

Trip Report - IUCN Mission to Dhamra, India

Dec 10-17, 2007

The objectives of the recent mission to Bhubaneswar and Dhamra, in Orissa State, India, were to address the potential for impacts from dredging and to develop mitigation measures to minimise any interactions with marine turtles during this critical phase of construction. The Port intends to dredge some 60 million cubic meters of material, with about 5 million cubic meters of sand from a borrow area to build up the actual Port facility, and the balance being dredged to deepen the access channel, berthing area and turnaround point.

Following a careful search amongst sea turtles experts within the MTSG, Dena Dickerson (US Army Corps of Engineers) and Eric Hawk (NOAA/NMFS) volunteered to assist on the mission, having spent many years working on just these subjects. Phillip Bates (a design engineer with US Army Corps of Engineers also volunteered to participate but was held back over some paperwork issues). Dena has spent many years designing systems to minimise entrainments on dredging operations in the US, and Eric has spent a similar amount of time developing regulatory measures to guide mitigation efforts. Nicolas Pilcher, Co-Chair of the MTSG, who has been involved nearly since the inception of the Dhamra Port Company Limited (DPCL) – IUCN link-up first started, also participated on the mission.

The first half of the mission was spent in consultation with the Port and with the dredging firm's engineers, learning about detailed plans for the dredging (schedules, vessel design and specifications, locations of borrow and dump sites, etc) and coming up with a rough plan for mitigating impacts. Dena provided a very thorough history of ways in which turtle – dredger interactions have been minimised in the past (such as through the use of draghead deflectors), following 27 years of history working on these issues in the US and elsewhere around the globe. Eric provided an example of a very succinct mechanism for monitoring interaction levels (inflow screening, for instance) and regulating operations in such a manner as to minimise turtle entrainments (through the use of relocation trawling, as an example). During this phase of the mission the IUCN team and officers from DPCL

opinion were the number of floating and stranded dead turtles which were likely the result of fishery-induced mortality, rather than any of the ongoing dredging works, given the fact that the carcasses were whole and not damaged by any mechanised dredger equipment. The real concern then was the potential for turtle-dredger interactions at the sand borrow area, which lies about 5-10 km north of the wildlife sanctuary's northern marine boundary. It is at this site that turtles are more likely to be entrained during dredging operations, given the nature of the substrate and the proximity to the wildlife sanctuary. Based on this, the IUCN team recommended installation of inflow screens and an observer programme to detect any such entrainments, relocation trawling efforts to reduce the number of turtles in the vicinity of the dredger, installation of deflectors on any new vessels arriving to assist with the works, and retroactive fitting on vessels in the area already which are found to entrain turtles.

Protocols for each of these activities were developed by the IUCN team for DPCL, based on existing protocols in use elsewhere in the world (see Annexes to this report summary). In brief however, protocols developed for DPCL were based on those developed for ports in Baltimore and Ocean City MD, Charleston and Georgetown SC, Galvon and re

ANNEX I: DPCL MARINE TURTLE CONSERVATION PROJECT

Protocols for Dredging Observer Watch Procedures

These protocols complement the general DPCL Marine Turtle Conservation Project observer programme protocols, but are aimed specifically at dredging operations. During each observer watch, primary duties will be to observe all draghead, inflow, and overflow screens whenever available but not less than once each time the hopper is completely unloaded. The vessel will be required to have 100% screening of all inflow. This is to be done by placing screening baskets with a 10-cm mesh at the point where the intake pipe discharges into the hopper, but the screens may be located elsewhere.

