The Occurrence of Cutaneous Fibropapillomas in Marine Turtles in Queensland

Colin J. Limpus and Jeffrey D. Miller
Queensland Department of Environment and Heritage

Fibropapillomas in marine turtles were first reported 52 years ago (Locke 1938: Smith and Coates 1938). However, the causes of these tumors and their impact on the overall health of marine turtle populations is still unclear (Jacobson et al. 1989: Mansel et al. 1989). The recently reported increased occurrence of these sometimes debilitating and/or lethal tumors on marine turtles in Hawaii and eastern Florida is causing concern for health of those populations (Jacobson 1990: Balazs 1990).

The physical structure of the fibropapillomas resembles that of fibropapillomas that occur in other animals (see Jacobson et al. 1989). Both the tissue response and the occurrence suggest an infectious agent, most likely a virus (Jacobson et al. 1989). However, because no virus-like particles or evidence of other pathogenic agents could be demonstrated in any of the cells cultured from the Indian River samples and examined by electron microscopy (Mansell et al. 1989), the cause of the infection remains unknown.

Since 1969, when the Queensland Turtle Research Project commenced, a very low incidence of fibropapillomas has been recorded annually in nesting loggerhead, green and flatback turtle populations in Queensland. Systematic studies of turtles in their feeding areas commenced in 1974 within the Capricornia Section of the Great Barrier Reef and additional study sites have been included in recent years. Until this last year, a very low incidence of fibropapillomas was also characteristic of turtles recorded in feeding area studies.

Table 1 summarises the incidence of turtles recorded with fibropapillomas at feeding area study sites in Queensland in recent years. Significant levels of this disease in some Queensland green turtle populations have now been recorded, namely Repulse Bay and Moreton Bay. The higher incidence of the disease in green turtles from the inshore soft-bottomed seagrass habitats contrasts with its low incidence in green turtles from coral reef habitats.

There is insufficient information on this disease to determine whether the higher incidence in these inshore, relatively enclosed waters results from pollution or whether it is a disease spread via a vector such as ozobranchid leeches. These ectoparasites of marine turtles are much more prevalent on the turtles from the soft bottomed habitats than those from coral reefs. Within Moreton Bay, green and loggerhead turtles live sympatrically and both carry large numbers of ozobranchid leeches. The higher incidence of fibropapilloma in green turtles (Table 1) suggests that green turtles are more susceptible to the disease than loggerhead turtles, whatever the cause.

Within green turtles, the disease appears to occur more frequently among the immature size classes than among adults (Figure 1). If small size is relevant to susceptibility to the disease for loggerhead turtles also, then the almost total absence of small loggerhead turtles, curved carapace length (CCL) = 40 -70 cm, from eastern Australian continental waters, could account for some of the lower incidence of the disease in loggerhead turtles. Additionally, if fibropapillomas can be debilitating to the infected turtle, it is to be expected that severely infected adults are not likely to reach the necessary fat condition for initiation of vitellogenesis. Therefore, the frequency of occurrence of fibropapillomas in nesting turtles may be an inappropriate indication of the extent of infection within a population.

The occurrence of fibropapillomas in Queensland marine turtles needs monitoring and the epidemiology of this disease deserves increased research emphasis.

References

Balazs, G. (1990) Health advisory for fibropapilloma disease. *Marine Turtle Newsletter* 49: 27.

Jacobson, E.R. (1990) An update on green turtle fibropapilloma. *Marine Turtle Newsletter* 49: 7-8.

Jacobson, E.R., Mansell, J.L., Sudberg, J.P., Hajjar, L., Reichmann, M.E., Ehrhart, L.M., Walsh, M. and Muru, F. (1989). Cutaneous fibropapillomas of green turtles (*Chelonia mydas*). *J.Comp. Path.* 101: 39-52

Lucke, B. (1938) Studies on tumours in cold-blooded vertebrates. Annual Reports of the Tortugas Laboratory, Carnegie Istitute of Washington 38: 92-94.

