

# 1 INTRODUCTION

Data and specimens collected from dugong carcasses and live stranded individuals provide vital information for research and management agencies. The ability to assign a cause of death (natural and/or human induced) to a carcass assists management to identify major threats to a population in certain areas and to evaluate and adjust as necessary management measures. Data collected from dugong carcasses have contributed to research in areas such as life history (Marsh 1980, 1999; Marsh et al. 1984a, b, c); feeding biology (Marsh et al. 1982; Preen 1995); investigating the stock structure of dugongs (Tikel 1998); contaminants studies (Haynes et al. 1999); heavy metal analyses (Denton et al. 1980); parasitology (Blair 1981); and the effects of habitat change. This manual has been adapted from the ‘Manual of Procedures for the Salvage and Necropsy of Carcasses of the West Indian Manatee (*Trichechus manatus*)’ in Florida, U.S.A. (Bonde et al. 1983).

## 1.1 Objectives

This manual provides a detailed guide for dugong (*Dugong dugon*) carcass handling and necropsy procedures. It is intended to be used as a resource and training guide for anyone involved in dugong incidents, including management officers, biologists, parks and wildlife field staff, and veterinarians and pathologists who may lack dugong expertise. Because of the wide range of professionals this book is targeting, information and the use of technical terms is necessarily extensive. Section 8 provides definitions of various terms used and italicised throughout the text.

Dugong stranding and *necropsy* procedures in place along the east coast of Queensland, Australia (southern Great Barrier Reef region) are provided as examples throughout the text; however, this book is intended to be used as a resource guide by those who respond to stranded dugongs throughout the dugong’s range. Throughout this manual, ideal dugong carcass handling and *necropsy* practices and procedures are described. Procedures may need to be modified in actual events depending on the location, available equipment and personnel, freshness of carcass, etc. Limited information is provided in this manual on managing live dugong stranding incidents. The Queensland Parks and Wildlife Service and Great Barrier Reef Marine Park Authority (1999) have provided information, adapted from Geraci and Lounsbury (1993), detailing options available in responding to stranded live dugongs.

## 1.2 Purpose of Necropsies

There is little information on the causes of morbidity and mortality in marine mammals that utilise inshore and near offshore habitats. In addition to providing biological information, *necropsy* (or *post-mortem*) examinations provide opportunities to investigate signs of natural and human-induced causes of death. For example, while diseases manifest in any species as either primary or secondary events, a finding of increased secondary diseases within a species could warrant an investigation of a possible common environmental determinant (B. Hill pers. comm. 2000). The main objectives of dugong stranding and *necropsy* procedures described here are (in descending order of priority):

- To gather the best possible information to identify cause of death;
- To collect other information relevant to management agencies implementing conservation initiatives for the recovery and conservation of dugong populations;
- To collect basic biological information.

It should be appreciated that evidence collected during dugong stranding and subsequent *necropsy* evaluations may be used in a court of law. Therefore, it is imperative that these

incidents be documented as extensively as possible. Standardised written and photographic documentation are the most effective means of collecting the appropriate data (see Section 3.2).

### **1.3 Summary of Status and Life History of the Dugong**

The dugong occupies a large range that spans some forty countries and includes tropical and subtropical coastal and island waters from east Africa to Vanuatu. A significant proportion of the world's dugongs is found in northern Australian waters, where most of the modern dugong research has been conducted. In Australia, the dugong's range extends from Moreton Bay in the east across the north coast to Shark Bay in the west (Marsh and Lefebvre 1994).

Australia is obligated to conserve dugongs under several international conventions and national conservation acts. The dugong is listed in The World Conservation Union Red Data Book of Threatened Species as 'Vulnerable to Extinction' (International Union for the Conservation of Nature 1996). At the national level, dugongs are included as a 'Listed Migratory Species' under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*, in view of its status under the Bonn Convention as a 'Listed Marine Species'. In Australia, the dugong is listed as 'Vulnerable' under Queensland's *Nature Conservation Act 1992*, as 'Protected' under the Northern Territory's *Territory Parks and Wildlife Conservation Act* and New South Wales' *National Parks and Wildlife Act*, and as 'Specially Protected' under Western Australia's *Wildlife Conservation Act 1950*. One of the World Heritage values of the Great Barrier Reef Region is that it 'provides major feeding grounds for large populations of the endangered species *Dugong dugon*' (Great Barrier Reef Marine Park Authority [GBRMPA] 1981).

Dugongs can live for about 70 years. Dugongs of both sexes that are less than 2.2 m in length are thought to be immature, whereas those greater than 2.5 m in length are mature. Those between 2.2 m and 2.5 m can be either immature or mature (Marsh et al. 1984c). Dugongs breed very slowly and females usually start having young when they are about 10 to 17 years old. Pregnancy lasts about 13 months and dugongs only have one calf at a time. Calves will stay with their mothers for 18 months or more. Female dugongs usually wait at least three years before they breed again (Marsh 1995). Population simulations indicate that even with the most optimistic combinations of life-history parameters (e.g. low natural mortality and no human-induced mortality), a dugong population is unlikely to increase more than 5% per year (Marsh 1999).