



Mahimahi are also known as dolphinfish, although they are not related to dolphins. (Susan Scott)

Another common game fish in Hawai`i, not related to tunas, is dolphinfish, an unfortunate name because these fish are not related to dolphins. To avoid confusion, people often use their Hawaiian name, *mahimahi*, here and in many other places. Most *mahimahi* in Hawai`i are a few feet long, weighing 15 to 25 pounds, but occasionally someone catches a whopper that weighs up to 70 pounds. The colors of these fish have inspired poetry. Bright blues and greens on the fish's body are visible against the sea, making it possible to see these fish on the surface from a boat. These colors ripple and vibrate as the animal dies.

Male and female *mahimahi* are easy to tell apart. Males have steep, nearly vertical, foreheads, while female foreheads slope back in a gentle curve. *Mahimahi* eat any small fish they find. Larger fish and small whales prey on *mahimahi*. Marlins sometimes impale them on their spears.

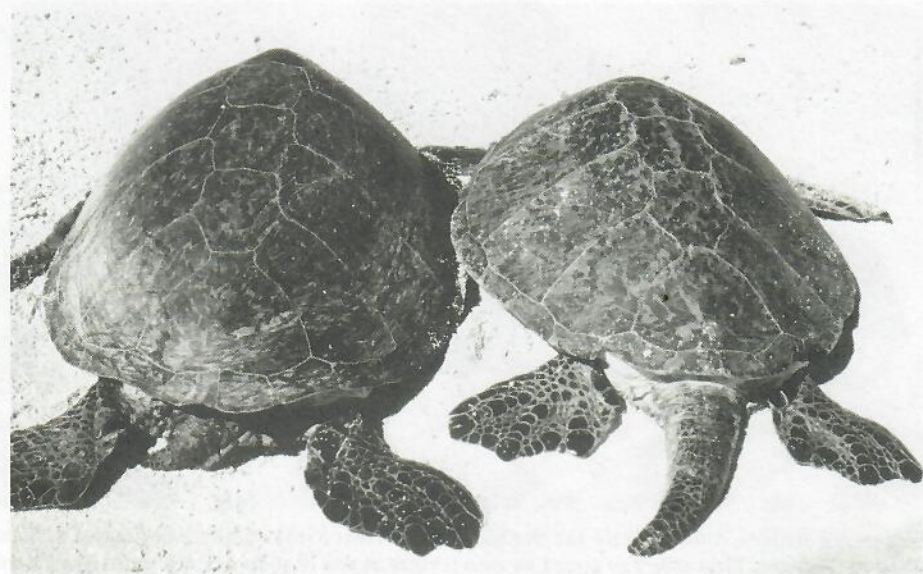
REPTILES

Reptiles are cold-blooded, air-breathing animals with scaly skin. *Cold-blooded* means they get heat from the environment rather than making their own.

Two types of reptiles, both marine, are native to Hawai`i: sea turtles and, rarely, sea snakes.

Sea Turtles

Sea turtles are relatives of land tortoises and freshwater turtles that have adapted to life in the ocean. Sea turtles' streamlined bodies and flipper-type limbs make them efficient and graceful swimmers. Sea turtles spend most of their time at sea, even mating in the water. The female swims while the male grasps her shell with his foreflippers. It's not unusual for a mating couple to be accompanied by another male or two, hoping for a turn. Male green turtles are often indiscriminate about their choice of partners, attempting to mate with crude decoys, other males, divers and even rowboats. Male and female sea turtles are easy to tell apart: Males have long, thick tails, while females have short, stubby ones.



A male (right) and a female (left) green sea turtle. Male sea turtles have long tails; females have short tails. These two are basking at French Frigate Shoals in Hawai`i's wildlife refuge. (George Balazs)



Tracks in the sand made by a nesting female sea turtle. These marine animals scoot along on strong flippers to find a suitable place to lay eggs. In this case, the nest is the indentation at the top of this track. (Susan Scott)

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 swim with such grace, are slow and labored on land. Female turtles inch themselves hundreds of feet along beaches looking for suitable nesting sites, then dig holes for eggs with hind flippers. Turtle eggs are about the size of ping-pong balls and have soft, leathery shells. Females lay from 50 to 250 eggs, depending upon the species. The incubation period is about two months. Studies show that egg temperature during incubation influences the sex of baby turtles. Lower temperatures produce males, while higher temperatures produce females.

