AN INVESTIGATION OF THE EFFECT OF BEACHED DRIFTWOOD LOGS ON NESTING TURTLES ON SANGALAKI ISLAND

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A constant problem for nesting turtles on Sangalaki is the debris of logs and branches that is washed up by the tide. New logs are being washed up almost daily. These are apparently debris from logging and land clearing operations on the mainland. The existence of such a volume of logs on the shore is likely to be a comparatively recent phenomenon associated with the increase in logging and clearing on the mainland in the last several decades.

The logs significantly impede the movement of turtles up the beach to nest, and field observations indicate that many false crawls are related to the turtle's path being blocked by logs. The logs probably have an even more significant impact on hatchlings trying to reach the sea, but since until now there is only limited natural hatching we have no data to support this assumption. Fishermen have told us that the logs on beaches on other islands are a significant deterrent to turtle nesting.

In the past, Turtle Foundation volunteers have done considerable work to remove such logs and debris, cutting large logs into sections with a chainsaw and moving them into the sea to be carried out by the tide and currents. Smaller wooden debris has been piled up and burned on the western spit.

A group of Mulawarman University graduates who were working with the Turtle Foundation to help monitor aspects of turtle management on Sangalaki carried out a study to try to determine the effect of driftwood logs on the success of turtle nesting attempts on Sangalaki. They mapped the location of driftwood logs on the beach on 18 February 2002 (see attached map). At the same time they carried out an analysis of the percentages of false crawls (= turtles coming up the beach and returning to the sea without laying) sector-by-sector.

Since there were suggestions that logs should be left on the beach to prevent wave erosion, observations were made to try to detect any correlation between erosion and presence of logs on the beach. Around 16 February and on subsequent days there was major erosion of the western spit in sectors 8 and 9, associated with the seasonal change in the direction of waves. Wave action cut erosion benches into the spit, some with heights in excess of one metre. These sectors were some with the most continuous extent of logs along the top of the beach. The presence of logs did not appear to provide any protection from erosion. In fact, in some places the flow of water back through gaps in the logs appeared to have been a factor in accelerating the process. Similarly in Sector 15 (the eastern spit) there was significant erosion around 18-20 February, despite the presence of large logs at the top of the beach.

Conclusions

Attempts at correlating percentages of false crawls in each sector with the presence of logs did not show any clear correlation. This is contrary to field observations, which indicate that the presence of individual logs frequently leads to false crawls. It is also fairly obvious that driftwood logs will block the paths of hatchlings to the sea, and thus expose them to predation and desiccation. Hatchlings which get past the logs will have used up some of their energy store which would normally be used in getting well clear of the predators in the vicinity of the reef. Another anticipated impact of logs is that they will concentrate hatchling movement into the spaces between logs, thus making them more vulnerable to predation.

It appears that there are factors other than logs which also cause false crawls, and which mask the effect of the logs on nesting success. This is consistent with field observations. These factors include the width of the beach, the density of roots in the sand, and the dampness of the sand in the back beach area.

Field observations indicate that the presence of logs provides no protection against erosion and may even accelerate erosion.

Recommendations

Further studies need to be done, taking into account all of the factors which might lead to false crawls, and attempting to separate the effects of the different factors. This should include keeping notes of the causes of all observed false crawls.

In the interim driftwood logs should continue to be removed from the beach, on the basis of field observations that they frequently lead to false crawls and the likelihood that they will block the paths of hatchlings moving to the sea.

Attachments:
Table: Compiled Data - Nests and False Crawls by Sector
Map: Analysis of Relationship Between Logs and False Crawls

Pulau Sangalaki Turtle Conservation Management Project
COMPILED DATA - NESTS AND FALSE CRAWLS BY SECTOR
9/2/02 to 19/2/02
(prepared by: Mulky Thamrin, Zulfikar I.Y.Maruapey, Vang Ahang Moord. Y., Iwan Hermawan)

	SECTOR:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
DATE	ACTIVITY																
9/2-10/2	Nests		1	8	1	3		1		2						3	19
	False Crawls			3	1	1	2	4	1			1	2	2		1	18
10/2-11/2	Nests		1	4	3		3	4	5			2	1		2		25
	False Crawls					5	2	5	2	2	1	1	4		1		23
11/2-12/2	Nests		1	1	3	1	1	2	1	5		1	1		1	4	22
	False Crawls	2		1	2	1			2	2	2	2		2		2	18
12/2-13/2	Nests		1	3					3	5						3	15
	False Crawls					3	1		1	3	1	1	1	1		1	13
13/2-14/2	Nests		1	1	3	1			2	3						3	14
	False Crawls			1		2				1						1	5
14/2-15/2	Nests				1	3				5	1		1		3	5	19
	False Crawls			2	6	3				3		1		1	2		18
15/2-16/2	Nests				1	3			2	5		1			1	6	19
	False Crawls				3	3	4	1	4	6	3	5	2	5	1		37
16/2-17/2	Nests		7	7	3	3	1		2	8		1			1	3	36
	False Crawls		1	2		3	3		1	2		1	1	1		2	17
17/2-18/2	Nests	3	1	4	2	1		2	4	1					2	2	22
	False Crawls		1	1				1		3		1					7
18/2-19/2	Nests		1	3	3				2	1						2	12
	False Crawls			1		2	1	1	1	1		1					8
19/2-20/2	Nests	1		2						3					1		7
	False Crawls				1	1				2				1	1		6
Sub-Total Nests		4	14	33	20	15	5	9	21	38	1	5	3	0	11	31	210
Sub-Total False Crawls		2	2	11	13	24	13	12	12	25	7	14	10	13	5	7	170
% False Crawls		33.33	12.50	25.00	39.39	61.54	72.22	57.14	36.36	39.68	87.50	73.68	76.92	100.00	31.25	18.42	44.74