

Photo-identification Monitoring of the Eastern Taiwan Strait Population of Indo-Pacific Humpback Dolphins (*Sousa chinensis*)

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In June and July 2012, photo-identification surveys were conducted with the first and last trips occurring on June 7 and July 22, respectively. The 2012 field season was especially challenging compared to the previous two years. The weather was unstable for most of June and strong southwest monsoon winds in July resulted in many lost potential survey days. In June, the East Asian rainy period or Mei-yu (also known as the plum rains) in the early part of the month, two typhoons, and strong southwest monsoon winds resulted in the loss of at least 13 potential survey days. In July, an entire week of strong southwest winds resulted in the research team being landlocked for an extended period. Even with such poor conditions, 12 survey trips (out of a possible 26 days) in June and 15 trips (out of 22 days) in July were conducted for a total of 27 survey trips.

Surveys were carried out primarily within the main distribution of the eastern Taiwan Strait population of Indo-Pacific humpback dolphins from as far south as Taisi (Yunlin County) and north to Tongshiao (Miaoli County). In addition, three surveys were conducted in waters much further south (to Luzhugou, Tainan County) to encompass almost the entire known distribution of this population (see Wang et al. 2007, Ross et al. 2010, Dungan et al. 2011). In general, the main surveys followed a zigzag pattern, alternating between previously preset inshore and offshore waypoints except for the three surveys in the waters south of the main distribution (see figure 1 for examples of the survey tracks). At the preset waypoints, oceanographic data were collected including: sea surface temperature, salinity, water depth and drift speed (with the boat engine turned off). A minimum of two observers searched the waters ahead of the research vessel for cetaceans using naked eyes. Each observer searched half of the field of view in front of the vessel with a 5-10° overlap into the other observer's sector in front of the boat. Observers were standing at sea level or about 30 cm above sea level. The survey vessel was a 4.5m long inflatable boat with a 30 hp outboard engine. When sightings were made, the boat was slowed to record data following line-transect methods as well as to record oceanographic parameters. The animals were then approached at a constant slow speed to allow the observers to photograph the dorsal fins of as many individuals as possible. Once the principal investigator was quite certain all individuals were photographed well or if the animals were lost (in the case of bad weather), the survey would be continued to search the study area for more dolphin groups to photograph.

About 1,495 km of waters were surveyed in more than 106 hours. On-effort surveys in sea states less than Beaufort Sea State of three or calmer occurred in 73.7 h and covered 1310.1 km. In total, 42 sightings were made during the field season and all were of the eastern Taiwan Strait population of Indo-Pacific humpback dolphins (no other species were observed) and a cumulative total of 186 dolphins were observed. At least 60 different recognizable individuals (based on preliminary examination of the photographs) were photographed. With the exception of one possible 'new' individual (a young dolphin that obtained new scars and spotting of the body and dorsal fin), all were in a catalogue that was started and has been maintained by the *FormosaCetus* Research and Conservation Group since 2002 (see Wang et al. 2012). Over 21,200 photographs were obtained during 2012 and are being screened for quality before individuals in the photographs are identified by matching them to catalogued individuals. These analyses are underway and partially completed. It is anticipated that a similar number of photographs will be taken in 2013 and the processing of all

photographs will be completed during the latter part of 2013. The data will be used to construct a capture history for each individual and subjected to a similar mark-recapture analysis as in Wang et al. (2012) to determine the population's trajectory since 2007.

Entanglement in fishing gear has been identified as one of the five main threats affecting this population (Wang et al. 2007, Ross et al. 2010, Dungan et al. 2011, Slooten et al., 2013). During this study, at least three individuals were observed to be carrying fishing equipment or bearing new injuries that were suspiciously similar to the injuries found on other dolphins that likely resulted from entanglement in fishing gear (see figure 2). With potentially thousands of fishermen capable of using gillnets along western Taiwan and many operating within the habitat of the eastern Taiwan Strait population of Indo-Pacific humpback dolphins, nets are likely the most serious, immediate and direct threat to these dolphins (Slooten et al. 2013). The incidence of new injuries and entangled animals being observed appears to be increasing (since 2007) but more data is needed to support this observation.

Preparations are underway for the 2013 field season, which is scheduled to commence in late May and will extend to late July. Data analyses of the 2013 photographs should be completed before the end of the year and ready for the final report in early 2014.