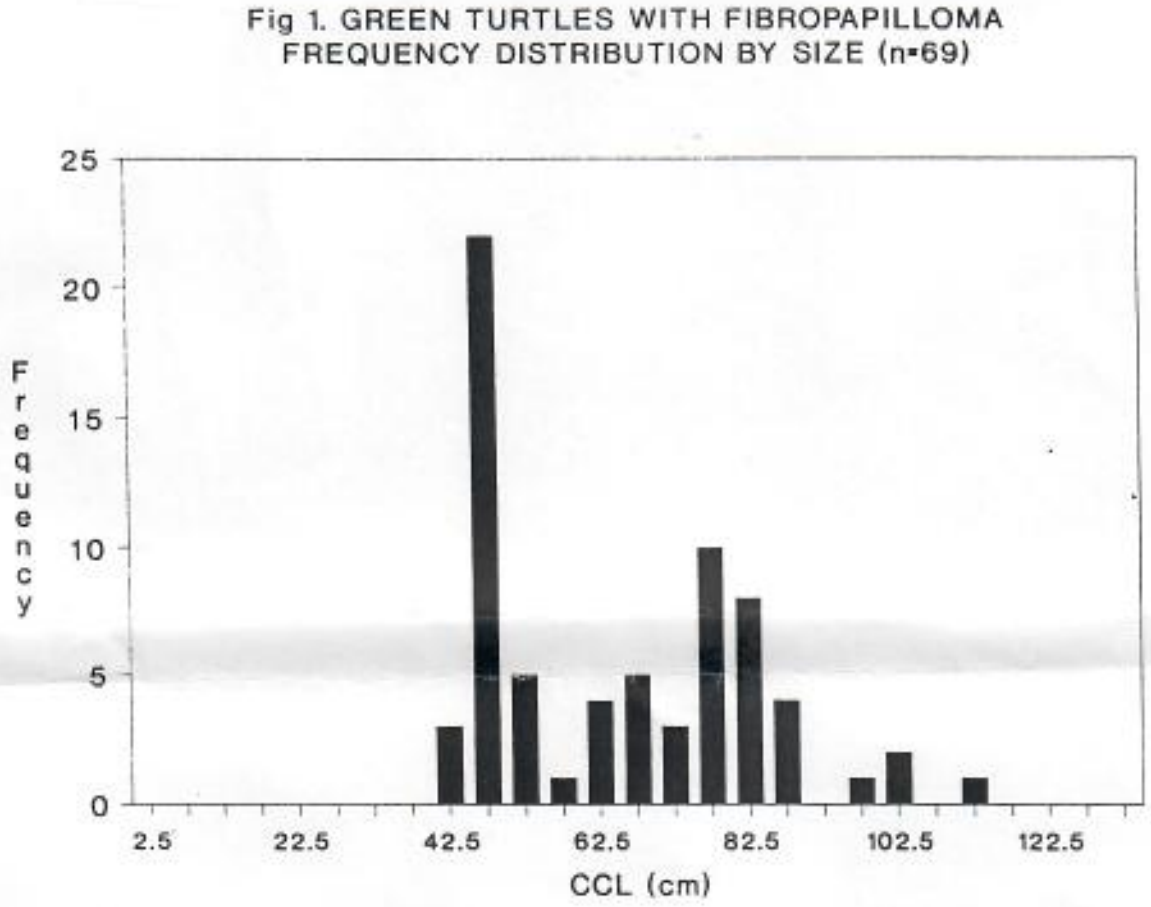
Mansell, J.L., Jacobson, E.R.and Gaskin, J.M. (1989) Initiation and Ultrastructure of a reptilian fibroblast cell line obtained from cutaneous fibropapillomas of the green turtle, *Chelonia mydas*. *Vitro Cellular and Developmental Biology* 25: 1062-1064.

Smith, G.M. and Coates, C.W. (1938). Fibro-epthelial growths of the skin in large marine turtles, *Chelonia mydas* (Linnaeus). *Zoologica* 23: 93-98.

Table 1. Incidence of fibropapilloma in marine turtles captured in feeding area study sites in Queensland.

Locality / Year	Green		Loggerhead		Hawksbill	
	total	with papilloma	total	with papilloma	total	with papilloma
A. INSHORE SEAGRASS HABITAT IN BAYS						
Moreton Bay (Moreton Banks)						
1990	249	20 (8%)	82	1 (1%)		
Shoalwater Bay (western)						
1988	235	4 (2%)				
1989	355	8 (2%)				
1990	407	12 (3%)	2	0		
Repulse Bay (northern)						
1988	137	0				
1989	112	3 (3%)				
1990	54	12(22%)				
Bowen						
1989	11	0				
B. INNER-SHELF CORAL REEFS						
Hazelwood Island Reef						
1989	102	0			2	0
Green Island Reef						
1988-90	246	0			28	0
Clack Island Reef						
1988-90	812	0	3	0	43	0
C. OUTER-BARRIER CORAL REEFS						
Heron Island and Wistari Reefs						
1988	192	0	87	1 (1%)	14	0
1989	141	0	119	1 (1%)	42	0
1990	204	0	128	2 (1%)	36	0

