

Trichechus manatus (West Indian Manatee)

Family: Trichechidae (Manatees)

Order: Sirenia (Sea Cows)

Class: Mammalia (Mammals)



Fig. 1. West Indian manatee, *Trichechus manatus*.

[<http://faculty.ucmerced.edu/rortiz/manatees.html>, downloaded 21 November 2011]

TRAITS. The largest surviving sirenian (Sirenian International, 2002). They are large creatures with fusiform shaped bodies, ending with a flattened and rounded tail (Fig. 1). They have paddle like flippers, with three or four nails on each and no hindlimbs. Their body colour is usually brown to grey in colour, although the growth of algae on the body often gives them a patchy greenish colouration. The skin of *T. manatus* is finely wrinkled with sparse body hair coverage.

Their body sizes range in length and weight, typically some 2.5-6 m from head to tail and a weight of about 300- 500 kgs (Odell, 1982). *T. manatus* shows sexual dimorphism, or physical differences between the females and males. The females have a larger body size than males. They can be distinguished by means of examining their urinary and reproductive openings, which in females is located at the front of the anus, whereas it is situated a short distance underneath the navel in males. In the females there is an outstanding teat at the bottom of each of their flippers, in the axillary position which they use to nurse their young (Reynolds & Odell 1991).

In terms of facial structure, they have a rounded faces; small eyes which have a protective inner membrane to prevent against seawater irritation; nostrils on the upper surface of the snout which enables them to breathe comfortably even while submerged, the nostrils also have valves which shut the nasal cavity to prevent water entry when submerged; small, lobe-less ear openings located just behind the eyes; a flexible upper lip divided by a vertical cleft which is lined with bristle like hairs for drawing food into the mouth and large grinding molar teeth which are continually replaced (Domning & Hayek 1986).

At birth they are darkish brown and over a period of four weeks they usually lighten to a grayish colour. In addition to being smaller than the adults, infants can be recognized by the presence of vertical lines which is referred to as fetal folds. These lines enclose the entire circumference of the body at the region just before the tail (Odell, 1982).

ECOLOGY. Found in shallow coastal areas, slow moving rivers and estuaries, canals and saltwater bays. They are distributed throughout the Caribbean and are also found in south-eastern United States (IUCN, 2008). They exhibit tolerance of freshwater, saline water and brackish water. The diet of the manatee mainly herbivorous, they prefer seagrasses, mangrove leaves and algae. However, may inadvertently feed on small water insects, crustaceans and fishes in the wild. Captive animals have been known to readily accept fish (Powell 1978). They are solitary creatures, although they exhibit socialization during mating season. They are also migratory (Hartman, 1979).

SOCIAL ORGANIZATION. They are both nocturnal and diurnal. Animals are fully independent and pass their time alone. In terms of mating, they are polyandrous, or mate in groups of one female and several males. The only firm relationships are the one between cow and calf, as well as the formation of the estrous (or mating) herd. All other associations tend to be casual and temporary (Hartman, 1979) although Koelsch (1997) reports that there is a degree of non-random strong association established among a few individuals, whereas the majority exhibit much weaker bonds. He also notes that lasting relations exist among manatees of the same sex. Males exhibited greater sociality than females.

ACTIVITY. *T. manatus* lacks rigid daily routines. Normally, feeding, resting and other activities are done either at day or night (Hartman, 1979). However, in temperate regions where there are cold spells they time their activities by the daily temperature cycle. Manatees in the Blue Spring, Florida would migrate to the nearby St. John's River in the late afternoon, just as the water temperature started to decline and would return to the spring in the early morning when the water was warm. This behavior stopped when the temperature returned to constant warmth (Bengtson, 1981). Manatees usually undertake their activities at times where there is a low chance of them encountering humans or boats (Hartman, 1979).

FORAGING BEHAVIOUR. Spend within six to eight hours of the day feeding during which they consume sometimes 4% to 8% of their body weight by feeding on mostly wet, abrasive vegetation (Reynolds & Odell 1991). As predescribed, *T. manatus* has a bilobed upper lip. This lip is covered with firm bristles. When feeding these lobes are turned inside out, which allows for the bristles to penetrate the vegetation. They are then laterally closed, enabling the bristles to tuck the food into the interlobular cleft and direct it into the mouth. Chewing is independent of this lip pad manipulation. They masticate at a rate of two chews per second and they masticate as

they rise to the surface to breathe, it pauses while they breathe and resumes as they re-submerge. The flippers are often used to position themselves and to sweep away encumbering vegetation when feeding on submerged and rooted vegetation. The tips of the flippers can also be used to dig into sediment or to hold the food to their mouths (Fig. 2) (Hartman, 1979).

COMMUNICATION. Olfactory communication: *T. manatus* scent marks by rubbing the secretory parts of their bodies, namely the area under the chin and the flippers against stationary objects in its habitat which include rocks and large logs. Females exhibit this type of behaviour more frequently than males and its purpose is thought to be to convey the breeding status of the female (Taylor, 2004).

