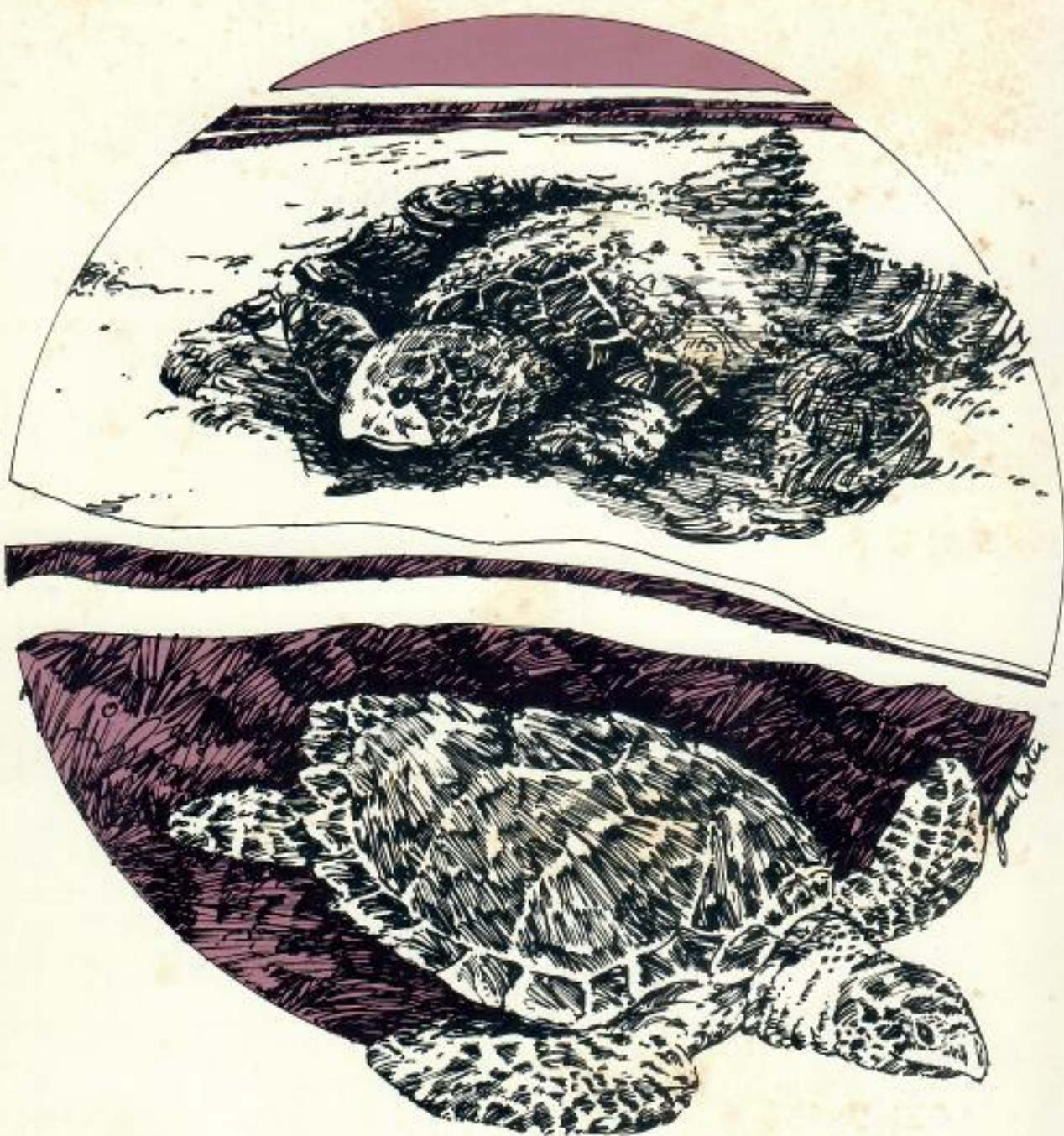


Sea Turtles



Center for Environmental Education

Definitions

anal—of or pertaining to the anus

aphrodisiac—a food or drug that arouses sexual desire

anatomical—pertaining to the body structure of an organism

calipec—the part of a turtle next to the plastron consisting of a yellow jelly-like substance

carapace—the upperside of a turtle's shell. It is made up of scutes that fit together to form a mosaic of plates

carnivorous—an organism that primarily eats meat

cartilaginous—pertaining to a part of the body composed of a translucent elastic tissue known as cartilage

cellulose—a carbohydrate that is the main compound of plant cell walls

class—a classification of organisms that differentiates orders but is included within the same phylum

cloacal—pertaining to the body organ cloaca, a tubelike canal which is used for excretion and reproduction in reptiles, birds and amphibians

clutch—the number of eggs produced or incubated at the same time

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)—a convention originally held in 1973 and now representing 67 signatory nations to develop control of international trade in endangered species through a system of national government licensing of their imports, exports, reexport and introduc-

tion. Species listed on Appendix I are threatened with extinction; commercial trade in these species is prohibited. Appendix II species may become threatened and require restrictions in trade

costal—pertaining to the rib

crustaceans—invertebrate animals found in water having two pairs of antennae—including lobsters, crabs, wood lice and barnacles

dorsal—situated on or near the back of an animal

ectotherm—an organism that relies on air or water temperature for maintaining its body heat

Endangered Species Act—U.S. federal legislation passed in 1973 which provides for the protection of species and their habitats that are considered endangered or threatened with extinction

family—the scientific classification that contains one or more genera

genus—the scientific classification that may contain one or more species with similar characteristics (pl. genera)

inframarginal scutes—scaly plates connecting the carapace and the plastron together

lateral—situated on or near the side of an animal

migration—the act of animals moving from one region or climate to another for feeding or breeding

mutualistic—a relationship between two or more organisms which is not life

dependent but beneficial to those involved

omnivorous—eating both animal and plant foods

pharyngeal—referring to the pharynx, a part of the gut between the mouth and throat passage

prefrontal scales—dry plates of skin on the front part of the head

scute—a horny, boney plate that covers the bones of a turtle's shell. Scutes meet edge to edge on most turtles but overlap each other in some cases

species—the smallest unit of scientific classification for individuals which share common characteristics and are capable of breeding among themselves

sporadic—appearing in scattered or isolated instances

suborder—a classification of organisms that differentiates genera but is included within the same scientific order

superorder—a classification of organisms that differentiates orders but is included within the same scientific class

symbiont—an organism living in cooperation with a different organism so that both can survive

ventral—located on the lower surface of an animal—the belly

vertebrate—an animal with a spinal column, i.e., mammals, birds, reptiles, amphibians and fish

Abbreviations and Equivalencies

METRIC UNIT	METRIC ABBREVIATION	METRIC EQUIVALENT	ENGLISH EQUIVALENT
kilometer	km	1000 m	0.62 miles (mi)
meter	m	100 cm	39.37 inches (in)
centimeter	cm	0.01 m	0.39 inches (inch)
liter	l	1 liter	1.057 quarts (liquid) (qt) 0.264 gallons (gal)
metric ton	MT	100 kg	1.1 ton (t)
kilogram	kg	0.001 MT	2.2 pounds (lb)

1 knot = 1.15 miles per hour = 1.85 kilometers per hour

For more information write to:
INFORMATION
Center for Environmental Education
1925 K St., NW, Suite 206
Washington, DC 20006

Sea Turtles

Text by James Sternberg

Illustrations by Mary Beath

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This fact sheet packet is part of a set
of three: Whales, Sea Turtles and Seals.
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Seven Species

There are seven recognized species of sea turtles that comprise the five major groups or genera of the order Chelonia (Testudines): *Chelonia* (green and flatback), *Eretmochelys* (hawksbill), *Caretta* (loggerhead), *Lepidochelys* (ridleys), and *Dermochelys* (leatherback). All of these genera except for *Dermochelys* are of the family Cheloniidae. The leatherback is in its own family Dermochelyidea.

The history of sea turtles goes back at least 150 million years to the age of the dinosaurs. Sea turtles are not present-day dinosaurs but a separate branch of reptilian evolution. They maintain a predominantly marine existence throughout the Indian, Pacific and Atlantic oceans. Females come ashore to lay their eggs in the sand during nesting seasons.

The Southeastern coast of the United States, primarily from North Carolina to Florida, plus the Caribbean Islands, Puerto Rico and U.S. Virgin Islands, provide suitable nesting and feeding habitat for loggerhead and green turtles during the warmer months.

Greens and loggerheads are also found in Hawaii, American Samoa, and other Pacific trust territories. Research in these areas has resulted in valuable information about nesting behavior, migration patterns, feeding behavior and other characteristics of these species.

Aside from being forms of life in their own right, sea turtles have historically been a food source for many native peoples. Recent exploitation of local turtle stocks to supply a broad world market for turtle products has depleted populations and left native communities without this important source of food. Restrictions on the international trade in sea turtle products have reduced some exploitation but there is still an extensive turtle product market.

Historical accounts from people who live in areas where turtles have consistently nested for many years show that the number of turtles is declining. Long-term research and turtle-tagging projects support this observation. There is no accurate method of estimating the population sizes of sea turtles, but the obvious decline in numbers and the pressures of exploitation jeopardize their continued existence.

The seven species of sea turtles differ in their physical appearance, their behavior and their distribution around the world.

The leatherback is the most distinctive physically: it may reach a length of 6½ feet and weigh 1300 pounds. It is the only sea turtle without a hard shell; instead it carries a mosaic of small bony plates beneath the leathery skin on its back, hence the name "leatherback."

The ridleys have a unique nesting behavior. Instead of nesting individually like the other species of turtles, the ridleys come ashore primarily at one time to nest, a phenomenon known as an

"arribada" — the arrival. In the case of the Kemp's ridley, this occurs during the day and on only one beach in the entire world. The number of nesting Kemp's is only in the hundreds today and the effects of extensive egg poaching and possibly incidental catch in previous years are thought to be the major causes of such a depleted population.

Sea turtles are lasting forms of a lineage of marine reptiles. Their unusually accurate sense of time and location when migrating to nest makes them scientific wonders. It is thought that female turtles will return to nest on the beach from which they hatched many years ago. This most important part of their life cycle is now being threatened. Many ancestral nesting grounds are being altered by beach-front development making them unsuitable for nesting and they are thus being abandoned by nesting females. Some turtles may nest on less developed beaches while others may not nest at all.

Extensive exploitation of various species for their "product value" is lowering sea turtle populations. After their 150 million years of evolution, sea turtles may now be facing their most serious threat.

