Report on the Status of the Monkey Mia Dolphin Mothers and Calves

Dr. Janet Mann (12-Jun-08)

Executive Summary: ***The four mother-calf pairs that are currently being provisioned at Monkey Mia show a marked decline in (1) the total number of associates; (2) association with non-beach dolphins; (3) time socialising. These data are consistent with Dr. Bejder's findings on changes in female reproduction and habitat use in Red Cliff Bay. Given the importance of dolphin social networks to survival and reproduction, negative short-term or long-term impacts on the Monkey Mia dolphins must be considered.***

Research Objectives

The major research objective was to determine the current status of Monkey Mia dolphin behaviour offshore. Put another way, how are the Monkey Mia (beach) calves facing the ecological and social challenges of development?

(1) Do calves forage at the expected rate compared to non-beach calves?
(2) Do calves socialise at the expected rate compared to non-beach calves?
(3) Who do the beach dolphins currently associate with?
(4) Have there been changes in the total number associates available to calves over the last 18 years?

Methods

We conduct focal follows on dolphin mother-calf pairs for an average of 2.5 hrs several days per year so that each pair is not followed for more than 15 h per year (average is 9.6 h per calf per year). Behavioural and ecological data are collected at set intervals (1 and 5 minutes) including which dolphins are within 10 metres of the focal mother, calf, or another group member. All dolphins within this 10 m chain are considered to be group members or associates. Beach mother-calf pairs are followed "offshore" when they are more than 200m away from the provisioning beach. The four mother-calf pairs that currently visit Monkey Mia and accept fish hand-outs are Nicky-Yadgalah, Puck-India, Surprise-Burda and Piccolo-Eden. We conducted 117 h of focal follows on these 4 pairs over the last 4 years. Sample sizes are indicated on the remaining figures. More details about data collection are available in our publications or from the author.

Results and Discussion

(1) Do calves forage at the expected rate compared to non-beach calves?

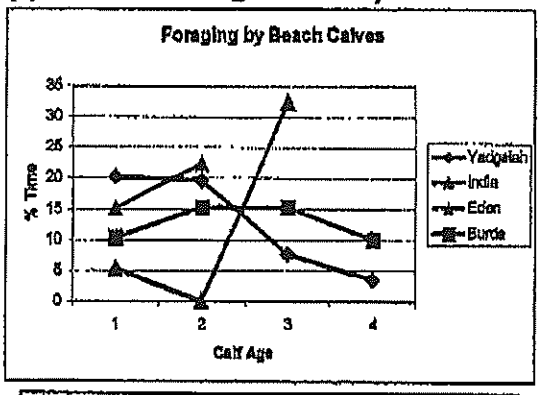

Figure 1. This figure shows the proportion of time the beach calves forage when away from the provisioning area at Monkey Mia

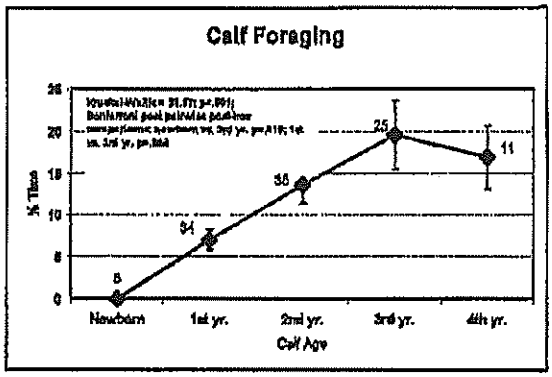

Figure 2. This shows the increasing proportion of time that calves forage during development (includes all other calves: Mann & Sargeant 2003)

Discussion: Although individual beach calves show variable rates of foraging during development, they are foraging at rates consistent with normal development (>10% of the time). The exception is Yadgalah, whose foraging rate has declined steadily over the last two years.

2) Do beach calves socialise at the expected rate compared to non-beach calves?

