United States Department of the Interior, Fred A. Seaton, Secretary
Fish and Wildlife Service, Arnie J. Suomela, Commissioner
Bureau of Commercial Fisheries, Donald L. McKernan, Director

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SEA TURTLES OF THE UNITED STATES

by

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Popular articles and a generally increased interest in biology have focused more and more attention on the natural history of many forms of wildlife. The sea turtles are included, and their conservation has received considerable publicity in recent years--particularly along the southeastern coast of the United States.

Once an important source of food, the sea turtle no longer occupies a prominent place as one of our important fisheries. At the present time, only about 5 to 10 thousand pounds of turtles are reported to be taken commercially each year in the waters of the United States--mostly on the west coast of Florida. Many times this

quantity was taken there a century ago, and the area of fishing included most of our southern Atlantic states. Large numbers of turtles are still imported from Central America, but this number too is rapidly falling off.

Nearly all of the sea turtles that are taken commercially in the United States by legal means are captured with large-meshed entangling nets set around known feeding areas or with irons (spears) thrown by hand from a small boat. Many more are taken incidental to other commercial or sport fishing activities. Most of these turtles are consumed by their captors, though many may reach local markets. There are no records available of the numbers of such turtles captured, but they are probably considerable and include all species. These sporadic landings, of some small economic importance, cannot be considered an organized fishery. Probably many more individuals are taken illegally on the beaches, and these depredations of the nesting turtles and their eggs have most surely contributed to the decline of the sea turtle. The sea turtle is placed at a great disadvantage since the female must come ashore to deposit her eggs, and the number of beaches suitable and available as nesting areas is greatly limited. Because of the depredations by man and other predators, it is likely that only a very few of the young ever reach maturity. Fortunately in the United States there are rigid laws that prohibit persons disturbing the nests, taking the eggs, or molesting the adults and young while they are on land. This usually includes even touching the turtle as she lays or crawls on the beach. It is not necessary to handle the turtle in order to see the nesting process, and if regulations are obeyed, the turtle populations will increase and our own future generations will be assured the fascinating experience of seeing this age-old form of reptilian life plant the seeds to reproduce itself.

Hunting turtles in the water probably should be regulated, but because many males--which will satisfy a large share of the demands of gourmets just as well--will also be taken under these conditions, the ultimate consequences are not as shattering as those possible with the depredation of the nesting females and their eggs.

The Fishery

The green turtle is the most important of the sea turtles as a source of human food. Today there are only a few local fisheries, mostly on the Gulf coast of Florida, the production of which is used almost entirely in local markets. This is a seasonal fishery, spring and summer, pursued by a handful of turtlemen on a population of juveniles (10 to 115 pounds) presumably hatched in the Caribbean.

Most of the green turtles listed in statistical summaries for the United States are imported from Costa Rica and Nicaragua to Key West and Tampa, Florida. Many of these reach northern markets alive or in various processed forms.

In the northern Gulf of Mexico, the ridley turtle is of local commercial importance nearly equal to that of the green turtle. It supports a small organized fishery, pursued seasonally with that for the green turtle, and also draws on a population of immature individuals (5 to 60 pounds) for a local trade bringing a slightly lower price. Unlike the green, none are imported and the origin of the population is subject to much speculation.

The loggerhead is of much less commercial importance though it occurs regularly in the temperate and tropical waters of the United States and is the only species nesting regularly there. There is no organized fishery for it. Its flesh is considered to be of much poorer quality than that of the green and ridley turtles and it is landed only when the supply of ridleys and greens does not meet local demands. Unfortunately, as the only regular nester in the eastern United States, its eggs suffer a particularly high predation, despite existing laws.

The hawksbill retains some importance in the Caribbean as the source of commercial tortoise shell, but the species has little or no economic importance in the United States. Only a few reach the local food markets and no organized fishery exists for them in North America.

The leatherback, because of its pelagic habits, is a rarity; its flesh is not esteemed and the species has no commercial value.

Many fishermen observe sea turtles in the water, but the glimpse is usually a brief one and affords little opportunity to study the animal, for frequently only the head will be seen as the turtle surfaces to breathe. Visitors to docks and fish houses may occasionally see a large, trussed-up turtle awaiting the soup pot thus providing an opportunity for a thorough firsthand examination of the animal.

An excellent opportunity for study is afforded by the female turtles as they drag themselves onto the beach to lay their eggs. Here is a natural phenomenon that provides a good chance for leisurely study of the animals themselves, as well as permitting the viewer an insight into one of the basic life proccesses.

Nesting Habits

Nesting by sea turtles in the United States is mainly concentrated along our southeastern Atlantic shores, from North Carolina to Texas. Three species are known to nest in that area, but only the loggerhead is common. The leatherback and the green turtle nest occasionally in southeastern Florida, but their principal nesting grounds lie farther south. A fourth species, the hawksbill, may nest there, but there are no recent records for this. All four species and particularly the leatherback, green, and hawksbill nest further to the south in the Caribbean Sea. Although the loggerhead nests as far south as Costa Rica, it is really a temperate-water species with a center of abundance in the Atlantic waters of the United States. The Atlantic ridley is presently known to nest only in Mexico along the shore of the Gulf of Mexico. Pacific sea turtles may occasionally nest in southern California, but they are apparently uncommon there and can generally nest only in Baja California or on still more southern mainland beaches of the eastern Pacific. Little is known of their activities in Hawaii, but all might be expected to nest there.

Nesting takes place during late spring and summer. Based on the results of limited tagging, a number of qualified statements can presently be made. An individual turtle may lay eggs several times a season at approximately 2-week intervals (there are records at present of three nestings in one season for loggerheads). There is evidence that a given turtle may not nest every year, but that she does return to the same place when her time comes again. Although individuals of a species may nest anywhere throughout their nesting range, most of the laying is accomplished in very restricted areas known as rookeries which are used year after year. The turtles may come from long distances, as much as 1,000 miles or more to nest on a rookery, but the mechanisms they use for navigation are unknown. Groups of turtles apparently stay together and come ashore to lay on the same or closely approximated nights--so the same turtles nesting in a group one night will probably repeat the process about 2 weeks later. Presumably the individuals remain together in the interim and may migrate together to the rookery area from some common feeding ground in groups or flotillas. Probably all movement, at the rookery or away from it, is in these same flotillas. Whether the adults return to nest on the beach where they were hatched is unknown.