HEAD

CARAPACE

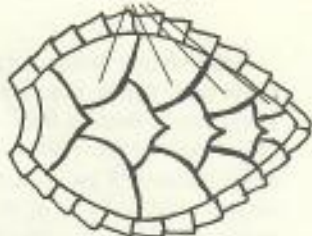
PLASTRON

Hawksbill:

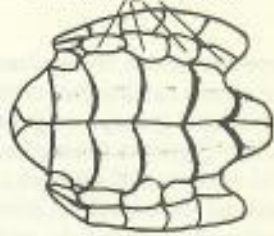
2 pair of prefrontal scales



4 costal scutes



4 inframarginal scutes



Green:
curved green shell
Flatback:
depressed shell

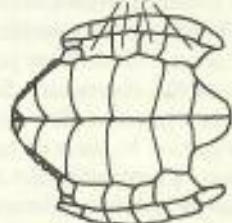
single pair of prefrontal scales



4 costal scutes



4 inframarginal scutes

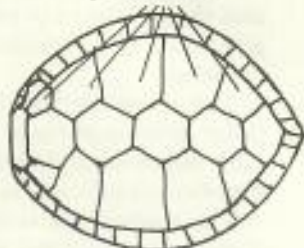


Kemp's ridley:
4 costal scutes
Olive ridley:
6-9 costal scutes

2 pair of prefrontal scales



5 costal scutes



pores between
inframarginal scutes

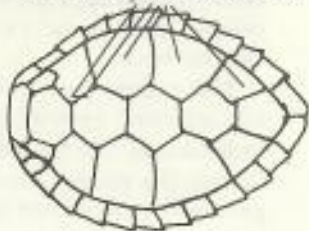


Loggerhead:

2 pair of prefrontal scales



5 or more pairs of costal scutes



3 inframarginal scutes



Leatherback:

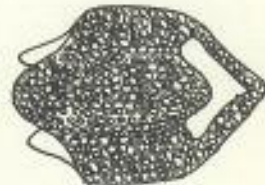
notches



5 ridges



no inframarginal scutes



Anatomy

Turtles are reptiles, a class of about 6000 vertebrate species that have scaly skin, breathe air and use sunlight to heat their bodies (ectotherms). Like all reptiles, turtles reproduce through internal fertilization and, like most reptiles, lay their soft-shelled eggs on land.

One unique feature of the turtle is its shell. This protective skeletal structure is an armored enclosure for the soft vital inner organs. The upper part of the shell (carapace) is covered with large scale-like structures known as scutes. The carapace is connected to the underside (plastron) by hard-shelled plates known as lateral bridges.

The large-sized body cavity of turtles, especially sea turtles, contains bulky intestines needed for digesting vegetation and small sea creatures. The green sea turtle, which is primarily vegetarian, has a unique feature in its digestive system. A specialized part of its digestive tube contains bacterial symbionts which aid in digesting cellulose. Only a few other reptiles are primarily vegetarian.

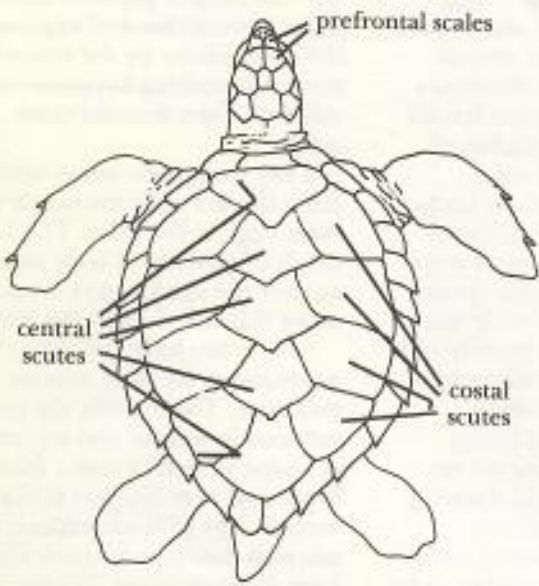
The large body cavity also enables female turtles to produce and hold a large volume of eggs. Female sea turtles seem also capable of storing live sperm for several years, although fertility decreases over time. This enables the female to fertilize numerous clutches of eggs without having to mate.

In addition to using their lungs for breathing, turtles have developed supplemental forms of respiration. Some aquatic turtle species bring water in through their nasal passages and into their mouth and throat where oxygen is extracted by the pharynx. This is done through the pharyngeal lining which acts as a gill. Some turtles take water into their anal opening where two sacs are filled and emptied with water, causing a slow current which enables oxygen to be collected. One newly discovered fresh water turtle species in Australia has cloacal gills for respiration. Turtles are also capable of containing larger concentrations of carbon dioxide in their blood than most other air-breathing animals, therefore, they are able to use their oxygen supply very efficiently over a long period of time. Both blood and muscle tissue can store oxygen in large quantities, helping the turtle to remain underwater for long periods of time.

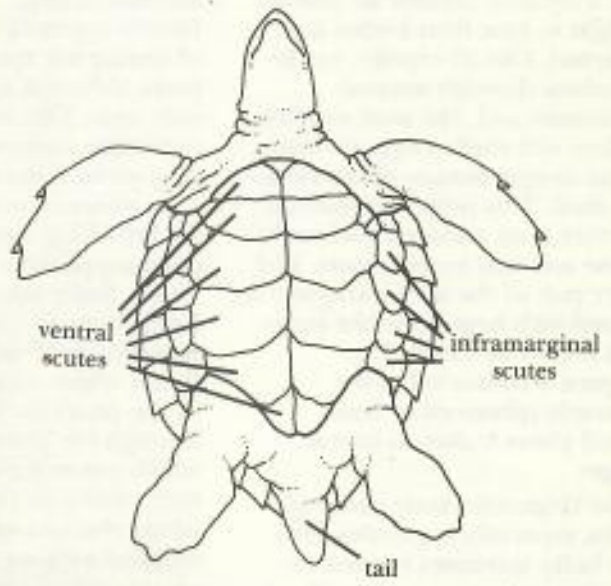
Another aspect of turtle respiration is the need for exterior flexibility. The hinged plastron allows for some contraction and expansion of the chest cavity. In the case of sea turtles, breathing becomes more difficult when females come ashore.

They drag their heavy bodies from the sea onto the beach to lay their eggs in the sand. The hundreds of pounds of body weight against the sand makes breathing more difficult than in the water.

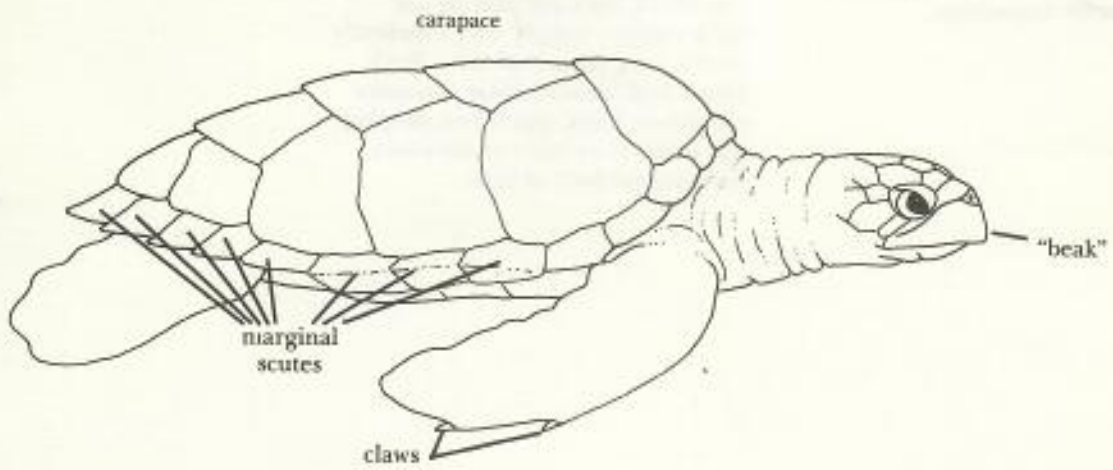
Sea turtles have specialized adaptations for their marine existence. Their shells are greatly reduced in weight and streamlined in shape to reduce water friction. Front and rear flippers replace the stumpy legs of land turtles and contain well-developed muscles for swift long distance travel. Sea turtles have been known to move through the water as fast as 35 mph. These adaptations have been refined over millions of years of sea turtle evolution and environmental changes.



DORSAL



VENTRAL



LATERAL

Evolution

Turtles are reptiles, a class of vertebrate animals that has survived for more than two hundred million years through stable periods and times of catastrophic environmental change. Reptiles evolved from amphibians, an even earlier class of vertebrates that lives on both land and in fresh water. Over time, the reptiles came to dominate the Earth—on land, in freshwater and the sea, and in the air. But it was early in the history of reptiles that turtles, members of the order Chelonia (or Testudines), split from the main line of reptilian evolution.

The origin of chelonians is uncertain, but recognizable turtles are known as far back as the Triassic period, at least 180 million years ago when the dinosaurs were becoming the dominant land animals. Although the Triassic turtles did not look very different from some modern ones, closer examination would have revealed some charac-

teristics absent from turtles living today. For example, some of the earliest known turtles had teeth rather than sharp edged jaws. Much later in turtle evolutionary history, towards the end of the Cretaceous period over 65 million years ago, turtles as large as the 3m (9 ft, 10 in) *Archelon ischyros* lived in the shallow sea that covered much of the western United States.

The fossil record and chemical evidence in some rocks show that the Earth underwent some drastic changes about 65 million years ago which resulted in the extinction of many groups of organisms on land and sea, including the dinosaurs. But some groups of turtles survived these changes, and two suborders remain. One includes the side-necked turtles that retract their necks into their shells with a sideways motion. Turtles in the other more diverse suborder, which includes the sea turtles, retract their necks straight in.

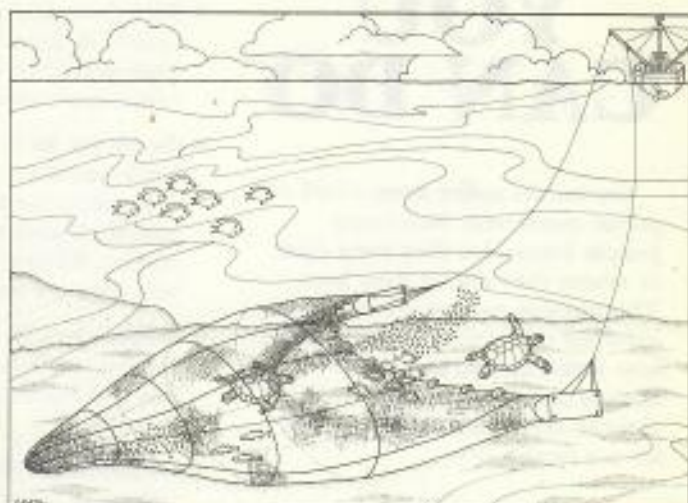
The sea turtles of today belong to two families, the Dermochelyidae, which has a single species, the leatherback turtle (*Dermochelys coriacea*); and the Cheloniidae, which has two subfamilies, each

with two genera and three species. The subfamily Chelonini includes green turtles (*Chelonia mydas*), flat-back turtles (*Chelonia depressa*), and hawksbill turtles (*Eretmochelys imbricata*). The subfamily Carettini includes loggerhead turtles (*Caretta caretta*), olive ridley turtles (*Lepidochelys olivacea*) and Kemp's ridley turtles (*Lepidochelys kempi*). Although sea turtles have not changed much for a long time, the slow process of evolution will continue unless we, through neglect, cause them to become extinct.

