

Dugong

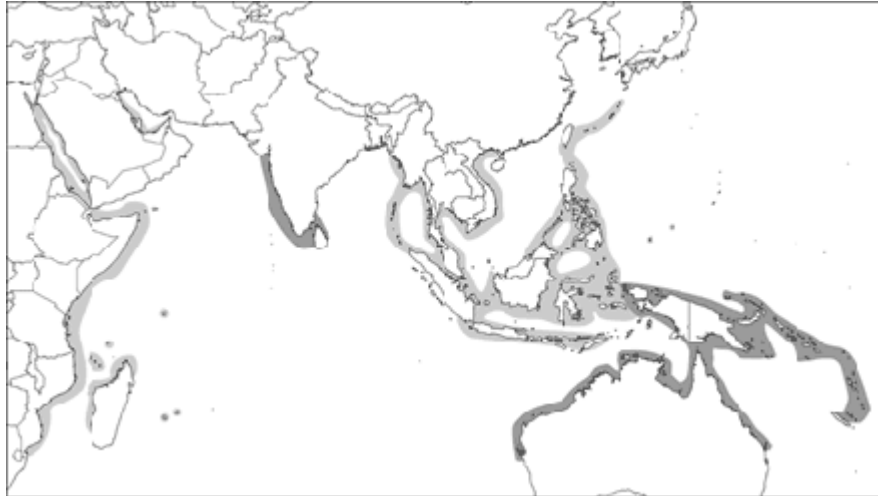
Status Report and Action Plans for Countries and Territories



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Executive Summary

- The dugong (*Dugong dugon*) is the only herbivorous mammal that is strictly marine, and is the only extant species in the Family Dugongidae. It is listed as vulnerable to extinction at a global scale by The World Conservation Union (IUCN). The dugong has a large range that spans some 37 countries and territories and includes tropical and subtropical coastal and island waters from East Africa to Vanuatu, between about 26° north and south of the Equator.
- The purpose of this document is to present a global overview of the status of the dugong and its management in the various countries in its range. We aimed to provide comparative information that will enable individual countries to develop their own, more detailed, conservation plans.
- This document contains information on dugong distribution and abundance, threatening processes, legislation, and existing and suggested research and management initiatives for 37 countries and territories in the dugong's known range. The report is organised in a geographical sequence from the Western Indian Ocean region, through to the South West Pacific. Chapter One introduces the Dugong; Chapter 2 comprises information on East Africa; the Red Sea and the Arabian Gulf. Chapter 3 discusses India and Sri Lanka; Chapter 4 presents data from Southeast Asia including Japan, Taiwan (China), China, the Philippines, Vietnam, Cambodia and Thailand; Malaysia, Singapore and Indonesia; Chapter 5 discusses Palau, Papua New Guinea, the Solomon Islands, New Caledonia and Vanuatu; and Chapter 6 presents information from Australia.



Distribution of Dugongs

[Explore the map](#)

- Throughout much of its range, the dugong is believed to be represented by relict populations separated by large areas where its numbers have been greatly reduced or where it is already extirpated. However, the degree to which dugong numbers have dwindled, and its range has been fragmented, is not known for any country in its range. The dugong is still present at the historical limits of its global range, although there is evidence of a reduction in its area of occupancy within this range.
- In most countries in the dugong's range, our knowledge of dugong distribution and abundance is known only from anecdotal information. In ten or so countries, some information on dugong distribution and abundance has been obtained from spatially and temporally limited surveys generally conducted parallel to the shoreline. These surveys provide minimum counts only. Extensive quantitative aerial surveys using transects across the shoreline depth gradient have resulted in a more comprehensive knowledge of dugong distribution and abundance in the coastal waters of most (but not all) of the dugong's range in northern Australia and the Arabian region. However, even in these regions, the information is not comprehensive enough to establish trends in abundance for most areas, especially as there is increasing evidence that dugongs undertake large-scale movements.
- It is inappropriate to compare the abundance of dugongs estimated using shoreline and quantitative surveys. We believe that most of the estimates of dugong population size recorded in this document are underestimates, probably major underestimates. Nonetheless in most parts of its range the anecdotal evidence suggest that dugong numbers are declining.
- Dugongs are long-lived with a low reproductive rate, long generation time, and a high investment in each offspring. 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 at more than about 5% per year. This makes the dugong vulnerable to over-exploitation. The

rate of change of a dugong population is most sensitive to changes in adult survivorship. Even a slight reduction in adult survivorship as a result of habitat loss, disease, hunting or incidental drowning in nets, can cause a chronic decline.

