

*To my best friend Craig,  
who understood my fears  
and helped me learn to love the ocean.*

Published by:

**GREEN TURTLE PRESS**

P.O. Box 8658

Honolulu, HI 96830



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Library of Congress Catalog Card Number: 88-81836

ISBN: 0-9620712-0-X

Manufactured in the United States of America

Designed by Frank Hajek

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*COVER PHOTOS*

*Front: Pacific spotted dolphin,  
hawksbill turtle, marlin,  
tropic bird and chick.*

*Back: Portuguese man-of-war  
jellyfish, Hawaiian monk seal,  
humpback whale.*

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# PREFACE

You don't have to be a diver, snorkeler or even a swimmer to enjoy Hawaii's unique marine life. It's all there to see from a boat, a beach or while gazing at the sea from one of Hawaii's many lookouts.

This guide is for people who are interested in learning more about Hawaii's marine animals. It is also intended to be fun, something to make a beach outing or a channel crossing even more of a good time. It is satisfying to identify an animal, learn something about it and pass that information along to others.

All marine animals are impacted by human activity. I sincerely hope that this guide will help readers learn what is needed for these animals to survive.

Susan Scott, 1988



man-of-war. These blue jellyfish have long tentacles that can sting.

Blue buttons, violet shells and goose barnacles will also appear on beaches after strong winds. These are harmless to examine although the tentacles around the edge of blue buttons can irritate human skin.

Beach walkers should keep an eye out for two rare but possible sights: sea turtle tracks and monk seals. Sea turtles come ashore at night to lay eggs, leaving tracks that look like a single tractor tread. At the end of the track is the nest, a shallow depression in the sand. Monk seals bask in the sun and nurse their young on beaches. Both these events are now rare on the major islands but do happen occasionally. If you spot sea turtle tracks or monk seals on a beach, do not disturb the nest or animals and report these events to the National Marine Fisheries Service in Honolulu. Both species are protected by state and federal law.

On a dark-night beach stroll, try stamping your feet along the surf line to see bioluminescent plankton light up. This bluish-green glow is also visible in breaking waves.

You can find many interesting things on Hawaii's beaches. Each beach is different every day.

#### • ON ROCKY SHORES

Rock hopping is fun in Hawaii where lava flows have formed tide pools, arches and rocky ledges. Be careful. Beach exploration can be dangerous during high surf conditions.

Look for dark rock crabs in these places. People catch rock crabs for food and bait in Hawaii, therefore, these crabs are nervous around humans. Sit quietly and young ones will peek out from behind a rock. You will rarely see the wily adults up close but you can find their red,

#### LEFT

*This tide pool shelf near Manele Bay, Lanai, is completely submerged during high tide. This adds to the diversity of life in the pools.*

#### BELOW

*Local people eat limpets raw. Because they live on surf-swept rocks, limpets are often difficult to collect.*

#### BOTTOM

*One type of hermit crab in Hawaii has bright blue eyes. The large claw of this crab does not pinch. The animal uses it to cover the opening of the shell when it withdraws.*



**ABOVE**

*Monk seals, once common in the islands, are now rare and in danger of extinction. This one lives at the Waikiki Aquarium.*

molted shells along the shore. This is an easy way to examine the animal.

Limpets, shingle urchins, nerites, periwinkles and hermit crabs live in distinct zones. Limpets and shingle urchins prefer rocks in pounding surf. Nerites feed in higher areas well within the splash zone. You can see periwinkles at the upper edge of the tideline. Look for hermit crabs wearing nerite or periwinkle shells in and around tide pools.

Local people eat limpets and the gonads of shingle urchins uncooked but they eat nerites and periwinkles boiled.

#### • IN BOAT HARBORS

Harbors are good observation points because you can stand on a dock and look into deep water. Look for barnacles, mussels, fan worms, sponges and dozens of other marine animals stuck to or nibbling at harbor structures. These sedentary marine animals prefer to live on piers, pilings, and boat bottoms because the water is quiet and nutrient rich.

Tilapia are small, gray fish, common in Hawaii's harbors, that breathe air at the surface when water is polluted. Rays sometimes cruise harbors in search of plankton. White jellyfish, called moon jellies, pulsate gracefully among boats.

You may see moray eels among the rocks at a harbor's edge. People often mistake eels for snakes but they are fish, and harmless unless a hand or foot is placed directly in the animal's mouth. Sea snakes are rare in Hawaii.

