

Movement behaviours and habitat usage of West Kimberley dugongs: A community based approach.

Summary of progress

The first deployment of GPS tags was performed in July 2009 in Beagle Bay, approximately 120kms north of Broome. Four mature adult animals (3 male, 1 female) were tagged between the 16th and 19th of July.

Deployments were for a minimum period of 4 weeks and a maximum of 8 weeks dependent on the longevity of the peduncle attachment. The at-sea positions of each animal are presented in the figures below. The data provided have been filtered to provide the GPS and quick fix pseudo-range (QFP) positions during deployment. The period of the deployment for tags not physically recovered from the animal was determined by examination of the time-depth recorder attached to the tag. Data on this instrument shows the time of detachment as benthic foraging dives cease and the tag remains on the surface.

Three of the four animals remained within the confines of the site of tagging, Beagle Bay and showed a high level of foraging site fidelity. There was some evidence of movement out of the enclosed bay by these 3 animals but it was restricted to short excursions within a few days of the capture and tagging date and may be considered a reaction to the capture event. There was some overlap of foraging areas within the northern section of the bay among the four animals. The three animals remaining within Beagle Bay showed similar foraging ranges, moving along the length of the bay on tidal cycles but also displayed some foraging site fidelity (Fig. 1).

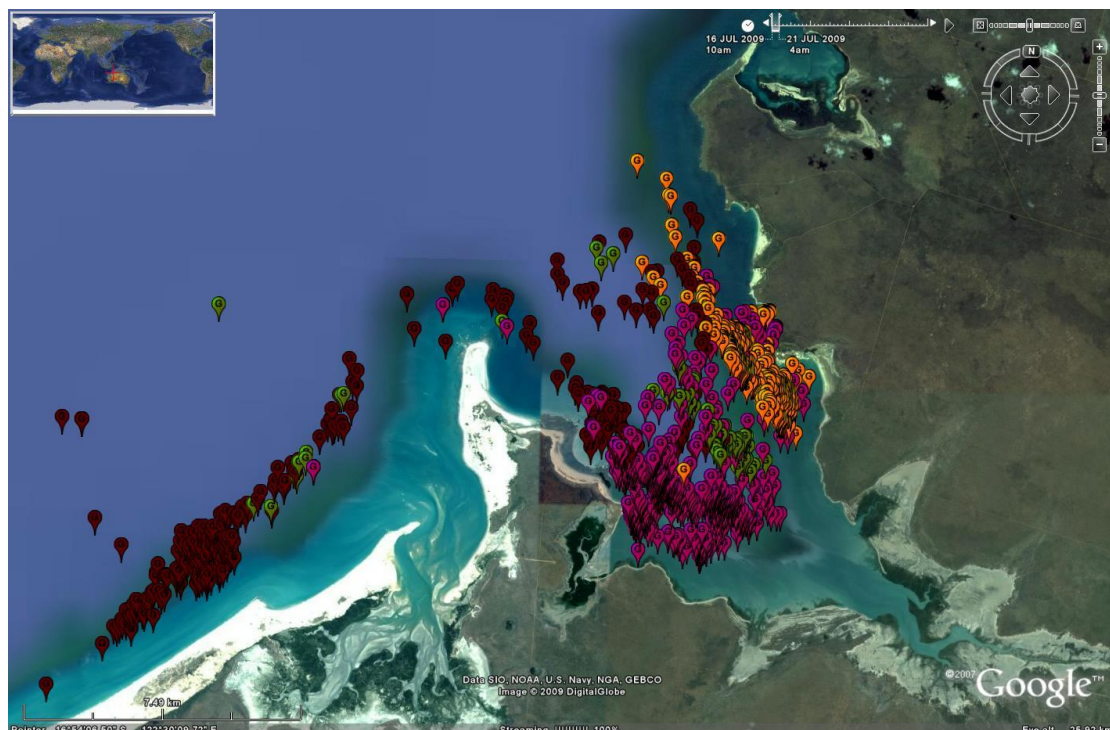


Figure 1. At-sea positions of the four tagged dugong in Beagle Bay shown in different colours. The data were filtered to provide GPS and QFP positions only. Extensive foraging within Beagle Bay was shown by 3 of the 4 animals.

