

## Browsing of Mangroves by Green Turtles in Western Australia

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Four species of sea turtles nest on the islands and coastline of the North West Shelf of Western Australia; hawksbill turtles (*Eretmochelys imbricata*), green turtles (*Chelonia mydas*), loggerhead turtles (*Caretta caretta*) and flatback turtles (*Natator depressus*) (Prince 1994). The nesting season commences around September-October for hawksbill turtles and October-November for the other three species. Nesting typically ends by March, with hatchlings emerging until May.

In March 1998, the authors were members of a survey team mapping the subtidal, intertidal and supratidal habitats of the near shore island chains, consisting of the Mangrove Islands, Mary Anne Group and the Passage Islands. The habitat information was required for the environmental impact assessment and management of a proposed oil and gas-drilling program. A specific objective of the March survey was to identify and quantify any sea turtle presence. This report constitutes a summary of some of the observations arising from the survey.

In the area extending from the Passage Islands to the Mangrove Islands, hard substrates were dominated by macroalgae and shallow sediments often supported seagrass meadows. The aptly named Mangrove Islands, supporting dense stands of flowering *Rhizophora stylosa* and fruiting *Avicennia marina*. Small submerged coral reefs (known locally as bomboras) were also scattered throughout the area.

The subtidal and intertidal zones were dominated by *Sargassum*, *Padina* and *Dictyota* macroalgae while the most common seagrasses were *Halophila* spp. (*H. spinosa*, *H. ovalis*, *H. ovata* and *H. minor*), *Halodule* and *Cymodocea*. Common coral genera included *Porites*, *Turbinaria* and *Goniopora*. Coral bleaching was widespread at the time of the survey with approximately 80% of the corals observed in the Mangrove and Mary Anne Island groups exhibiting severe bleaching (M. Ford, pers. comm.).

Sea turtles were commonly observed at sea throughout the region, however the greatest concentrations were noted around the islands at the southern end of the island chains and over seagrass beds in near shore (mainland coast) waters. An area of particular importance was a broad shallow limestone platform between Middle and North Mangrove Island. The platform substrate supported a dense meadow of

*Halodule* mixed with *Halophila* and *Cymodocea* seagrass growing on the thin veneer of soft sediments. While no animals were observed, the seagrass beds were characterized by *Dugong dugon* scars. The area was also favored as an area for green turtles. Whilst standing in water 40 cm deep it was possible to count in excess of 10 individuals within a 50 m radius. Most animals appeared to be resting or feeding in the warm shallow water and could be approached easily. Of note was the fact that most of the animals observed were mature males (determined by obvious elongated tails).

On the North West Shelf male turtles are typically only seen in waters off nesting beaches during the mating season. Occasionally they are found on their backs on the nesting beaches where they have rolled off a female while mating in the surf zone on a falling tide. Observation of such a large congregation in shallow water is unusual in the region.

The team also found another area of high turtle density amongst the mangroves on the northern coast of North Mangrove Island. Numerous sharks, rays, fish and sea turtles were observed following the rising tide across the intertidal flats. Most of the sea turtles were observed sheltering or feeding in the water under the mangrove canopy which was 50 cm deep. A single large female green turtle was observed on the seaward edge of the mangrove fringe, raising her head clear of the water to break off and eat the mangrove (*Avicennia marina*) leaves. Only the physical impact of the slowly drifting inflatable boat bumping against her carapace that caused her to break from her feeding and move a short distance away. A closer inspection of the branch showed that the animal had cleanly removed parts of a number of leaves. The leaves appeared free of epiphytic algae or invertebrates. Although the authors were unable to find reference to mangroves as a sea turtle food source in the scientific literature, feeding on leaves and fruits of mangrove by sea turtles in King Sound is known to the people of One Arm Point Aboriginal community in the West Kimberley region of north-western Australia (Prince, pers. comm.).

PRINCE, R.I.T. (1994) Status of the Western Australian Marine Turtle Populations: The Western Australian Marine Turtle Project 1986-1990. In R. James (Compiler). Proceedings of the Australian Marine Turtle Conservation Workshop, November 1990. pp 1-14.

an overestimate of population size (J. Mortimer pers. comm.). Given the population estimates, two possibilities are likely:

- 1) The historical nesting population was much larger than that found in the 1970's and/or
- 2) The harvest in the mid 19<sup>th</sup> Century was likely to be causing a severe reduction of the population.

It is not known when the harvest was lessened, however by the early part of the 20<sup>th</sup> Century, levels were much lower with annual records ranging from 54-188 females.

The annual turtle harvest was co-ordinated by the various custodians of the Island (1815-1821 the Royal Navy; 1821-1922 the Royal Marines, culminating in a concession by the St. Helena Governor to the Eastern Telegraph Company (the company changed its name to Cable and Wireless in 1929). Commercial exploitation was deemed uneconomic and ceased in 1935. From 1936 to the present day, information on harvest is scant and often anecdotal.

Even in 1942, when a large number of US service men were stationed on the island, only about 20 turtles were turned and held captive, a dozen being used by the servicemen, about half-a-dozen used by the British community, with the rest being allowed to return to the sea.

A Saint Helenian Government Representative's Despatch to the Governor, 24 June 1943 noted that the:

*"Island consumption of turtles remained static at between 3-5 per annum".*

Clifford Jones, resident on Ascension in 1957-61, informed the author that occasional turtles were "turned" during their stay to provide meat or soup for visiting VIPs. For example, one turtle was slaughtered to celebrate HRH The Duke of Edinburgh's visit in 1957 and others were presented to visiting Royal Navy ships.

As far as available records show, no further harvest has been undertaken on the Island, except for egg collection by Mariculture Ltd. This commercial company was given permission to start collecting turtle eggs on Ascension during 1969. Whilst records are incomplete, it seems that large collections of eggs were made between 1969 and 1975. Of the eggs harvested each year, the majority were exported to the Cayman Islands for commercial rearing and sale whilst a proportion were hatched locally, with young turtles being subsequently released into the sea.

Although in the early days of man's occupation of Ascension, turtles were killed in large numbers, as time moved on a sense of affection and responsibility for the animals evolved along with the recognition that they should be treated as humanely as possible. Today all turtles are fully protected on Ascension Island and, being so small in area, protection is easily enforced - something not always possible at breeding sites elsewhere. This was summarised in 1980, by Dr Jeanne A Mortimer of the University of Florida who wrote to the then Administrator:

*"The Ascension Island nesting population (of green turtles) is one of the most important colonies in the world. There are many biological attributes unique to Ascension's turtles, including their large size, their outstanding migratory feats, and the fact that the Island is the type locality for the species. However, perhaps of even greater importance at a time when the turtle populations everywhere are being extirpated at an alarming rate, the Ascension Island population has the distinction of being one of the best protected green turtle colonies in the world...".*

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