# 1. INTRODUCTION

Although sea turtle conservation programmes have been encouraged by the recent discovery of important new nesting beaches, the future of sea turtles is still threatened by the decline of their natural populations, especially in nesting areas. Research and conservation activities on sea turtles are increasing, but there are still many gaps in our knowledge of the life history of these animals.

This catalogue provides a brief description of the world's eight sea turtle species, as well as up-to-date information on the state of the various populations presently or historically exploited by man. It also includes guidelines for species identification, diagnoses of families, genera and species, and notes on geographical distribution, habitat, and biology of each species. A good understanding of the biology of sea turtles is essential for their management and protection.

Since the present document is not intended as a primarily taxonomic work on the group, the complex problem of subspecies has not been treated in detail. Furthermore, the compilation of information for each species is far from complete and hence, it is advisable to consult other recent publications on this group, such as, for example, **Björndal, K.E. (ed.), 1981**: Biology and Conservation of Sea Turtles. Proceedings of the World Conference on Sea Turtle Conservation. Washington, D.C., 20-26 November 1979, and **Bacon, P. *et al.* 1984**: The Proceedings of the Western Atlantic Turtle Symposium, WAYS-I, San Jose, C.R., 17-22 July 1983 (Spanish edition 1987). and WATS-II, Mayaquez, Puerto Rica, 12-16 October, 1987.

Finally, it is obvious that not all existing information on sea turtles was available to the author. Catch statistics by species were usually difficult to evaluate or were available only in local records; no statistics are recorded on the bycatch of sea turtles in shrimp fisheries, and in many places, catch figures are concealed or mislabelled. The reader is hereby kindly requested to notify the editors and the author of possible errors and omissions that should be corrected in eventual future editions of the catalogue.

## 1.1 Plan of the Catalogue

Following the general introductory section and the illustrated keys, the information on families, genera and species is presented in alphabetical order. The species accounts are arranged as follows:

**(1)** **Scientific name** : Reference is given to the original description of the species.

**(2)** **Synonymy** : Synonyms and different name combinations are listed (misidentifications and other nomenclatorial problems are discussed under "Remarks" (see paragraph 11).

**(3)** **FAO Species Names** : English, French and Spanish names for each species were selected on the basis of the following criteria: (i) each name must apply to one species only, in a worldwide context; (ii) the name should not lead to confusion with other species. Wherever possible, the denominations selected were based on vernacular names (or parts of names) already in existence within the areas where the species occur. FAO species names are not intended to replace local names, but they are considered necessary to overcome the considerable confusion caused by the use of a single name for many different species, or several names for the same species.

**(4)** **Diagnostic Features** : Distinctive characters of the species as an aid for identification. Species identifications should be attempted only after consultation of the illustrated key to families and genera.

**(5)** **Geographical Distribution** : The entire geographic range of the species, including areas of seasonal occurrence, is given in the text and shown on a small map. In cases where only scattered records of occurrence are available, interrogation marks are used to indicate areas of suspected distribution.

**(6)** **Habitat and Biology** : The typical habitat and biological information, such as details of migrations, breeding, egg-laying behaviour, season and areas, and food and feeding grounds.

**(7)** **Size** : The maximum total carapace straight-line length and weight. Also, average size and weight of eggs and hatchlings. Size at first maturity, and average size recorded during the nesting period.

**(8)** **Interest to Fisheries** : An account of the areas where the species is captured and of its fishery. Its importance is either qualitatively estimated or figures of annual landings are provided. Data on utilization are also given where available. Here too, the quality and quantity of the information available vary considerably with species and countries. If species are considered threatened or endangered, and if they are the object of an enhancement programme, or protection laws, this is mentioned under "Remarks" (see paragraph 11).

**(9)** **Local Species Names** : These are the names used locally for the various species. The present compilation is necessarily incomplete, since only a fraction of the local names used throughout the world is actually published Usually, local names are available only for species supporting traditional fisheries. Apart from

possible omissions due to limitations of available literature, some of the denominations included may be somewhat artificial (i.e. through transliterations of indigenous words into English or *vice versa*). Each local species denomination is preceded by the name of the country concerned (in capital letters) and, where necessary, by the geographical specification (in lower case). Whenever possible, the language of the transcribed vernacular name is added in parenthesis. When more than one name is used within a country, the official name, if available, is underlined.

**(10)** **Literature** : This includes references to important publications relevant to the species, the emphasis being on biology, conservation, and fisheries. These references are included in the bibliography at the end of the catalogue.

**(11)** **Remarks** : Important information concerning the species not fitting in any of the previous paragraphs is given here.

## 1.2 General Remarks on Sea Turtles

Sea turtles were common in the Cretaceous, 130 million years ago, and their fossil record extends back at least 200 million years. They lived together with dinosaurs, and have survived the giant *Plesiosaurus* and the *Ichthyosaurus.* All present-day genera and species originated in the period from the early Eocene to the Pleistocene, between 60 and 10 million years ago. Together with the marine snakes and iguanas, they are the only surviving sea-water-adapted reptiles. Their distribution is mostly tropical and subtropical and they depend on the land only during the reproduction period (except some viviparous sea snakes).