Threats



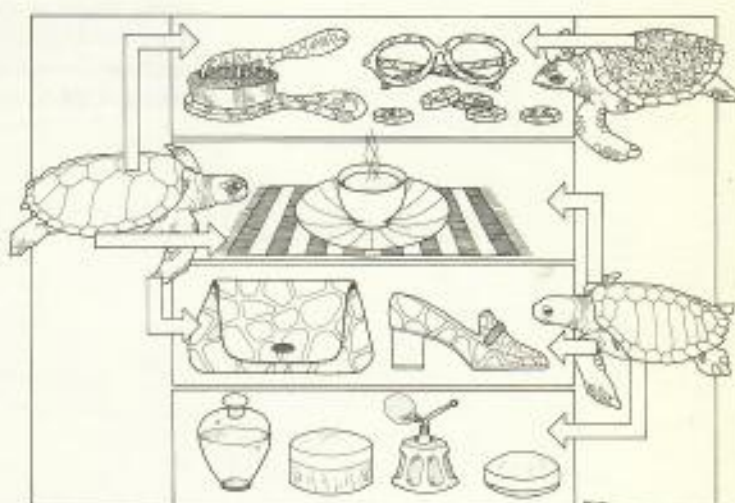
egg poaching



fishery conflicts



beach development



product trade

There are many different threats that endanger sea turtle populations. Four of the biggest problems are pictured above.

Around the world, poachers steal turtle eggs from nests. These eggs are sold in restaurants and bars and are used for baking. A single turtle egg can sell for \$12 in a New York bar as an alleged aphrodisiac. This poaching of eggs is dangerously reducing most sea turtle populations worldwide.

The drowning of turtles in fishery nets is another threat to

dwindling sea turtle populations. As the nets are dragged for long periods of time across ocean floors, they sometimes trap and drown sea turtles. This problem exists on the southeast coast of the United States where environmentalists and shrimp fishermen are working together to find a solution.

Development in coastal areas, such as construction of buildings and cement sea walls, is making it difficult for turtles to find beaches to nest on. If sea turtles cannot find suitable beaches to nest on, they will not lay their clutch of eggs. Noise, lights and beach obstructions are disruptive to natural beach areas.

Turtle products command a high price in many parts of the world and create a market for sea turtle exploitation. Turtle hides are tanned for leather; the oil is used in cosmetics, turtle shells are used for jewelry, eggs are consumed as delicacies, and the meat is also eaten. These products are outlawed in many countries, including the United States, but the illegal trade continues.

WHAT YOU CAN DO

Sea turtles suffer from a lack of public awareness. Not many people know that they even exist or where they spend their lives. This ancient marine reptile has survived many time periods and now is threatened by actions of human beings. There *are* things you can do to stick your neck out for sea turtles.

- Educate yourself about sea turtles so you can explain their plight to others.
- Distribute sea turtle information (available from the Center) to interested friends, local nature centers, museums and libraries.
- Be on the lookout for illegal sea turtle products. Common items are: green turtle soup, tortoiseshell jewelry and stuffed sea turtles. Write to the Center if you discover any of these items.
- Submit articles and editorials to local newspapers about sea turtles and the threats to their existence.
- Organize fund-raising events to help save sea turtles.
- Write letters to the embassies of Japan, Hong Kong and Taiwan asking them to stop their trade in sea turtle products. These countries account for 60% of the tortoiseshell trade in the world.

Addresses:

Embassy of Japan
2520 Massachusetts Ave. NW
Washington, DC 20008

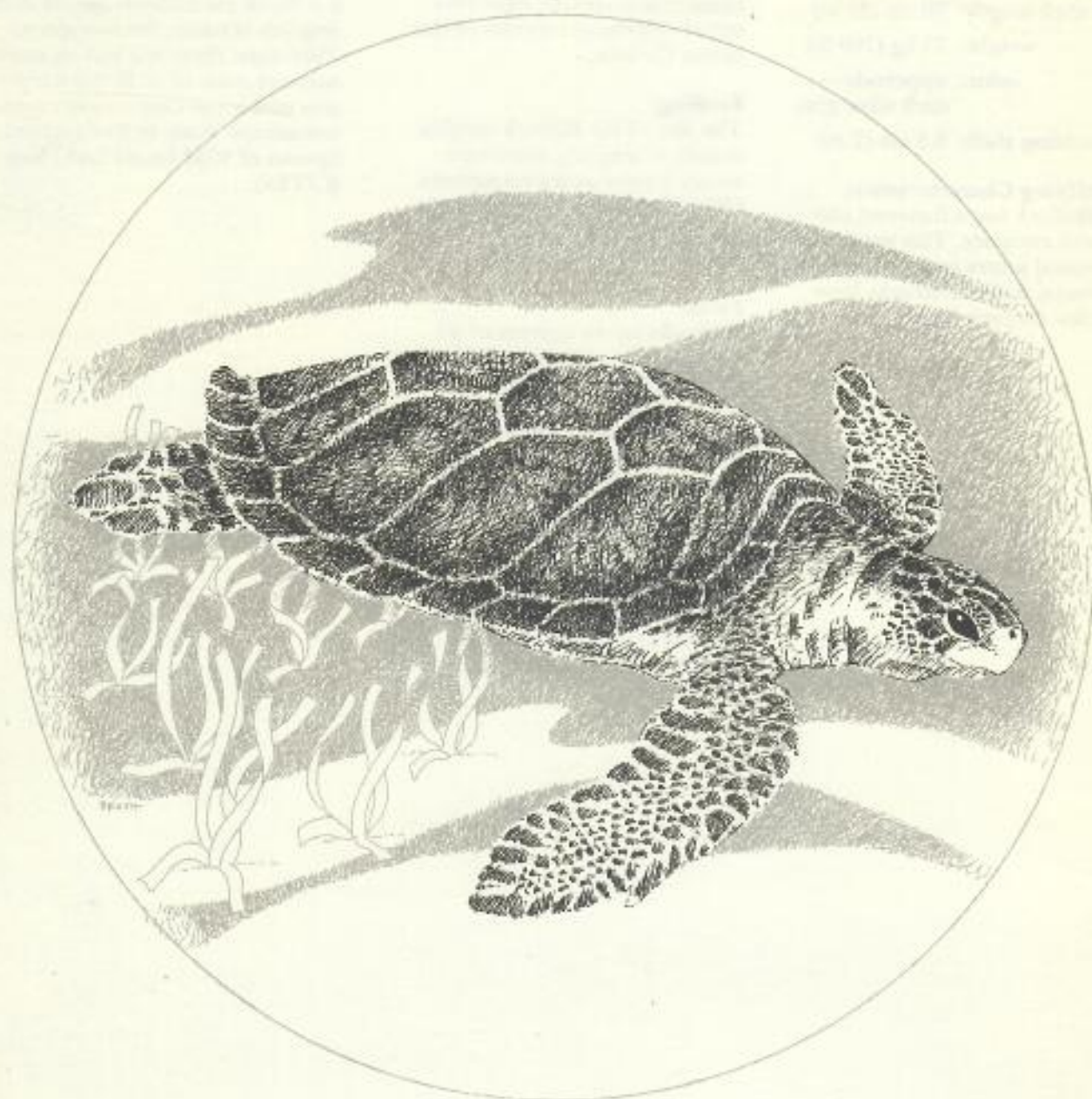
Hong Kong Office
% British Embassy
3100 Massachusetts Ave. NW
Washington, DC 20008

Taiwan Office
Coordinate Council for North
American Affairs
5161 River Road
Bethesda, MD 20014

Most importantly, spread the word that sea turtles are out there and need protection. As you explore the legends and lifestyles of these gentle reptiles, you will appreciate their unique qualities and threatened existence.

Flatback Sea Turtle

Chelonia depressa



The flatback turtle is a close relative of the green turtle, yet noticeably smaller in size. Strangely enough, flatback hatchlings are 40% larger than green turtle hatchlings. There was an ongoing debate for many years whether *Chelonia depressa* (flatback) and

Chelonia mydas (green) were distinct species. The depressed shell of the flatback, other more specific anatomical differences, and its limited distribution finally led to its designation as a distinct species. The flatback only nests in northern Australia and, due to the remote nesting beaches, is thought to be in no danger of decline. Because of its resemblance to other sea turtle species, it is listed under the Con-

vention on International Trade in Endangered Species of Fauna and Flora (CITES) on Appendix I.

FLATBACK SEA TURTLE

Scientific Name: *Chelonia depressa*

Physical Characteristics:

Adult

shell length: 90 cm (35 in)

weight: 73 kg (160 lb)

color: upperside —
dark olive gray

Hatchling shell: 5.5 cm (2 in)

Identifying Characteristics:

The flatback has a flattened (depressed) carapace. This species has four costal scutes and one pair of prefrontal scales. Flatbacks have one claw on each flipper.

Range:

The only area flatbacks are known to nest is in northern Australia, from western Australia to northern Queensland. The geographic isolation of this species and other population characteristics have protected this distinct species of the genus *Chelonia*.

Feeding:

The diet of the flatback consists mainly of trepang, more commonly known as sea cucumbers. Other food items might include starfish, sea urchins, and other echinoderms.

Facts:

Flatbacks lay an average of 50 eggs, half the number of eggs that most sea turtles usually lay. The meat of the flatback species is not very tasty and is rarely eaten, unlike the meat of its close relative, the green turtle.