Only the females (recognizable by their short tails--see figure 11) come ashore during nesting. The males (long-tailed--see figure 12) lie in the water just off the beach and mating for later layings seems to take place in the area at this time.

There appears to be no correlation between nesting and the

phase of the moon or stage of the tide. Speculation concerning this remains a controversial subject, however. Detailed studies on the rookeries indicate that some nesting takes place every night during the season and at every level of the tide. Daily or weekly variation in numbers of turtles nesting on a given night or stage of tide seem to be more closely related to the arrival of flotillas of turtles off the beach than to moon and tide. Arrival of the flotillas appears to occur randomly. The fact that more people are searching for nesting turtles on clear, brightly moonlit nights may be the chief basis for this popular belief in a correlation with the full phase of the moon.

The turtles come ashore to lay almost exclusively at night, and nests are usually placed near the bases of prominent sand dunes. After selecting a site, the turtle uses her hind and fore flippers to dig a preliminary pit or depression so that her entire body is lowered several inches below the original surface of the beach. This done, she uses her hind flippers to dig a neat, nearly cylindrical hole, somewhat larger at the bottom, in the sand. Depending on the kind of turtle and the size of the individual, a hole 18 to 36 inches deep is dug, after which the eggs are deposited--nearly filling it.

The almost spherical eggs have a leathery shell which helps protect them as they fall into the nest in ones, twos, and threes. After the eggs are deposited (about 75 to 200 of them, usually about 100 to 150), she uses the hind flippers to drag sand back into the hole to cover the eggs. After the eggs are covered, the hind flippers pack the sand firmly. This done, the turtle usually flings sand about the nest site, using all four flippers again, apparently in an effort to disguise the exact location of the nest itself. The entire process usually lasts 1 to 2 hours, during which time "tears" stream from the reptile's eyes. Although giving the impression of pain, this has a much less dramatic purpose: that of keeping the eyes clear of loose sand. After the nest has been disguised to her satisfaction, the turtle laboriously drags herself back to the surf, often stopping several times to rest.

All of this process can be watched by a careful observer without unduly disturbing the turtle. After the eggs start to fall, the turtle is not easily disturbed so a light can be turned on.

On land, in addition to man's depredations, the young turtles are eaten by raccoons, birds, sand crabs, dogs, hogs, and the like. In the water the baby turtles must face carnivorous fishes and sea birds. Consequently, relatively few turtles reach maturity, and many young must hatch out and be sacrificed naturally in order to insure the survival of a few.

Growth and Feeding Habits

After the turtle has returned to the water, the sun will provide the heat to hatch her eggs in about 2 months. The tiny hatchlings (only 1 to 4 inches long, depending on the species) mostly come out of the nest at one time, usually at night, and seldom err in making their way directly to the sea. Nothing is known of their whereabouts after they enter the ocean. Turtles less than a pound or so are rarely seen in nature, and in fact, sea turtles much smaller than mature size are rarely seen. Young captive sea turtles grow rapidly, and though captive conditions may be more beneficial than natural ones, at least from the aspect of food supply, such growth indicates that sea turtles mature at a much younger age than formerly believed. Some of the nesting individuals may be only 15 or 20 years old, rather than the hundreds often attributed to them. This does not rule out the possibility of great age, and many of the adults might be very old, although recent research indicates that such estimates should be modified.

The scarcity of records of small turtles seen in the ocean as compared with adult or subadult individuals is a most intriguing and puzzling circumstance. While the apparent rarity may result from not looking in the proper places, it may be that the lack of numbers is real. Considering a high mortality on the very young, a rapid growth of those which do survive, and long life after reaching maturity, it is quite possible for the population to consist mostly of large turtles.

Although most species of sea turtles tend to be either carnivorous or herbivorous, all actually are omnivorous when necessity dictates. This is particularly true of young turtles and those kept in captivity. The adult green turtle appears primarily to be a herbivore, while the ridley, loggerhead, and hawksbill show preferences for animal food. The leatherback, as far as is known, seems to be a true omnivore.

With the exception of the comments on food, the above discussion of general biology seems to apply (with only slight modifications) to all sea turtles, although most of the data are based on studies of Atlantic species, particularly the loggerhead, green, and leatherback. For more specific and detailed aspects of the natural history of sea turtles the reader is referred to the bibliography at the end of this leaflet. It is surprising, however, how little is known of such details for any of the species.

Description of Species

As an aid to the identification of the various kinds of sea turtles, the following distinguishing characters and accompanying photographs are offered. Young sea turtles may not on first glance look like the adults of their kind, but if the basic differences as given below are noted, no great difficulty should be encountered in recognizing the kind of sea turtle at hand. Sea turtles, and only sea turtles, have paddle-like legs (flippers); for turtles with non-paddle-like legs, even though from salt water, one of the general books listed in the bibliography should be consulted.

Figure 1 was originally published by Carr and Ogren (1959; page 6). Figure 2 is included through the courtesy of Dr. Archie Carr. Figures 8-12, 17, 18, and 24-26 are copyrighted and originally appeared in a book by Carr (1952), being reproduced here through the generous permission of Dr. Carr and the Cornell University Press. Figures 27 and 28 were first published by Carr and Caldwell (1957; page 255). The remainder of the figures in this leaflet are the original work of Caldwell.

Leatherback or trunkback sea turtle, *Dermochelys coriacea*

Figures 1-4

Distinguishing features: The adult is the largest of all the sea turtles--reaching at least 1,500 pounds. Unlike all other sea turtles, its oval back is covered with a smooth black skin and lacks the scales or plates of other sea turtles (the very young have numerous tiny scales covering the back, but these are not to be confused with the few large plates found on other sea turtles at all sizes). The back has seven narrow longitudinal ridges and the belly five. There is a cusp (projection) on each side of the upper jaw.

The validity of expressed differences between the Atlantic and Pacific stocks is doubtful, but for the present, the Atlantic leatherback is recognized as *Dermochelys coriacea coriacea* (Linnaeus), and the Pacific leatherback as *Dermochelys coriacea schlegelii* (Garman). The only obvious differences are of detail in coloration.