In spite of their circumtropical distribution, sea turtles are represented by species that differ widely in their seasonal cycles**,** geographical ranges and behaviour. There are also considerable differences among populations of the same species.

All sea turtles have a high commercial value. Their importance varies among countries and also, locally within countries. In some areas, they constitute a valuable protein source, in others they are only used as a delicacy. In certain countries, sea turtles have been the object of ancient ritual practices, or they are venerated as sacred animals. Since the Second World War, commercialization of sea turtles has increased considerably. As a result of this, the formerly numerous colonies have been very rapidly depleted and some of them nearly extinguished. Nowadays, additional problems such as pollution, beach invasion, poaching, entanglement of turtles in set-nets, or their drowning in trawl-fishing, are further endangering these species, and it has become evident that the remaining sea turtle populations are seriously threatened if these dangers cannot be reduced.

The sea turtle catch is primarily directed to the sale of fresh meat for human consumption. However, egg-harvesting is also important to riparian people of many countries. Leather made from turtle skin is a relatively new product introduced in the international market about 20 years ago. Tortoise-shell or “Carey” was common for ornamental use in Europe during the Middle Ages, and even earlier in Oriental countries (e.g. Japan), where it had and still has a deeper cultural value, being used during wedding ceremonies in the bride’s costume, and as carved pins in the hair. Turtle oil has multiple uses, principally as a basic ingredient of certain cosmetic creams, or as medicine for pulmonary diseases. The commercial value of sea turtles varies strongly from one species to another. The green sea turtles (***Chelonia***) are pursued for their meat; the hawksbill (***Eretmochelys***) for its shiny tortoise-shell; the Ridley (***Lepidochelys***) for its excellent leather; the leatherback (***Dermochelys***) for its large yield of oil; the loggerhead (***Caretta***) is the least profitable of these species. The eggs of most species are harvested wherever found, usually irrespective of official permits. All species, except the leatherback, are used for the production of “calipee” and “calipash” which are strips of cartilaginous tissue taken from the rims of the carapace and plastron and between the bone plates of the plastron. This product is used for the preparation of “turtle soup”, an expensive item in many top quality restaurants.

Nowadays, almost all sea turtles are considered threatened or endangered by the International Union for the Conservation of Nature and Natural Resources (IUCN), quoted in the Red Data Book, and their commerce is prohibited in those countries that have signed the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)**.**

Programmes for the recovery and enhancement of depleted populations are undertaken in the framework of a worldwide action, supported by local or international wildlife foundations in conjunction with various governmental organizations. Those campaigns include principally law enforcement, adoption of fishing regulations, gear restrictions (e g ., TED or “Trawl Efficiency Device” or “‘Turtle Excluder Device”), protection of nesting areas through turtle camps, nurseries for hatchling release, and “imprinting-headstarting” aimed at the development of new nesting places and of the avoidance of the strong predation to which small turtles are subjected during the first year of their lives. Some of these activities are still in the experimental phase but may become important tools for avoiding the extinction of these valuable animals**.**

Because of the depletion of natural populations, two additional methods of augmenting sea turtle populations (especially of the green turtle ***Chelonia mydas***) have been introduced. The first method, called “**Ranching**”- involves raising sea turtles from eggs or hatchlings taken from wild stocks to a marketable size. This is not a closed-cycle system as it

continually relies on wild populations as a source for eggs or hatchlings. The second method, known as **"Farming"** - relies only initially on wild populations for eggs or hatchlings (and occasionally, later, in order to maintain a genetic diversity, to avoid problems with inbreeding); it attempts to raise these hatchlings to maturity for breeding and development of a self-sustaining captive population. Both practices appear to be harmless and could be of aid to the survival of natural populations by reducing the trade pressure on wild stocks, but they have raised more controversy than had been suspected at their inception. The commercialization of sea turtles is now under review by CITES, and trade with animals bred in captivity is allowed only if the breeding stock is not replenished from the wild popuation and if the farm can reliably produce a second generation offspring under captive conditions. A second generation is defined as that conceived in captivity from parents that were also born in the farm.

Official catch statistics for sea turtles are rather scanty and doubtless represent only a small fraction of the actual capture. The world catch of adults reported for 1987 in the FAO Yearbook on Fishery Statistics totalled 3 100 metric tons, of which ca. 1 200 metric tons came from the Western Central Atlantic (Fishing Area 31), 864 metric tons from the Eastern Central Pacific (Fishing Area 77), 305 metric tons from the South East Pacific (Fishing Area 81), 258 metric tons from the Western Central Pacific (Fishing Area 71), 190 metric tons from North West Pacific (Fishing Area 61), 153 metric tons from the Eastern Central Atlantic (Fishing Area 34), 50 metric tons from the Eastern Indian Ocean (Fishing Area 57), 37 metric tons from the Western Indian Ocean (Fishing Area 51), 20 metric tons from the Mediterranean (Fishing Area 37) and 10 metric tons from the South East Atlantic (Fishing Area 41). No statistics are reported for turtle eggs.

