# DUGONG SURVEYS

It has been thought to date that the dugong herds that frequent the vast offshore waters of north Western Australia were forever secure from man's predation.

Western Australia is currently expanding its frontiers both in exploration and recreation and with today's sophisticated equipment, encroachment into dugong habitat is already happening. No longer is it safe to assume that because of reasonable numbers, remote breeding grounds and the classification of rare and in need of special protection, the dugong is safe in W.A.

The areas of Shark Bay and Exmouth Gulf where dugong now abound are subject to increased boating pressure from amateur and professional fishermen. In the future these areas and others to the north will also be visited and searched by mineral exploration vessels.

During 1979 Dr. R. I. T. Prince of the Western Australian Wildlife Research Centre, with the assistance of Fisheries Inspector D. Blackman, continued to gather general information, by aerial survey, on dispersal and abundance of dugong in Shark Bay. Information on the North West Coast, prior to 1979, had been obtained in conjunction with the Pelican research programme and confined to the coastline between Shark Bay and Port Hedland. Detailed knowledge of Shark Bay dugong had also been obtained as a result of aerial surveys, a short field investigation during June 1978 and liaison with commercial fishermen based at Denham.

Four areas of significance to dugong have been identified *viz.* Shark Bay, Exmouth Gulf, the area between the mouths of the Cane and Robe Rivers and the Cape Preston-Dampier Archipelago area. Shark Bay and Exmouth Gulf appear to be the most important areas on present information.

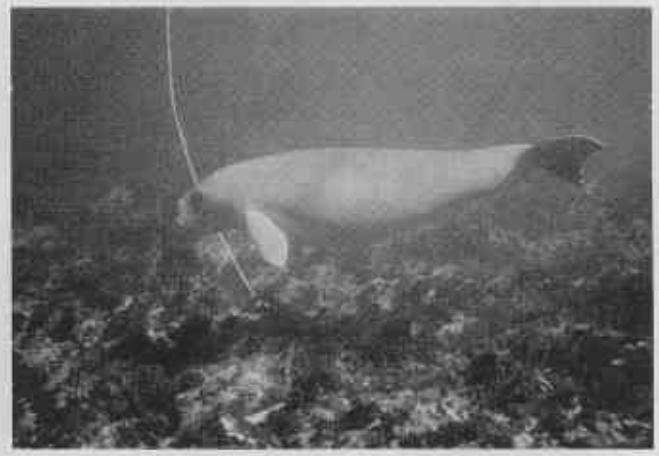
Further research is needed to better understand the potential hazards which could effect the populations in these areas so that anticipatory management planning can be undertaken.

The Exmouth Gulf population probably exceeds 200 individuals on presented information. The inaccessibility of the eastern shores of Exmouth Gulf from the landward side and the extensive shallows in this part of the gulf have to date restricted knowledge of dugong prior to the current surveys.

Detailed knowledge of dugong populations in offshore waters north and east of Tubridgi Point (Exmouth Gulf) to Port Hedland and in coastal waters from Port Hedland to the Northern Territory border is also unknown. In order to conserve the dugong it will be necessary to gather such information.

Professor Paul Anderson from the University of Calgary in Canada recently completed a biological survey and research programme on dugong populations in the Shark Bay area. Departmental on-site involvement was limited, but logistic support, and co-operative involvement was directed to familiarisation with the research undertaken, the methodology used and the possibilities for additional follow-up work.

Shark Bay is a unique area for dugong observation in that the animals are rarely disturbed or hunted and are quite approachable in their clear water domain.



The Dugong

The objects of the study were to establish a basic understanding of the behaviour and habitat requirements and to lay a foundation for future protection of one of the world's most distinctive mammals.

In early June Professor Anderson's survey party started their observations at Dirk Hartog Island. The previous survey there in 1978 had disclosed 80–100 resident animals in extremely clear water in South Passage, with visibility to about 20 metres. It appeared therefore to be the best and easiest place to commence the behavioural observations in 1979. South Passage however, was vastly different this year with poor visibility and only a few animals around.

It was therefore decided to concentrate on areas off the eastern shore and northwards along Dirk Hartog Island, even though underwater visibility was only 3–5 metres. Animals were located by aerial spotting or by the use of outboard motor boats and then approached by divers in inflatable canoes.

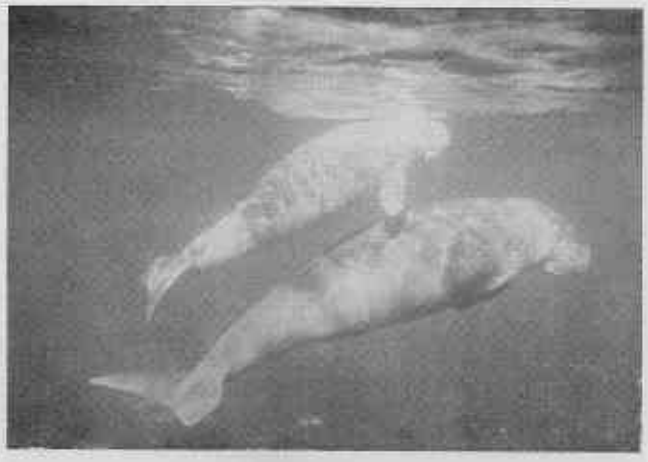
During all occasions, the curiosity of dugongs presented the unwanted situation of the observers being observed. This unnatural situation persisted as the animals detected divers long before the divers saw the dugong. The beasts would appear out of the murk to circle at 1–4 metres, move ahead in a zig-zag fashion and then after a period swim away.