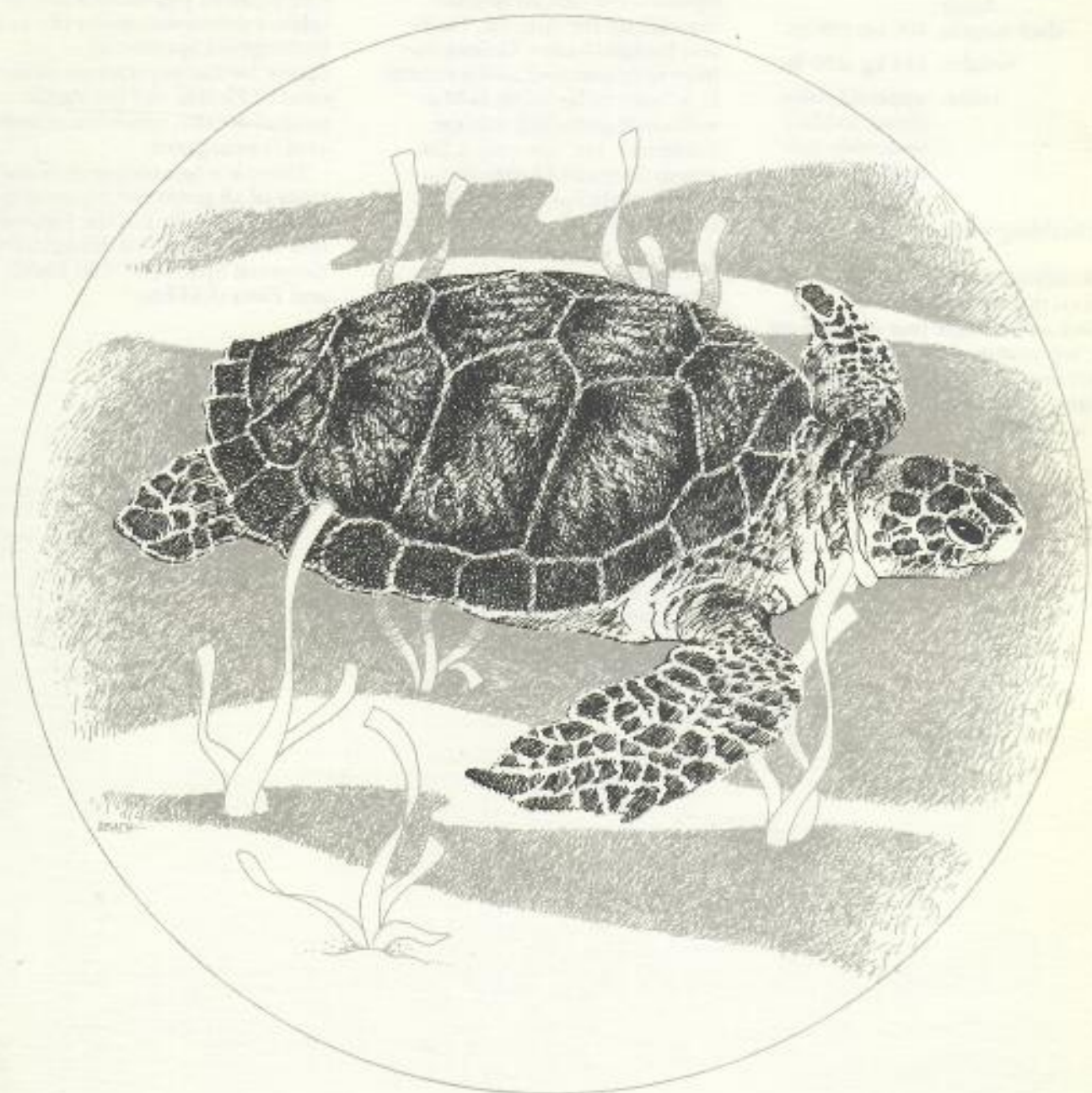
Sea birds are often seen perched on the shell of the flatback in the open sea. This is thought by some to be a mutualistic relationship: The bird acts as a warning of approaching danger for the turtle, and the turtle is a resting place for the bird.

Population Status:

The flatbacks are only common in the waters off Australia where they have lived for many years in stable numbers. Their resemblance to the endangered green sea turtle makes it difficult for customs agents to distinguish between the two species. Therefore, there is a ban on international trade of all flatback products under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Green Sea Turtle

Chelonia mydas



The green turtle is distributed throughout the world's oceans. On the beaches in Hawaii, males as well as females come ashore during the day to bask in the sun. This behavior has not been observed in other species or by greens in any other part of the world. The green

is considered by many to be the most commercially valuable turtle because of the various products made from its parts: shell for jewelry, skin for leather, flesh for meat, calipee for soup, bone for fertilizer, and eggs for protein and as a reputed aphrodisiac.

The accelerated exploitation of the green turtle in the early 70's has reduced nesting populations in

many places. The recent federal listing of the species in Florida and the Pacific coast of Mexico as endangered emphasizes the need for protection.

GREEN SEA TURTLE

Scientific Name: *Chelonia mydas*

Physical Characteristics:

Adult

shell length: 100 cm (39 in)

weight: 114 kg (250 lb)

color: upperside-olive
brown to black
underside-pale
yellow, creamy
whitish

Hatchling shell: 4 cm (1.5 in)

Identifying Characteristics:

Green turtles have four costal plates and a single pair of scales on the top of their heads between their eyes. The greens are the largest of the hard shelled species of sea turtles.

Range:

Green turtles can be found in waters between 35° north and 35° south latitude. They are found in both the eastern and western hemispheres and nest on beaches throughout the Atlantic, Pacific and Indian Oceans. Greens may have been common to the eastern U.S. coast as far north as Massachusetts and south into the Caribbean, but now only a few greens frequent Florida and a small population inhabits the Caribbean.

Feeding:

The green turtle is predominantly vegetarian except for its first year when it is carnivorous. Its adult diet consists mostly of algae and certain sea grasses. Greens appear to swallow their food in lunging gulps without much chewing.

Facts:

The green turtle is the best known species of sea turtle in the world because of its value as a food source. 50% of its wet weight is an edible protein source. It is not known how many years it takes a green turtle to reach sexual maturity. Estimates range from 8 to 50 years.

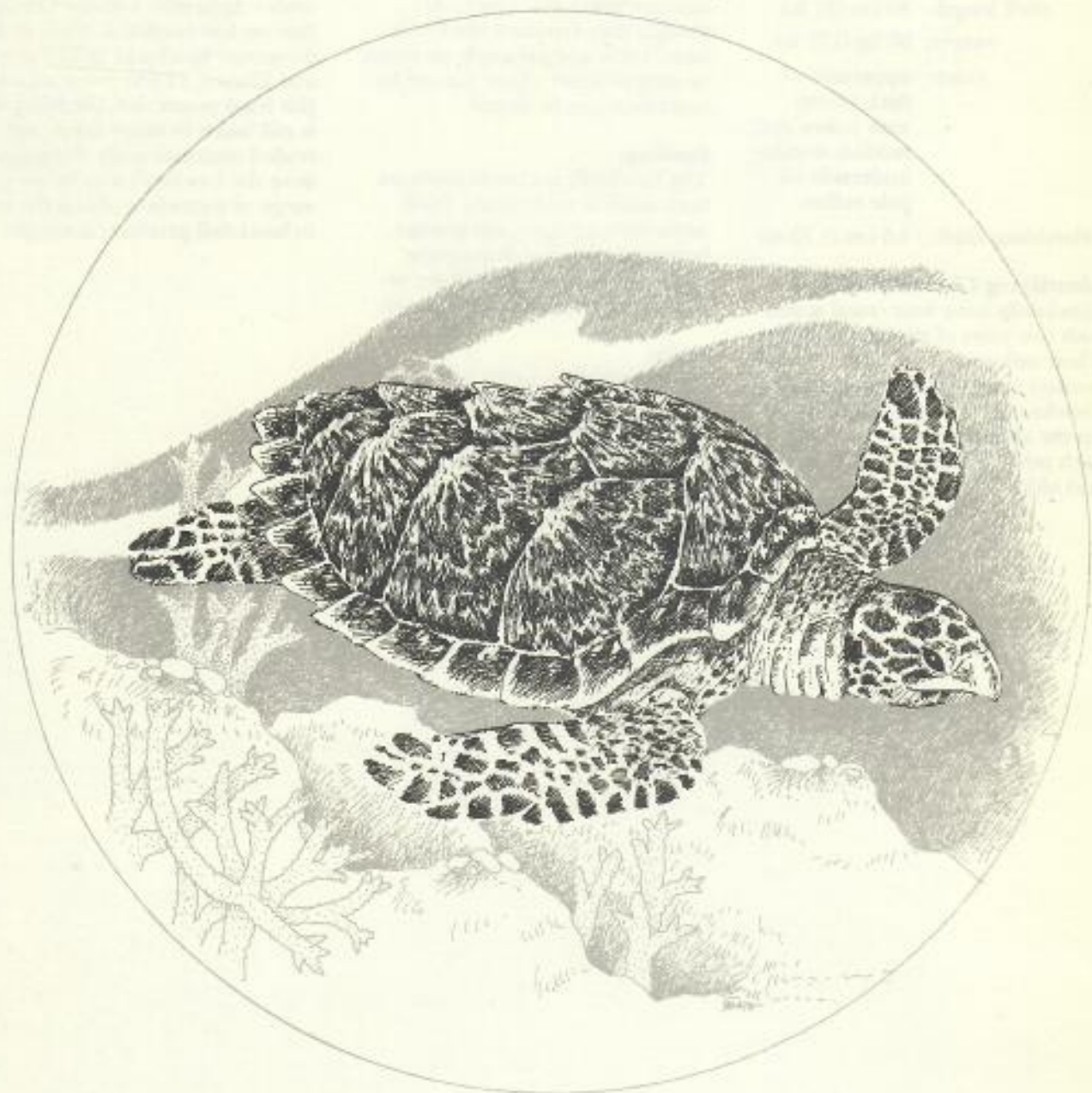
Population Status:

Certain populations of greens remain uncouneted but historical accounts of abundant nesting females indicate drastic declines. Currently, all populations are considered threatened under the U.S. Endangered Species Act, except for the populations off the coast of Florida and the Pacific coast of Mexico which are considered "endangered."

There is a ban on international trade of all green turtle products under Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Hawksbill Sea Turtle

Eretmochelys imbricata



The hawksbill sea turtle was named for its "beak-like" upper jaw bone that resembles a hawk's bill. Most people only know this turtle from the jewelry made from its shell called "tortoiseshell." The beautiful coloration and consist-

ency of the hawksbill shell makes this turtle a sought-after commercial resource. The extensive trade in both raw and worked tortoiseshell is creating a demand for the killing of hawksbills both on land and in water. Most turtles nest in numbers on particular beaches, but the hawksbill is erratic in its

nesting behavior and never heavily populates any one beach. This makes it difficult to fully assess the current status of this turtle.

HAWKSBILL SEA TURTLE

Scientific Name: *Eretmochelys imbricata*

Physical Characteristics:

Adult
shell length: 80 cm (31 in)
weight: 60 kg (132 lb)
color: upperside — dark brown with yellow and reddish streaks/
underside — pale yellow.

Hatchling shell: 4.5 cm (1.75 in)

Identifying Characteristics:

Hawksbills have four costal scutes with two pairs of prefrontal scales. Their yellowish jaws form a narrow hooked beak — thus the name "hawks-bill." The plates that make up the shell imbricate (overlap) each other (except for hatchlings and older adults).

Range:

Hawksbills have a more limited range than other species of turtles. They prefer the warmer tropical waters. Another characteristic of hawksbill behavior is that they rarely nest in large numbers on any one particular beach. Although they frequent the Caribbean, there are presently no major nesting beaches where numerous hawksbills can be found.

Feeding:

The hawksbill sea turtle feeds on both animals and plants. Food items include algae, sea grasses, barnacles, fish and Portuguese men-of-war. Sponges and sea urchins are favorites of this species.