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## 1.3 Illustrated Glossary of Technical Terms and Measurements

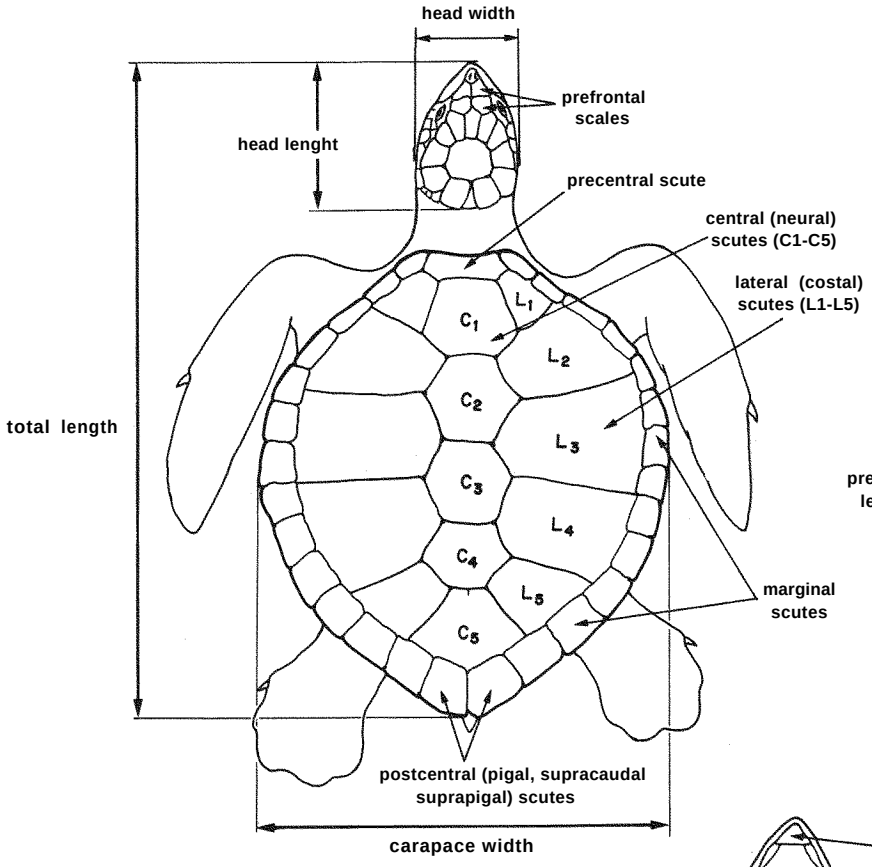


Fig. 1 Schematic dorsal view of a sea turtle

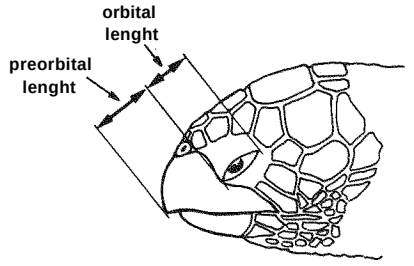


Fig. 2 Lateral view of head

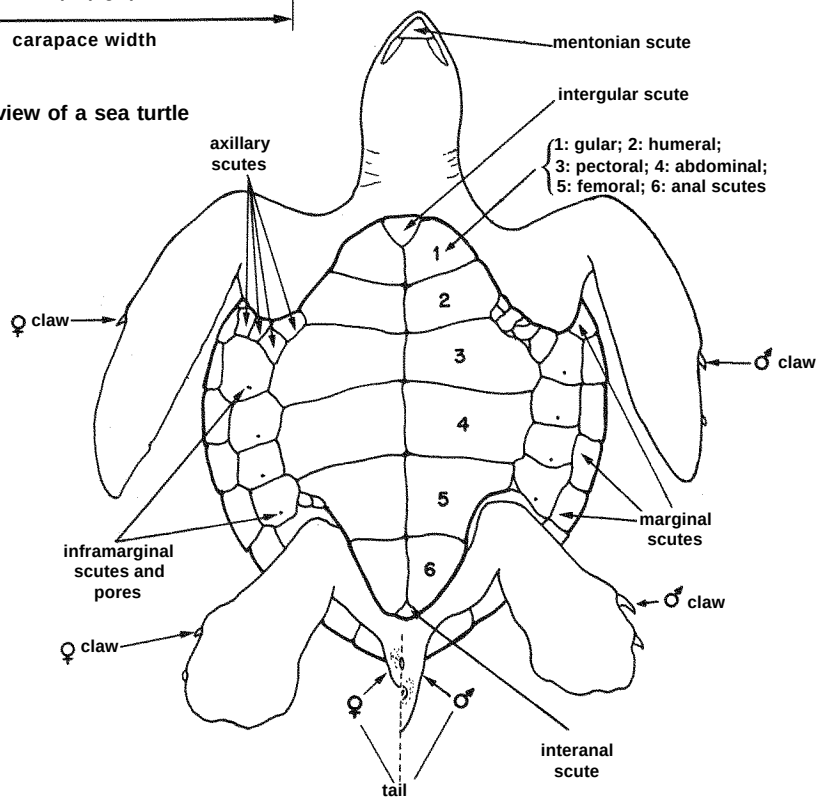


Fig. 3 Schematic ventral view of a sea turtle (right side: male, left side: female)