Observer Duties and Requirements

The observer should report to the Captain of the vessel upon boarding;

The observer should liaise with the dredging Superintendent to coordinate monitoring activities;

During dredging operations, the observer should remain on the bridge and monitor for at-sea turtles and other key sightings;

At the conclusion of each loading cycle, the observer should inspect each of the screen baskets for turtles or parts thereof;

The observer will be required to don a work vest and safety harness before opening the top gate of the screening basket, then climb into the basket to inspect it for any sea turtle body parts;

If the screens are clogged with seaweed, rocks or debris, the observer is expected to clean the screens at that time in order to keep them functioning properly. Also, if the screens have been damaged in any way, the observer should report this immediately to the Captain or Superintendent so that the repairs can be completed before the next loading cycle;

The draghead should be checked after every load as well to ensure that marine turtles have not been entrained there;

Dead turtles or turtle parts found in the screens should be identified, measured and photographed;

A Sea Turtle Incidental Take Data Form should be completed and should include comments as to the estimated freshness of the kill in order to provide information

allow themselves to feel pressured in any way or influenced by any input at all other than their own objective, scientific observation;

Occasionally the Observer may recover incomplete viscera, small carapace fragments, or other body parts from the dredge screens that are suspected to be from a sea turtle, but are too incomplete to be identified in the field with normal taxonomic keys. The NOAA document [*Anatomy of Sea Turtles*](#) may be used as a reference for an educated guess.

After recording each lethal taking, or the capture of a live turtle, the observer must notify the DPCL Manager (Environment) within 8 hours by radio, telephone, fax or email;

Whether sea turtles or sea turtle parts are found in the screens or not, the observer will fill out a Load Data Form for each load dredged. It is important that the observer list all species being deposited on the screens. The number of specimens of each species should be included, even if only estimated, where possible;

When not checking screens or completing reports, the observer will remain on the bridge of the vessel to record any in-the-water sightings of sea turtles. Occasional visits to the drag tender's station should also be made to observe draghead operations;

At the end of each day, a Daily Report form must be completed which will summarize the events of the day, characterize the material being dredged and list the biological specimens being deposited on the screens. A Bridge Watch Summary Form will also be completed and included;

The Daily Report forms and Weekly Summary forms, with copies of any Sea Turtle Incidental Take Data Form(s), should be submitted to the DPCL Manager (Environment) on a weekly basis. The observer will maintain a copy for his/her files.

A Sea Turtle Incidental Take Data Form form should be completed by the Observer with all available information on the remains, including the address and telephone number of the receiving laboratory.

Protocol for Turtle Takes During Dredging Operations

In extremely rare cases, a turtle may survive entrainment and may be recovered alive on the inflow screens. Whether injured or not, the turtle should be photographed, weighed, and measured, and released at least three (3) nautical miles from dredging operations, or at the offshore load dump site. The observer will be authorized to dispose of dead turtles or turtle body parts at sea. This should be done in the dredge disposal area, and not in the area being dredged.

The following actions are taken in the event the dredge takes a turtle:

- Remove any turtle parts from the discharge box;

- Identify species (if identity cannot be determined, list as "unknown");

- Take appropriate measurements and record;

- Complete a Sea Turtle Incidental Take Data Form;

Photograph parts individually (use label stating species, name of piece, dredge name, project area and load number);

Any tags on these turtles should be recovered prior to disposal and tag numbers noted on the Sea Turtle Incidental Take Data Form.

Weight body parts, spray paint the carapace with an X, and dispose of at the dump site;

Fax incident report and load sheet to the DPCL/IUCN office.

If a live turtle is encountered, move the turtle to a safe and shaded area on the deck;

Partially cover the turtle with a wet towel. Cushion or secure the turtle so it is not further injured by activities on deck or vessel rolling (laying it on its back on a tire may be appropriate);

Notify the Captain;

Keep skin moist;

Photographs will be taken of each turtle captured. Each photo will be accompanied by a 4- x 6-inch (10- x 15-cm) card with tag numbers, date and location written in black letters.

Data will be entered on standard data sheets.

Remain with the turtle until transported to release site.

Other photos should be taken of injured turtles, unusual bycatch and any item of technical interest.