#### • AT THE WATER'S SURFACE

Whether floating in a boat, kayak, sailboard or cruise ship, the surface of the sea is the place to discover the largest variety of marine life.

If you are on a boat listen carefully when below





**ABOVE**  
*Fishermen catch rock crabs to use as bait.*



**LEFT**  
*Dolphins are common in Hawaiian waters but you can also see these friendly faces at Sea Life Park on Oahu.*



deck. The crackling sound is the noise of snapping shrimp guarding their territories. You can also hear snapping shrimp while swimming.

Sea turtles often bask at the water's surface, looking like floating brown disks or debris. A turtle head raised for a breath of air will confirm the identity of the brown disk. Sea turtles mate in the water so it is possible to see two heads together.

The fish you will see most often from a vessel are flying fish which leap out of the water in squadrons and glide for amazing distances. Occasionally, unlucky ones land on boat decks at night. Flying fish are good to eat.

Trolling offshore, you will most likely catch skipjack tuna (*aku*), yellowfin tuna (*'ahi*), little tunny (*kawakawa*), wahoo (*ono*) or dolphinfish (*mahimahi*). Other species of gamefishes swim in Hawaiian waters but these are the easiest and most common catches.

It is rare to see a shark in Hawaii but it does happen. Boardsailors cruising outside the reef sometimes see the dark shape of a shark pass by and, occasionally, fishermen see a shark fin hovering around a lure.

Black frigatebirds soar high overhead, white tropicbirds and boobies fly lower, and shearwaters and petrels swoop close to the surface, all looking for fish. Boobies sit on navigational buoys and young ones will occasionally land on boats for a rest.

#### UPPER LEFT

*Only female frigatebirds have white breasts. Males are all black, although they sometimes display red throat patches during the mating season.*

#### LOWER LEFT

*No one knows why humpback whales leap from the water in these spectacular displays called breaching.*



Watch for splashing in the distance. Dolphins like to play around boats and it is common for them to come leaping and bounding toward a vessel to play in the bow wave.

Humpback whales from Alaska winter every year in Hawaii. The humpbacks mate and give birth here. You can see these whales around all the islands but they are most common between Maui and Lanai from November to April. Humpbacks often breach (leap into the air). Look for baby whales with their mothers beginning in January. If you get a chance to swim in the vicinity of these animals, listen underwater for their famous song. Humpback whales are an endangered species, protected by state and federal law.

If traveling at night, watch the water for displays of bioluminescence. Flashes of light occur where oars or paddles hit the water, where a propeller turns and in the wake of the vessel. Dolphins can put on an impressive bioluminescent light show on dark nights.

#### • FROM A LOOKOUT

Oceanwatchers can sometimes see the wingtips of manta rays from boats but the balconies of a few hotels along the Kona coast of the Big Island of Hawaii are a sure bet for manta ray watching. On moonless nights, spotlights from the hotels attract plankton and small fish, which in turn attract mantas. The hotels welcome manta ray watchers. Ask for directions at Kona dive

#### UPPER RIGHT

*Sea turtles are air-breathing reptiles that can stay underwater for about two hours.*

#### LOWER RIGHT

*Dolphins surf on the bow waves of moving boats. If the wake is good, they may stay with the boat for 20 minutes or more.*



shops.

Hawaii is famous for spectacular cliffs which plunge to the sea. Find a comfortable place on top of one and settle down to watch breaching whales (in winter), spinning dolphins and leaping billfish. Seabirds sometimes ride the updrafts above cliffs.

It is easy to watch the ocean in Hawaii. In fact, it is hard to get away from it. So, whether sitting, walking, sailing, motoring or kayaking, keep your eyes and ears open to discover Hawaii's special marine life.

**RIGHT**

*Two immature Red-footed Boobies hitch a ride on the rail of an offshore sailboat. Adults, stronger and more efficient at sea, rarely rest on boats.*





# REPTILES

Reptiles are cold-blooded, air-breathing animals with scaly skin. Cold-blooded means the animal gathers warmth from the environment rather than producing its own. That is why reptiles bask in the sun: They are absorbing heat.

You can see two types of marine reptiles in Hawaii: sea turtles and, rarely, sea snakes.

## • SEA TURTLES

Sea turtles are relatives of land tortoises and fresh water turtles. They have adapted to life in the ocean with streamlined bodies and flipper-type limbs that make them efficient and graceful swimmers.

These reptiles mate in the water. The female swims while the male grasps her shell with his foreflippers. It is not unusual for a mating couple to be accompanied by another male or two. Males and females are easy to tell apart: Males have long, thick tails while female tails are short and stubby.