One animal made a longshore excursion from the tagging site out of Beagle Bay and tracked south approximately 500 kilometres south over a period of approximately 6 weeks. The tag became detached approximately 120 kilometres east of Port Hedland. This animal travelled in the nearshore habitat, passing by the proposed site of the LNG processing facility at James Price Point and the township of Broome. Extensive longshore movement of dugongs has been previously recorded on the east coast of Australia and these data highlight the variation in animal behaviour and the importance of local and regional management.

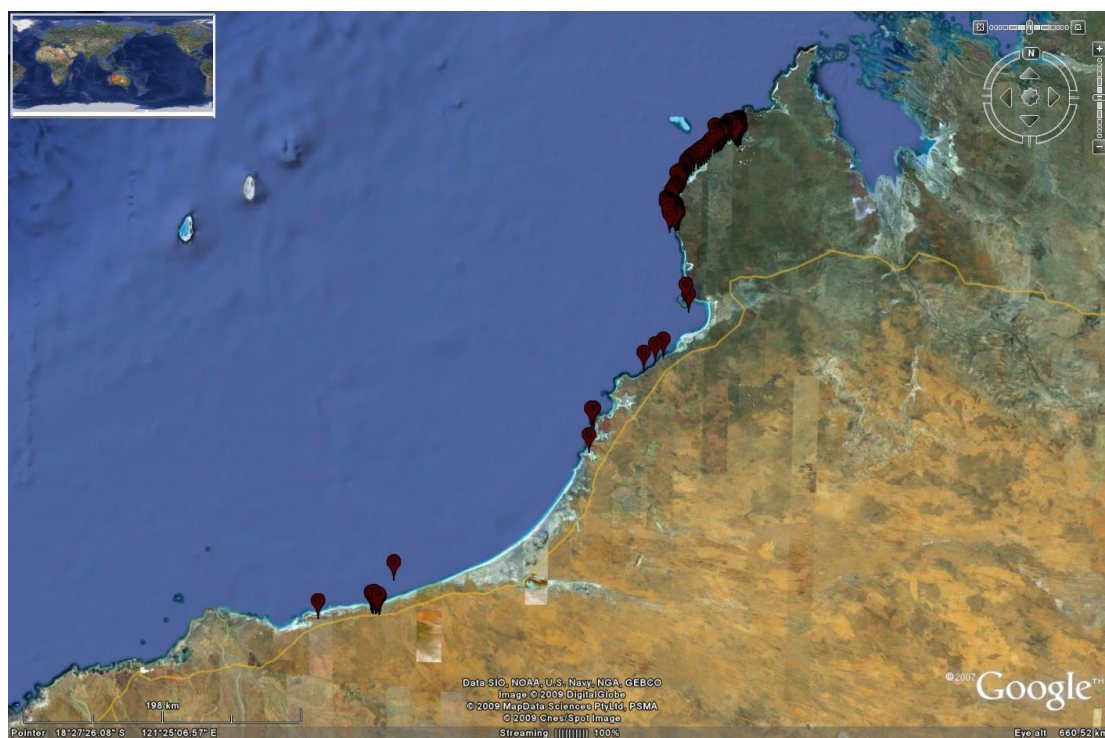


Figure 2. At sea locations of the fourth tagged animal (85052) showing its excursion out of Beagle Bay and south along the coast until the tag became detached west of Eighty Mile beach.

