Even a few mangroves make a difference: observations of juvenile Mangrove Whiptail Rays (*Urogymnus granulatus*) in Geoffrey Bay, Magnetic Island

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Abstract

Inshore habitats are well known to be important to the ecology of a range of stingray species. Here we report the use of a very small area of mangroves by juvenile Mangrove Whiptail Rays (*Urogymnus granulatus*) as high tide refugia on Magnetic Island, North Queensland.

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Magnetic Island is a continental island that lies eight kilometres east of the city of Townsville in North Queensland. In August 2017, over the course of three days Mangrove Whiptail Rays (*Urogymnus granulatus*) were observed at the northern end of Geoffrey Bay, adjacent to Bremner Point on the east coast of the island.

On the 20th August, in the late afternoon T. Freeman observed 7–10 juvenile Mangrove Whiptail Rays approximately 30–40 cm in disc width following the incoming tide into Geoffrey Bay seemingly to take refuge amongst mangroves that lined a small part of the eastern end of the bay. We observed the same behaviour the following two evenings (21st and 22nd) and the morning of the 23rd (always on incoming tides). At one time we observed up to four individuals under a single isolated Club Mangrove (*Aegialitis annulata*) that was less than two metres in height (Fig. 1). All of the bay, including the mangrove area, was completely dry during low tide indicating that, over the course of our observations, the rays were moving in and out of the mangroves in relation to the tides within consecutive diel cycles. During low tide two Mangrove Whiptail Rays were

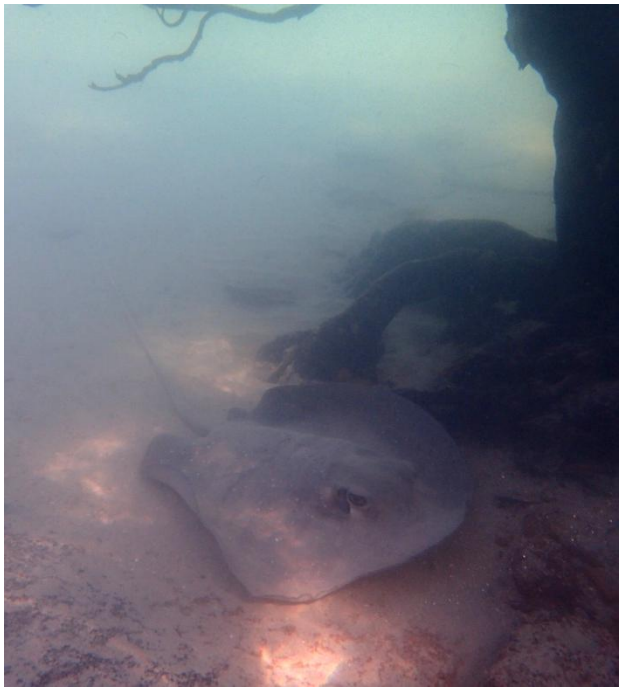

Figure 1. A juvenile Mangrove Whiptail Ray at the base of a Club Mangrove (*Aegialitis annulata*) in Geoffrey Bay, Magnetic Island.
At one stage up to four rays were observed sheltering under this individual, isolated mangrove. Photo: Alastair Freeman.

observed in the shallows on reefs approximately 200 m from the mangroves. These rays were of similar size (30–40 cm disc width) to those that had been observed amongst the mangroves on the previous evenings.

The Mangrove Whiptail Ray occurs throughout the coastal Indo-Pacific as far south as northern Australia (Last & Stevens 2009). While listed by the IUCN as Vulnerable, the conservation status of the Australian population is generally thought of as of Least Concern (Manjaji Matsumoto *et al*. 2016). Mangrove Whiptail Rays are found in a variety of habitats with adults being observed on sandflats and amongst coral outcrops while juveniles are known to occur in inshore habitats such as estuaries and mangroves (Last & Stevens 2009; Davy *et al*. 2015). Similar behaviour to that which we observed has been recorded at Orpheus Island north of Townsville, with researchers in this study concluding that these movements served a predator avoidance function (Davy *et al.* 2015).

What is striking about the behaviour observed in Geoffrey Bay is the very small area of mangroves the rays sought refuge in. Made up of fewer than eight individual trees (*Avicennia marina* and *Sonneratia* sp.), a few small shrubs and seedlings (*Av. marina*; *Ae. annulata*; *Rhizophora* sp.), over an area of less than one tenth of an hectare (Fig. 2). These mangroves are the only mangroves present within Geoffrey Bay. This suggests that even very small areas of mangroves, perhaps even individual trees, may play a role in Mangrove Whiptail Ray ecology, and more broadly is potentially further evidence of the importance of these coastal ecosystems for maintaining inshore fish communities. It points toward potential benefit of protecting small mangrove fragments and investigating the biodiversity associated with small bays and micro-estuaries (Human *et al*. 2018).

Figure 2. A view of the area of mangroves where the juvenile Mangrove Whiptail Rays were observed. The mangrove species most prominent in the foreground is the Grey Mangrove (*Avicennia marina*). Photo: Alastair Freeman.

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