Sea turtles spend most of their time in the water. Females do not mate every year, but when they do, they come ashore several times to make nests and lay eggs on sandy beaches. These animals, which exhibit such grace in the water, are slow and labored on land. Female turtles inch themselves hundreds of feet along beaches looking for suitable nesting sites, then dig holes for the eggs with hind flippers better suited to swimming.

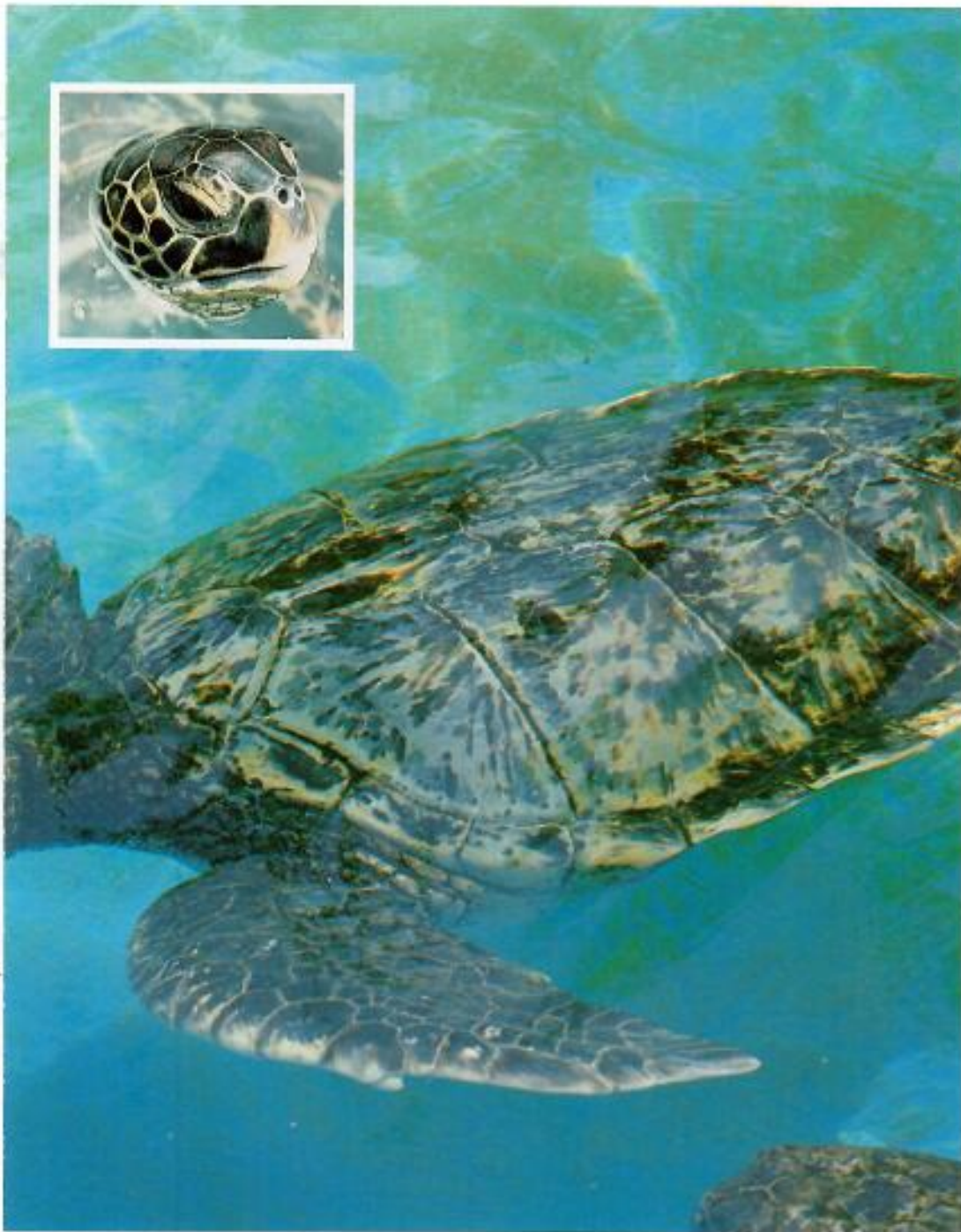
Turtle eggs are about the size of ping pong balls and have leathery shells. Females lay 50 to 250 eggs depending upon the species; the incubation period is about two months. Studies have shown

RIGHT INSET

*Pacific green sea turtles swim in bays and along shorelines looking for a type of seaweed called sea lettuce.*











egg temperature during incubation influences the sex of baby turtles: Lower temperatures produce males while higher temperatures produce females.

