Progress report for Atlantic humpback dolphin work in Gabon and Congo funded by the IWC Small Cetacean Conservation Research Fund

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BACKGROUND

The Atlantic humpback dolphin (*Sousa teuszii*) is endemic to tropical and sub-tropical near-shore waters of western Africa. Given an obligate shallow-water niche and an apparent preference for sheltered coastal areas, it is probable that the species has never been very common (Reeves *et al*. 2003). Although there are no published estimates of its abundance, available evidence suggests a precipitous decline in numbers, a patchy distribution of subpopulations and many documented threats (Van Waerebeek *et al.* 2004; Van Waerebeek & Perrin 2007). Directed catches by fishermen, fisheries competition, habitat loss and disturbance are factors believed to be responsible for the species' decline. Evidence presented at the 2010 meeting of the IWC provides strong support for this hypothesis; the species had either not been encountered in recent surveys or encounter rates were much reduced. Given a general absence of effective monitoring and law enforcement in most areas, long-term, range-wide prospects for the species are grim.

INTRODUCTION

In 2011 the IWC awarded funding to the Wildlife Conservation Society (WCS) Atlantic Humpback Dolphin project. The project, formalized in 2009 after several years of sporadic effort, focuses on the waters of Gabon and the Republic of Congo (hereafter Congo) and has a series of interlinked objectives. These are listed below, the first two being central to the IWC proposal:

- Estimating the abundance of humpback dolphins in Gabon and Congo and refining scientific methods for robust and cost-effective assessment.
- Characterising the distribution and habitat preferences of humpback dolphins in Gabon and Congo, including identification of critical habitat and candidate sites for increased protection
- Assessing and mitigating key threats to the long term health of coastal dolphins in Gabon and Congo
- Raising awareness of the species amongst coastal fishermen and limiting takes in coastal gillnets
- Raising awareness amongst and training key personnel (including national park and fisheries managers) in research and conservation methodologies

Work has not proceeded as planned, largely due to the catastrophic failure of all three vessels (RIBs) owned and operated by WCS in Gabon (2) and Congo (1). In addition the discovery of a significant bycatch problem in Congo has required a very direct approach. Clearly neither of these issues was identified in the IWC proposal, and we have had to secure substantial funding to either replace or repair vessels and to conduct an extensive outreach and bycatch mitigation campaign. Funding awarded by the IWC remains largely unspent, with only a minor amount allocated to further development of survey protocols. Despite these setbacks we have made significant progress on this project, reported in brief below.

PROJECT SUMMARY

Boat repairs and replacements

Two vessels were rolled in lagoon passes during 2011 (not by author). Crossing these passes is a twice daily hazard for marine surveys in Gabon and Congo, but these are the first accidents that we have had. One vessel was irreparable; the other required such substantial repair that complete replacement of the tubes was necessitated. Repairs to the third and remaining vessel were suggested given sun damage. As of May 2012 both vessels in Gabon have been repaired and a new vessel was delivered from South Africa to Congo in early 2012. The scale and costs of these tasks were substantial and required identification of new donors and significant legwork. These boats are clearly critical for the work proposed and three vessels may seem excessive, but the coasts of Gabon and Congo are generally quite remote, there is an almost complete absence of coastal

infrastructure and there are very few coastal roads, points of access or anchorage. Moving people is easier than moving vessels over large distances.

Bycatches in Congo

During 2011 and 2012 we recorded nine dolphin deaths in the coastal National Park of Conkouati-Douli (Congo) (Table 1). Of these seven are directly attributable to bycatch in coastal gillnets (images, confirmation from fishers), or linked to bycatch through other factors. They include six humpback dolphins, five of which were bycatch, the sixth has an apparent machete scar in the cranium. Although we still lack population abundance estimates, we suspect this spike to be a recent phenomenon and intimately linked to industrial fisheries (see below). Recorded densities for the Gabon-Congo area appear to be naturally low (Collins *et al.* 2010), and the persistence of the species in Congo, despite significant artisanal fisheries pressure, suggests that bycatches of this scale are both exceptional and recent. We are concerned, particularly given patterns of decline in other areas (Van Waerebeek *et al.* 2004; Clapham and Van Waerebeek 2007). However, given voluntary reporting of captures by fishers and their generally enthusiastic engagement with the project and local researchers, we are reasonably confident that the majority of catches are being reported, and that a solution can be found.

We have responded to catches whenever possible. Complete necropsies were completed for two humpback dolphins, including collection of relevant tissues for pathology and toxicological analyses. Stomach contents (limited to otoliths) were collected for 3 animals and tissue samples were collected in every instance. We have also recovered 5 skulls, each with associated mandibles and for the two necropsied animals we collected complete post-cranial skeletal material (see figs 2-5).