- Dugongs are seagrass specialists and frequent coastal waters. Major concentrations of dugongs tend to occur in wide shallow protected bays, wide shallow mangrove channels and in the lee of large inshore islands. Dugongs are also regularly observed in deeper water farther offshore in areas where the continental shelf is wide, shallow and protected. The dugong's fecundity is very sensitive to the availability of its seagrass food. When dugongs do not have enough to eat they delay breeding, making habitat conservation a critical issue.

- Dugongs are vulnerable to anthropogenic influences because of their life history and their dependence on seagrasses that are restricted to coastal habitats and are often under pressure from human activities. The seagrass ecosystems on which dugongs depend are very sensitive to human influence. Seagrass beds may be destroyed directly by mining and trawling or lost through the effects of disturbances such as dredging, land clearing and land reclamation. These activities cause increases in sedimentation and turbidity which, in turn, lead to degradation of seagrass extent, density and productivity through smothering and lack of light. Episodic losses of hundreds of square kilometres of seagrass are associated with extreme weather events such as some cyclones, and floods. Most losses, both natural and anthropogenic, are attributed to reduced light intensity due to sedimentation and/or increased epiphytic growth caused by nutrient enrichment. In some cases, factors such as poor catchment management and sediment instability interact to make the processes more complex so that it is often difficult to separate natural and anthropogenic causes of seagrass loss. In addition, herbicide runoff from agricultural lands presents a potential risk to seagrass growth adjacent to sugarcane production areas.

- Accidental entangling in mesh nets and traps set by fishers is a major, but largely unquantified, cause of dugong mortality in many countries and was identified as a major concern in most of the countries covered by this document.

- Dugongs are culturally significant to communities throughout their range. In this document, we record information about the indigenous use of dugong products in most countries in the dugong's range. Dugongs are caught for meat, oil, medicaments, amulets and other products. In many countries hunting dugongs is banned and they are no longer hunted deliberately, however, dugong products are still highly valued and stimulate direct takes. Australia's indigenous peoples consider dugong hunting to be an important expression of their identity.

- Although there are few records of dugong deaths resulting from vessel strikes, increasing vessel traffic in the dugong's range increases the likelihood of strikes. Extensive shallow areas used by regionally important populations of dugongs and situated close to areas of high boat traffic, are particularly at risk.

- The expansion of ecotourism has resulted in the establishment of tourism operations involving dugong-watching cruises and/or swim with dugong opportunities in several countries, including Australia, the Philippines and Vanuatu.

- There are socio-political impediments to dugong conservation, particularly in developing countries. The displacement and urbanisation of rural human populations has led to the loss of traditional values and taboos to resource exploitation. The nearshore areas where dugongs occur have become an easy and convenient source of food and income. The provision of philanthropic aid from 'developed countries' increases the efficiency and level of exploitation. The situation is exacerbated by an absence of adequate legislation, enforcement and management.

- Unless human values change dramatically, we believe that it will be impossible to reduce anthropogenic impacts on the dugong throughout its vast and remote range. Detecting trends in dugong abundance is difficult, particularly at low densities. The objectives of maintaining dugong numbers at present or higher levels and facilitating the recovery of depleted populations will not be achieved if the only trigger for management intervention in an area is a demonstratively declining population.

- A survey by the World Resources Institute rates the risks from coastal development as medium to high for much of the dugong's range outside Australia because of high levels of human population growth and rapid rates of industrialisation. In view of the multiple impacts to which dugong populations are subjected, we consider that the optimum conservation strategies are to

1. identify areas that still support significant numbers of dugongs
2. extensively involve the community and jointly consider how the adverse impacts on dugongs can be minimised and their habitat protected (Ideally this should be done in the context of comprehensive plans for coastal zone management, perhaps using the dugong as a "flagship" species.)

- Control of direct mortality on dugongs in these key areas should reduce dugong mortality provided the areas chosen consistently support high numbers of animals (even though individual dugongs will move in and out of the areas). The long-term effectiveness of these areas will depend on community support and the maintenance of high-quality dugong habitat. This will hinge on the capacity to control land-based inputs.