Facts:

"Tortoiseshell" is really hawksbill shell. Many jewelry products are made with this material and are illegal to sell in this country. Trade in tortoiseshell is the major threat to this endangered species.

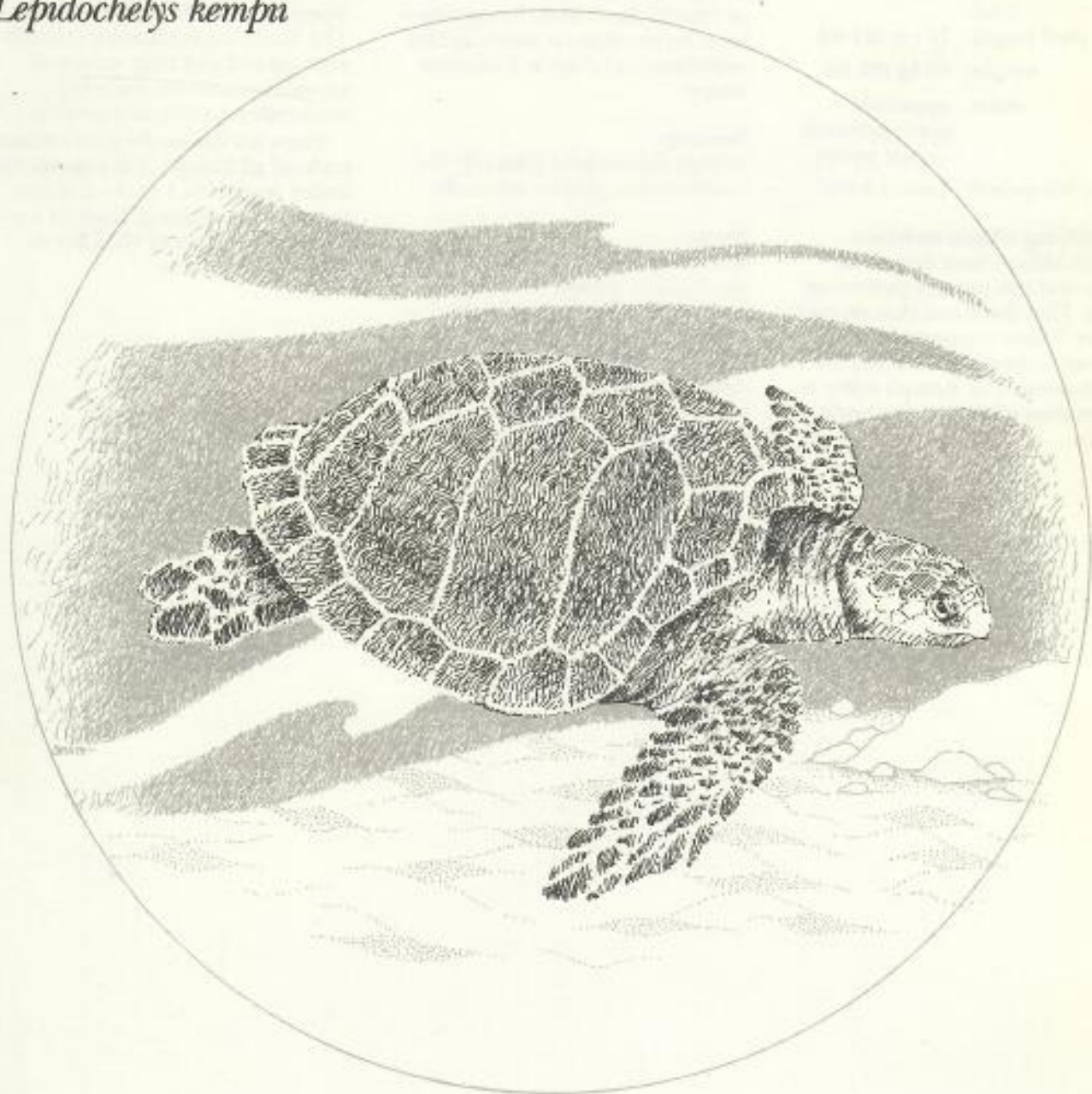
Population Status:

The hawksbill is endangered throughout its range and is listed under the U.S. Endangered Species Act.

There is a ban on the international trade of all hawksbill products under Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Even with all of this legal protection, the hawksbill is still taken in many areas and traded internationally. Scientists believe the hawksbill may be on the verge of extinction unless the trade in hawksbill products is stopped.

Kemp's (Atlantic) Ridley Sea Turtle

Lepidochelys kempii



The Kemp's (Atlantic) ridley sea turtle is the rarest of all the sea turtles. The only known major nesting beach is at Rancho Nuevo, Mexico. Other nesting beaches may have existed before egg poaching pressures became extensive. Turtle eggs are a valuable

food resource for many native cultures but more commercial interests have become a threat to the ridley population. Kemp's ridleys are mass nesters like their close relative the olive ridley. On certain days during the nesting season, the female nesters, who have gathered offshore, crawl up the beach to lay their eggs. The number of females involved in these mass nestings, known as arribadas, have greatly

diminished in recent years. Protection of nesting beaches and other conservation measures are attempts to preserve this critically endangered species.

**KEMP'S (ATLANTIC) RIDLEY
SEA TURTLE**

Scientific Name: *Lepidochelys
kempii*

Physical Characteristics:

Adult
shell length: 70 cm (27 in)
weight: 42 kg (92 lb)
color: upperside —
gray/underside
— pale yellow

Hatchling shell: 4 cm (1.5 in)

Identifying Characteristics:

Kemp's ridleys have five costal scutes and two pairs of prefrontal scales. They have one claw on each flipper. There are pores between the four inframarginal scutes on the plastron. The Kemp's ridley is the smallest of the marine turtle species.

Range:

This species is only found in the Gulf of Mexico and along the eastern coast of the U.S. The only known nesting beach is in Rancho Nuevo, Mexico. The species is thought to hibernate off the coast of Florida. Individual Kemp's have been reported as far north as Massachusetts and even in European waters.

Feeding:

Kemp's ridleys feed primarily on invertebrates, particularly crabs.

Facts:

Kemp's ridleys usually nest during the daytime (mostly between the hours of 9 am and 1 pm). There is no regular interval between nestings. Instead, the winds may be the determining factor for mass nesting. This species is the rarest of the marine turtles and closest to extinction.

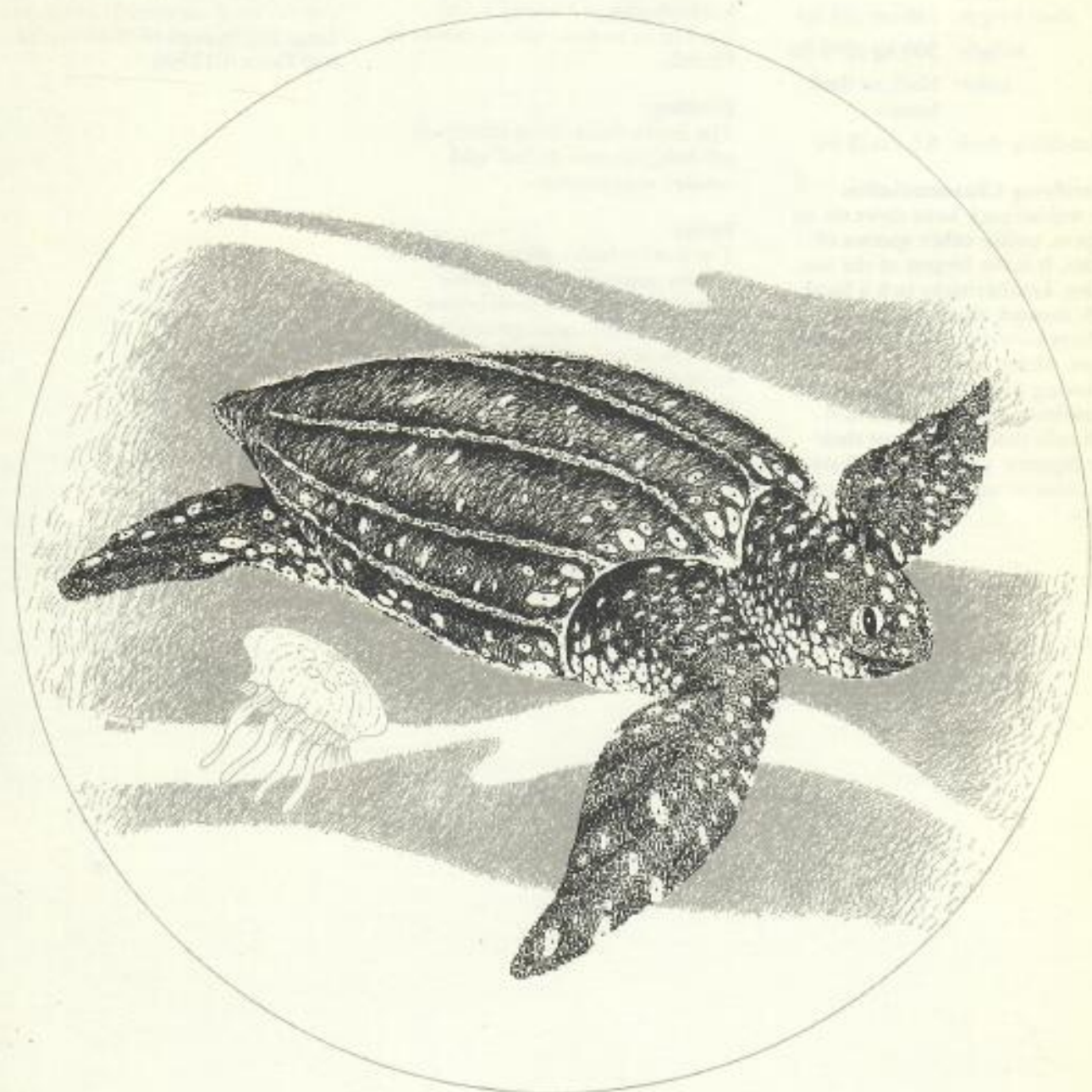
Population Status:

In 1947, a reported 40,000 Kemp's ridleys came ashore to nest on a single day in Rancho Nuevo, Mexico. Since then, that number has declined. Only a few hundred nesting females return to Rancho Nuevo to lay their eggs each year. The Kemp's is considered critically endangered and large scale conservation measures are being undertaken to save this species.

There is a ban on the international trade of all Kemp's ridley products under Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Leatherback Sea Turtle

Dermochelys coriacea



The leatherback sea turtle is one of the largest marine reptiles alive today. The heaviest leatherback ever recorded weighed 1,300 pounds. Its leathery-covered shell distinguishes it from other "hard-shelled" turtles. The leatherback more than other marine turtles is a long distance ocean wanderer. It is speculated that leatherbacks commute from South America to the

northeastern United States and back again in a single year.