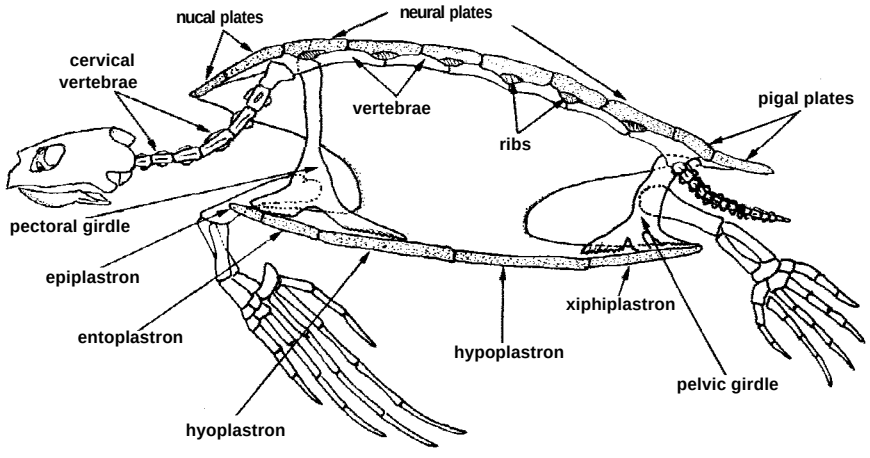


**Fig. 4 Schematic generalized sea turtle skeleton**

**Abdominal scutes** - The pair of plastral scutes in nearly central position. They are in contact with the pectoral, femoral and inframarginal scutes (Fig. 3).

**Alveolar** - The ridges and inner grooves of the mandibles where the horny beak or tomium is implanted (Fig. 5).

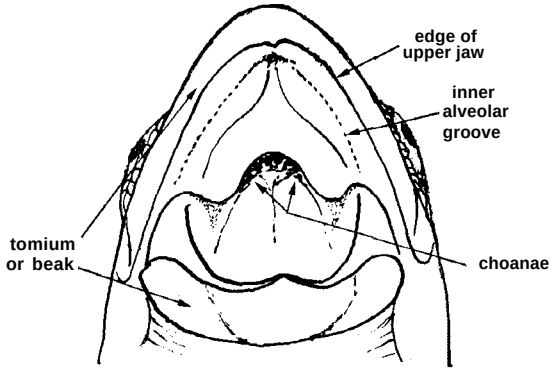


**Fig. 5 Diagrammatic ventral view of head of an adult Kemp's ridley**

**Anal scutes** - The rearmost pair of scutes of the plastron (Fig. 3).

**Angular bone** - Postventral element forming the lateral surface in each ramus of the lower mandible (Fig. 6).

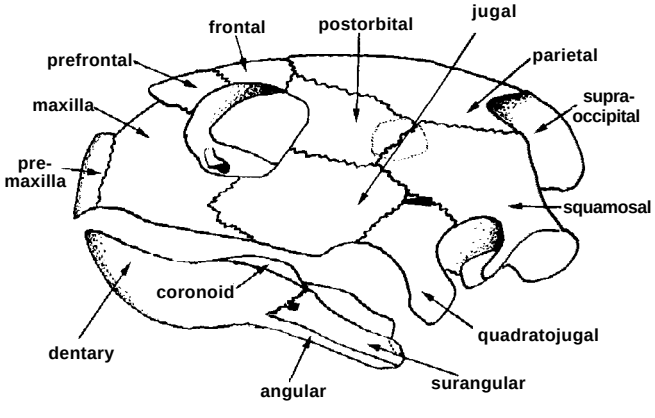


**Fig. 6 Schematic skull of an adult Kemp's ridley, showing basic structures (adapted from Romer, 1956)**

**Arribazon** (Arrival) - Spanish word used to describe the simultaneous emergence of nesting females on a small stretch of sandy beach. It extends from several hours to several days. Also "Arribada" is used.

**Axillary notch** - Frontal cavities on each side of the body between the carapace and plastron, from which the fore flippers project (Fig. 7).

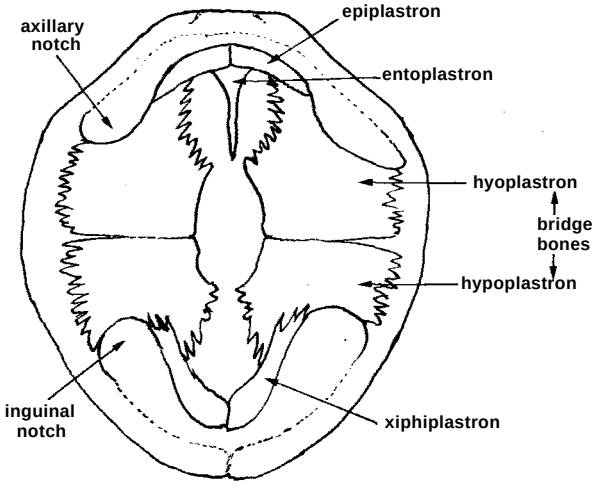


**Fig. 7 Schematic ventral view of the plastron bones**

**Axillary scutes** - The variable number of scutes between the marginal, humeral and pectoral scutes, on the rear margin of the axillary notches (Fig. 3).