The records from the time-depth recorder showed that the animal was foraging the entire length of the trip with repeated shallow benthic dives for the entirety of the deployment. An example of the diving patterns is shown in Figure 3. Maximum depth of nearly 20 metres was reached on a number of occasions along the coast; however the majority of diving was to less than 10 metres. Mean depth ($\pm$ s.d.) of dives was 4.8m ($\pm$ 3.5) and the mean dive length ($\pm$ s.d.) was 2:01 minutes ($\pm$ 2:17). Maximum dive length was 11:28. This animal spent nearly 70% of the deployment period diving and 56% of the time actually on the sea bottom foraging. This animal averaged nearly 20 dives per hour over the length of the deployment. The frequency histogram of dive depths shows that the vast majority of diving was to depths less than 5 metres (Fig. 5), highlighting the importance of the intertidal and shallow water habitats throughout the Kimberley.

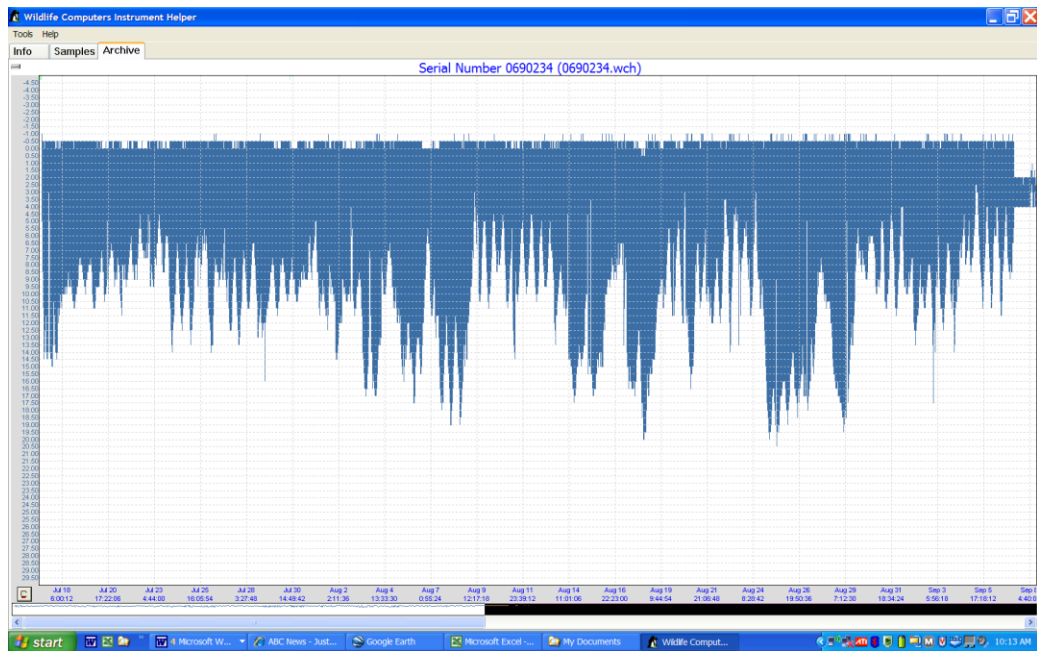


Figure 3. The full dive record of animal 85052, showing the extent of foraging throughout the deployment. The change in dive pattern at the end of the scale shows the time of detachment of the tag.