Egg collection by humans is the major threat to this turtle. Leatherback eggs, like other turtle eggs, are considered delicacies and command a high black-market price. Leatherback nesting beaches are becoming commercially developed and tourists flock to the beaches at night to observe nesting turtles. This creates disturbances

that may deter nesting females from returning to the beach next time. Native tribes of the South Pacific are known to use the oil from the leatherback for domestic purposes. This oil is used medicinally in the Virgin Islands and as a boat sealant by the Indians in the Gulf of California.

LEATHERBACK SEA TURTLE

Scientific Name: *Dermochelys coriacea*

Physical Characteristics:

Adult
shell length: 140 cm (55 in)
weight: 300 kg (660 lb)
color: black or dark brown
Hatchling shell: 5.5 cm (2 in)

Identifying Characteristics:

The leatherback lacks claws on its flippers, unlike other species of turtles. It is the largest of the sea turtles. Leatherbacks lack a hard shell; instead, they have a soft leathery covering with five dorsal ridges. Males differ from females by having concave plastrons, more streamlined shells in back, and thick tails that extend past their rear flippers. Leatherbacks have two pointed notches in their upper beaks.

Range:

Leatherbacks are found predominantly in tropical seas but are known to migrate to temperate waters as far north as Nova Scotia and as far south as South Africa and New Zealand. In the U.S., leatherbacks nest yearly in the Caribbean and on rare occasions in Florida.

Feeding:

The leatherback feeds mostly on jellyfish, but also on fish and smaller sea creatures.

Facts:

The leatherback's skeletal structure retains much of its embryonic characteristics. The limb bones have extensive cartilaginous ends and the bones and shell contain large quantities of oil. The leatherback has long-backward spines that line its mouth and throat and assist the turtle in keeping jellyfish and other food items down.

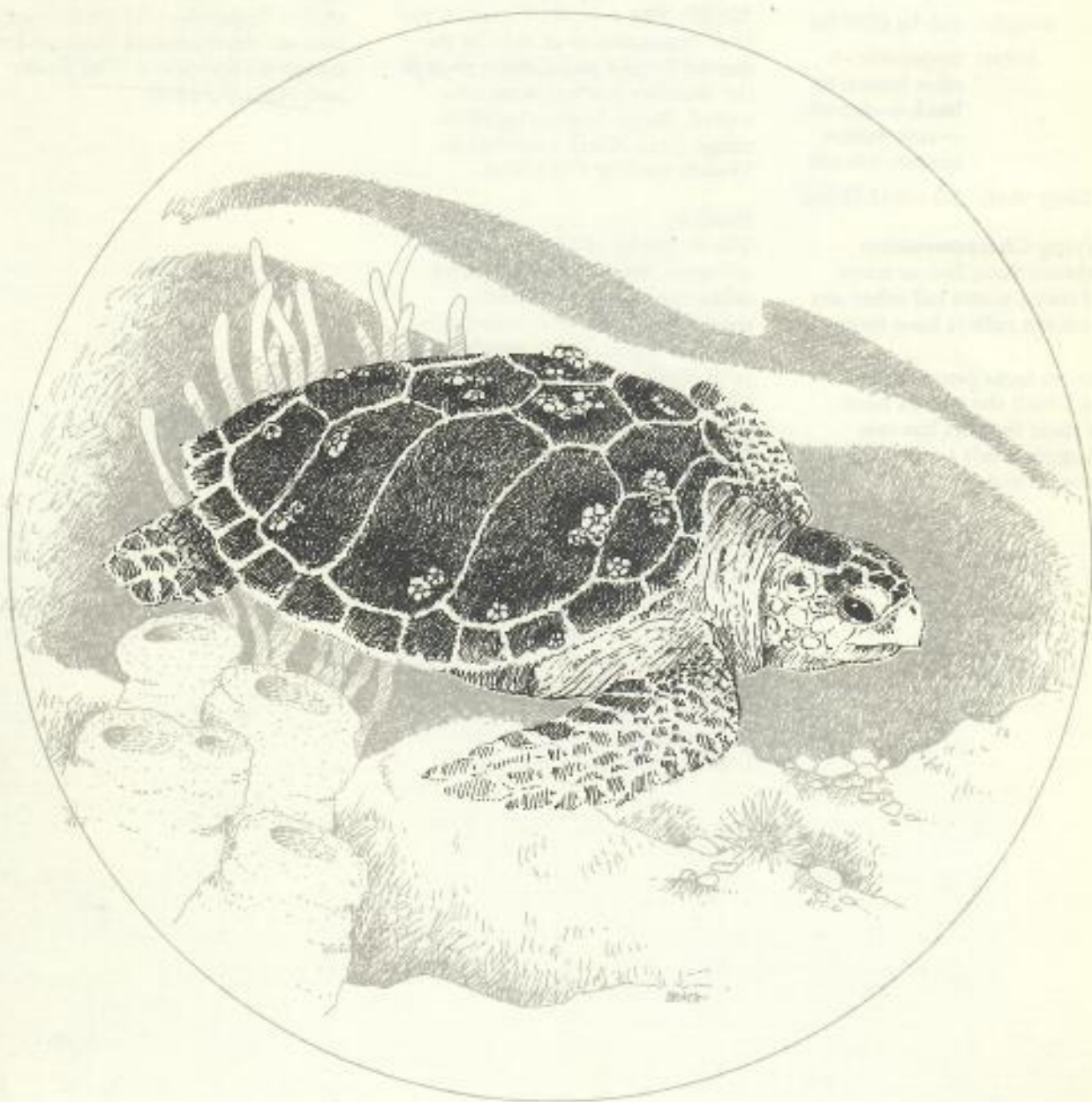
Population Status:

The leatherback is listed as endangered under the U.S. Endangered Species Act.

There is a ban on international trade of all leatherback products under Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Loggerhead Sea Turtle

Caretta caretta



The loggerhead turtle got its name from fishermen who thought that the head of the turtle on the surface of the water resembled a floating log. Sea turtles are known to float and mate on the surface of the water but prefer the underwater environment for feeding and possibly hibernating. Loggerheads are found in areas off the coast of

Florida buried in mud, remaining under water during the winter months. The colder temperatures cause their energy requirements to be drastically minimized and they are able to fulfill their respiratory needs by taking oxygen from the water as fish do.

This species is common to North American waters, nesting between May and August on beaches from

New Jersey to Texas. The population off the southeast coast of the United States is one of the largest in the world yet suffers the decline that other species display. Habitat destruction and incidental take by fisheries are major causes of this decline.

LOGGERHEAD SEA TURTLE

Scientific Name: *Caretta caretta*

Physical Characteristics:

Adult
shell length: 110 cm (43 in)
weight: 105 kg (230 lb)
color: upperside —
olive brown to
black underside
— pale yellow,
creamy whitish
Hatchling shell: 4.5 cm (1.75 in)

Identifying Characteristics:

Loggerheads have five or more pairs of costal scutes (all other sea turtles except ridleys have four pairs).

This species lacks pores on the plastron which the ridleys have. Each of their flippers has two claws. Loggerheads have two pairs of prefrontal scales.

Range:

The loggerhead species is found throughout the world in varying numbers. Masirah Island off the coast of Oman hosts probably the largest number of nesting females in the world, approximately 30,000. The southeast coast of the U. S. maintains what may be the second largest population, though the number has not been estimated. Major nesting beaches range from North Carolina to Florida and the Caribbean.

Feeding:

The loggerhead is primarily carnivorous, feeding on crabs and other crustaceans, shellfish, sponges, jellyfish and sometimes fish and algae. The loggerhead's powerful jaws are well suited for eating hard-shelled food items.

Facts:

Some scientists believe that female loggerheads, like other sea turtles, may be able to store fertile sperm for long periods of time for future fertilization of eggs. Loggerheads are known to enter rivers and streams which contain only limited salt concentration in order to feed. Beach destruction and the incidental take of loggerheads by various fisheries are serious threats to the U. S. population of this species.

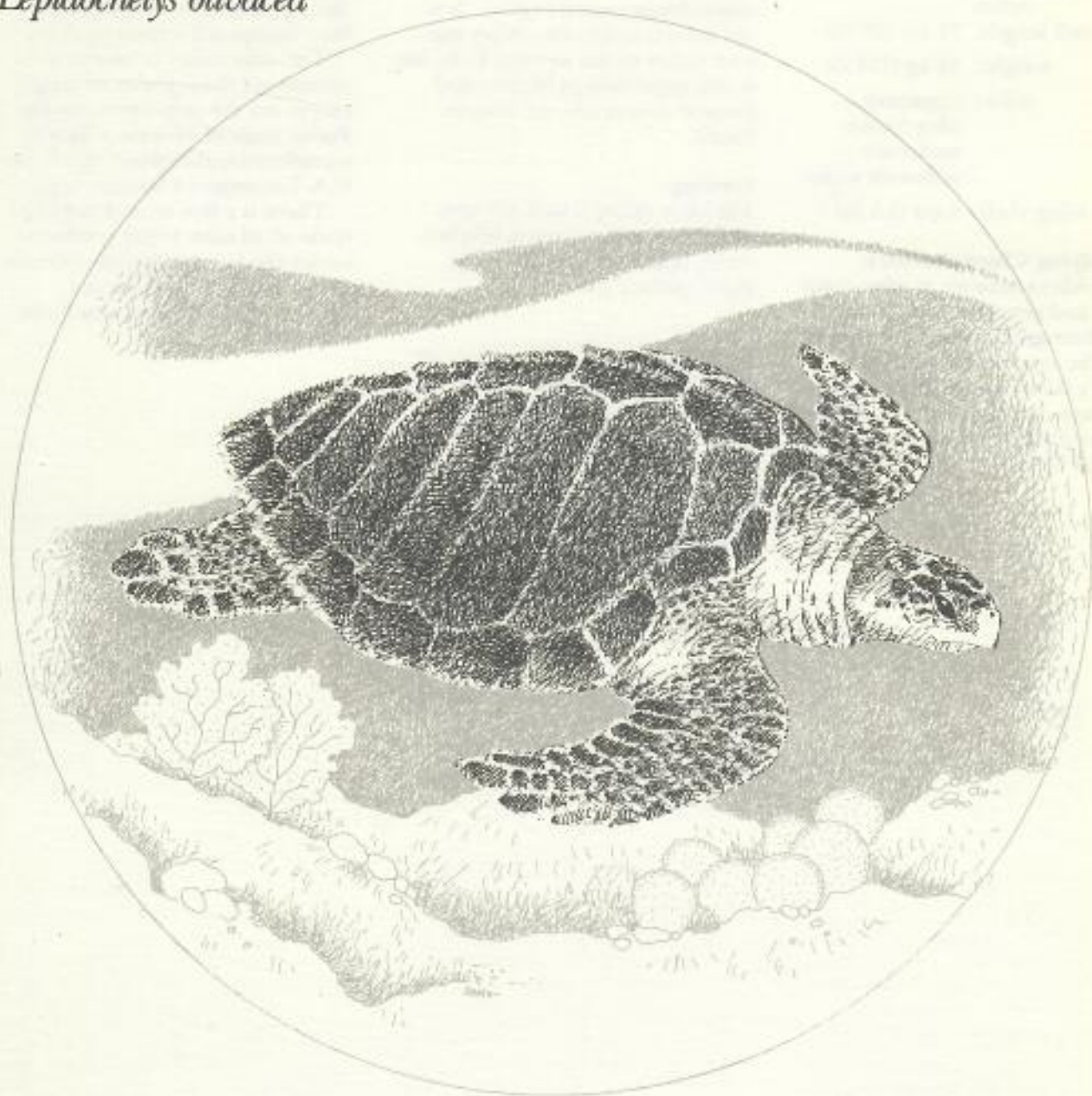
Population Status:

On a worldwide basis, the loggerhead is a threatened species and is listed as such under the U. S. Endangered Species Act.

