

THE WEST INDIAN MANATEE IN THE CARIBBEAN AND NORTHERN SOUTH ATLANTIC

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NOTE:

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PREFACE

The Global Plan of Action for the Conservation, Management and Utilization of Marine Mammals (MMAP) was developed between 1978 and 1983 as a joint effort by the United Nations Environment Programme (UNEP), the Food Agriculture Organization of the United Nations (FAO) and other governmental and non-governmental agencies concerned with marine mammal issues, such as the International Whaling Commission (IWC) and the World Conservation Union (known as IUCN).

The principles of MMAP were approved by the FAO Fisheries Committee in October 1983, and adopted by UNEP's Governing Council in May 1984. During its annual meeting in June 1984, the IWC lent support to the portion of the MMAP relevant to cetaceans. In November of that year, the General Assembly of IUCN approved the promotion of the MMAP as an item of high priority. With this official support, the implementation of the MMAP was initiated.

The primary objective of the MMAP is to generate a consensus among the world's nations on which to base a worldwide policy for the conservation of marine mammals. "Conservation" here means the rational exploitation of the species and the management of human activities that may affect it. The concept involves "the preservation, maintenance, sustainable use, recovery and enhancement of the natural environment".

The MMAP consists of five target areas: policy formulation, regulatory and protective measures, improvement of scientific knowledge, improvement of law and its application, and enhancement of public understanding. The MMAP aims to enlist public support for measures of conservation in general and the Action Plan in particular, and the consolidation of the interests of all parties with similar objectives in the sphere of marine mammal conservation.

Organizations willing to play important roles in the implementation of the MMAP include governmental and non-governmental organizations such as UNEP, FAO, the Intergovernmental Oceanographic Commission (IOC/UNESCO), the Inter-American Tropical Tuna Commission

(IATTC), IUCN, World Wide Fund for Nature(WWF), Greenpeace International, and the International Fund for Animal Welfare (IFAW) which are all signatories to a Memorandum of Understanding on cooperation in the framework of the Action Plan.

Scientific investigation and conservation of aquatic mammals in South America has expanded notably since 1984. The communication and exchange of ideas among researchers was reinforced with the organization of the biannual Workshop of Experts on South American Aquatic Mammals. The first workshop took place in 1984 in Buenos Aires, Argentina; the second in Rio de Janeiro, Brazil in 1986; the third in Montevideo, Uruguay in 1988; the fourth in Valdivia, Chile in 1990; the fifth in Buenos Aires in 1992, and the sixth in Florianópolis, Brazil in 1994. Experts throughout South America have participated in the meetings, and the quantity and quality of presentation at those meetings attest to the increasing interest shown in aquatic mammals in the region.

The Caribbean manatee (*Trichechus manatus manatus*) is a large yet gentle mammal that lives in warm waters. Unlike other marine mammals (seals, dolphins, porpoises and whales), manatees do not feed on fish but subsist almost entirely on vegetable matter. Manatees share waterways and coastal areas with man and this makes them vulnerable to human activities. Because of their gentle habits, slow movements, and preference for habitats favoured by man, they are in danger of becoming extinct in all areas where they live. Commercial and subsistence hunting, associated with a low rate of reproduction, and present rates of loss of habitat have caused their decline. Despite legal protection in most countries, some manatee populations are still decreasing because they are being killed by local people for food.

This booklet is an attempt to bring together information on the biology, ecology and behavior of manatees along the coasts of Central and South America and to raise awareness of the delicate situation in which they survive. In areas where specific knowledge on the Caribbean manatee is not readily available, information is provided on the Florida subspecies (*Trichechus manatus latirostris*), which has been studied more intensively.

Description

Adult Caribbean manatees have massive, cylindrical bodies, which average about 300 cm in length and 500 kg in weight. The record weight belongs to a 1,200 kg animal entangled in a net in northeastern Brazil in 1982. A 366 cm animal was recovered in Puerto Rico in 1985. Manatees have peculiar diaphragms (which are in a horizontal position) and lungs (which are very elongated and dorsally located). These characteristics, associated with very dense and massive bones of the skull and ribs, and

the large body size, allow good stability in the water and prevent manatees from expending excessive energy when moving about feeding.

Manatee skin is not smooth like that of dolphins, but rough and covered with sparse short, fine hairs. The colour may vary with age, from almost black to grey or brown, but algae growth may lend it different shades. One cannot determine the sex of a manatee, unless it is accompanied by a calf or rolls over onto its ventral surface. The only sexual dimorphism is in the position of the genital apertures. In females it is more caudal, closer to the anus; in males the genital opening is located

toward the middle of the body, in close proximity to the umbilicus. The single mammary glands are found behind each flipper, in the axilla.