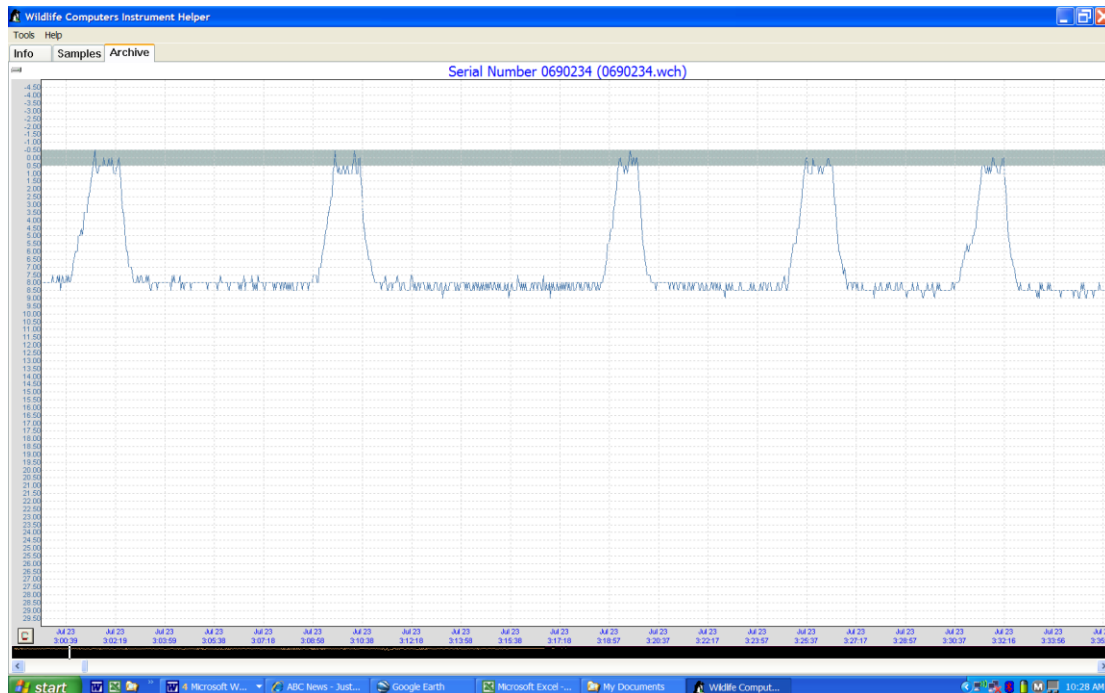


Figure 4. Period of 35 minutes during the deployment of 85052 showing the benthic foraging dive pattern, typical of dugong. The grey band represents the water surface and the start and end of each dive. There is a very short inter-dive period of approximately 30 seconds between dives.

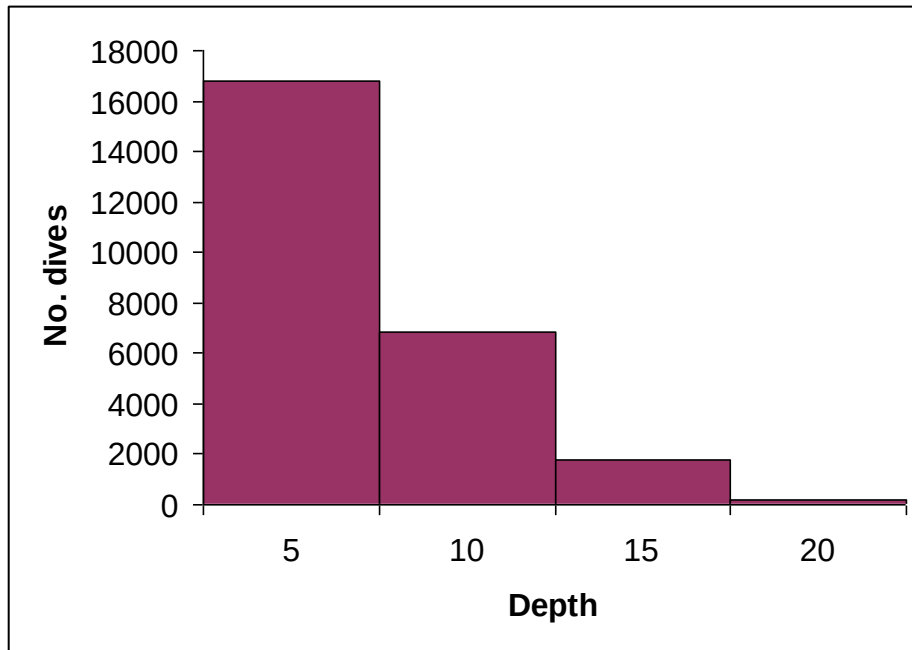


Figure 5. Frequency histogram of diving depths for animal 85052 showing the high level of foraging in waters less than 5 metres. Very little diving activity was evident in waters greater than 10 metres.