Date	LatinName	#	Closest Village	Latitude	Longitude	By Catch Evidence
10/30/2008	*S. teuszii*	1	Paris	-4.112048	11.347799	Dolphin captured in coastal gillnet - image confirmation
1/1/2009	*Tursiops sp.*	1	Kondi	-4.171610	11.375140	Dolphin captured in coastal gillnet - image confirmation
8/27/2009	*Tursiops sp.*	1	Tchibota	-4.270990	11.468390	Found at a landing site and dorsal meat removed by fishers
9/9/2009	*Tursiops sp.*	1	Mikoundji	-3.960160	11.153190	Dolphin severed in two
9/12/2009	*Tursiops sp.*	2	Longobondi	-4.243000	11.433000	2 animals - an area with lots of artisanal fishing activity
12/6/2009	*M.novaeangliae*	1	Mikoundji	-3.964900	11.160830	None
9/10/2010	*M.novaeangliae*	1	Niandji	-3.979290	11.183040	None
10/15/2010	*Delphinus sp.*	1	Plage	-3.960160	11.152970	None - but may be linked to stranding of same species (below)
10/15/2010	*Delphinus sp.*	1	Lifelo	-4.025110	11.247150	Proximity to landing site
7/10/2011	*S. teuszii*	1	Longobondi	-4.295256	11.499010	Definite bycatch - information volunteered by fishermen.
8/4/2011	*Tursiops sp.*	1	Longobondi	-4.309082	11.516036	Definite bycatch - information volunteered by fishermen.
8/13/2011	*Tursiops sp.*	1	Longobondi	-4.309082	11.516036	Tourists watched the animal being landed and then butchered.
9/27/2011	*S. teuszii*	1	Bondi	-4.229557	11.416539	Proximity to landing sites, apparent machete hack in left parietal
10/20/2011	*S. teuszii*	1	Lifelo	-4.040640	11.267320	Definite bycatch - information volunteered by fishermen.
12/6/2011	*S. teuszii*	1	Conkouati	-4.018870	11.238850	Definite bycatch - information volunteered by fishermen.
1/26/2012	*S. teuszii*	1	Bondi	-4.222400	11.407550	Reported caught in net 3 days prior, released (supposedly) alive.
2/29/2012	*Delphinus sp.*	1	Longobondi	-4.294180	11.497410	Proximity to landing site
5/6/2012	*S. teuszii*	1	Noumbi	-4.123540	11.356000	Bycatch - call made to TC to report fresh capture.

Table 1: Records of strandings and bycatches in Conkouati-Douli National Park (Congo).

Outreach Efforts

We have invested considerable energy in an outreach campaign in coastal Congo, focusing in Conkouati but extending efforts beyond as opportunity arises. Village meetings were conducted in participation with the Conkouati Douli Conservator, a prominent local NGO (COGEREN) comprised of elder fishers and WCS local staff (see fig 6). Village meetings can be elaborate, involve the majority of inhabitants and each presentation is routinely translated into dialect (*Vili*) for the benefit of fishers that do not speak French. Every fishing village in Conkouati has been reached and we have presented concerns and discussed solutions with practically every fisher operating in the national park, as well as many *commerçants* (traders). The active support of the Conservator (Ministry of Sustainable Development, Forest Economy and Environment) is particularly important. He has led much of the outreach effort, and links the project and associated management decisions directly to the Government. In December 2011 we were able to complete village meetings in the company of a Congolese TV

production company organized by him, and the humpback dolphin segment has already been broadcast on the national network. The Conservator was also critical for the organization of a *reunion de restitution*, considered a critical step for the project. Involving local politicians, the police, fisheries agents, village chiefs as well as prominent fishers, we were able to revisit concerns and compile conclusions reached during the village tour. We reached a formal (signed) agreement with village chiefs to seek participative solutions, including recruitment of fishers to assist in the dolphin project and development of fisheries cooperatives (see below).

Sightings and beach based research effort

In Congo we have recorded 211 beach-based dolphin sightings since the start of the project in 2009, 137 of these are considered high quality, where ID was certain. Of these 49 (36%) were of bottlenose dolphins (Tursiops sp.) and 73 (53%) were of humpback dolphins and 15 (11%) were of mixed groups of bottlenose and humpback dolphins. The latter have been reported for other areas of the species range (Weir 2009) but the regularity of these associations seems exceptional. The Congolese team, comprising 4 locally recruited researchers, surveys the entire beach of the national park once per month (60 km). Details of general methodology were reported by Collins *et al.* (2010). We have refined our methodology since then in order to satisfy modeling demands. These data will be reported on in due course.