**Body pit** - A depression made by the female turtle on the sandy beach, during nesting. Shape and depth of the pit are generic characteristics. The pits made by the ridley, hawksbill and flatback are shallow (Fig. 8a), while those of the loggerhead, green and leatherback are medium to deep (Fig. 8b). Some turtles (e.g., green turtle) construct several body pits before they lay the eggs.

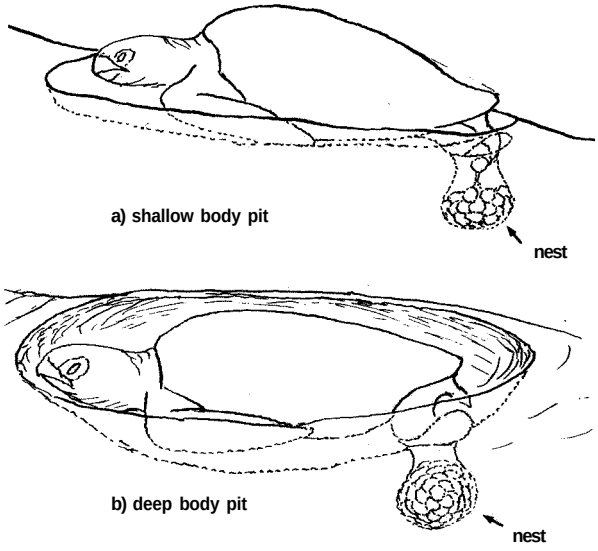


**Fig. 8 Female sea turtle in nesting attitude**

**Bridge bones** - Ventral parts of the shell that connect the peripheral bones of the carapace with the plastral bones. The contact area may be calcified or cartilaginous material (Fig. 7).

**Calipash** - Cartilaginous strips obtained from the edge of the carapace or extracted as jelly from the dried flippers. Generally of green colour when fresh.

**Calipee** - Cartilage extracted from the border of the plastron, along the axillary and inguinal notches, the bridge and between the bones of the plastron. Calipee and calipash are used for the preparation of turtle soup.

**Carapace** - Dorsal osseous shell of the turtle covered by horny scutes or soft skin (Figs. 1,4).

**Carapace length** - Distance either in straight-line (SCL) or over the curve (CCL), between the anteriormost edge to the rearmost edge of the carapace (Fig. 9).

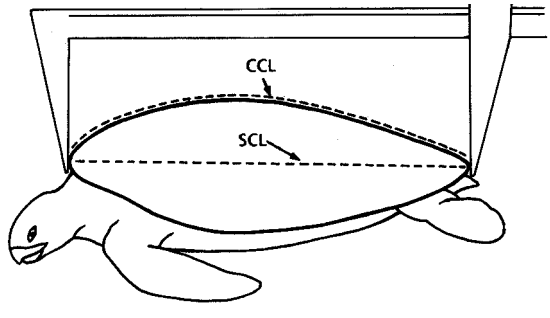


**Fig. 9 Measurements of carapace length**

**Carapace width** - Distance in straight-line or over the curve across the widest part of the carapace, measured on its dorsal side (Fig. 1).

**Carey** - See tortoise shell.

**Caruncle** - Sharp horny tubercle on the tip of the upper tomium of newborn hatchlings; used to pierce the egg-shell (Fig. 10). Usually disappears two weeks after hatching.

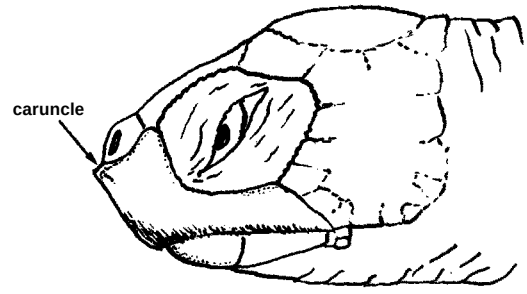


**Fig. 10 Head of a newborn Kemp's ridley hatchling**

**Central scutes** - The middle scutes covering the neural plates of the carapace, in between the lateral scutes. Also named neural or vertebral scutes (Fig. 1).

**Cervical vertebrae** - Anterior (8) bony elements of the vertebral column. In turtles, the neck is typically retractile. The shortening of the neck in sea turtles is an adaptation to marine life (Fig. 4)

**Choanae** - The internal openings of the nasal funnels through the vomerian bones on the palate (Figs 5, 13).

**CITES** - An acronym for "Convention on International Trade in Endangered Species of Wildlife and Flora". The IUCN determines the criteria for addition of species and other taxa to Appendix I (Endangered) and Appendix II (Threatened) of CITES, and for the transfer of species and other taxa from Appendix II to Appendix I. All the sea turtles are included in Appendix I, because their survival is affected by international trade.