References

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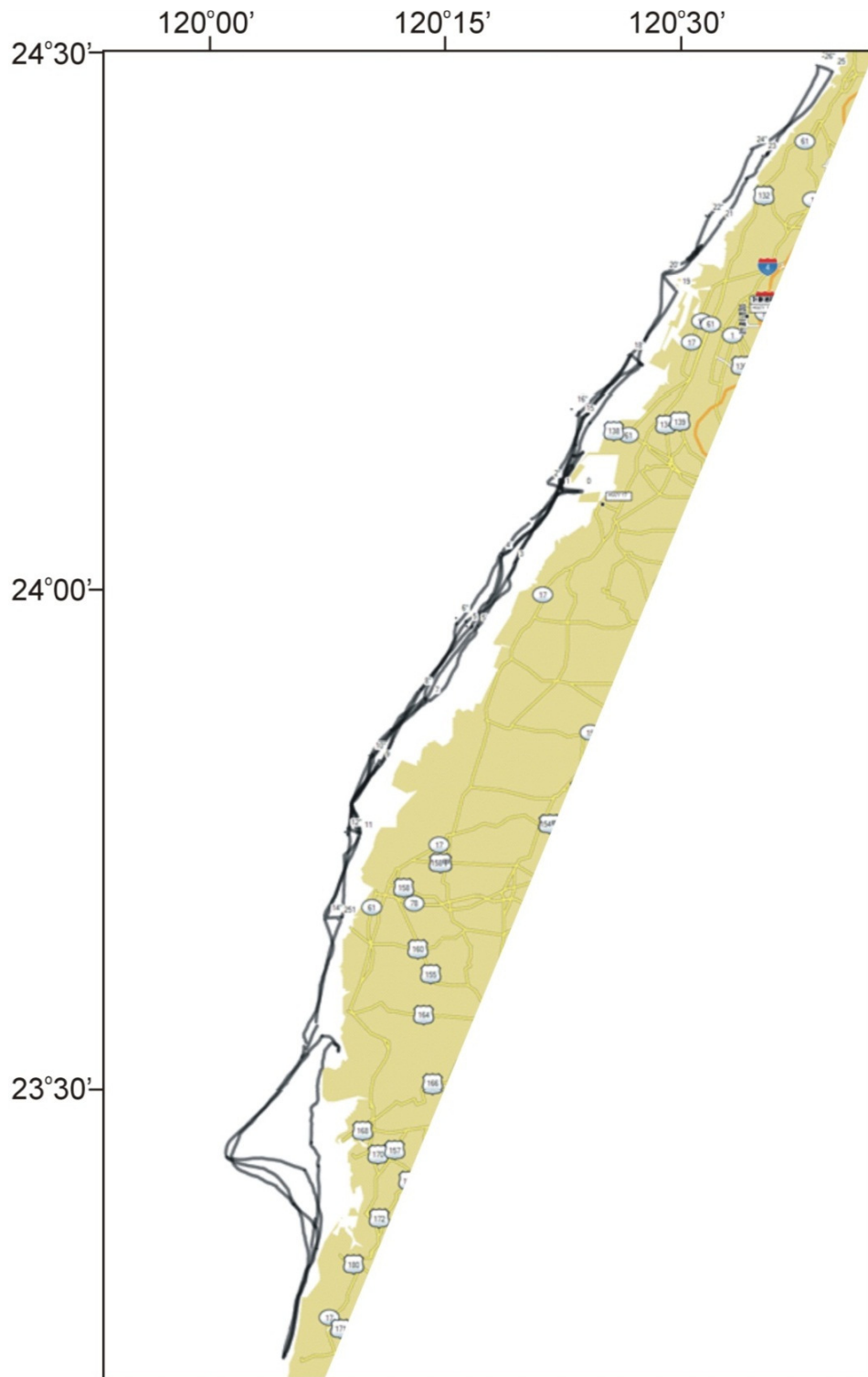


Figure 1. Examples of six survey track lines that were followed along western Taiwan’s coastal waters. These surveys covered almost the entire known distribution of the eastern Taiwan Strait Indo-Pacific humpback dolphin (*Sousa chinensis*). The survey tracks that apparently departed from shore a large distance at the southern end of the study area (near 24°30’) actually followed a large long sandbar (not visible in the map) that was oriented in a northeast-southwest direction. The map was generated using Garmin’s MapSource software.



Figure 2. Entangled or seriously injured dolphins that were photographed in 2012: a fishing line around the torso of a young calf (top); TW-04, an individual known since 2002, exhibiting many healed linear injuries on the tail stock, many of which were not seen in previous years (upper centre); TW-88 was seen dragging two pieces of fishing line that were embedded into and slicing through the dorsal fin (lower centre) (also note the large healed scar below and anterior to the base of the dorsal fin on the left side); and TW-111 with a very fresh serious injury behind the dorsal fin (bottom).