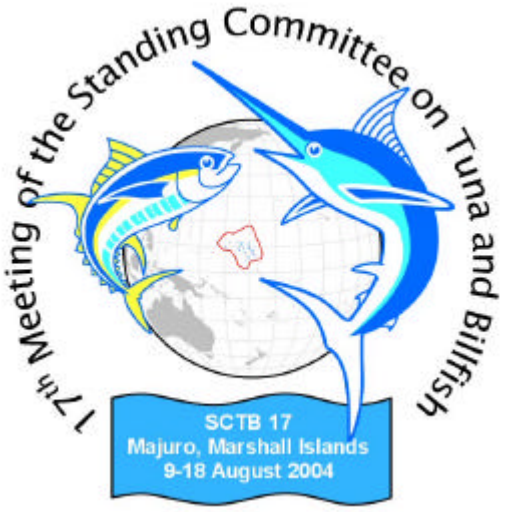
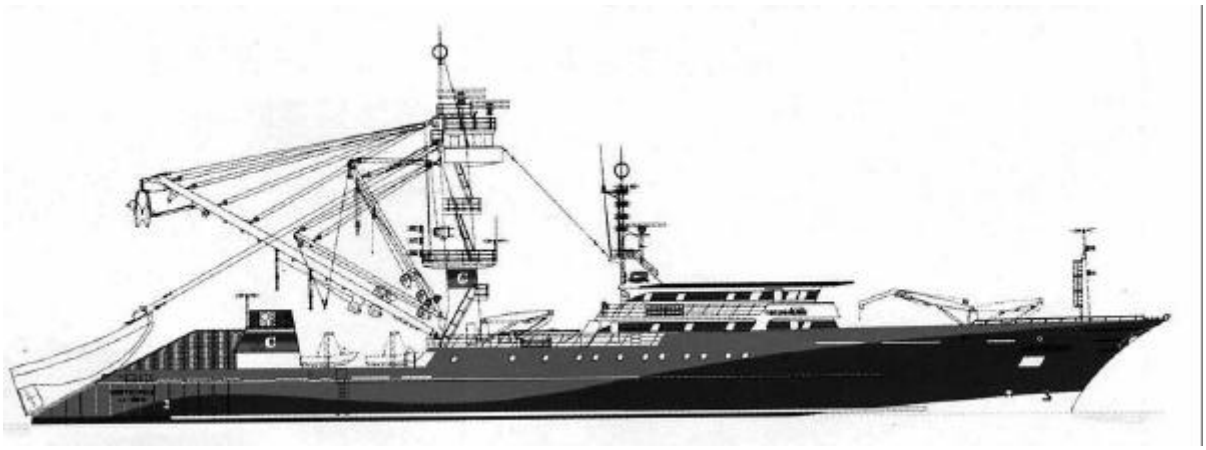


SCTB17 Working Paper

FTWG–7f

SURVIVORSHIP AND DIVE BEHAVIOR OF OLIVE RIDLEY (LEPIDOCHELYS OLIVACEA) SEA TURTLES AFTER THEIR RELEASE FROM LONGLINE FISHING GEAR OFF COSTA RICA

Yonat Swimmer, Randall Arauz, Mike Musyl, Lianne McNaughton, Jorge Ballestero and Richard Brill



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Survivorship and dive behavior of olive ridley (*Lepidochelys olivacea*) sea turtles after their release from longline fishing gear off Costa Rica.

Yonat Swimmer[1], Randall Arauz[2], Mike Musyl[3], Lianne M[c]Naughton[3], Jorge Ballestero[2] and Richard Brill[4]

[1]National Marine Fisheries Service, Pacific Island Fisheries Science Center
2570 Dole Street
Honolulu, Hawaii 96822

[2]PRETOMA & Sea Turtle Restoration Program
1203-1100 Tibás,
San José, Costa Rica

[3]Joint Institute for Marine and Atmospheric Research
University of Hawaii
1000 Pope Road
Honolulu, Hawaii 96822

[4] Virginia Institute of Marine Science&
National Marine Fisheries Service
1208 Greate Road
Gloucester Point, VA 23062

Abstract

We deployed pop-off satellite archival tags on incidentally-caught sea turtles during five cruises in the Gulf of Papagayo on the Pacific Coast of Costa Rica between November 2001 and June 2003 in order to determine turtles' survivorship post-release from fishing gear. PSATs were deployed on 9 olive ridley and 1 green *(Chelonia mydas)* sea turtle incidentally-caught on longline fishing gear. We also attached PSATs to five olive ridley turtles hand-captured as they rested at the surface, which thus served as controls by which to compare the dive behavior and survivorship of longline-caught and released turtles. PSATs were programmed to release after either 8-months or one year or post-release. PSATs were attached either with a marine epoxy or by drilling through the carapace. Independent of attachment method, PSATs consistently shed early. PSATs were retained on average 56 and 60 days for control- and longline-caught turtles, respectively, between 35 to 113 days. The PSAT remained attached to the green turtle for 27 days. By group, turtles traveled an average minimum distance of 274 n mi (SE=55.0; range = 119-516 n mi) for longline-caught turtles and 399 n mi (SE=122.4; range = 85-669 n mi) for controls, which was not statistically significant ($t = -1.08$, $p > 0.30$). Average minimum distance traveled per day was similar, 4.7 n mi (SE=0.725) for longline-caught turtles and 7.7 n mi (SE=2.34) for control turtles.

Turtle dive behaviors did not fall out by gro up. Our results suggest that turtles' median daily depths appear more highly correlated to oceanographic conditions than to condition (e.g. free-swimming or hooked in longline gear). Specifically, two longline-caught and two control turtles were tracked during the same period of time over two consecutive years. The longline caught turtles had both the deepest and shallowest median depths while the two control turtles were in between. We believe this is due to the fact that the turtle with the deepest distr ibution was tracked during the 2002/2003 time period as compared to the other turtles that were tagged the previous year. As determined with AVHRR data, the time period in 2002/3 was approximately 3 ^{o}C warmer in this general area. Chlorophyll concentrations were similarly different from one year to the next, which could likely account for depth distributions noted among tagged turtles. Of particular note, we have found evidence to suggest that turtles apparently compensate their dive behavior in order to mai ntain within a similar range of ambient temperatures. We will continue to explore the impact of the fisheries interaction in the context of other factors influencing turtles' movements.

Our results indicate that olive ridley turtles apparently survive the ir encounter with longline fishing gear at least for the first two months post-release. Turtles in this study that were incidentally-captured in longline gear (and for which we received some response from the satellite tag) all survived a minimum of 3.5 we eks, and most survived a minimum of six weeks post-release before the tag was shed.

In the one case for which we have data indicating a mortality, the turtle was tagged after it had been resting on the ocean surface and thus served as a "control". Perhaps as a result of "natural causes", we speculate that after approximately 5 weeks at liberty, the turtle sank to the bottom and remained on a coastal shelf or on a seamount at approximately 900 m for four days before the PSAT released to the surface. The PS AT performed exactly as programmed which we feel validates the utility of PSATs to identify delayed mortality.