The Atlantic leatherback has been recorded in the Americas from Nova Scotia southward to Mar del Plata, Argentina. The Pacific leatherback has been reported from British Columbia to Chiloe Island, Chile, and Hawaii.

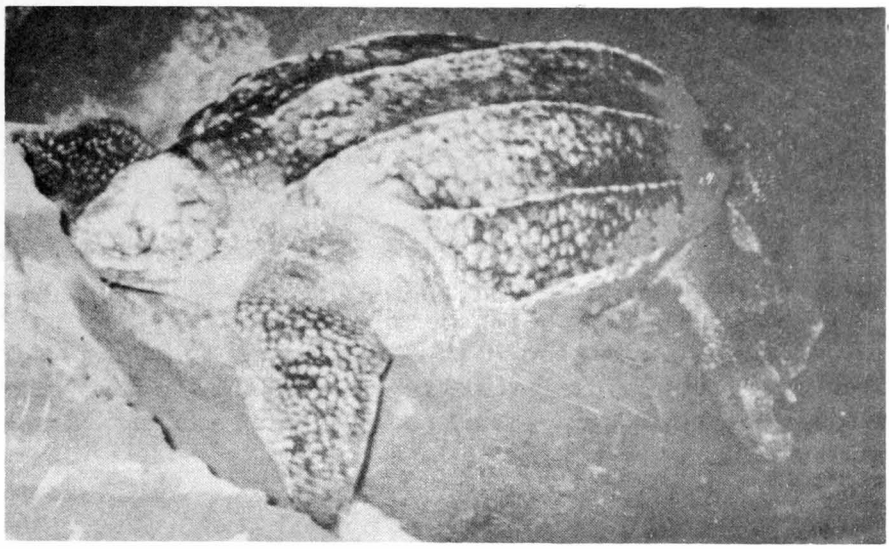

Fig. 1--Adult Atlantic
Leatherback, nesting

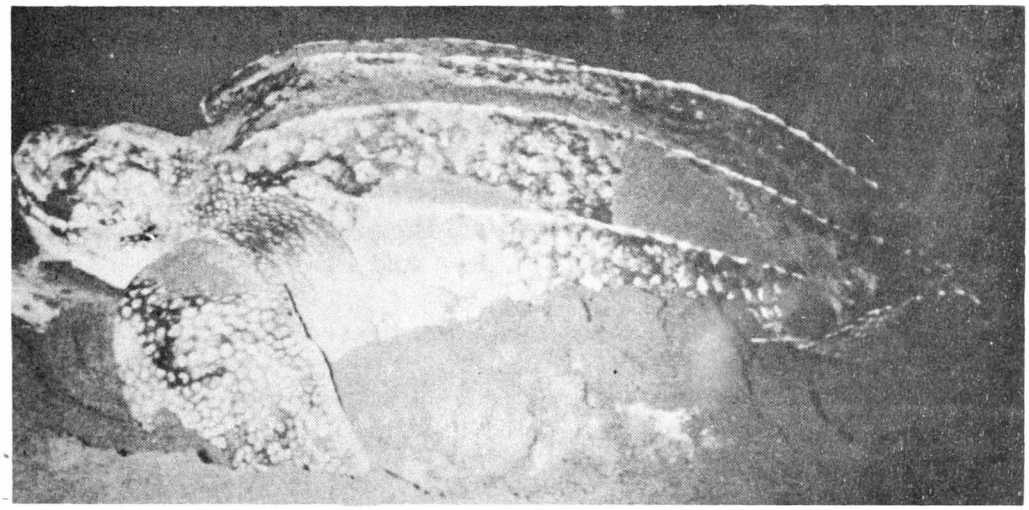

Fig. 2--Adult Atlantic
Leatherback, nesting

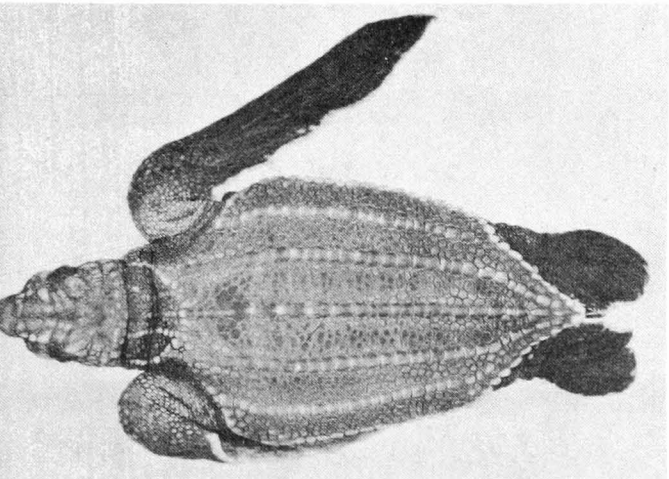

Fig. 3--Top view hatchling
Atlantic Leatherback

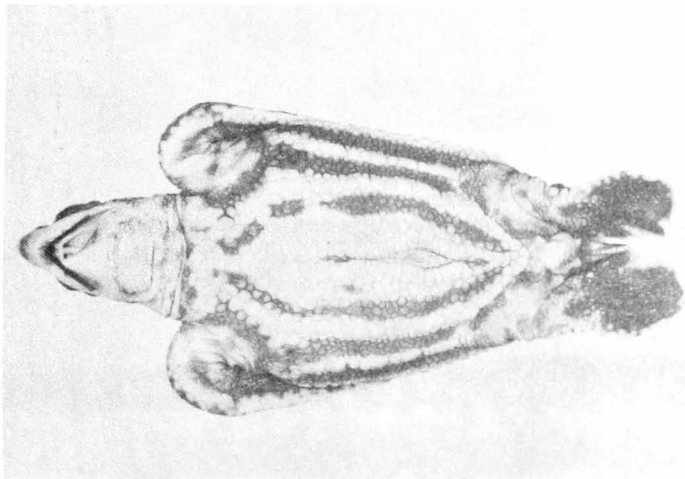

Fig. 4--Bottom view hatchling
Atlantic Leatherback

Green sea turtle, *Chelonia mydas*

Figures 5-12

Distinguishing features: Recognized by a single pair of prefrontal scales on the top of the head (figure 5) and four pairs of lateral plates on the oval shell (figure 6). The lateral plates are juxtaposed or butted with their edges touching (figure 9), rather than overlapping shingle-roof-fashion. The head is often described as being too small for the rest of the turtle, and "very clean cut."