During June the weather deteriorated thereby decreasing underwater visibility and it was decided to establish shore-based observation points from high bluffs and promontories. This proved to be the most productive and economical way to locate, observe and photograph the animals during the entire exercise.

Throughout the survey it was noticed that dugongs appeared to prefer a 2–4 metre depth of water over banks of *Amphibolis antarctica*, one of the 2 predominant species of sea-grass in the area. Nearby depths up to 7 metres were used occasionally for feeding and idling.

From the data to hand it is not known why dugong spend time in South Passage, an area of heavy breakers and little sea grass.

Prior to the 1979 work it was generally thought that dugong sought sheltered areas in the event of rough weather. However, during one day of 30–50 k.p.h.



The Dugong and calf surfacing

winds and 1 metre waves in the Bay, the animals were observed not to alter their routines and were content to lie just beneath the surface.

Cow-calf relationships were noticed to follow the same pattern as observed in 1978. The usual position of calves, swimming above their mothers and appearing to use their slipstream for ease of swimming, were observed, with the occasional "piggy back" ride to the surface for air. (See photo).

To determine the reactions and abilities of dugong to cope with intruding power boats, an outboard motorboat was driven at varying speeds at and among a herd of animals. Below 15 knots, the boat caused the herd to take evasive measures by disappearing and appearing elsewhere *en masse*. This collective avoidance reaction is one of the factors which support the opinion that the animals are socially orientated. At 20 knots and above however, the animals were incapable of evasive action. When the boat was stopped amongst them, the animals commenced their inspection procedures, i.e. circling the boat, diving and surfacing up-sun to breathe. This inability to take evasive action points to a future conservation problem with possible injuries and death from fast moving boats.

During the survey hydrophonic microphones were used to record any evidence of vocalisations by dugong. The equipment was capable of recording any underwater sounds between 5 hertz and 20 kilohertz. One or two noises were recorded but until the tapes are investigated in a laboratory no positive conclusion can be made.

Bird-like sounds have been recorded from captive animals during an experiment in Queensland some time ago.

Interactions between dugong and other animals were noted during the survey, the most notable being between a dolphin and a dugong cow and calf. The dolphin appeared to harass or play with the cow and calf by speeding in from the side and veering away at the last moment. After a few passes several large mature dugong placed themselves around the calf in a diamond formation, thereby ending the dolphin's game. This appears to have been a herd reaction, again displaying social behaviour and a possible defence procedure.

Tiger sharks were seen in the area but at no time was there any interference to dugong even though on one occasion a large shark was seen to swim through a herd.

Cormorants were noticed to fly from a nearby colony, directly to a herd of feeding dugong, possibly to feed upon small fish flushed from the sea-grass. Individuals or small groups of fish were often seen swimming approximately 20 cms under a dugong's snout presumably to feed on small invertebrates also flushed from the sea-grass. Due to their curiosity however, the dugong did not feed in the presence of divers.

A photographic registry was made of all dugong sighted during the survey so that identification by patterns and scars can be used in future surveys.

The dugong population in Shark Bay is very likely the largest occuring in any single well defined area in the world. Aerial surveys were confined mainly to the Eastern side of Dirk Hartog Island.

The maximum number of animals seen on any single aerial survey was 500, and an unconfirmed report of a further 200 animals elsewhere in the Bay was made at the same time.

From these observations, it is estimated that there may be several thousand dugong in the Shark Bay population. With clearer waters than the Eastern Australian habitats, Shark Bay is a prime and as yet largely undisturbed area for studying dugong.

The Department of Fisheries and Wildlife is indebted to Professor Paul Anderson for undertaking this work which was supported by the National Science and Engineering Research Council of Canada, Earthwatch Massachusetts, U.S.A. and the Research Committee of the University of Calgary, Canada. Additional support was organised by Dr. Prince from Esso Australia Ltd., and Alcoa of Australia Ltd.

# FIRETAILS AGAIN

In response to the article on Red-eared Firetail finches in S.W.A.N.S. Volume 9 Number 1, a farmer from the south coast near Denmark wrote to the Department describing those beautiful birds on his property. He stated that there are literally hundreds of them on the property and said that many feed and nest around his house.

A major portion of the gentleman's property has been retained in its natural state, therefore encouraging the birds to remain in the area, and he says that the sight of all the birds during the breeding season is one to behold.

Other reports from around the south west of the State show that Red-eared Firetails can be found in small pockets of suitable habitat along the South coast. The species is, however, now rare through most of its range along the west coast.

It would be nice to report areas where the birds can be readily observed, but such information would have illegal trappers swarming into the areas, and this would not help in the conservation of such a rare species. Unfortunately the activities of illegal trappers will always restrict worthwhile reporting of important sightings. People declaring such information to the Department will always have their observations etc. treated in the strictest confidence.