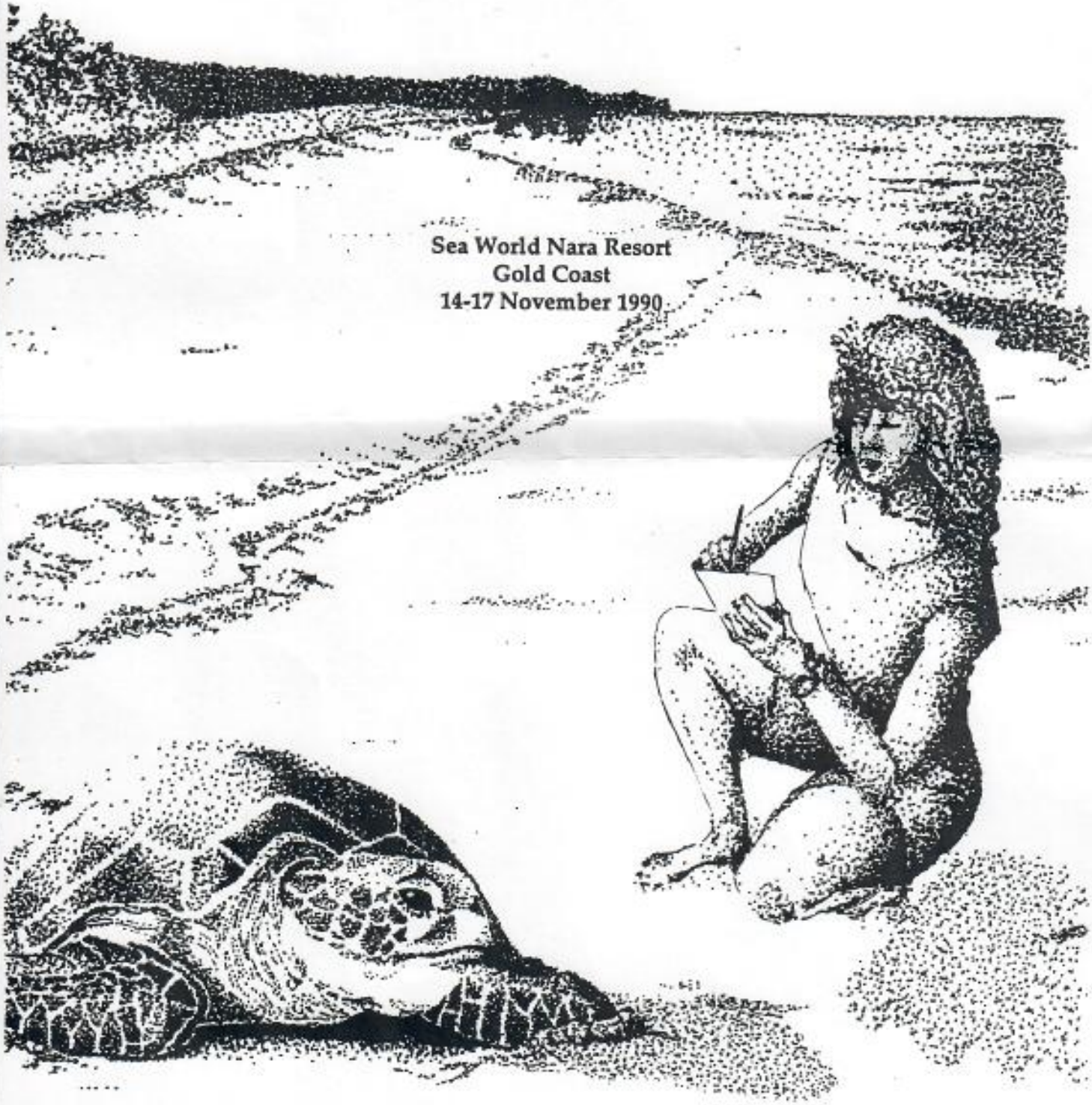
Figure 1. Size range distribution of *Chelonia mydas* recorded with fibropapillomas. Data obtained from Queensland feeding areas, 1988-1990 (Table 1).



AUSTRALIA

Proceedings of the

AUSTRALIAN MARINE TURTLE CONSERVATION WORKSHOP



Sea World Nara Resort
Gold Coast
14-17 November 1990

QUEENSLAND DEPARTMENT OF ENVIRONMENT AND HERITAGE

and