Vocal communication: Although they generally are silent, *T. manatus* employs underwater vocalizations produced by their larynx and the different acoustics made represent different functions. The vocal communication used is often described as “chirps and squeaks”, and this is thought to help maintain contact when in groups (Cavendish, 2010). Vocalizations comprise intricate, one note sounds with several harmonies and inflections. (O’Shea et al. 2006). *T. manatus* has a hearing range of 0.4 - 46 kHz. The typical frequency of these calls lie within 1.75 – 390 kHz and has an inverse correlation with body size. Also, the highest rates occur between antiphonal (calling and responding) communication between mother and calf. This only occurs when they are trying to rejoin following a brief parting. This suggests that individuals can recognise each other by sound. (O’Shea et al. 2006)

Visual communication: Manatees use their vision to investigate objects. Dependant on water clarity, manatees react to visual stimuli from remote locations, sometimes over 100 feet away (Hartman 1979).

SEXUAL BEHAVIOUR. Females are uniparous which means they give birth to one offspring at a time, although on rare occasion multiple births may occur. The gestation period is 12- 13 months, and several years often 2-5 elapse between pregnancies. There is no fixed time during the year in which calving occurs (Van Meter, 1989).

Females have a lengthy estrus period, this means that they undergo a long period of sexual excitement in which they are highly receptive to mating, preceding their ovulation. This allows time for a great number of males to assemble, thereby causing the amount of potential mates to increase. The gathering of males and a female is known as a “mating herd” (Fig.3) and can last anywhere from a week to a month, dependant on the receptivity of the particular female. Males frequently join and abandon, and rejoin different mating herds. Formation of a mating rights hierarchy for the female, based on male dominance is common. Often they pursue the female relentlessly, mouthing and embracing her back and riding her as she surfaces. They roll to an upside down position to approach her abdomen. The female manatee spends the majority of the mating period attempting to escape and keep away from the males. Often, she comes more inland since in shallower water it is more difficult for the male to approach her sexual organs which are on her underside (Hartman, 1979).

As receptivity of the female is achieved, copulation occurs with an individual or several males, continuously. The process of copulation is short. The male positions himself below the female in an orientation such that his abdomen and hers are opposite. In shallow habitats, this arrangement is sometimes modified to a “side by side” one (Fig 4). The association between the female and her mates are very temporary (Hartman 1979).

Bengtson (1981) utilized radio transmitters to monitor the locomotory patterns of individuals in the St. John's River. He discovered adult males patrol sections of the river in a systematic manner, in what was described "circuits". Adult females which were not in estrus maintained a much smaller home range than the males. It was thought that this behaviour allows them to increase the likelihood of finding females in estrus, in the same way the likelihood of females in estrus contacting males was increased. Also, the "mating herd" attracts more male for mating.

JUVENILE BEHAVIOUR. The length of newborns is typically around 4 to 4.5 feet and their weight is approximately 30 kg. They require a high degree of parental care and are dependent on their mother for approximately two years. They nurse on milk produced by their mother. Nursing takes place underwater in roughly three minute intervals at a time during which the calf lines up laterally adjacent to its mother to reach her teat (Fig. 5). However they have also been observed nibbling on underwater plants at several weeks old (Van Meter, 1989). Mothers and offspring recognise each other and some offspring have been known to spend part of their sub adult life in the same range as their mother. This is thought to be advantageous to a calf since it helps it to learn established feeding grounds and migratory routes. Juvenile males often engage in play with juvenile and adult females in a manner which is suggestive of sexual activity. Once fed, they play for hours (Hartman, 1989).

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Author: Petal A. Bissessar

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Fig. 2. West Indian manatee using flippers to uproot and eat *Hydrilla*.
[<http://www.sciencephoto.com/media/103832/view>, downloaded 13 November 2011]



Fig. 3. Mating herd of *T. manatus*.

[<http://photoartsc creations.com/manatees.htm>, Downloaded 13 November 2011]

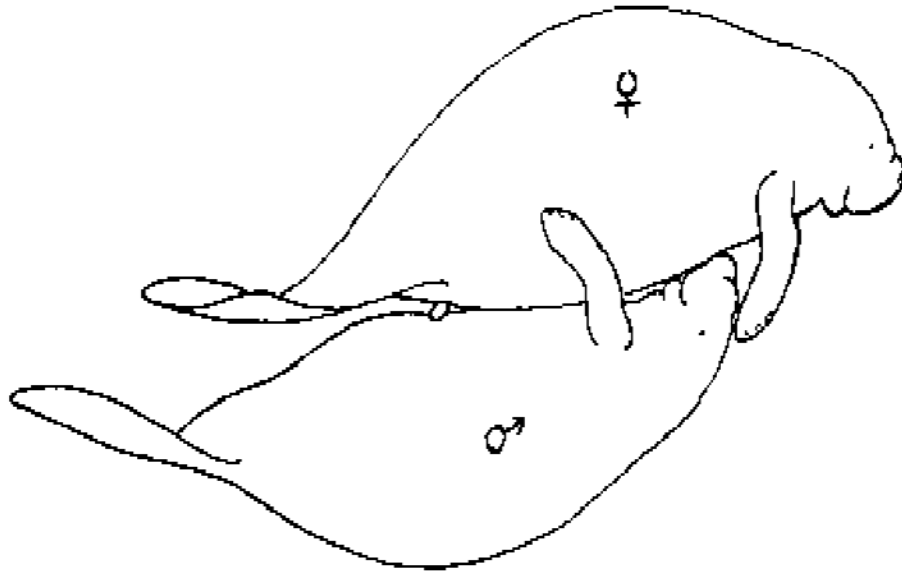


Fig. 4. Copulatory embrace.

[Figure 36 of Hartman (1979)]



Fig. 5. Calf suckling at teat of mother.

[<http://www.fws.gov/athens/endangered/temammals.html>, downloaded 13 November 2011]