Two American forms are recognized--the Atlantic green, *Chelonia mydas mydas* (Linnaeus), and the Pacific green, *Chelonia mydas agassizii* Bocourt. The color of the Atlantic form is described as predominently brown on the upper surfaces, while the Pacific form is greenish or olive brown. The Pacific form is said to have the margin of the shell often markedly indented above the hind legs (figure 8), while the Atlantic form does not (figure 9).

On American shores, the Atlantic green turtle has been found from Massachusetts southward to 38° S. latitude, in Argentina. It has been reported from as far north as Newfoundland, but apparently no specimens have been taken there. The Pacific green turtle has been taken in American waters from southern California south to southern Chile at latitude 43° S., and Hawaii.

This is the sea turtle most used for human consumption--particularly as soup or steaks.

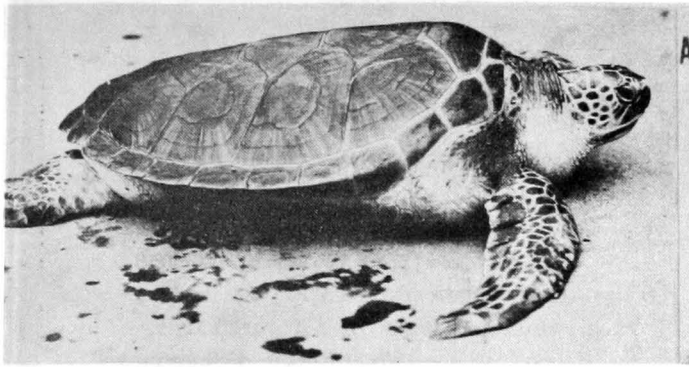

Fig. 9--Side view adult
Atlantic Green

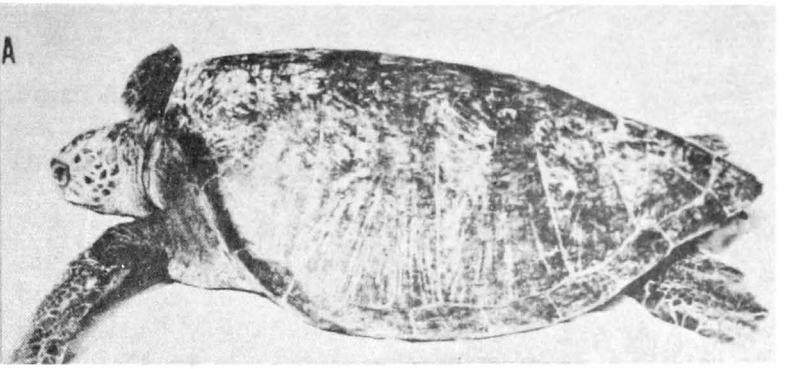

Fig. 8--Side view adult
Pacific Green

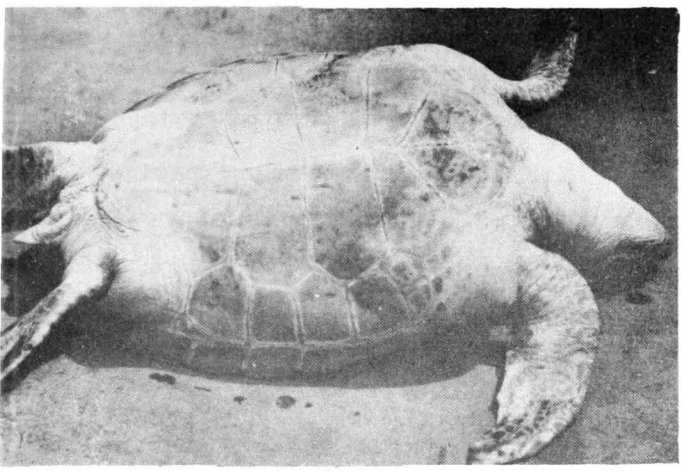

Fig. 10--Bottom view adult
Atlantic Green

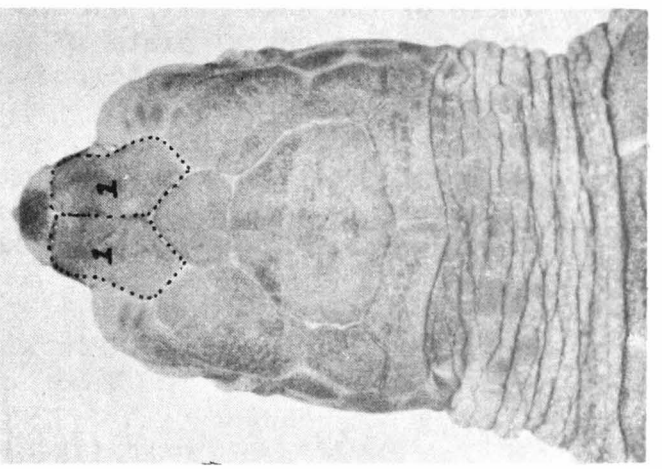

Fig. 5--Top of head of Atlantic
Green (single pair of prefrontal
scales outlined)

