Incidental capture of the Dugong, *Dugong dugon*, in gillnets, Mohéli, Union of the Comoros

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INTRODUCTION

Accidental entanglement of dugongs *(Dugong dugon)* in gill and mesh nets has been identified as a major concern in almost all countries of its range (Marsh *et al*., 2002). This pressure has arisen primarily from artisanal fishing on shallow seagrass beds, which are also commonly frequented by dugong. The rapid decline and prospective extinction of dugong in the Western Indian Ocean (WIO) (Dutton, 1998) has led to calls for increased research, management and education at a regional level (WWF Eastern African Marine Ecoregion, 2004). Immediate and effective actions, in collaboration with local communities and authorities, have been deemed essential to conserve the region's isolated populations and interviews of local fishers have been recommended as a low-cost means to rapidly obtain information on distribution, hunting and bycatch (Marsh *et al*., 2002).

The Union of the Comoros consists of the islands of Grande Comore, Mohéli and Anjouan (Fig. 1). Little is known about the status of the dugong population of the Comoros, and few research, monitoring or awareness-raising activities have ever been carried out. A rapid assessment questionnaire survey of 41 people identified Mohéli as the only remaining island where dugong occur, and suggested that although deliberate hunting was a problem in the past, the key contemporary threat was accidental capture in gillnets (Fatouma, 2004). In April 2001, Mohéli Marine Park was created in the southern region of the island (Fig. 1); one of the regulations introduced was a complete ban on gillnetting. To date, this ban has been enforced with varying levels of success, with fishers expressing dissatisfaction at the lack of provision of alternative fishing gears and training in alternative techniques (C3-Comores, *unpublished data*). In June 2006, to address these issues, C3-Comores initiated an integrated dugong research, monitoring, capacity-building and awareness-raising programme on Mohéli (Alfthan & Davis, 2006). The present study utilized local knowledge to assess current and historical rates of incidental capture of the dugong on Mohéli and levels of community awareness.

MATERIAL AND METHODS

Fisher interviews

Fishers comprised a significant proportion of all twenty-three village communities of Mohéli and interviews were therefore carried out in every village, 10 within the Marine Park boundaries and 13 outside (Fig. 1). Only fishers who had seen dugong were interviewed. The semi-structured interview was designed to ascertain details of dugong sightings (both live and dead); causes of death; and awareness of the status of the species. A team of interviewers, which included Marine Park rangers, visited each village. On locating groups of fishers, the team introduced the research programme, and determined which fishers had seen dugong. Correct identification of the species was confirmed by showing the fisher a photograph or

drawing of a dugong. Fishers were assured that their answers to the questionnaires would remain confidential.

Incidental sighting cards

Incidental sighting cards were distributed to all the villages of Mohéli. The cards were deposited with the village eco-guard, a reputable fisher or the village chief. These cards were intended to provide a means to record sightings of dugong as and when they occurred. Cards were then sent directly to Mohéli Marine Park allowing data entry into a centralized database and the opportunity to gather further information from the site (e.g. tissue samples in the case of a dead animal). Although no sightings were recorded during the course of the study, a number of fishers who had not been approached during the interviews used the cards to report historical sightings.

RESULTS AND DISCUSSION

A total of 156 fishers who had observed dugong were interviewed, resulting in a total of 392 dugong sightings, 65% of which were alive, and 35% dead. The fishers who reported sightings ranged from 19 to 80 years old, the modal age group was 31-40 years old (35%). Sightings were reported from 1950 to 2006 (Fig. 2), with more sightings reported in recent years, 35% since 2000 (probably because these were more easily remembered). The majority of sightings of dead animals were reported from the 1970s to 1980s (59%) whereas the highest number of live sightings were made since 2000 (52%). A significant majority of interviewees (86%) believed that the dugong population of Mohéli had declined in recent years. The fishers who perceived the population to have increased (11%) came from the villages of Nioumachoua and Itsamia, within the Marine Park. The percentage frequency of dead sightings had fallen both inside and outside the Marine Park since the 1960s, with only one dead dugong reported inside the Marine Park since its creation (Fig 2). When questioned about the cause of death, the majority of fishers did not answer, although 21% were confirmed as being caught in a gillnet and 29% of these catches were reported as being accidental. No data were available regarding the incidence of illegal gillnetting within the Park, however in the absence of an efficient surveillance programme, illegal fishing activities certainly continue (C3-Comores, unpublished data).

The majority of fishers living within the Marine Park were aware that the dugong was protected by law (72%), however, fewer knew that the dugong was endangered (51%). Fishers outside the Marine Park showed lower levels of awareness regarding the law (49% knew that dugong were protected) although their level of knowledge regarding its endangered status was the same as fishers from within the Park (52%).

CONCLUSIONS AND RECOMMENDATIONS

The high percentage of dead dugong sightings during the 1970s and 1980s indicates that dugong were deliberately hunted during these decades. Fishers almost unanimously reported a decline in dugong numbers on Mohéli; thus it may be inferred that the lower percentage of dead sightings in recent years indicate that dugong are no longer deliberately hunted owing to their rarity. It is impossible to estimate the size of the population from this study, although it would certainly appear that the there are extremely few individuals surviving in the waters of Mohéli. The threat of incidental capture in gillnets must thus be eliminated if the population is to have any chance of recovery. Further research into the significance and characteristics of the gillnet fishery will be an essential step towards effective policy development.