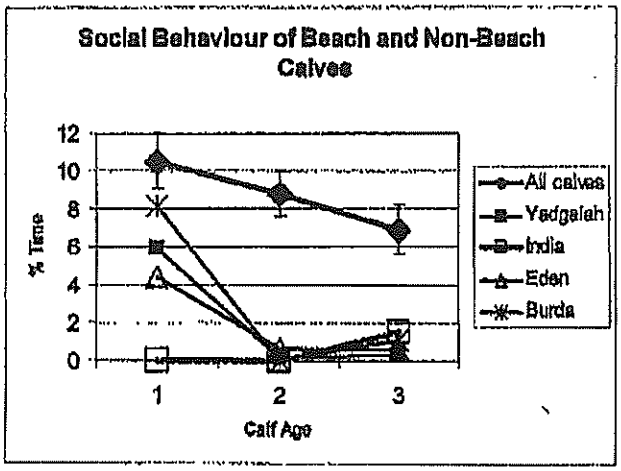

Figure 3. This shows the proportion of time that 4 current beach and 55 other calves spend socialising. All four beach calves spent very little time socialising in their 2nd and 3rd year of life (0.3-1.5%) relative to the 7-11% of time typical of their peers. For non-beach calves, the % time socialising does not significantly decrease with age.

3) Who do the beach dolphins currently associate with?

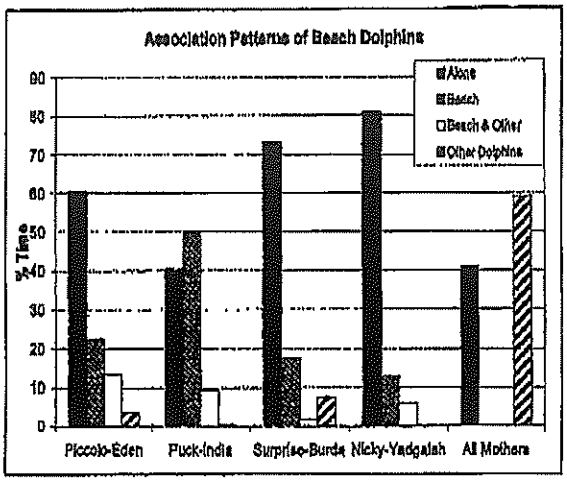

Figure 4. This figure shows that the four mother-calf pairs that visit Monkey Mia spend most of their time either alone or with other beach dolphins. They spend very little time with non-beach associates.

(4) Have there been changes in the total number associates available to calves over the last 16 years?

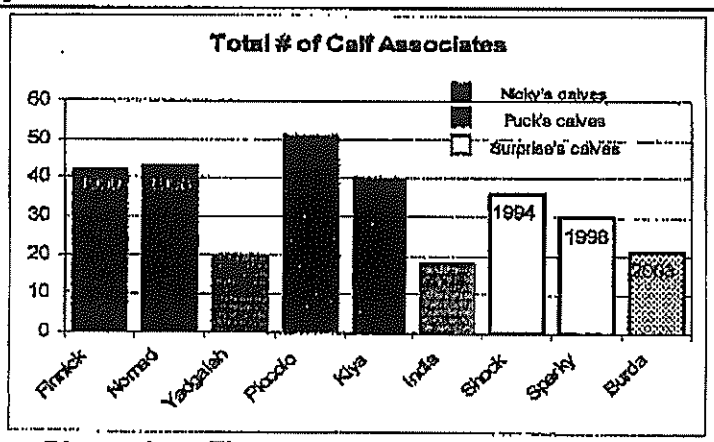

Figure 5. This figure shows the total number of associates sighted with the three adult females and their 9 calves that have visited Monkey Mia since 1990. Each adult female has been observed with three offspring that have survived to their third year. Each calf, born between 1990 and 2004 was observed for more than 20 h over two or more years (301 h in total). The birth year for each calf is indicated in each bar. The decline in the total number of associates over time is evident. Yadgalah, India, and Burda have far fewer associates than their older siblings did and are now well below average in the number of associates typical for mothers and calves in Shark Bay. For 61 *non*-beach calves, the average # of associates = 33.6±2.9.

Discussion: The trends are clear. The Monkey Mia dolphins are showing a reduced rate of interaction with non-beach associates. An additional consideration is that nearly all of the data on the provisioned dolphins was collected in the afternoon, *after* all 3 feeds are over and when the dolphins had the greatest chance of associating with any available individuals in Red Cliff Bay. If the morning hours were included in this analysis, roughly a 3-6 hour period when their associations are almost exclusively restricted to beach dolphins, the combined effect of provisioning and lack of available associates would be even more striking. Given the importance of social networks to survival and reproduction, the pattern of social decline shown here could have deleterious effects on the Monkey Mia beach dolphins.