The head is relatively small, not distinctly visible from the body, and is often surrounded by heavy folds. The snout is squarish and downturned, adjusted to the feeding habits of the species. The fleshy, movable lips have stiff bristles and food is grasped in the mouth between tough pads in the front of the upper and lower jaws. The tail

Photo: Natura Artis Magistra



Fig 1: Fine hairs scattered over the body may perform a sensory function as the animals maintain close contact

is a large spatulate paddle shape. Pectoral flippers are well developed and flexible, and have three to four small nails. Manatees lack a dorsal fin and hind limbs, but the pelvic bones remain as vestigial reminders of a land ancestor.

The eyes are small, although well-developed; they are positioned laterally on both sides of the head. Of limited use in murky water, they allow object detection within several metres in clear waters. The sense of smell seems to be deficient or at least unused in the underwater environment. There is no external ear, and the opening is reduced to a minute hole located behind the eye. Ear bones are large even in small animals, and hearing is very acute. Good auditory capabilities have helped manatees detect and avoid hunters. Unlike other marine mammals, manatees do not seem to use echolocation.

Manatees normally keep their nostrils closed, whether above or below the surface. They open them only for a few seconds, when taking

a breath. Breathing intervals may be greater than 10 minutes^{22,37}, but usually range between 1.5 and 5 minutes, depending on the manatee's activity. Young calves remain submerged for very short periods of time compared with adults³⁷.

A unique manatee characteristic is its dentition. The entire tooth row migrates forward (at approximately 1 mm/month), and the worn teeth eventually fall out halfway through to the front, their roots having been reabsorbed. There are only 6-8 erupted functional molars at any one time in each half jaw. New teeth emerging from the rear replace the ones lost, as is the case with elephants. However, the manatee, unlike the elephant, has an unlimited number of teeth. The migration starts when the calf begins to chew on solid food. This mechanism is adaptive to increased tooth wear due to the abrasive effects of silica in the diet. This kind of dentition renders the widely used age determination through teeth inapplicable in the case of manatees. Manatee ear bones, on the other hand, contain growth rings similar to those found in the teeth of other mammals and may be used to estimate age⁵⁸. A male manatee (297 cm) from Puerto Rico was estimated to be 26 years old when it died. The oldest manatee examined in Florida so far, contained at least 50 layers on its ear bone at time of death. Unfortunately this manatee was hit and killed by a boat so there is no telling how long it might have lived if it hadn't had the accident.

Although manatees have been portrayed as quite unintelligent creatures due to their slow mode of life, recent research has demonstrated that their brains are well developed⁹³.

Related Species

Trichechus manatus is a member of the family Trichechidae in the order Sirenia. This family is composed of only three species of manatees, all of which are found in tropical and subtropical latitudes along the coasts of the Atlantic Ocean and in adjacent rivers. Two subspecies of the West Indian manatee have been described: *Trichechus manatus latirostris* (Florida manatee) inhabiting coastal Florida and the Gulf of Mexico, and *Trichechus manatus manatus* (Antillean manatee), occurring in the Caribbean and along the coasts and rivers of northern South America^{29,42}. The deep water and strong currents of the Straits of Florida on the one hand and the cool winters along the northern coast of the Gulf of Mexico on the other, may constitute barriers to gene flow between the two subspecies²⁹. *Trichechus senegalensis* (West African manatee) occurs in the rivers and estuaries of West Africa. *Trichechus inunguis* (Amazonian manatee) lives exclusively in freshwater, and inhabits rivers of the Amazon basin.

Manatees are closely related to the dugong (*Dugong dugon*), a totally marine species of the Indo-Pacific region. The most conspicuous difference between manatees and dugongs is the fluked tail in the latter. *Hydrodamalis gigas* (Steller's sea cow) inhabited the Bering Sea and was the only sirenian to have lived in cold waters. It attained sizes almost three times as large as recent manatees and was over-exploited by meat hunters and exterminated within 25 years of its discovery in the early 18th century.

Evolution

The group Sirenia includes the manatees and dugongs, which derive from an ancestral group of early plant-eating land mammals that existed some 50 million years ago⁹⁴. Hyraxes (small mammals from Africa and Asia) and elephants are the closest living relatives to manatees and dugongs⁴⁸.

Sirenians used to be much more diverse in the New World waters. During the Eocene, dugongids thrived in the marine waters whereas early manatees appeared in the Miocene and lived in the fluvioestuarine areas. Conditions changed with the uplift of the Andean chain. Erosion processes added silt and nutrients to the waters, stimulating plant growth, especially seagrasses. Manatees adapted to the changes by developing their specialized dentition, but dugongs were unable to evolve rapidly

enough to compete with manatees, and disappeared from the Western Atlantic.

During the mountain-chain forming, some manatees were trapped in inland waters long enough to allow the evolution of the Amazonian manatee²⁷.

Habitat



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