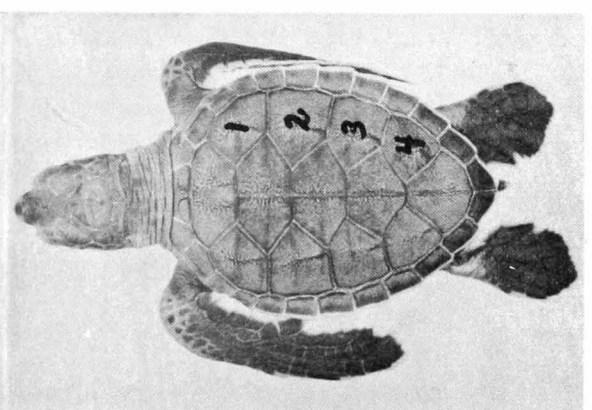

Fig. 6--Top view hatchling
Atlantic Green

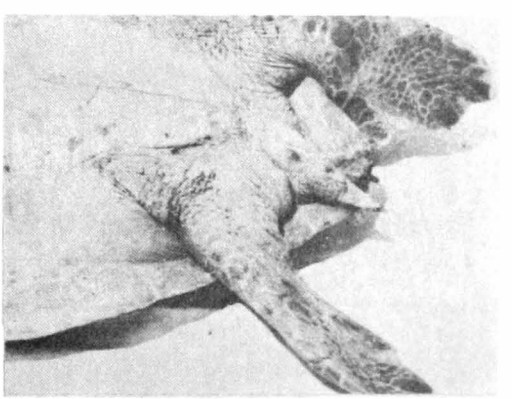

Fig. 11--Short-tailed female Green

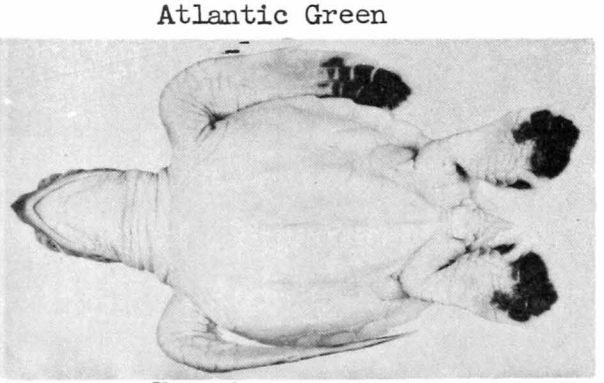

Fig. 7--Bottom view hatchling
Atlantic Green

Fig. 12--Long-tailed male Green

Loggerhead sea turtle, *Caretta caretta*

Figures 13-19

Distinguishing features: Two pairs of prefrontal scales (figure 13) and five or more pairs of usually non-overlapping lateral plates (figure 14). From above, the shell is oval in outline, rather than rounded as in the ridley (figure 17). The head is large and often referred to as "coarse in appearance." The shell is brown or reddish brown. The hatchlings especially may be confused with those of the hawksbill, but are easily distinguished by the fact that the precentral plate of the shell is in contact with the first lateral plates (figure 16), while this is not the case in the hawksbill.

The differences between the Atlantic form, *Caretta caretta caretta* (Linnaeus), and the Pacific form, *Caretta caretta gigas* Deraniyagala, are slight, and not externally visible.

Range in America: In the Atlantic, along the coasts from Nova Scotia to Rio de la Plata, Argentina. In the Pacific, from southern California to Chile, and Hawaii.

This is apparently the most common sea turtle on the Atlantic coast of the United States, and the only one regularly seen nesting there.

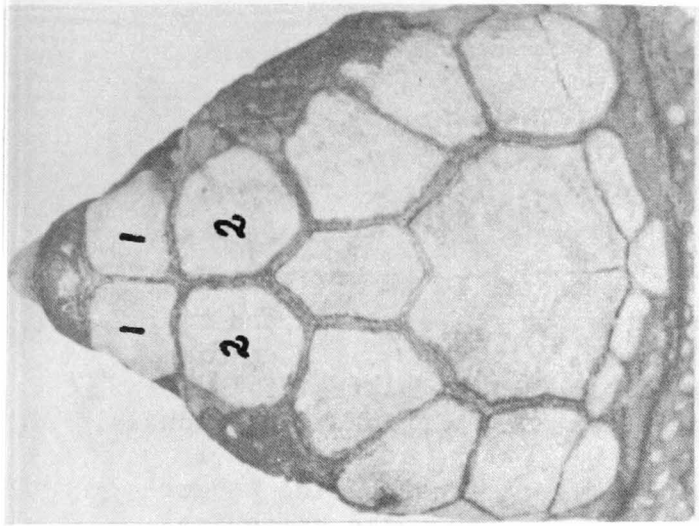

Fig. 13--Head of hatchling Loggerhead (note two pairs of prefrontals)

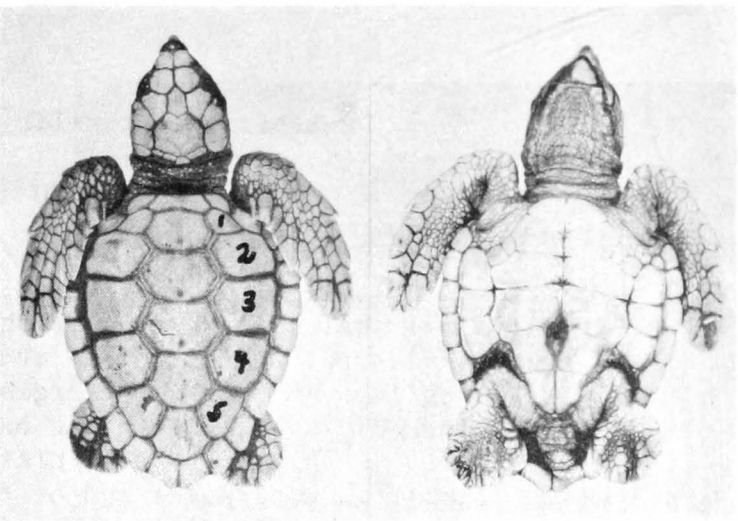

Fig. 14--Top view hatchling Atlantic Loggerhead (left)

Fig. 15--Bottom view hatchling Atlantic Loggerhead (right)

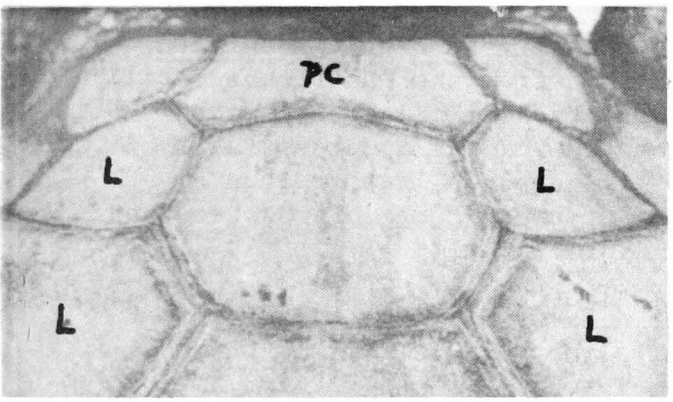

Fig. 16--Front portion of Loggerhead shell (note first laterals, L, touch precentral, PC)