**Claw** - Sharp, horny nail on the anterior margin of the flippers. The claws (usually one or two on each flipper) are more strongly developed in males than in females, and they are used to hold the female during copulation (Figs 1, 3).

**Clutch size** - Total number of eggs laid simultaneously to form a nest (Fig. 8).

**Coronoid bones** - Flat, paired, bony elements of the lower mandible (Fig. 6).

**Costal plates** - Expanded, ossified dermal plates fused to the axial skeleton (vertebrae and ribs), between the peripheral and neural plates of the carapace (Fig. 11).

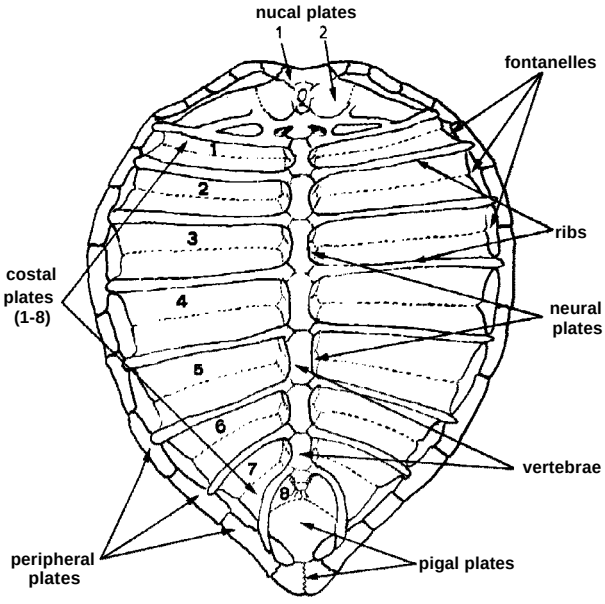


**Fig. 11 Carapace bones in schematic ventral view of a juvenile green sea turtle, showing the characteristic fontanelles of premature ages**

**Crawl** - Symmetrical tract left by the fore and rear flippers of turtles on the sandy beach. Sizes and shapes of the crawl are considered characteristic for the species.

**Cusp** - Sharp projection, usually on the tip of the jaws (Fig. 12).

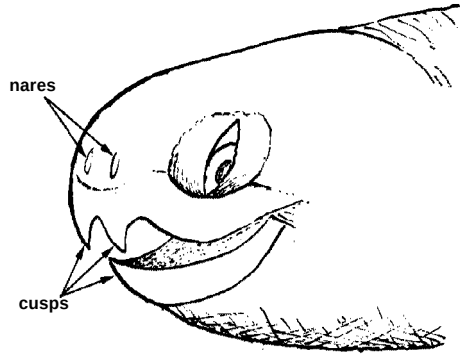


**Fig. 12 Beak cusps on jaws of adult leatherback sea turtle**

**Dentary bone** - Largest element of the lower jaw, the principal support of the lower tomium (Fig. 6).

**Endemic** - Found only in a limited region.

**Entoplastron plate** - Median bony plate lying between epiplastra and hyoplastra (Figs. 4, 7).

**Epifauna** - Those animals living on the body of a turtle.

**Epiplastron plate** - The foremost paired bony plates of the plastron (Figs. 4, 7).

**Farming** - The culturing of sea turtles in tracts of sea water for commercial purposes. It must not rely on wild populations except initially or later occasionally, to avoid inbreeding problems and genetic degeneration.

**Femoral scutes** - The pair of posterior plastral scutes in contact with the abdominal, inframarginal and anal scutes (Fig. 3).

**"Flotilla"** - Spanish name for a large number of migrant turtles drifting or swimming together in the open ocean.

**Fontanelles** - Carapacial unossified areas between the peripheral and costal bones, usually disappearing with age (Fig. 11).

**Frontal bone** - The long bone above the orbit on each side of the skull (Fig. 6).

**Gular scutes** - The foremost paired scutes of the plastron (Fig. 3).

**Habitat** - The environment in which a species usually occurs.

**Hatchery** - Construction for the incubation of eggs and releasing or rearing the produced hatchligs. The incubation of eggs can be done in fenced areas of the beach or indoors, under semi-controlled conditions, using styrofoam boxes.

**Head length** - The distance between the tip of the beak and the posterior margin of the head (Fig. 1).

**Head-starting** - The practice of raising hatchling turtles in captivity for a few months to give them a better chance of survival when they are later released into the wild.

**Head width** - The distance across the widest part of the head (Fig. 1).

**Humeral scutes** - The anterior paired scutes of the plastron, between the gular, pectoral and axillary scutes (Fig. 3).

**Hyoplastron plates** - The median-front paired bony plates of the plastron (Figs. 4, 7).

**Hypoplastron plates** - The median-rear paired bony plates of the plastron (Figs. 4, 7).

**Imbricate** - Overlapping condition (like shingles on a roof) of the scutes of the carapace and plastron in the hawksbill sea turtle. Hatchlings and juveniles of other species commonly also have this condition.

**Imprinting** - Theoretical procedure by which a sea turtle hatchling unconsciously "memorizes" environmental cues of its natal beach, that enable it to relocate the same beach when mature.