Recent data indicate that there may also be transient or small resident populations of dugong on Anjouan and Grande Comore (C3-Comores, unpublished data), and so any conservation strategies must adequately include all three islands as well as the nearby French territory of Mayotte. There are currently plans to establish two further Marine Protected Areas, on Anjouan and Grande Comore; both of these sites include potential dugong habitat, and so legislation must ensure the effective control of gillnetting and provide alternative options to fishing communities. Furthermore, awareness-raising campaigns need to focus on the reasons for dugong protection, including the international context of conservation efforts in order to increase voluntary compliance with regulations. C3-Comores is currently compiling a National Dugong Conservation Action Plan for the Union of the Comoros, which will be published in 2007.

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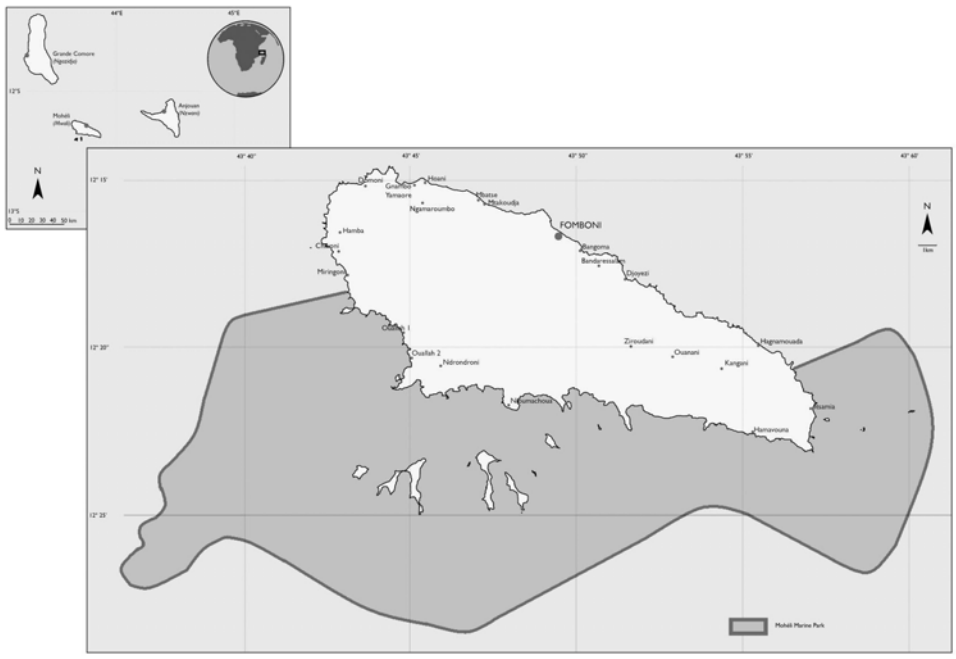

Figure 1: Map of Mohéli, showing demarcation of Marine Park boundaries and villages visited during the study (inset shows the Union of the Comoros).

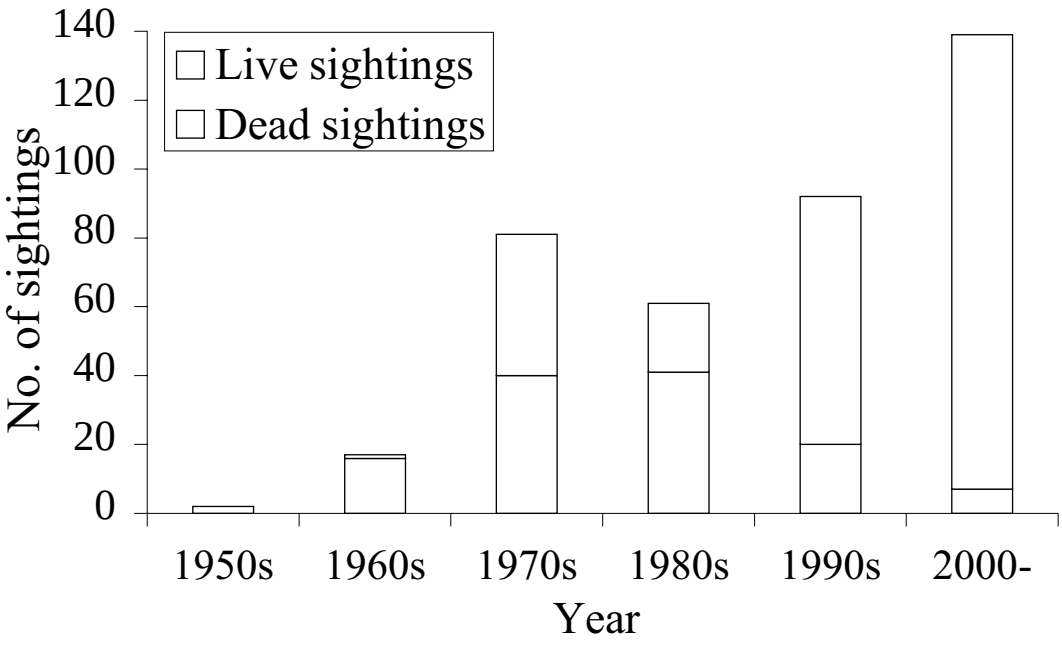

Figure 2: Fisher's recounted sightings of dugong on Mohéli Island.