ANNEX II- DPCL MARINE TURTLE CONSERVATION PROJECT

Guidelines for Endangered Species Observers

Dhamra Port Company Limited (DPCL) seeks endangered species observers who can function on dredges (e.g., hopper dredges) and dredge disposal (e.g., tugboat) operations off the Dhamra coast. The following criteria should serve as a guideline for sea turtle observers. Approved sea turtle observers should have a variety of experiences, enabling them to perform the required duties with necessary skill and familiarity. Each observer is evaluated on a case-by-case basis, but the following criteria will assist in determining qualified candidates. Supporting information and documentation on these criteria should be included with the candidate's application.

Education & Experience

Please note that a degree is preferred, but not required if the candidates have a diversity of suitable experiences.

The candidates will be evaluated in terms of their experience aboard vessels, including but not limited to the criteria listed below.

Has the candidate worked for a minimum of two months in any capacity aboard fishing/shipping vessels?

Has the candidate worked in any capacity with wildlife conservation?

Does the candidate have documented field experience focused on the species or its habitat?

Skill sets to be Provided

The successful observer candidate should possess certain skills in order to effectively perform the observer duties.

Is the candidate able to identify sea turtle species, including morphological differences?

Is the candidate able to handle live sea turtles and is he/she knowledgeable of holding and release procedures for the respective species?

Is the candidate able to take standard field measurements of samples for sea turtles?

ANNEX III - DPCL MARINE TURTLE CONSERVATION PROJECT

Relocation Trawling Scope of Work

Introduction

The following scope of work is to remove sea turtles from the area being dredged to minimise turtle interactions with the dredgers, and for assessment of the relative abundance of sea turtles in entrance channels and borrow sites which are being dredged by hopper dredges. Sea turtles will be captured by trawling, which will provide supplementary information on the times of occurrence and general location of turtles in these channels. Species, size, sex, and general condition will be recorded for captured turtles.

Objectives

To safely remove and relocate turtles from the immediate vicinity of dredging operations and determine relative abundance of sea turtles in the area of concern during dredging operations.

Trawling Specifications

Trawling will be conducted to capture turtles for removal and to determine relative abundance in the dredging zones.

Trawlers will be hired from the fleet based at Dhamra fishing jetty and crews will be trained by the DPCL Manager (Environment) and made aware of the purpose of the work.

Operations and survey methods and equipment will be standardized as much as possible including data sheets, nets, trawling speed and direction (with or against tidal current), duration of tow (minutes), and length of tow (km).

Trawling will be conducted with repetitive 30-minute (maximum total time) tows in the areas of concern in front of dredging vessels.

Data sheets will be provided by DPCL/IUCN

Nets to be used will be the standard trawl turtle nets used in the region, to be upgraded to 8-in mesh in the future.

Trawling speed will be at a constant rate and consistent for each tow (approximately 2.5-3.0 knots).

Trawling will be conducted in such a manner as to maximize the opening width (i.e., spread) of the net but also to maximize trawl coverage in the path of the dredge. This shall be decided in consultation with the boat captain and consistent with vessel/personnel safety concerns.

Trawlers will operate in close radio communication with the dredger to maximise safety and operational efficiency.

Sample Periods

Trawl surveys will be conducted in front of dredgers (or as near the dredge as safely possible) during all dredging operations on a continuous (24 hour) basis.

It is recommended that two trawlers be contracted to operate on a 12-hour shift followed by another two trawlers to operate the second 12-hour shift, to match the 24 hour operations of the dredgers.

Trawl operations, if possible following the projected dredger path, should continue even when dredgers leave the area to dump the dredged sediment load.

Permits

Permits for handling threatened and endangered species and for collecting other organisms will be obtained from the appropriate Indian Government and Orissa State agencies.