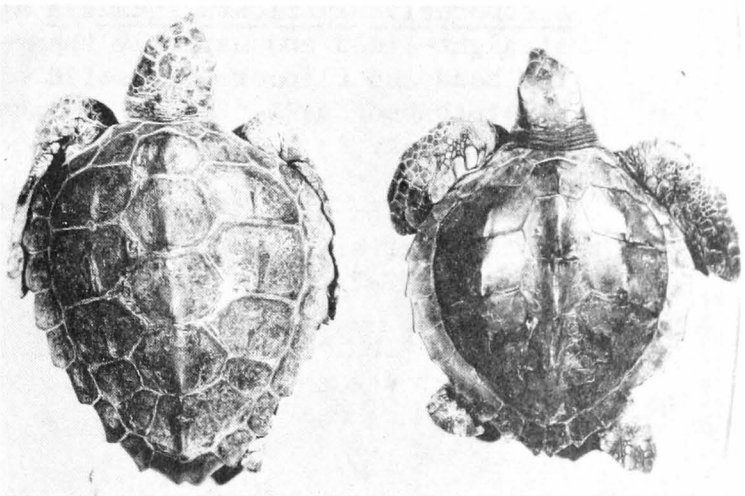

Fig. 17--Comparison between Atlantic Loggerhead (left) and Atlantic Ridley (right)

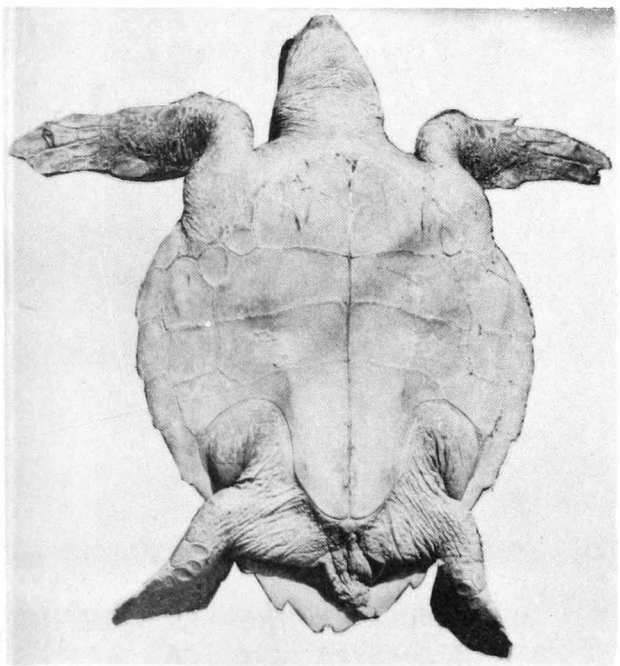

Fig. 19--Bottom view sub-adult Atlantic Loggerhead

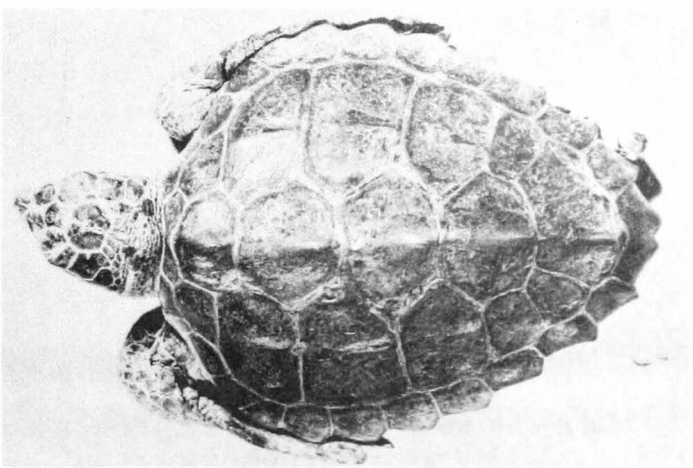

Fig. 18--Top view sub-adult Atlantic Loggerhead

Hawksbill sea turtle, Eretmochelys imbricata

Figures 20-24

Distinguishing features: Recognized by two pairs of prefrontal scales on the top of the head (as in figure 13) and four pairs of lateral plates on the oval shell (figure 20). Except in the hatchlings and the very largest specimens, the plates of the shell markedly overlap. In the hatchlings and the oldest individuals, a tendency is shown for these plates to be juxtaposed or butted. The hatchlings especially may be confused with those of the loggerhead, but are easily distinguished by the fact that the precentral plate of the shell is not in contact with the first lateral plates in the hawksbill (figure 22), while they are in contact in the loggerhead.

The Atlantic hawksbill, Eretmochelys imbricata imbricata (Linnaeus), generally can be distinguished from the Pacific hawksbill, Eretmochelys imbricata squamata Agassiz, by having its shell more straight-sided and narrowly tapered behind and the upper surfaces of the head and flippers not solid black (figure 23), rather than a heart-shaped shell (figure 24) and the upper surfaces of the head and flippers almost solid black.

In the Americas, the Atlantic form has been recorded from Massachusetts to southern Brazil, while the Pacific form is known from Baja California to Peru, and Hawaii.

The plates from the shell of this turtle only are used to make tortoise shell jewelry and other art objects.

