagues. Perhaps Dutton and Benson will be able to greet Labax or others in her cohort if they reach the feeding grounds safely off the California coast in nine months time. Or perhaps the turtles will go south. Whatever they do, the information will provide new insights into the ecology of this endangered species, and will allow more effective conservation strategies to be developed. It is clear that these migratory animals do not recognize national territorial boundaries, and that many nations will have to work together to craft and implement a cohesive plan if they are to be saved from extinction. It is also clear that protection measures on the nesting beaches will be ineffective if the animals continue to be killed accidentally by fishing activity when they are migrating or at feeding grounds thousands of kilometers away. Likewise, given the current population crisis, every nest that is protected and allowed to produce baby turtles on beaches such as Kamiali will increase the chances that future generations of Papuans will continue to greet the arrival of the leatherbacks on their beaches each year. This project is an important step forward to implementing a Recovery Plan in the Pacific, and integrates hi-tech cutting edge science with grass-roots, community-level conservation. New information from the tracking will hopefully allow critical areas or migratory corridors to be identified, and possibly lead to modification of fishing practices to avoid accidental

encounters with the turtles. At the very least, the turtles have brought together people of different cultures from opposite sides of the Pacific, to share experiences, exchange information and develop new perspectives and a new partnership to tackle the challenge of halting the decline of this magnificent species.