**Incidental catch** - The unintentional catch of non-targetted species, such as turtles and bottom fishes during shrimp trawling.

**Incubation period** - The time elapsed between egg laying and hatching. In sea turtles, it ranges from 45 to about 70 days, depending on species, temperature, humidity and latitude.

**Indigenous** - An organism that originated and is living in a specified region (see endemic).

**Inframarginal pore** - A single, small orifice through each inframarginal scute, serving as the outlet for the Rathke's gland secretions; their function is unknown. These pores are present principally in turtles of the genus ***Lepidochelys*** (Fig. 3).

**Inframarginal scutes** - The scutes covering the bridge bones, between the ventral side of the marginal scutes and the central scutes of the plastron (Fig. 3).

**Inguinal notch** - The cavities on each side of the plastron from which the rear flippers project (Fig. 7).

**Interanal scute** - The middle, rearmost plastron scute or scutes between the pair of anal scutes (sometimes absent) (Fig. 3)

**Intergular scute** - The middle, foremost plastron scute or scutes between the pair of gular scutes (sometimes absent) (Fig. 3).

**Isotherm** - A theoretical warped plane or line in the water connecting points of equal temperature.

**I.U.C.N.** - An acronym for the International Union for the Conservation of Nature and Natural Resources.

**Jugal bone** - The long bone under the orbit, forming part of the cheek region on each side of the skull (Fig. 6).

**Kraal** - A pen used for holding turtles before slaughter; also an artificial beach for nesting purposes, an installation used to protect nests on a beach, or a fenced area against predation. Also called "corral".

**Lateral scutes** - The lateralmost scutes covering the carapace on both sides, between the central and marginal scutes. Also named pleural or costal scutes (Fig. 1).

**Lepidosis** - Configuration of the scales and scutes covering the body; of taxonomic value at genus level (Figs. 1, 3).

**Lost year** - The elapsed time between newborn hatchlings and growth to small-plate-size juveniles**,** during which the turtle is rarely encountered and its habits are largely unknown.

**Marginal scutes** - The scutes covering the peripheral bones of the carapace, forming a hard edge all around it (Fig. 1).

**Maxilla** - The large bone extending up to the orbit and forming, with the premaxilla, the upper jaw margin (Fig**.** 6).

**Melanism** - The propensity of an organism to develop dark pigment throughout the skin.

**Mentonian scute** - The scute under the tip of the lower tomium (Fig. 3).

**Nares** - Pair of openings into the nose, the nostrils (Figs 12,14).

**Nekton** - Free-swimming organisms whose activity largely determines direction and speed of their movements, independent of water currents**.**

**Neritic** - Relating to the waters over the continental shelves**.**

**Nest** - The cavity where the eggs are laid by the turtles. Shape and depth differ by genus (Fig. 8). It is also related to the clutch of eggs.

**Neural plates** - Carapacial osseous plates fused to the vertebrae (Figs 4, 11).

**Niche** - The habits or role of an organism in a particular community. Mainly concerned with the food chain, competitors and enemies.

**Nucal bones (or plates)** - The bones (usually two) forming the foremost central part of the carapace (Figs 4, 11).

**Orbital length** - Longitudinal diameter of the eye socket (Fig. 2).

**Papillary projections** - Spine-like growths present in the throat of the sea turtles; they are more conspicuous in the leatherbacks (Fig. 13).

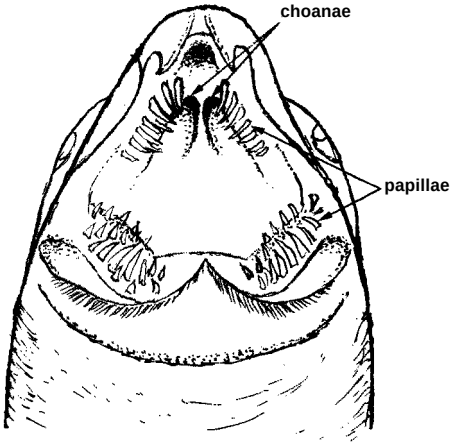


**Fig. 13 Buccal cavity of a leatherback sea turtle**

**Parietal bones** - The major elements of the skull roof between and behind the orbits (Fig. 6).

**Pectoral girdle** - Bones forming the support for the fore-limbs or anterior flippers (Fig. 4).

**Pectoral scutes** - The median pair of scutes in contact with the humeral, inframarginal and abdominal scutes of the plastron (Fig. 3).

**Pelvic girdle** - Bones forming the support for the hind-limbs or posterior flippers (Fig. 4).

**Peripheral bones (or plates)** - Osseous elements forming the edge of the carapace (Fig. 11).

**Philopatry** - Tendency of sea turtles to nest in, or very near to, the previous nesting place, during the same or in successive breeding seasons. Also called "nesting site fixity or fidelity".

**Pigal bones (or plates)** - The rearmost marginal osseous plates that form the carapace (Figs 4, 11).

**Pigal scutes** - The rearmost pair of marginal scutes of the carapace. Also named postcentral, suprapigal, or supracaudal scutes (Fig. 1).

