
Point Survey of Sea Turtles in Entrance Channels

Introduction

A point survey will be conducted in Entrance Channel. This survey will be conducted prior to dredging to determine if the area contains high sea turtle densities.

Objective

To determine if the Entrance Channel is an area of high sea turtle density or activity.

Methods

The survey design is based on point day observations and probability sampling theory. This technique has been used extensively for surveying birds (Ralph and Scott 1981) and other animal abundances. The design employs predetermined stations separated by a standard distance. Stations will be selected randomly by blind draw. The use of fixed point observations addresses the confounding factors of encountering a turtle surfacing at the same time the vessel passes and the effect of a moving vessel on the ability to observe a turtle. Observations of sea turtles from a moving vessel were felt to be less likely than from a stationary boat. Visual observations will be made for a 1 hour time interval at each station. The underlying assumptions are that **1)** within the area surveyed, all turtles on the surface are counted, **2)** turtles observed at the surface in the channel will dive to the channel bottom, **3)** the systematic visual sample acts as a random sample, and **4)** a specific turtle will surface during the one hour observation interval. The 1 hour observation time is based on previous studies which show most turtles surface at least once every hour (Byles 1988, Keinath et al. 1992, Standora et al. 1992). This survey will be conducted two to seven days prior to dredging. The channel area will be divided into 1000 ft transects beginning at the shoreline of the harbor extending 3000 ft seaward of the end of the jetties. Observations will be made from a boat anchored at a fixed point at the center of each transect for a period of one hour per site. The boat will meet all Coast Guard and Corps of Engineers safety requirements. Two observers will be used for observation of 180 degrees each. The maximum distance of observation from the boat is estimated at 500 ft. Each observer will record sea turtle observations, location, time, time at surface, and species (if identifiable). Observations which can not be clearly identified will be recorded as unknowns. A third observer will record station data and verify observations of the other observers. In addition, observers will record dolphin and manatee sightings. A minimum of 5 stations per nautical mile of channel will have one hour of observation (2 observers) for each station. Observations will be made at a minimum of 10 stations total for a channel survey.

Loran or GPS will be used to determine station position. Turtle positions will be triangulated relative to the boat position and points on land, and marked on a map.

Physical data, including wave height, wind speed and direction, air temperature, water temperature, tidal flow, water depth, and percent cloud cover will be recorded at each station during the survey. Wave height, tidal flow rate and direction, cloud cover, and wind speed will be estimated from onsite observation. Water and air temperature will be taken with a water temperature meter (e.g. YSI) and verified with a mercury thermometer. Water depth will be recorded from a boat depth sounder. PERMITS

All appropriate permits will be obtained from Federal and state regulatory agencies by the contractor. The US Coast Guard and local law enforcement agencies will be contacted by the contractor as necessary.

REPORTS

The contractor will report survey results to the Corps of Engineers within twelve hours after survey completion either by phone or fax. The contractor will provide a written report to the Corps of Engineers within 2 working days after completion of the survey. Included in the report will be documentation of methods, equipment, weather conditions, water quality data, and numbers of turtles, manatees, and dolphins observed. The data will be provided in tabular format (e.g. Table 1.).

Literature Cited

Butler, R. W., W. A. Nelson, and T. A. Henwood. 1987. A trawl survey method for estimating loggerhead turtle, *Caretta caretta*, abundance in five Eastern Florida Channels and Inlets. *Fishery Bulletin* 85(3):447-453.

Byles, R. A. 1988. Behavior and Ecology of Sea Turtles from Chesapeake Bay, Virginia. PhD Dissertation, Virginia Institute of Marine Science, College of William and Mary, Gloucester Pt., VA. 112 pp.

Keinath, J. A., D. E. Barnard, and J. A. Musick. 1992. Behavior of loggerhead sea turtles in St. Simon Sound, Georgia. Final Report to USAE Waterways Experiment Station, Virginia Institute of Marine Science, College of William and Mary, Gloucester Pt., VA. 46 pp.

Ralph, C. J. and J. M. Scott (eds.) 1981. Estimating numbers of terrestrial birds. *Studies in Avian Biology* 6, Cooper Ornithological Society, Allen Press, Inc. Lawrence, Kansas, 630 pp.

Standora, E. A., S. J. Morreale, and A. Bolton. 1992. Assessment of sea turtle baseline behavior and trawling efficiency in Canaveral, Florida. Preliminary Report for the USAE Waterways Experiment Station, prepared by Buffalo State College, Buffalo, New York, Okeanos Ocean Research Foundation, Inc, Hampton Bays, New York, and University of Florida, Gainesville, Florida. 102 pp. Table 1. Example of table to be used to report point survey data.

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Last updated 11/26/04