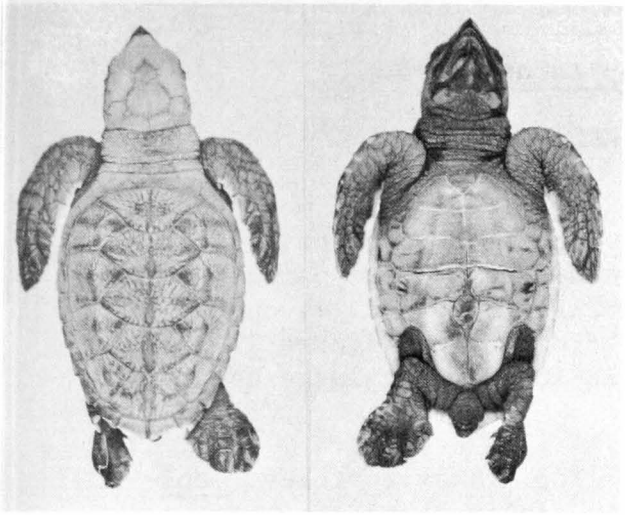

Fig. 20--Top view hatchling Atlantic Hawksbill (left)

Fig. 21--Bottom view hatchling Atlantic Hawksbill (right)

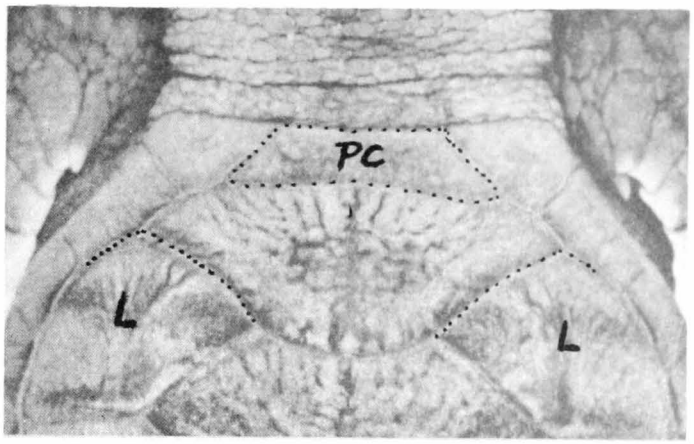

Fig. 22--Front portion of Hawksbill shell (note first laterals, L, do not touch precentral, PC)

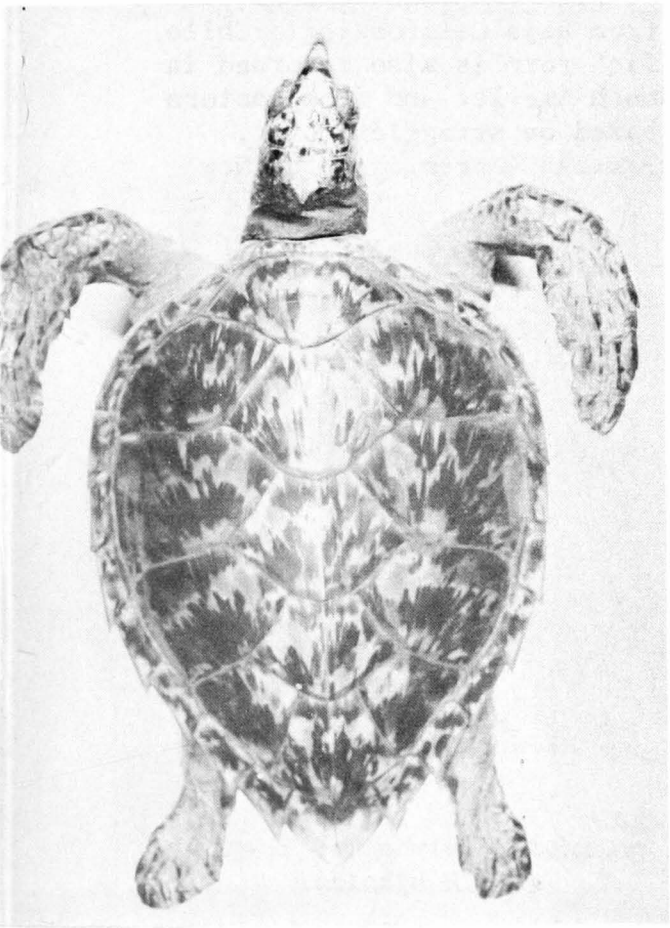

Fig. 23--Top view sub-adult Atlantic Hawksbill

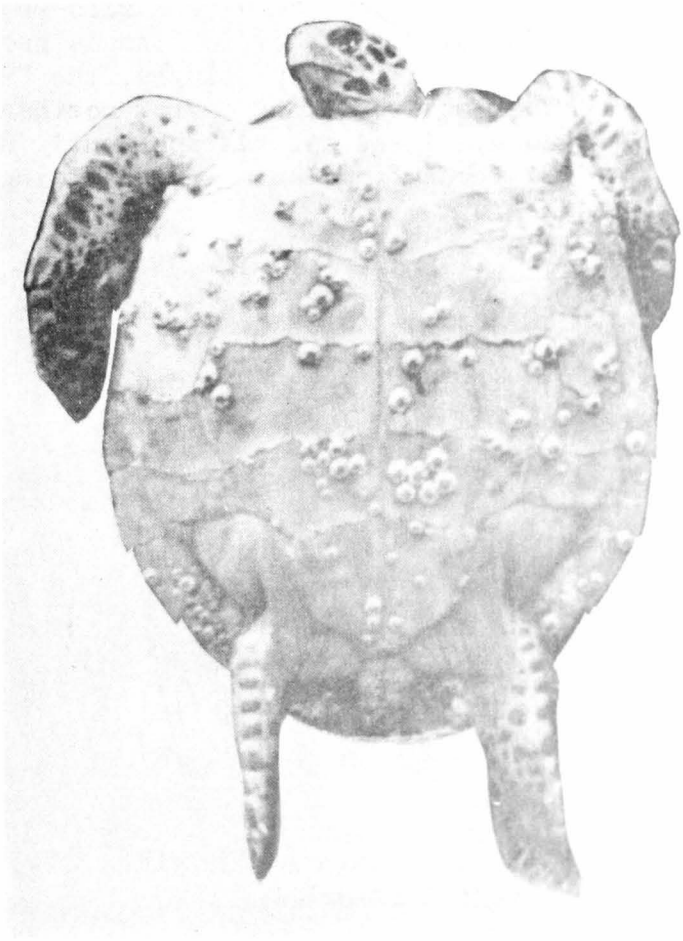

Fig. 24.--Bottom view sub-adult Pacific Hawksbill

Ridley sea turtle, *Lepidochelys* sp.

Figures 25-28

Distinguishing features: Two pairs of prefrontal scales (as in figure 13) on top of the head, and five or more pairs of non-imbricated lateral plates on the shell. The shell is chunky and nearly circular in general outline from above (figures 17, 25). The head is large, but not so much so as that of the loggerhead. The shell is gray to olive green.