Hatchlings escape from the nest in a group effort, usually during the night. Because they find the ocean by heading for the brightest horizon, artificial lights near nesting beaches can mean death to these young turtles.

Researchers believe that sea turtles return to the place of their own birth to mate and nest. During other times of the year, they migrate to distant feeding grounds.

Adult sea turtles are long-lived but no one knows their exact life spans. Some turtles may take 40 to 50 years just to reach sexual maturity. Many turtle lives are cut short by sharks or humans, adult sea turtles' major predators.

Of the seven species of sea turtles that exist, three swim in Hawaiian waters.

#### **Hawaiian Green Sea Turtle (*Honu*)**

If you see a dark disk at the water's surface with a round head raised occasionally for a breath, it will most often be the Hawaiian green sea turtle. Green sea turtles are by far the most numerous species in Hawaii. They are named after their green body fat which people once coveted for soup.

Green turtle shells are mottled black, brown, gold and olive. These turtles can grow three or four feet long and weigh 400 pounds. You can see them in bays and near the shores of all Hawaiian islands where they graze on underwater seaweed.

In late spring, some adult green sea turtles migrate to the uninhabited Northwest Hawaiian Islands which extend 1,000 miles northwest of Kauai. Here, in the protection of the Hawaiian Islands National Wildlife Refuge, females crawl ashore to lay eggs. A few turtles also nest on the



#### **ABOVE**

*A female sea turtle leaves a trail that looks like a single tractor tread leading to her nest, a shallow depression in the sand. She digs the hole for her eggs above the high tide line.*

#### **UPPER LEFT**

*You can tell a male sea turtle from a female by his long tail. Males are usually smaller than females of the same age.*

#### **LOWER LEFT**

*Sea turtles mate in the water, sometimes for hours. It is common to see male turtles swimming around mating couples.*







main islands, so you could see turtle tracks or even turtles while walking on isolated beaches.

The stories about lusty, male sea turtles are true. They are often indiscriminate about their choice of partners and will attempt to mate with crude decoys, other males, divers and even rowboats.

Beach basking is rare among sea turtles but the Hawaiian population of green turtles has shown a penchant for this in the Northwestern Hawaiian Islands. Both males and females bask on the sand there to increase body temperature and, probably, to avoid sharks.

#### **Hawaiian Hawksbill Turtle ('Ea)**

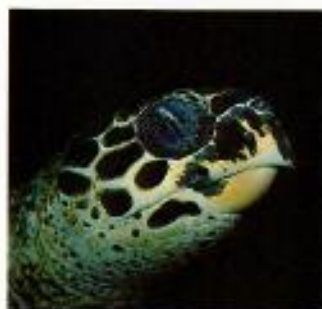
Hawksbill turtles are no longer common in the Hawaiian Islands but people occasionally see them around the islands of Molokai and Hawaii. You are most likely to see hawksbills in the water along the east coast of the island of Hawaii near Hawaii Volcanoes National Park and off Halawa Valley at the east end of Molokai. These turtles swim close to coral reefs where they poke narrow beaks into crevices for sponges and other invertebrates. Females recently have made a few nesting attempts on the black sand beaches of these islands but have laid no eggs.

The 'ea is smaller and has a more elongated beak than the *honu*. You might be able to recognize an 'ea in the water by its distinctive shell which is serrated on the edges. Identification by shell, however, is sometimes difficult and not always accurate because of color variations and algae growth.

#### **LEFT**

*Hawksbill turtles have distinctly colored "tortoise" shells with sharp, scalloped edges.*



**TOP**

*The beak of the hawksbill is narrow and elongated for grabbing sponges from holes in the reef.*

**ABOVE**

*Sea turtles lay soft-shelled eggs that look like ping pong balls.*

A few people have died after eating hawksbills. Researchers suspect the meat of these turtles is toxic from the sponges they eat.

People have slaughtered hawksbill turtles to near-extinction for their beautiful shells. This is the familiar "tortoise-shell" of combs, brushes, buttons and jewelry.

**Pacific Leatherback Sea Turtle**

Leatherback turtles are deep-water animals. Local fishermen occasionally see them beyond the 100-fathom line but still within sight of land. The north coast of Oahu and the Kona coast of the island of Hawaii are two areas of common sightings. Also look for leatherback turtles during channel crossings. Identification of this species is fairly easy: They are darker, larger and faster swimmers than other sea turtles.