**Pivotal temperature** - Theoretical temperature at which incubation produces a sex ratio of 1:1.

**Plastron** - Ventral osseous shell of the turtles, covered by horny scutes or soft skin (Fig. 3,4,7).

**Postcentral scutes** - The rearmost pair of marginal scutes of the carapace. Also named suprapigal, supracaudal or pigal scutes (Fig. 1).

**Postorbital bone** - The bone behind the orbit that forms part of each cheek of (Fig. 6).

**Postorbital scales** - The horny scales (usually 3 or 4) covering the sides of the head behind the orbits (Fig. 14).

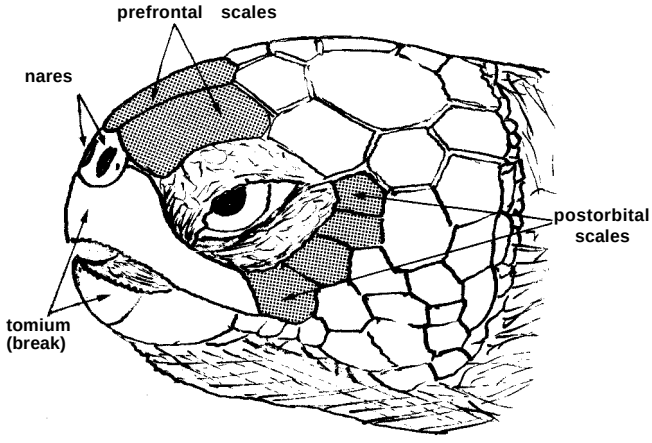


**Fig. 14 Head showing disposition of scales in a green turtle (schematic)**

**Precentral scute** - The foremost central scute of the carapace (Fig. 1). Also named prevertebral, nucal or cervical scute.

**Prefrontal bones** - A pair of circumorbital bones, extending anteriorly and also bordering the external nares (Fig. 6).

**Prefrontal scales** - Usually 1 or 2 pairs of horny scales covering the anterior interorbital area (characteristic at generic level) (Fig. 14).

**Premaxilla bones** - The paired bones forming the front margin of the snout, supporting, together with the maxilla, the upper tomium (Fig. 6).

**Preorbital length** - The shortest distance between the anterior margin of the orbit and the tip of the snout**.** Also called preocular length (Fig. 2).

**Quadrate bone** - Thick bone close to the jaw articulation. Laterally, it is bound to the quadratojugal bone (Fig. 6).

**Ranching** - The raising of turtles from wild stock eggs or hatchlings to marketable size**.**

**Remigrant** - Turtles that return to nest in a subsequent season.

**Renesting** - Successive visits of a turtle to a nesting area, laying eggs each time.

**Ribs** - Beneath the carapace of chelonians there are eight pairs of dorsal ribs fused to the costal or pleural and to the neural plates. The tips of the ribs are inserted in ventral pits of the peripheral bones (Figs 4, 11).

**Scales** - Thin, leathery or horny shields covering the head and flippers and forming callosities in some parts of the flippers (Fig. 14)**.**

**Scutes** - Horny shields covering the carapace and plastron. The shape and size do not correspond with the underlying bony plates. The thickest and most valuable scutes are those of the hawksbill turtle (Figs 1,3).

**Sexual dimorphism** - Morphological differences between males and females that appear at sexual maturity. Males develop stronger claws and thicker and longer tails (Fig. 3). Females become heavier and have a deeper body shape.

**Squamosal bones** - The principal component of the cheek region of the skull (Fig. 6).

**Supracaudal scutes** - The rearmost pair of marginal scutes of the carapace. Also named postcentral, pigal or suprapigal scutes (Fig. 1).

**Supraoccipital bones** - Paired bones of the upper part of the occiput at the back of the skull (Fig. 6).

**Suprapigal scutes** - The rearmost pair of marginal scutes of the carapace. Also named postcentral, pigal or supracaudal scutes (Fig. 1).

**Surangular bones** - The upper posterior bones of each ramus of the lower jaw (Fig. 6).

**T.E.D.** - An acronym for “trawl efficiency device” or “turtle excluder device”. Originally, a collapsible structure fitted to a shrimp trawl net, designed to reduce incidental catch, especially of sea turtles. Today there are several kinds of T.E.D.‘s tested and approved by the US National Marine Fisheries Service.

**Tomium** - The horny beak that covers the alveolar surface of the mandibles of birds and turtles. In sea turtles, the cutting edges can be smooth or serrated (Figs. 5, 14). Also known as ramphoteca.

**Tortoise shell, or “carey”** - The generic name for the scutes of the plastron and carapace of the hawksbill, used in jewellery and handycraft work.

**Total length** - The straight-line distance between the snout and the rearmost part of the carapace (Fig. 1).

**Vertebrae** - The elements of the vertebral column or axial skeleton. In turtles, the dorsal and sacral vertebrae are deeply modified and dorsally fused to the neural plates of the carapace (Figs. 4, 11).

**Vomerine bone** - One of the pairs of osseous elements centrally placed behind the premaxillae and forming a bar between the internal nostrils or choanae.

**Xiphiplastron bones** - The rearmost pair of bones forming the plastron (Figs 4,7).

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