There is a ban on the international trade of all loggerhead products under Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Olive (Pacific) Ridley Sea Turtle

Lepidochelys olivacea



The olive (Pacific) ridley resembles its close relative the Kemp's ridley. Mass nesting is also a characteristic of this turtle, a phenomenon known as "arribada"—the arrival. Major nesting beaches are found on the west coast of Mexico and along the Indian coastline.

Records of past arribadas indicate there is a decline both in the

number of females nesting and the number of arribadas. The olive ridley sea turtle is a food resource for many coastal people but the current trend of declining populations threatens its availability and abundance.

One threat to the olive ridley off the coast of Mexico is the high level of nest predation by poachers, domestic dogs, pigs, raccoons, possums, coyotes and ringtail cats.

This loss of eggs combined with large scale hunting for adult turtles to provide products for international commercial interests is largely responsible for the current endangered status of the olive ridley. Extensive harvests of this species in Mexico and Ecuador, primarily for turtle leather, has reduced local turtle populations.

OLIVE (PACIFIC) RIDLEY SEA TURTLE

Scientific Name: *Lepidochelys olivacea*

Physical Characteristics:

Adult
shell length: 72 cm (28 in)
weight: 52 kg (114 lb)
color: upperside—
olive brown
underside—
yellowish white

Hatchling shell: 4 cm (1.5 in)

Identifying Characteristics:

Olive ridleys have six to nine costal scutes and pores on their plastron. This distinguishes the olive ridley from the loggerhead and the Kemp's ridley sea turtles. Adults only have one claw on each flipper and two pairs of prefrontal scales on their head.

Range:

The olive or Pacific ridley is not exclusively found in the Pacific Ocean. It can also be found in the Atlantic and Indian Oceans. This species prefers the warmer latitudes and remains in the tropical/subtropical regions. It is not known if the olive ridley was ever native to the western U.S., but it now nests only in Mexico and Central America in the eastern Pacific.

Feeding:

The olive ridley is basically omnivorous, eating shrimp, jellyfish, crabs, snails and fish as well as algae and sea grasses.

Facts:

Mass nesting is a characteristic of the ridleys (both Kemp's and olive). Most olive ridleys nest at night while Kemp's ridleys nest during the day. The olive ridley is heavily exploited for its leather and oil. Eggs are also a highly valued and sought after item.

Population Status:

In 1967, 3,000 adult ridleys were killed daily for 3 months at Mazatlan, Mexico for the turtle leather market. Mass slaughters are still common today in Mexico and Ecuador. Trade restrictions and declining olive ridley populations have hampered certain markets.

The olive ridley is considered threatened throughout its range except for the population on the Pacific coast of Mexico, which is considered endangered under the U.S. Endangered Species Act.

There is a ban on international trade of all olive ridley products under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Turtle Tales and Other Activities

Teachers have opportunities to create activities that will enhance their students' understanding about sea turtles. Art, music, dance, and writing are all ways of expressing ideas, feelings, and creative thoughts. The suggestions below are just a sample of the possibilities that exist for getting students involved.

WRITING

1. Folk tale — Write a tale of a sea turtle. What do turtles do underwater most of their lives? Why do the females come ashore to lay their eggs? What mystical powers are stored in a turtle's shell? Turtles have been the subject of many native cultures' religion and story-telling. Write a story using your impressions about sea turtles.

2. Reporting — Write a newspaper article. **DATELINE:** Washington, D.C. — A new law passed by Congress today requires all those who receive this activity sheet to write a story about sea turtles that will be submitted to their local newspaper. Maybe you have just discovered a new fact about sea turtles that must be written up for the press or you have identified a new kind of sea turtle: who, what, where and when. Let your imagination run wild!

3. Poetry — Write a turtle poem. Poems don't have to rhyme to be poetic. They are just words that fit together to convey a mood, action, quality, etc. Limericks are poems with 5 lines. The first, second and fifth line rhyme with each other. The third and fourth lines rhyme with each other.

Example:

The mother turtles crawl up the beach
To dig a nest with a flipper's reach.
She lays her eggs
Between her legs
And then crawls back to sea
without speech.

4. Word Maze — Choose words that describe or relate to sea turtles and their life. Then write them down in a grid so they can be read up and down, side to side or diagonally. Fill in the extra spaces with any letter you want and then give it to a friend. Can he/she find all the hidden words? Here are some words you may want to start with:

- Carapace
- Scutes
- Flipper
- Crawl
- Nest

ART

5. Illustration — Drawing a turtle can be lots of fun. Sea turtles have flippers while land turtles have legs. All turtles have beautiful mosaic shells. They also have two eyes, nostrils and a mouth, just like us. If you put a few drawings together in a sequence, you have a picture comic strip. Can you make a picture comic strip of a turtle nesting on the beach? Large drawings can become posters or murals (if you have permission to draw on a wall).

6. Painting — You can paint an illustration or just paint, whatever strikes your fancy. Color expresses moods, atmosphere, temperature and other qualities. Paint a sea turtle the colors you feel. The shell is an area for real creativity. The Seri Indians believe the world was created on the back of a leather-back sea turtle. Do you believe it? Sea turtles are colorful creatures both in how they look and how they behave.

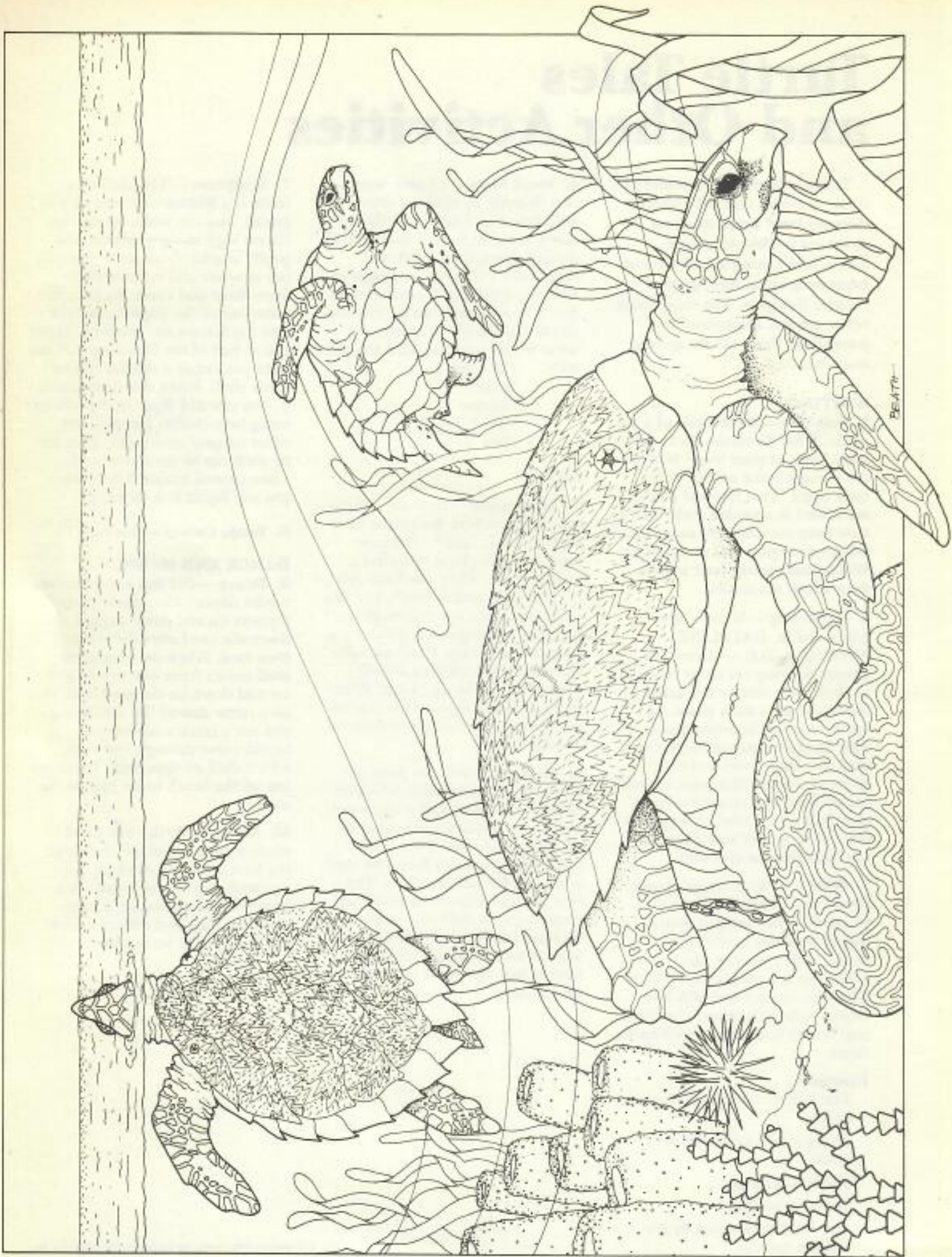
7. Sculpture — The shell of a turtle is a feature common only to turtles. You can make an easy imitation shell using a balloon and papier maché. Soak some newspaper in water and mix together some flour and water. Squeeze the water out of the paper and dip it into the flour-water mixture. Apply this to half of the blown-up balloon until you create a thick imitation turtle shell. When this dries, paint it. You can add flippers and a head using bent clothes hangers and other support structures. Your turtle shell can be used as a bowl when turned upside down. Don't put any liquid in it though!