Pacific leatherback sea turtles are the largest of all sea turtles, weighing up to 1,400 pounds. They live in the open ocean and feed almost exclusively on jellyfish. A tough, leathery shell which is flexible to the touch gives this turtle its name. Adults are black with white spots on their heads, backs and limbs.

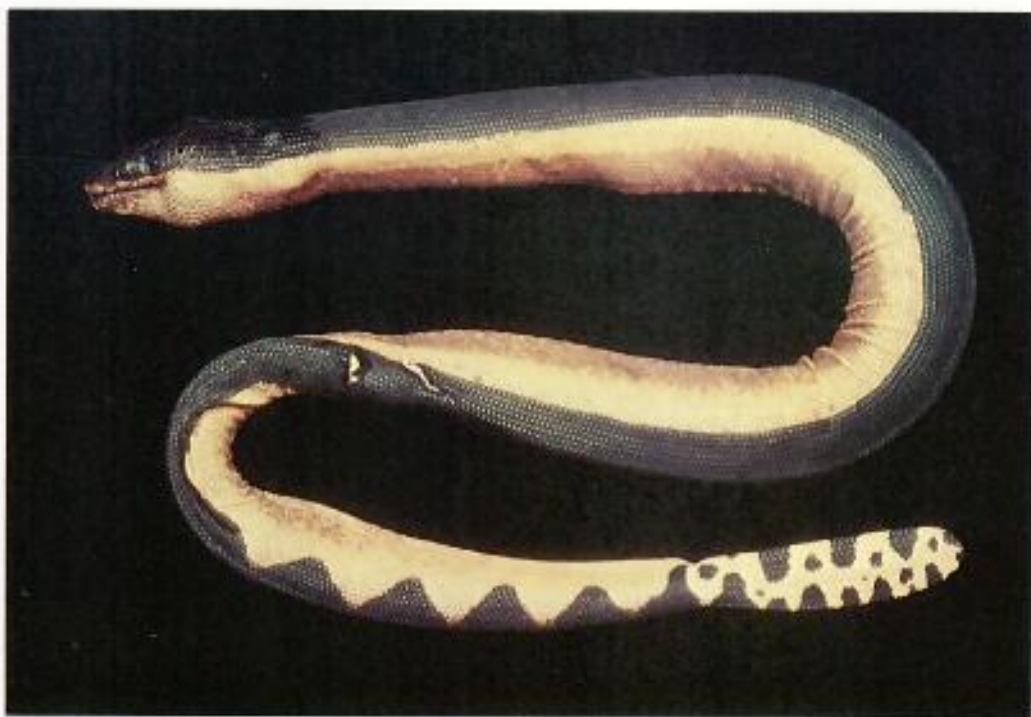
This giant turtle is the deepest diving of all air-breathing animals. One leatherback in the Caribbean Sea was tracked nearly three-quarters of a mile underwater in a dive that pushed the tracking device off its scale. Because of its large size, this turtle holds its body heat well and can tolerate the cold water of the deep ocean.

The meat of this turtle is oily and undesirable but humans eat leatherback eggs which threatens the species with extinction.

**• SEA SNAKES**

Sea snakes do not live near Hawaii but occasionally yellow-bellied sea snakes show up in Hawaiian waters. Yellow-bellied sea snakes are





common along the coast of Central America where they drift in currents. Changes in these currents occasionally bring a few to Hawaii where fishermen see them offshore or people find them on beaches.

You can easily distinguish these air-breathing reptiles from eels, which are sometimes mistaken for snakes. Yellow-bellied sea snakes breathe air, have scales and swim with flat paddle-shaped tails. Jet-black bodies with bright yellow bellies further identify these snakes which are related to cobras. These marine animals spend their entire lives in the ocean and are helpless on land.

Sea snake encounters are rare but if you do find one, be extremely careful. Although they are not particularly aggressive and have small teeth, their venom is so powerful that one drop can kill three people. Report any sightings to local authorities.

**ABOVE**

*Yellow-bellied sea snakes are extremely rare in Hawaii, but occasionally a few drift here on unusual currents from Central America. A bite from one of these snakes can kill.*

If you think you have seen a sea snake, check the section on eels in Chapter 5 before calling anyone. Eels wiggle like snakes and look menacing but are comparatively harmless.