ANNEX IV - DPCL MARINE TURTLE CONSERVATION PROJECT

General Observer Guidelines and Responsibilities

When stepping onto a vessel for one day, one week, or one month, be it on a sea turtle assessment or relocation trawling vessel, or a dredger, you the observer are entering a workplace and a home. It is a place where the crewmen have already established a system of communication and responsibilities. An individual observer's ability to deal with the situation is a reflection of the person's flexibility and resilience. The environment can be

Data Collection Instructions

If the information requested on a data collection form is not available or not applicable, leave the data field or code box blank. Describe the situation in the Comments section of the form.

1. Use a soft (#2) pencil on all forms. Line out any errors, and write the correct data

1. Photographs and a sketch
2. Applied or existing flipper tag numbers
3. Identifying characteristics described
4. Measurements for landed turtles
5. Skin biopsies from all turtles
6. Position and time of capture and release (for live turtles)
7. Detailed description of how turtle was landed and handled on deck

Measuring Turtles and Applying Metal Flipper Tags

Turtles are measured following the descriptions by Limpus et al. (1983b). Measurements are to be taken with a fiberglass tape measure (± 0.1 mm) of the Curved Carapace Length (CCL). Curved Carapace Length (CCL) – measured over the curve of the carapace along the midline from the anterior point at the midline of the nuchal scute to the posterior tip of the surpacaudal scutes See figures 1-3).

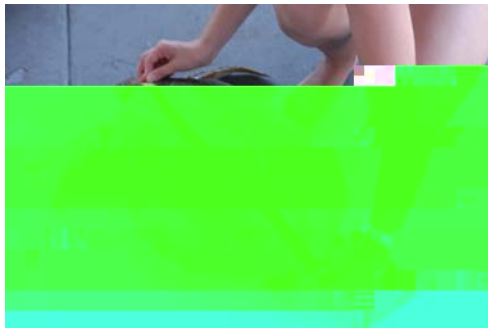


Fig 1. Measuring curved carapace length with a fibreglass tape.

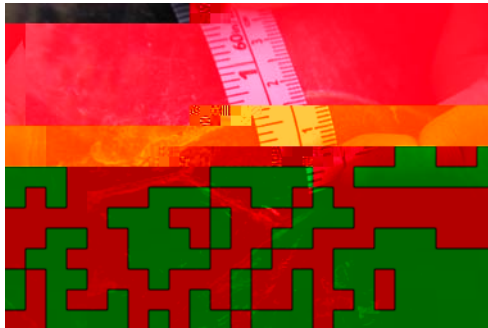


Fig. 2: Exact positioning of tape at edge of nuchal scute behind the head.



Fig. 3. Exact position of tape at midline inside the notch at the rear of the carapace.

Adult turtles are also to be weighed w

1. Remove a tag from the strip and record its alphanumeric number. Be careful not to bend the tag from its original shape.
2. With the piercing side of the tag up, place your index finger tip inside the bend of the tag. The piercing side of the tag has the numbers stamped into it. (Figs. 5 and 6).
3. Hold the tag applicator pliers in the other hand, making sure the handle with the paint mark (or label) is up. Using your index finger, pull the tag straight back into the open jaws of the applicator pliers. A firm pull will be needed to completely seat the tag into its correct position. Take care not to squeeze the applicator handles before you are ready to apply the tag. If the handles are squeezed partway and then released the bent tag will fall out and will not function properly (Figure 7).
4. Locate the correct site where the tag will be applied on the trailing edge (rear) of the front flipper. Ask for assistance holding the turtle still. Make sure to position the tag so there is some overhang after it is attached to the flipper (Figs. 8 and 9).
5. Apply the tag by squeezing the applicator handles firmly. The tag point will pierce the flipper and lock into place through the other tag end. The piercing tip must be bent over completely to lock the tag (Fig. 10). The handles of the applicator must be squeezed together very firmly at the final point in order to fully bend the point down.



Figure 6: Loading a flipper tag into tag applicator. The arrow indicates which handle should be up.