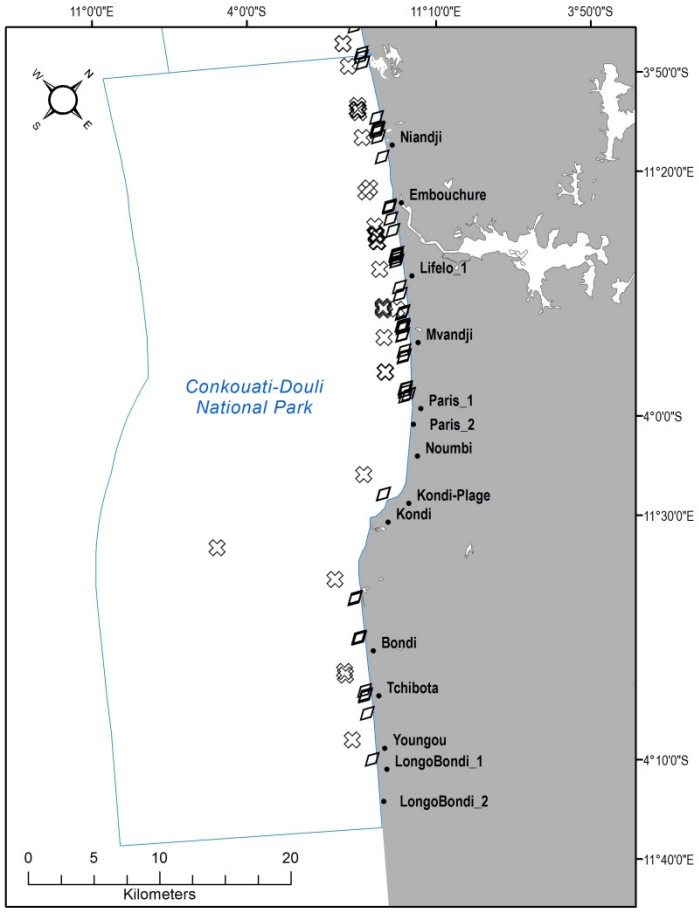

Figure 1: Sightings locations for beach based sightings of humpback and bottlenose dolphins in Conkouati Douli National Park. These sightings comprise only those of high-quality, for which species ID is certain. Note that positions are recorded with a GPS on the beach, and a perpendicular distance estimated, so all positions are approximations. They are deliberately offset from the coast in this figure coast to improve interpretation.

Available data for Gabon requires processing but surveys have been completed at two sites. These include Pongara National Park and Mayumba National Park. Data include initial photo-IDs and the foundation of a catalogue. We have also built a new and customized database for the project, and sightings, strandings and effort data are routinely entered by local researchers.

Village based reporting network

The project has used the momentum of recent outreach efforts to recruit five active artisanal fishermen in key locations (landing sites), as well as an influential *chef de terre* (traditional chief), to act as *piquets* (pickets).

Equipped with a waterproof notebook, pencil and laminated ID card, these fishers record both their effort (fishing days) and every passage of dolphins across their section of coast for each day they are at sea. Pickets are also required to call the project staff if dolphins are discovered trapped in nets. Pickets received a day of training at the park base, again in the company of COGEREN, and included extensive review of species identification and role playing through the use of dolphin video recordings. We are also trialing the use (by a single picket) of a waterproof, shock proof camera with integrated GPS (and floating strap) at one site, and hope to expand to all sites if successful. Fishers receive a ~$20 bonus each month for this effort, as well as sufficient prepaid telephone credit.

Voluntary releases
Led by COGEREN, we have begun negotiations with fishers from each village in Conkouati-Douli National Park for the development and formalization of fisheries cooperatives. The objectives of these are many, and largely linked to improving the quality of fish and the value of catches. We also hope to use this project to improve local management of dolphin bycatches. Specifically fishers that form cooperatives will become eligible for a compensation scheme linked to fines levied from illegal trawlers. A part of this scheme requires fishers to release living dolphins from nets whenever possible. Photographic evidence is required for compensation to be awarded, and fishers will be provided with camera phones. The scheme is exploratory and clearly optimistic, but something we believe worth trying.

C-Pods
In order to improve our understanding of spatial and temporal distribution (e.g. Bailey *et al.*2010; Elliot *et al.* 2011), we have secured additional funding for a modest C-POD[1] array. The array will span the international border, with 3 units in Mayumba, 3 in Conkouati and 3 south of Conkouati (see Fig 2). Initial work will focus on distinguishing between coastal bottlenose and humpback dolphins; necessitating additional high frequency recordings of click spectra. For these purposes we have invited an experienced C-POD practitioner (Ruth Leeney) and dedicated students to work in Mayumba during July and August 2012. We hope to improve our assessment of how humpback dolphins are using these waters, particularly in relation to seasonal fisheries patterns, as well as for informing mitigating plans for new port developments proposed for Mayumba and Point Noire.