#### • THE FUTURE OF SEA TURTLES

Millions of sea turtles once existed. Seventeenth century sailors could navigate through fog by following the noise of migrating turtle herds. But humans have killed and collected the eggs of so many sea turtles that now six of the seven species of marine turtles are listed under the federal Endangered Species Act as endangered or threatened.

In the United States, all sea turtles are protected from humans by state and federal laws. Not all countries have such laws, however, and relentless hunting continues to undercut efforts to save these prehistoric animals. While sharks may be sea turtles' greatest natural predator, humans are their deadliest enemy.

It is illegal to take any sea turtle for any reason. It is a crime to take, annoy or disturb a nesting female or her eggs. Divers should be aware that riding turtles is illegal and severely stresses the animal. You can help: Do not buy products that have any part of a sea turtle in them – shell, skin, meat, cartilage or eggs. Report tracks, nesting sites or turtles basking on the beach to the National Marine Fisheries Service, the Waikiki Aquarium, Sea Life Park or the U.S. Fish and Wildlife Service. If you accidentally catch a turtle or know of poaching, notify these authorities.

#### RIGHT

*Leatherbacks are huge, dark turtles. They stay in deep water hunting for jellyfish.*











**ABOVE**

*Turtles get rid of excess salt through tears. These salty tears also wash soil out of the eyes of nesting females.*

centers but as they travel along, they sort themselves out into swells. Since long waves move faster than short waves, the long ones move out ahead leaving the short waves behind. This sorting process is never complete; you can see this when swells arrive at the shoreline in bunches called sets. Intervals between sets are called lulls.

The erratic cycles of sets and lulls are why beaches and coastal areas can be dangerous during high surf conditions. They can surprise even the most seasoned beach walkers.

**Sea Salt**

Sea water is lethal to humans and most other terrestrial life in all but the smallest doses. Sea water is about three percent salt while the concentration of salt in the human body is less than one percent. Human kidneys cannot cope with three percent salt solutions so a person will die if he or she drinks only sea water.

Most marine creatures have evolved special systems to cope with high concentrations of salt but few can successfully cross the threshold between fresh and salt water. Animals that live where fresh and salt water mix have the widest range of tolerance.

Some primitive marine creatures such as single-celled animals and invertebrates, have salt and mineral concentrations similar to the surrounding sea. Most salt water fish have cells in their gills which excrete salt and sea turtles "cry" salty tears. Marine birds get rid of salt through tubes in their nostrils and the kidneys of marine mammals can handle high saline solutions.

Near coastlines, airborne droplets, or spray, are suspended long enough to dry out leaving tiny crystals of salt in the air. This is why you can smell the sea in the air before you can see it. Rain recycles this salt, washing it out of the air and back into the ocean.

#### • LEGENDS AND LORE

Stories about marine animals are common in Hawaii. Some tales are true; some are not. But all have an influence on how people react to certain animals and, in some cases, how animals react to humans.

#### **Shark Stories and Statistics**

Of all the animals in the sea, the shark, or *manō*, was especially meaningful in the religion of pre-Christian Hawaiians. They believed shark gods or *'aumakua* had human origins because sharks resembled miscarried human fetuses which were cast into the sea. Early Hawaiians believed the *'aumakua* would take on human form at will. Typical stories tell of strange men who became sharks when they jumped into the ocean.

