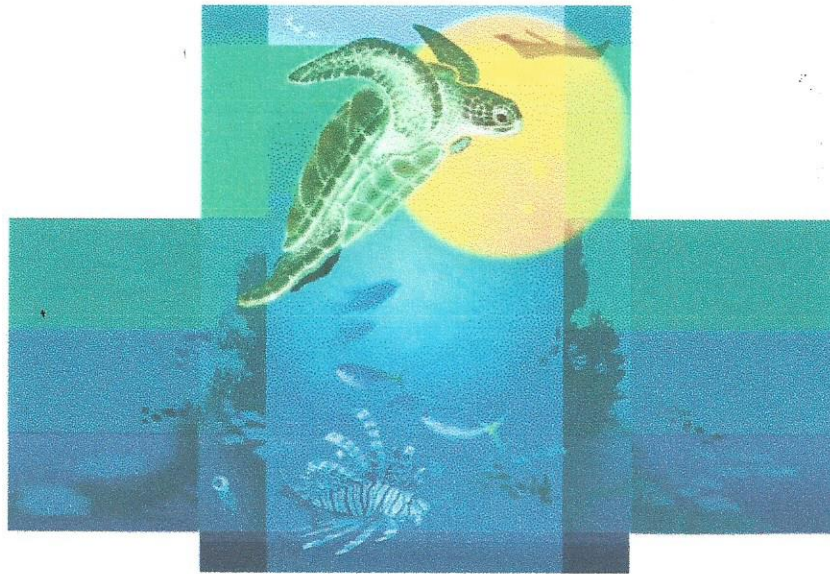




PROCEEDINGS OF THE THIRTIETH ANNUAL SYMPOSIUM ON SEA TURTLE BIOLOGY AND CONSERVATION



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considerably, leaning toward the larger stages with sizes between 60 and 90 cm CCL ($n = 166$). In the early and mid 2000s, most individuals were subadults with sizes between 40 and 80 cm CCL (56.94%, $n = 119$). The results of this study suggest that green turtle populations in the GV fluctuate over the years. Such variations may be due to various anthropogenic pressures and environmental changes occurring in this important feeding area. Similarly, it is important to highlight the possible influence of recruitment of juveniles from conservation projects with high success rates in the Caribbean region. It is necessary to conduct more studies (such as genetic analysis and abiotic data collection in the study area) focused on determining the reason for these fluctuations.

PHOTO ANALYSIS OF SEA TURTLES BY UNDERWATER PHOTOGRAPHS TAKEN BY DIVERS

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Previously, distribution of sea turtles has been investigated by documenting bycatch or stranded sea turtles. However, these methods are affected by biases such as differences in bycatch rate, mortality, ocean currents, research effort, and so on. Thus, other methods are needed to clarify sea turtle distribution. In this study, we focused attention on sea turtles observed by recreational divers. Many divers have a penchant for diving with their cameras and they usually take photographs when they come across a sea turtle. We attempted to clarify species composition, distribution, and timing of the appearance of sea turtles near the Japanese coast by analyzing photographs collected from divers. This is a useful method to clarify turtle distribution, though there is bias in when and where dives are conducted. From April 2008 to September 2009, we assembled photographs of 251 individual turtles. From these, we identified 206 green turtles (*Chelonia mydas*) (82.1%), 34 hawksbill turtles (*Eretmochelys imbricata*) (13.5%), 9 loggerhead turtles (*Caretta caretta*) (3.6%), and 1 olive ridley turtle (*Lepidochelys olivacea*) (0.4%). Green turtles were the most common species documented around the Japanese coast. However, it should be considered that they inhabit reefs, which are also preferred sites for divers. Green turtles were photographed on the Pacific coast, from southern to central Japan, and two were photographed in the Japan Sea. It was in the Ryukyu archipelago that green turtles were photographed most: 134 of 206 sightings (65.0%), with 62 sightings concentrated in the Kerama Islands. The Izu Islands and the Kii Peninsula followed, with 20.4% and 11.2% of sightings, respectively. In the Kerama Islands, there was a distinct seasonality in sightings: 12 turtles were photographed in June and 15 in November. Locations were Mikura-jima and Hachijo-jima in the Izu Islands, the southernmost area of the Kii peninsula, and the middle of Honsyu Island in the Japan Sea. Hawksbill turtles were photographed only in the Ryukyu archipelago and were seen most frequently in the Kerama Islands (79.4% of sightings). Nine loggerhead turtles were seen in the Ryukyu archipelago and Yakushima Island. Olive ridleys were seen in Amakusa, West Kyushu.