Illegal trawling
The project is actively soliciting additional funding to support enforcement patrols by Congolese park staff. The coastal waters of Congo and Gabon are routinely fished by either illegal trawlers or illegally trawled by boats (typically small Chinese-built wooden trawlers) registered for the most part in Congo. Commercial fishing is completely illegal within national parks in both states, and outside of them a three nautical mile coastal strip is reserved for artisanal fishing. During our outreach campaign the scale of abuses by these vessels in Congo became very apparent. Villagers reported the frequent passage of trawlers very close to shore (<500m), including within the national park, and they appear to target local fishers as much as they do fish, with nets are routinely taken or destroyed. Given an average value of over $400 dollars each, these nets represent a huge investment for fishers and their response has been to move nets inshore, often within 200 metres of the beach. We strongly suspect the recent spate of dolphin deaths to be related to this shift. The park will make use of a new 7.3 RIB, purchased by WCS but operated by trained marine *ecoguards* (rangers) to clear the park of illegal vessels. Levied fines will be fed into the cooperative fisheries scheme (above) and a portion set aside for compensation of lost gear.

Revised boat-based survey schedule
We intend to begin boat based surveys that were originally planned under this grant in July 2012. This work will initially comprise a bi-weekly component of field efforts for humpback whales at two field sites (Pongara and Mayumba). A more intensive survey schedule is planned for October-December. Primary objectives include photo-id, and completing surveys across as much of the coastal region of both states as possible.

[1] http://www.chelonia.co.uk/about_the_cpod.htm

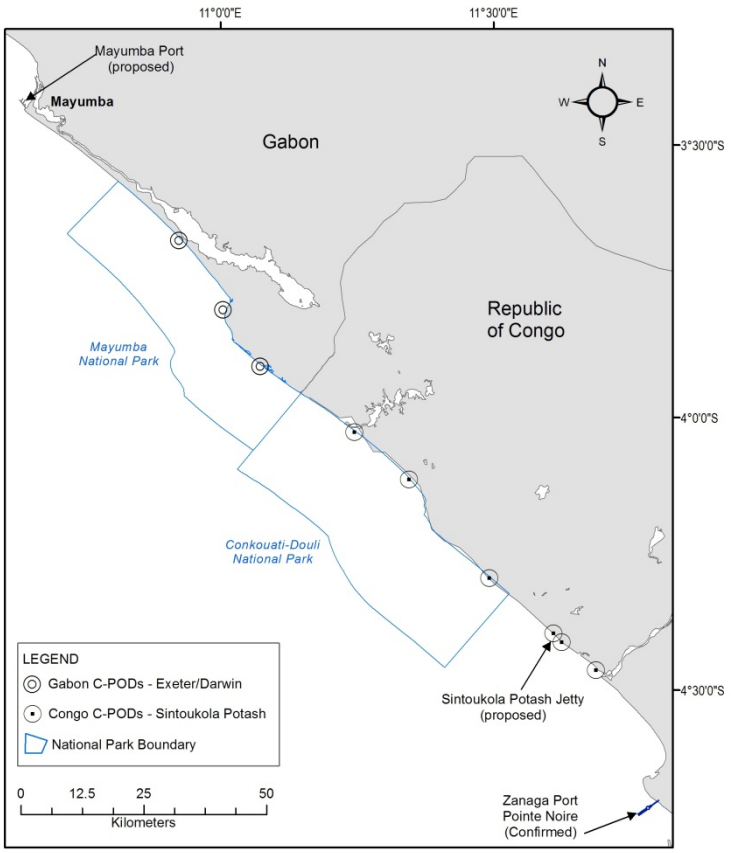

Figure 2: Locations of C-PODs in Mayumba and Conkouati-Douli National Parks, as well as areas south. Of particular note are newly planned port and jetty facilities either side of our survey region. These projects are either underway or threatened and are of particular concern for coastal species that are already under pressure from fisheries and other forms of habitat degradation.

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IMAGES

Figure 3: Necropsy of Sousa teuszii (SS3). Access to many locations is difficult and conditions less than ideal.

Figure 4: Many fishers see dolphin catches as a lucky bonus and the meat is salted for local sale and occasional transport to larger markets. However, we have also learned that dolphins can also make a complete mess of artisanal nets and the sale of their meat does not offset the cost of net-repairs

Figure 5: Fishers recognise that the majority of dolphins caught in gillnets are trapped largely by their teeth. Here the rostrum of the most recent capture (May 6th 2012) showing net lesions

Figure 6: The author (handsome chap at centre) with artisanal fishers at a recent outreach meeting. Material include images and an information poster