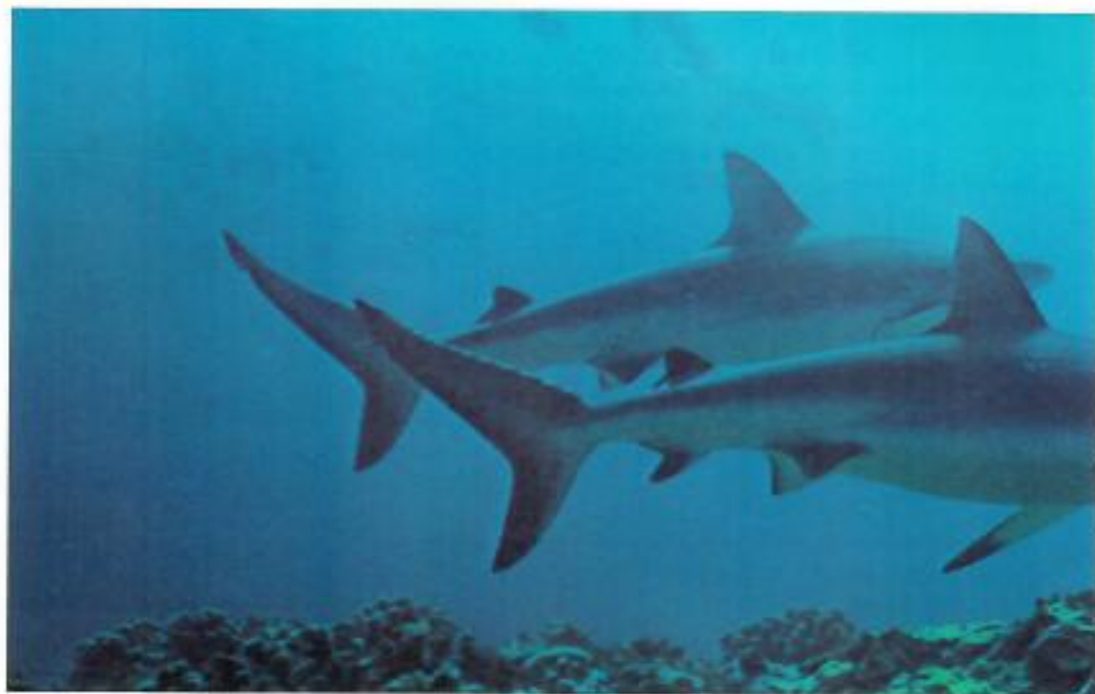
One such legend tells of Neneue the shark-man



ABOVE

*Marine birds, like this albatross, have glands above their eyes that secrete salt into their nostrils. These salt glands enable the birds to drink sea water.*