*MONITORING OF GREEN (*CHELONIA MYDAS*) AND HAWKSBILL (*ERETMOCHELYS IMBRICATA*) SEA TURTLES AT A NEARSHORE FORAGING AREA IN THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS, WESTERN PACIFIC USING AN INDIGENOUS APPROACH

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Estimates of nearshore sea turtle numbers in foraging areas around the Commonwealth of the Northern Mariana Islands (CNMI) have typically utilized methods involving tow or transect surveys performed by scuba divers or snorkelers. While these methods provided insight into turtle demographics within the region, Kolinski *et al.* (2004) suggested that estimates would benefit if combined with long-term mark-recapture studies. In this study we used an indigenous hand-capture approach to perform surveys in a nearshore foraging area. Indigenous hand-capture

technique refers to using traditional free-diving and hand-capture skills learned from a cultural knowledge base (such as traditional ecological knowledge from Micronesian village elders) to capture turtles. This traditional method was reliable in CNMI as the water was clear, visibility was good, and use of nets or rodeo technique was not feasible. Ninety-eight green turtles (*Chelonia mydas*) and six hawksbill turtles (*Eretmochelys imbricata*) were indigenously hand-captured during 139 survey hours near the islands of Saipan, Rota and Tinian, CNMI from August 2006 to August 2009. Seasonal yearly effort has been exerted at Saipan, while rapid assessments were conducted in July 2009 for Rota and Tinian. Upon capture, turtles were measured, weighed, dually tagged (metal flipper tags externally and passive integrated transponder [PIT] tags internally), skin biopsied, photographed, and then released. Turtles had a mean curved carapace length (CCL) of 53.5 cm \pm 9.9 SD (n = 104), mean curved carapace width of 48.9 cm \pm 9.1 SD (n = 104), minimum straight carapace length (SCL) of 33.6 cm (n = 76), maximum straight carapace length of 74.1 cm (n = 76), and mean weight of 20.7 kg \pm 13.2 SD (n = 78). Curved carapace lengths and widths were measured throughout the project period, while weight, straight carapace lengths and widths were only measured since October 2008. Juvenile size class (CCL < 70 cm; SCL < 65) accounted for 91.3% of turtles captured, while the remaining 8.7% were sub-adults (CCL 70–86 cm; SCL 65–80 cm). This is the first study of this size within the CNMI region to report on hand-captures producing actual (non-estimated) morphometric data on a foraging population of green and hawksbill turtles. Thus, this study serves as a preliminary description for population structure and size class composition for green and hawksbill turtles in CNMI regional waters. Furthermore, the approach used here reflects the inherent value of traditional ecological and scientific knowledge integration in sea turtle research and management in Micronesia and promotes conservation of indigenous knowledge.

ANALYSIS OF DIGESTIVE SYSTEM CONTENTS FROM STRANDED LOGGERHEAD TURTLES IN THE KANTO AREA, JAPAN

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The Tokyo University of Marine Science and Technology (TUMSAT) Sea Turtle Research Collegium has been collecting and analyzing digestive system contents from stranded loggerhead sea turtle since 2003. From samples collected, we have focused on anthropogenic debris, shells, ascidians, fishes, algae, and crustaceans. When analyzing those contents, we have assumed that anthropogenic debris does not necessarily lead to a turtle's death. Therefore, we discuss which contents can give us a clue about causes of stranding of loggerheads in the Kanto area. Here we present our first analysis of digestive system contents related to emergence rate, month, and the Koroshio Current. Our goal is to determine why loggerhead turtles strand on beaches in the Kanto area by analyzing digestive system contents. Acknowledgments: the authors would like to thank the NPO Everlasting Nature (ELNA), without whose full cooperation this research could not have been conducted.

EFFECT OF BITE FORCE TO PREY SELECTION OF LOGGERHEAD TURTLES (*CARETTA CARETTA*)

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Loggerhead turtles, *Caretta caretta*, are known to change their diet as they grow. However, the mechanism which triggers this change in diet remains poorly understood. It has been reported that they prey on gelatinous organisms in their pelagic stage, whereas in their coastal stage they prey on more nutrient-rich benthic organisms, such as crabs and snails. Since benthic organisms are harder than gelatinous organisms, it can be hypothesized that increased development in bite forces affect prey selection. In this study, prey items and bite forces of loggerhead turtles were examined to discuss this hypothesis. The study was conducted at northern coast of Japan, Sanriku coast, which has recently been demonstrated to be a summer foraging area for immature and mature loggerhead turtles. Loggerhead turtles accidentally caught by local fishing nets were transferred to the International Coastal Research Center, the University of Tokyo (39°21'05N, 141°56'04E). Each turtle was kept in a tank for a few weeks to collect feces. During this time, bite force measurements for each turtle were collected by using a bite apparatus that used a