## Project Update: August 2009

Bycatch of sea turtles in pelagic longline gear is very common around the world and Peru is no exception. Longline fisheries in Peru target sharks and mahi mahi *Coryphaena hippurus* and operate from many ports all along the coast fishing as far as 250 nautical miles offshore. Since 2002, we had been monitoring the interaction between sea turtles and longlines with on-board observers and encountered 4 of the 5 sea turtle species occurring in Peru as bycatch: Green turtle *Chelonia mydas*, Loggerhead *Caretta caretta*, Olive ridley *Lepidochelys olivacea* and Leatherback *Dermochelys coriacea* (Manrique et al. 2006, Kelez et al. 2007, Kelez et al. 2008).

Bycatch rates in Peruvian longline fisheries are not as high as in Pacific Central America (Segura and Arauz 1995) but they are considerable and represent a large number of individuals when extrapolating the rates to total fishing effort. However, we have not observed any instant mortality of sea turtles because while they are caught in the hook or line they can come up to the surface to breath. Nonetheless, injuries caused during handling of the individuals to bring them onboard, removal of the hook and line and liberation can cause post-release mortalities. This mortality has not been able to be evaluated but could be considerable high as estimated by veterinarians in North America (Epperly and Boggs 2004).

Considering all previously mentioned, this project is focusing on trying to minimize interactions by studying the foraging ecology of sea turtles in oceanic waters and the oceanographic characteristics during bycatch events to try to separate turtles from fishing operations. To minimize injuries when bringing turtles onboard, one of the project objectives is to we have produce dipnets and distribute them among fishermen crews.

In September 2008 we conducted the personal training of 2 new on-board observers. The observers were trained on how to collect the fishing operations data and also how to collect data from each sea turtle captured (species id, weight, size, gender, condition, etc), they also learn to tag sea turtles, collect skin samples and to disentangle turtles by removing hooks and lines. Besides these 2 new observers, we hired 2 observers that had previously worked for us collecting bycatch data.

From October 2008 to February 2009, 11 longline fishing trips targeting mahi mahi were observed. During the 11 trips 119 sets were conducted and a total of 277 440 hooks were observed. The on-board observers recorded 79 live sea turtles incidentally captured which were returned to the sea after all necessary data was recorded. The species observed were greens, loggerheads and olive ridleys.

To study the foraging ecology of sea turtles in oceanic waters we will employ stable isotope analysis to infer the diet of the three turtle species most commonly captured. During the observations we collected skin samples from each sea turtle captured and also conducted many tows using a plankton net to collect "habitat" samples (crabs, fish, snails, jellies, algae, etc). In addition we collected samples from the baits during the longline operations (Humboldt squid *Dosidicus gigas* and Chub mackerel *Scomber japonicus*). The analysis of stable isotopes will be conducted in the following months.

The production of 30 dipnets (with stainless steel) took much more time than expected but finally in March 2009 they were ready to distribute. Currently, we are in the process of distributing them to longline fishing boats. This handling tool will reduce injuries to sea turtles during the process of bringing them onboard because it will avoid that turtles be pulled directly by the line (and hook) or by a fishing gaffs. Moreover, it will reduce the turtle landing impact on the deck.

Another tool that was proposed to be produced and distributed was a dehooker. However, after hearing from veterinarians that hooks lodged in the esophagus are not lethal and that damages occasioned to the epiglottis during the removal of a hook with a dehooker are 100% lethal (Parga and Alegre 2007, Parga et al. 2008) we decided not to produce the dehookers and only produced the dipnets. Distribution of dehookers without a full training on its use could be more detrimental to the turtles than leaving the hook lodged in the esophagus.

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