8. Turtle Cutout — See page 13

DANCE AND MUSIC

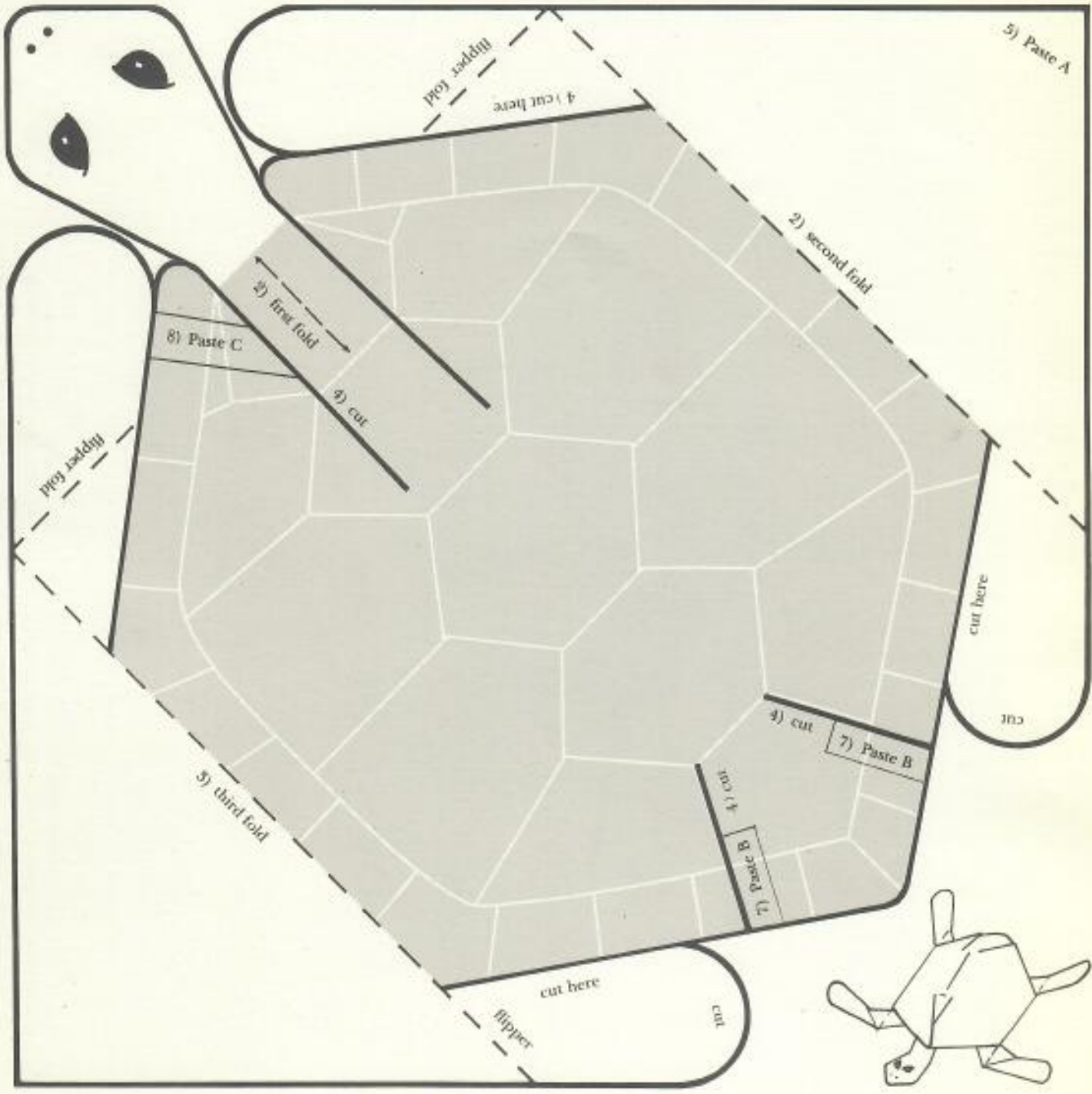
9. Dance — Did you know that sea turtles dance? They move their flippers up and down to pack down the sand after they cover their nest. When dancing, their shell moves from side to side and up and down on the sand. Can you do a turtle dance? Try imagining you are a turtle and how you would move through the water with a shell on your back. Try crawling up the beach to lay eggs in the sand.

10. Music — Turtles don't make many sounds when on land or in the water, but you can sing. Can you make up a song about a sea turtle? Dress up like a sea turtle and do a song and dance routine. It's bound to be an original.



Ten Tough Steps to Sea Turtles

- 1) Cut the directions from the turtle on the double line. Color the shell, flippers and head.
- 2) Fold along the "first fold" across the entire square. This makes a triangle.
- 3) Unfold the triangle to make the square again and fold along "second fold" and "third fold."
- 4) Cut along all the thick solid lines CAREFULLY. This will make the flippers, neck and head.
- 5) Put paste on "paste A" and pull the opposite corner over it. This makes a tunnel shape.
- 6) Fold the flippers out away from the shell.
- 7) Push the tail section down a little and pull the shell flaps over "paste B" and paste.
- 8) Now for the front end of the turtle. Fold the neck down slightly so the front flaps of the shell can be pasted over it. Paste front shell flap over "paste C."
- 9) Fold the diamond shaped head forward and then trim the back flippers so they are curved.
- 10) Fold the front flipper down and back along the "flipper fold".



HEAD

CARAPACE

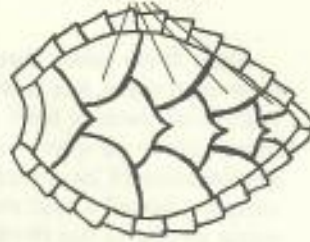
PLASTRON

Hawksbill:

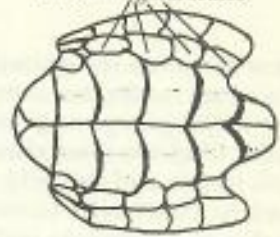
2 pair of prefrontal scales



4 costal scutes



4 inframarginal scutes



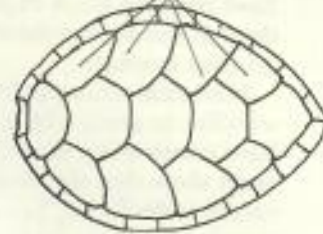
Green:
curved green shell

Flatback:
depressed shell

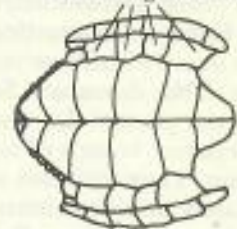
single pair of prefrontal scales



4 costal scutes



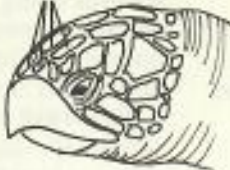
4 inframarginal scutes



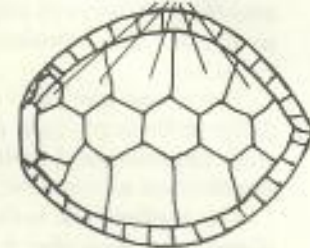
Kemp's ridley:
4 costal scutes

Olive ridley:
6-9 costal scutes

2 pair of prefrontal scales



5 costal scutes



pores between
inframarginal scutes



Loggerhead:

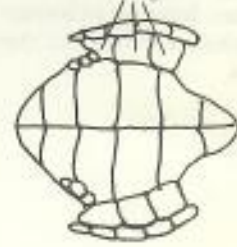
2 pair of prefrontal scales



5 or more pairs of costal scutes



3 inframarginal scutes



Leatherback:

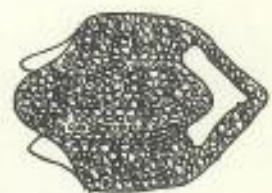
notches



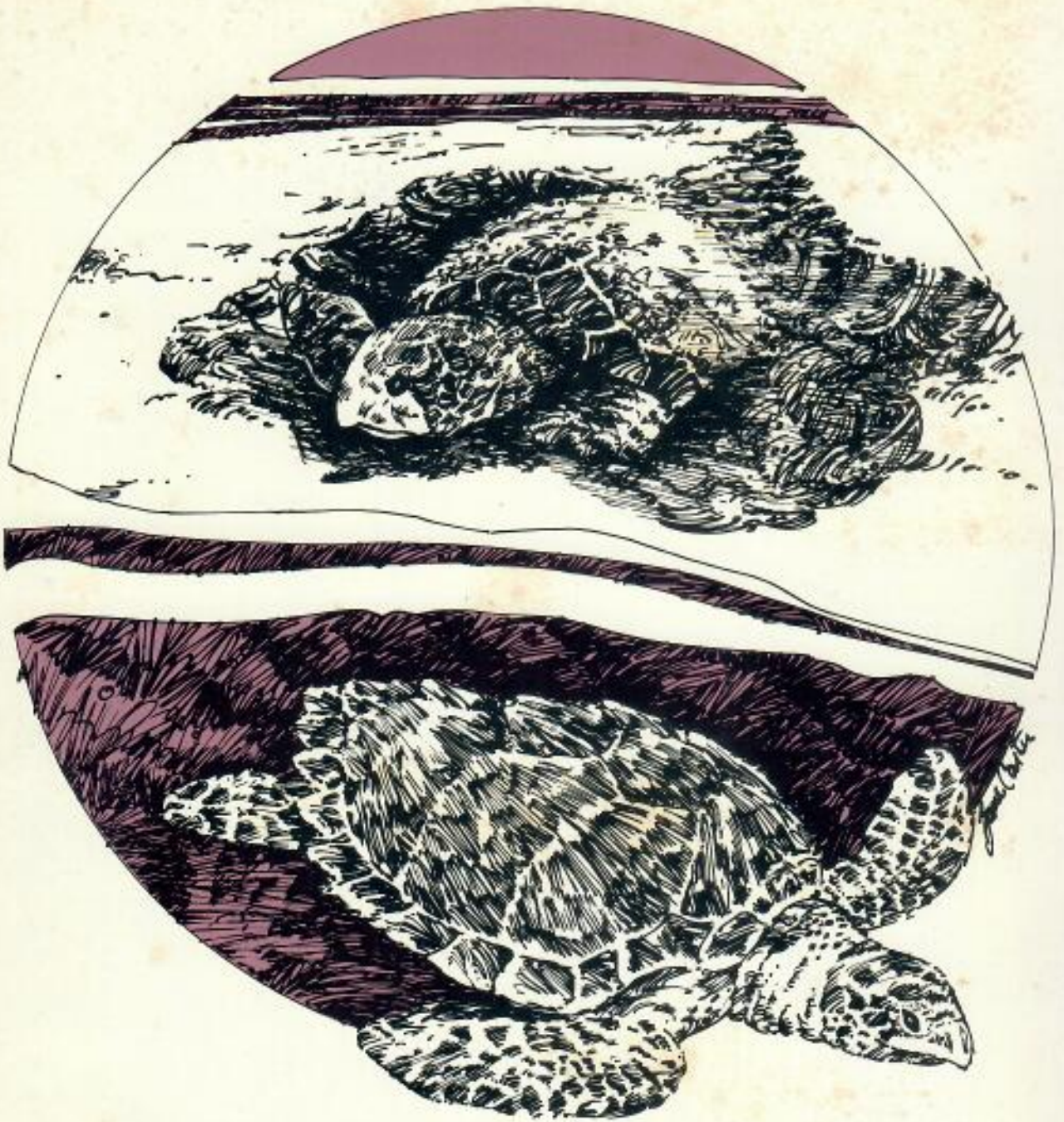
5 ridges



no inframarginal scutes



Sea Turtles



Center for Environmental Education