Notes on ....

A whale shark feeding in association with a school of giant herring at Ningaloo Reef, Western Australia

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Abstract. A whale shark was observed feeding among a school of giant herring at Ningaloo Reef. It is suggested that both the whale shark and the herring school were targeting the same planktonic prey.

Key words: whale shark, *Rhincodon typus*, giant herring, *Elops hawaiensis*

Introduction

The whale shark, *Rhincodon typus*, is a suction filter-feeder that targets dense concentrations of planktonic and nektonic prey, including aggregating crustaceans such as euphausiids and copepods, and schooling baitfishes such as sardines and anchovies (Compagno 1984). Fishermen often use its presence as an indicator of waters rich in plankton and plankton-feeding fish that may, in turn, attract more valuable predatory species (Colman 1997). There are a number of reports of feeding associations occurring between whale sharks and schools of predatory fishes, such as mackerel, jacks and tuna (*e.g.* Gudger 1941; Springer 1957; Hoffman *et al.* 1981). In each of these cases, the whale sharks appeared to be targeting the same prey as the predatory fishes rather than the predatory fishes themselves.

Similar feeding associations have not been reported in whale sharks seasonally aggregating in coastal waters off Ningaloo Reef, Western Australia, where they are thought to feed predominantly on the neritic euphausiid *Pseudeuphausia latifrons*. On a number of occasions whale sharks have been observed feeding in these waters on surface schools of this species (Taylor & Grigg 1991; Clark 1992; Taylor 1994). Additionally, two whale shark faecal samples collected off Ningaloo Reef were found to contain crustacean remains resembling *P. latifrons* (Wilson & Newbound 2001). Other potential prey includes the large schools of baitfishes frequently sighted at this location at the time of the whale shark aggregation (Taylor 1994).

Materials and Methods

The author accompanied pilots of fixed-wing aircraft flown along the northern section of Ningaloo Reef from 4-11 May 2001.

Results

On 7 May 2001 at 1100 hrs, a whale shark was observed from the aircraft swimming northwards along the reef front ~1 km south of South Passage (see Fig 1 in Wilson *et al.* 2001). A school of giant herring (*Elops hawaiensis*), recognisable by their distinctive body shape, was visible feeding at the surface ~300 m to the northeast of the whale shark. Although not initially swimming on an intercept course, the shark made a 45-degree turn towards the school at a distance of ~100 m. Fig 1 shows the whale shark approaching the herring school. The shark stopped swimming when in the middle of the school (Fig 2), then adopted a stationary feeding posture (Fig 3) similar to that described by Springer (1957), Hoffman *et al.* (1981), Taylor *et al.* (1983) and Silas (1986), with its head just below the surface and its tail pointing downwards at a 45-degree angle. It remained in this

Figure 1. Whale shark approaches the herring school.

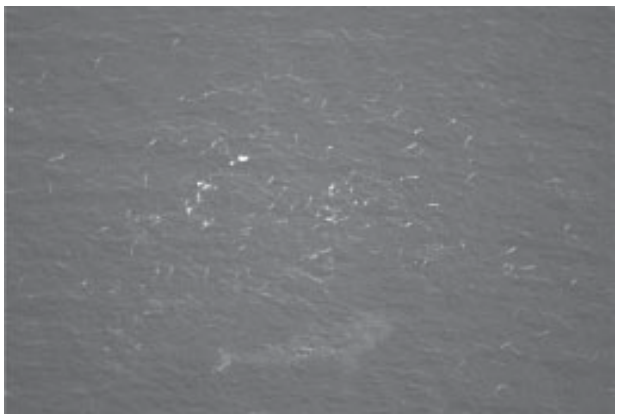

Figure 2. Whale shark stops swimming in the centre of the herring school.

Figure 3. Whale shark adopts a stationary feeding posture.

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posture for a period of 3-4 minutes, after which time the herring school dispersed and the shark continued swimming northwards.

Discussion

It seems likely that the whale shark described here was targeting the same prey as the herring, rather than attempting to feed on the herring themselves. A whale shark tour operator reported a similar observation that took place in shallow water directly off the front of Ningaloo Reef (P O'Halloran, personal communication): the whale shark was hanging vertically in the water, with its head just the below the surface and its tail sweeping along the sandy bottom, in the middle of a herring school; small, planktonic prey were being consumed by both the whale shark and the herring. This suggests that occurrences of whale sharks feeding among schools of giant herring may not be uncommon in these waters.

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