Two species are recognized: The Atlantic ridley, *Lepidochelys kempi* (Garman), and the Pacific ridley, *Lepidochelys olivacea* (Eschscholtz). These are sometimes referred to as *Lepidochelys olivacea kempi* (Garman) and *Lepidochelys olivacea olivacea* (Eschscholtz). The Atlantic form is usually gray and almost always has five pairs of lateral plates on the shell. The Pacific form, usually olive in color, almost always has six or more pairs of lateral plates.

In America, the Atlantic form is recorded from Massachusetts to Campeche Bay, Mexico--but *not* from the Caribbean or the Bahamas. The Pacific form is known from Baja California to Chile, and Hawaii. Surprisingly, the "Pacific" form is also recorded in the western Atlantic from northern South America and from eastern Cuba. These records apparently are based on stragglers of *L. olivacea* from South Africa riding the ocean currents to the New World.

The ridley is said to be a "mean" turtle--often attempting to bite, and especially when on their backs and tied up.

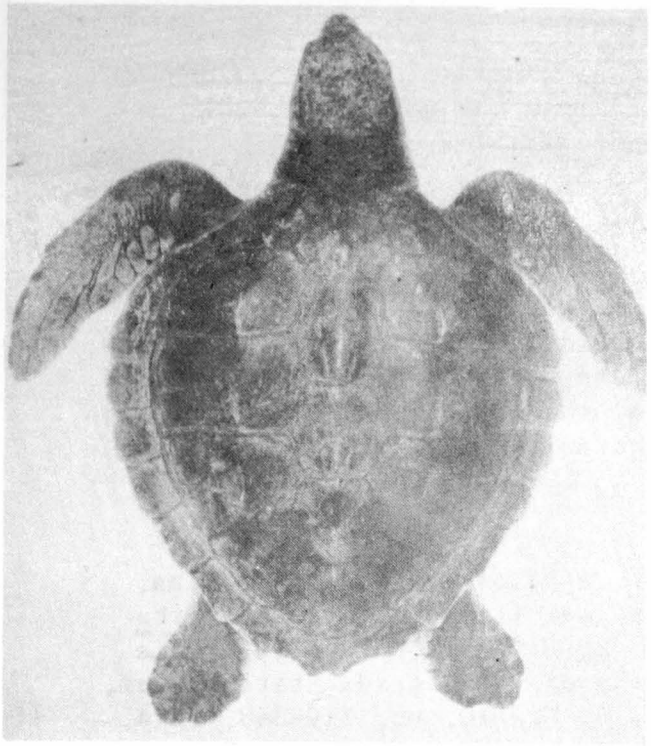

Fig. 25--Top view adult
Atlantic Ridley

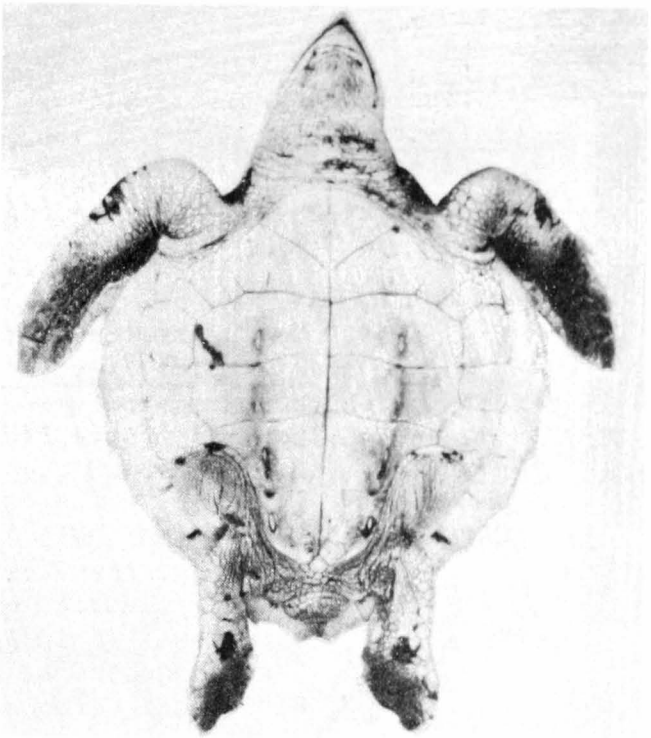

Fig. 26--Bottom view adult
Atlantic Ridley

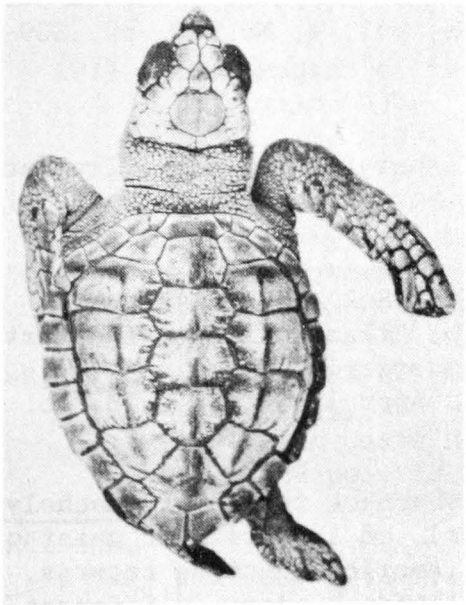

Fig. 27--Top view hatchling
Atlantic Ridley

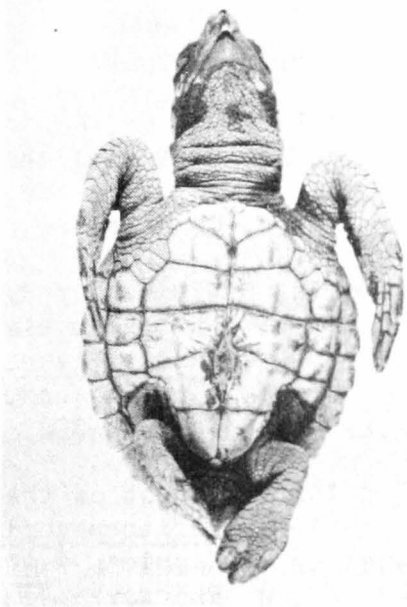

Fig. 28--Bottom view hatchling
Atlantic Ridley

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