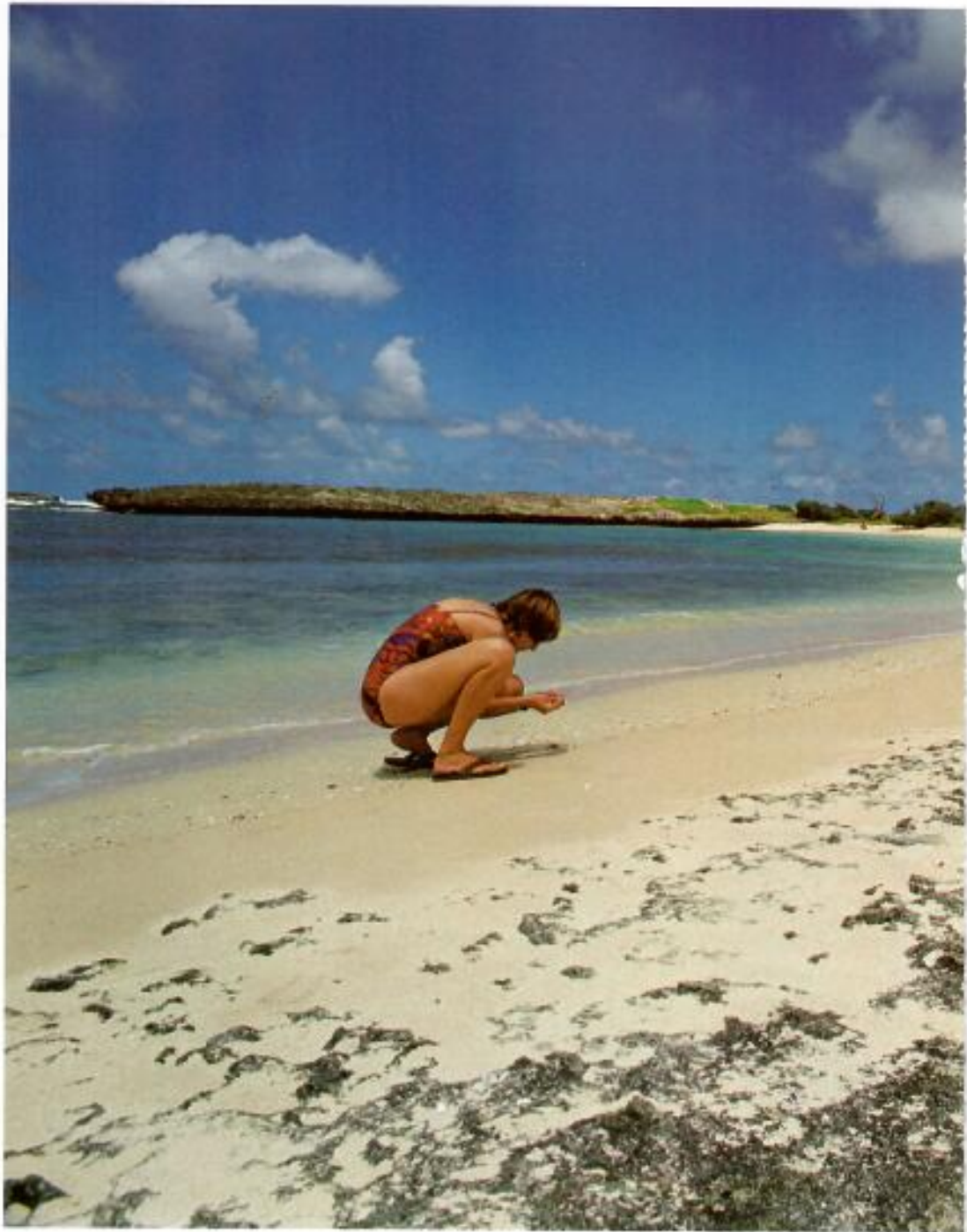


## ABOVE

*Early Hawaiians believed that sharks were gods or 'aumakua and could take on human form at will.*

who lived in the Waipio Valley on the island of Hawaii. Neneue would meet unsuspecting people on the path to the sea and, in a friendly manner, ask them where they were going. When swimmers or fishermen gave this information, Neneue would take a shortcut to the place, resume his shark form, and eat his victims when they got there. Because of this tale, some Hawaiians today will not say where they are going fishing.

Islanders considered other shark gods guardians, warning people of impending danger and bad omens. The shark guardians of Pearl Harbor became famous in 1914 when the U.S. Navy built a dry dock over the gods' underwater home. Despite warnings from local people that the site was *kapu*, or forbidden, to humans, and that building the dock would cause trouble, the Navy built it anyway. After its completion, the drydock collapsed in an eruption of water and timber.



# PHOTO CREDITS

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- Kewalo Basin  
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Laboratory page 117.



# ACKNOWLEDGEMENTS

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Writing and publishing this book has been like sailing from Connecticut to Hawaii. Most of the time it was fun but sometimes it was tedious, frustrating and just plain hard work. Some of the squalls along the way were scary. But I had a loyal crew on this adventure and they all helped make this landfall particularly sweet.

Special thanks to my friend and co-captain, Craig Thomas, for his encouragement, his faith in me and for sailing our boat in ridiculous places just so I could get better pictures.

My deepest gratitude goes to my friend and computer wizard, Judy Wooten, who worked the Macintosh magic that made this book, and Jean Nutting, our tireless computer helper in the Kaimuki office.

John Flanagan gets all the sailing trips he ever wants for attacking my passive verbs, curing my singular-plural disease and editing when he didn't feel like it. He never once changed the subject or ignored the question when I asked for help.

I thank Dr. Michael Hadfield, Dr. Johanna Resig and Marie Morin from the University of Hawaii; Dr. William Gilmartin and George Balazs from the National Marine Fisheries Service; and Spencer Tinker, former director of the Waikiki Aquarium, for their expert advice about details in the text. And thanks to Dr. Carol Hopper of the Waikiki Aquarium for squeezing me into her classes so I could learn more about beaches.

It is typical of my mother's love and support that she would cheerfully volunteer for the thankless but crucial jobs of proof reading and spell checking. A special thanks to her, Donna Miller, for this and everything else she has done for me.

# OCEANWATCHER



AN ABOVE-WATER GUIDE  
TO HAWAII'S MARINE ANIMALS  
BY **SUSAN SCOTT**







### SUSAN SCOTT

Susan Scott earned a bachelor's degree in biology from the University of Hawaii and is a graduate of the university's Marine Option Program. She lives and works in Honolulu aboard her 37-foot ketch which she sailed to Hawaii from Connecticut.

Scott writes a weekly column, OCEANWATCH, for the Honolulu Star-Bulletin.

- Wonder why stinging jellyfish sometimes litter Hawaiian beaches and other times are nowhere to be seen?
- Stumped for answers when your kids ask questions about marine animals?
- Afraid of sharks, sea snakes and moray eels?

OCEANWATCHER can help. OCEANWATCHER is designed for people who want to learn about Hawaii's marine animals. Whether you are a beach stroller, boardsailor, boater or angler, this book is a useful and fun addition to any ocean outing. OCEANWATCHER. For people who love - or want to love - the ocean.



ISBN 0-9620712-0-X

OCEANWATCHER BY SUSAN SCOTT

GREEN TURTLE PRESS