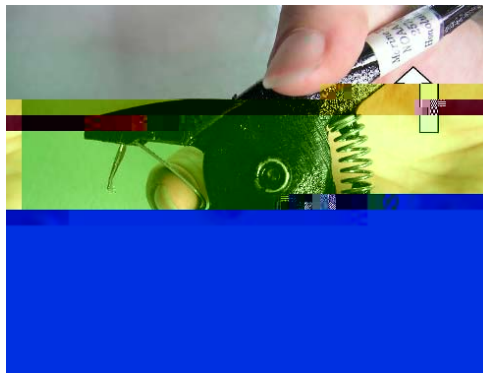


Figure 7: A fully seated tag in the tag applicator pliers.



Figure 8: Arrow indicating the preferred location for flipper tag replacement. The next preferred location is

salt. Using another disposable alcohol/betadine swab, clean around and inside the region of the turtle where the skin plug was taken.

8. Label the container with the specimen number, date, the turtle's flipper tag number, and /or any other unique identifying information available for the turtle. Samples shall be safeguarded until submittal to the DPCL Manager (Environment) for archiving/processing.



Fig. 11. Collecting a biopsy punch sample.

Annex V- SEA TURTLE INSPECTION CHECKLIST FOR HOPPER DREDGES

6. Ensure the CQC performs a startup-dredging inspection:
 - a. CQC is required to check the turtle deflector to see if the deflector is installed and adjusted for required dredge depth of this project in accordance with the approved deflector submittal.
 - b. CQC is required to assure the drag tenders are operating the dredge pump and draghead in accordance with the specs/permit.
 - c. CQC should perform a paint test to assure the deflector is plowing at least 6 in into the dredge material while the dragtender is consistently maintaining the (approved, submitted) approach angle to a tolerance of + 0 to – 4 degrees.
 - d. CQC should note the inspection results in his QC Daily Report.
7. QA should perform dredging operation inspection soon after the dredge starts dredging:
 - a. Review and inspect all items in paragraph 3.
 - b. Inspect the turtle deflector to assure the deflector is installed and adjusted for the required dredge depth of this project in accordance with the approved deflector submittal.
 - c. Require the contractor to perform paint test to ensure the deflector is plowing at least 6 in into the dredge material while the dragtender is consistently maintaining the (approved, submitted) approach angle to a tolerance of + 0 to – 4 degrees (over penetration of the deflector could reduce production and may increase fuel consumption of the dredge but is allowed).
 - d. Ride the dredge though at least one dredging cycle (dredging, to the dump, and back to the dredge site).
 - e. Watch the dragtender to ensure he is operating the dredging equipment in accordance with the plans and specs:
 - i. Starting the dredge pump only when the draghead is firmly on the bottom by watching the slurry specific gravity and swell compensator.
 - ii. Reducing the slurry velocity to the dredge pump idle speed velocity before raising the draghead off the bottom.
 - iii. Consistently maintaining the approach angle to a tolerance of + 0 to – 4 degrees when ever the draghead is on the bottom and the dredge pump is operating
 - iv. Watch to see if the dragtender is raising the draghead off the bottom because of plugging of the draghead or ship crabbing.
 - f. Lockout tagout procedure for cleaning the inflow and overflow screens.
 - g. Talk to turtle observers to assure they are aware of contract and permit requirements and are performing inspection of screens and deflectors and reporting any maintenance required to the dredge personnel. Ensure that correct turtle observer forms are being used and filled out properly.
 - h. Talk to Dredge Captain about maintaining the screens and deflectors.
 - i. Ensure Silent Inspector data is being sent to ERDC.
 - j. All pre-dredge/post-dredge and follow up inspections should be noted in the QC and QA the Daily Reports.

ANNEX VI - DPCL DREDGING OBSERVER PROGRAM

LOAD DATA FORM

PROJECT NAME: _____

DREDGE NAME: _____

DREDGE FIRM: _____