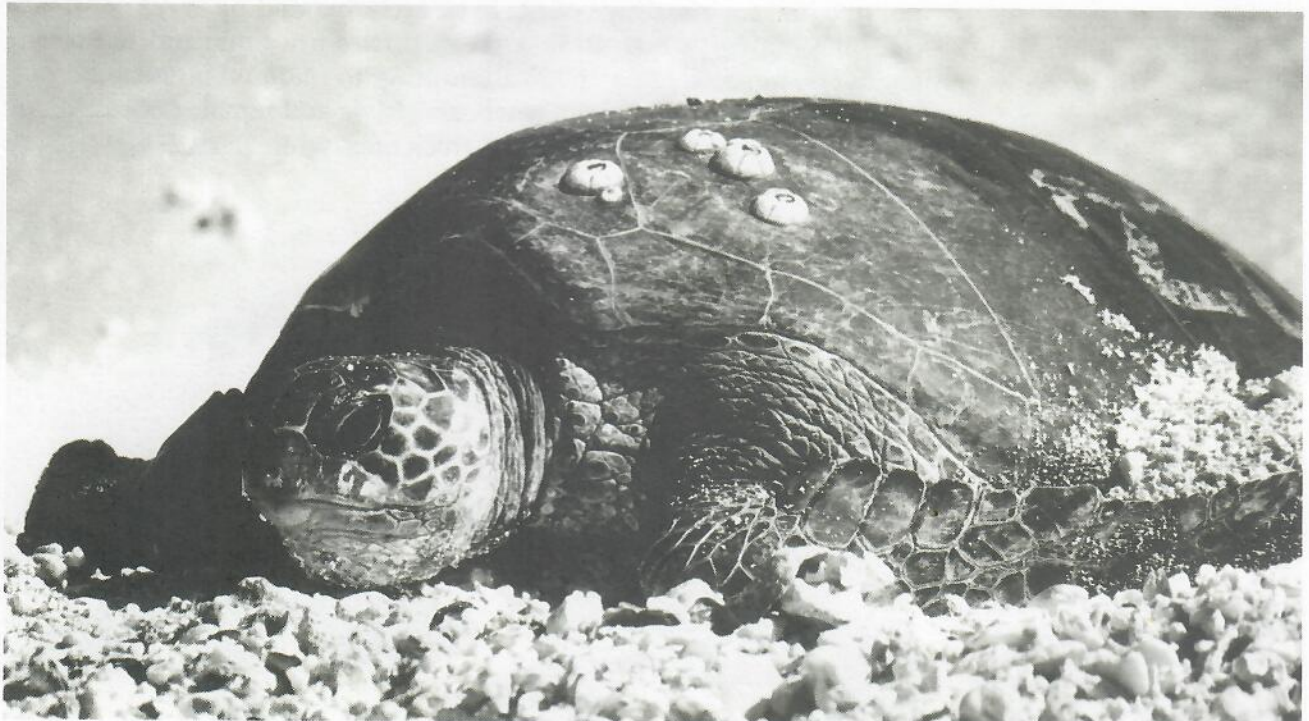
Hatchlings escape from the sandy nest in a group effort, usually during the night. Because they find the ocean by heading for the brightest horizon, artificial lights near nesting beaches can mean death to these youngsters.

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.

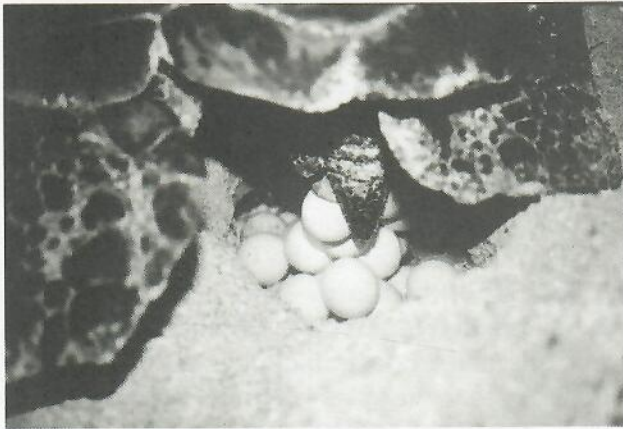
Adult sea turtles are long-lived, but no one knows their exact life spans. Some turtles may take 40 to 50 years just to reach sexual maturity. Many turtle lives are cut short by sharks or humans, adult sea turtles' major predators.

Of the seven species of sea turtles in the world, four are native to Hawaiian waters: green, hawksbill, leatherback and olive ridley turtles.

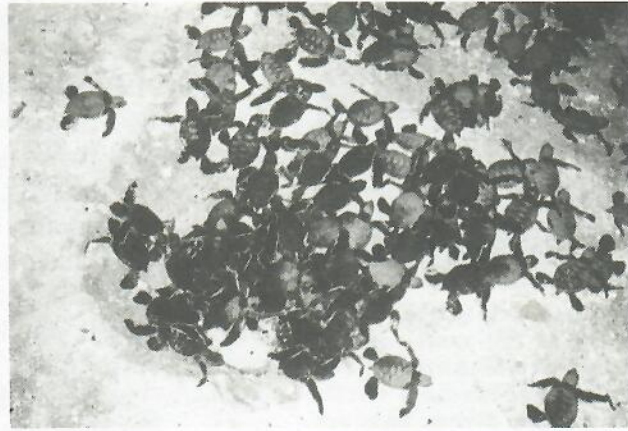
Green sea turtles, *honu*, are by far the most numerous species in Hawai'i. They are named for their green body fat, which people once used for soup. Green sea turtle shells are mottled black, brown, gold and olive. These turtles can grow three to four feet long and weigh up to 400 pounds. They swim in bays and near shore of all islands, where they graze on seaweeds.



Green sea turtles, *honu*, are by far the most numerous kind of turtle in Hawai'i. Nevertheless, they are still threatened with extinction. This one has spent so much time at sea that barnacles have grown on its shell. (Susan Scott)



A female green sea turtle lays eggs in a hole that took her hours to dig. Researchers believe that sea turtles return to the beach of their birth to lay eggs. French Frigate Shoals, Hawai'i. (Susan Scott)



Baby green sea turtles escaping in unison from their sandy nest. (Susan Scott)



A day-old green sea turtle, hatched at Sea Life Park. After tagging this one and its brothers and sisters, turtle workers released them in the ocean off Makapu'u, O'ahu. (Susan Scott)

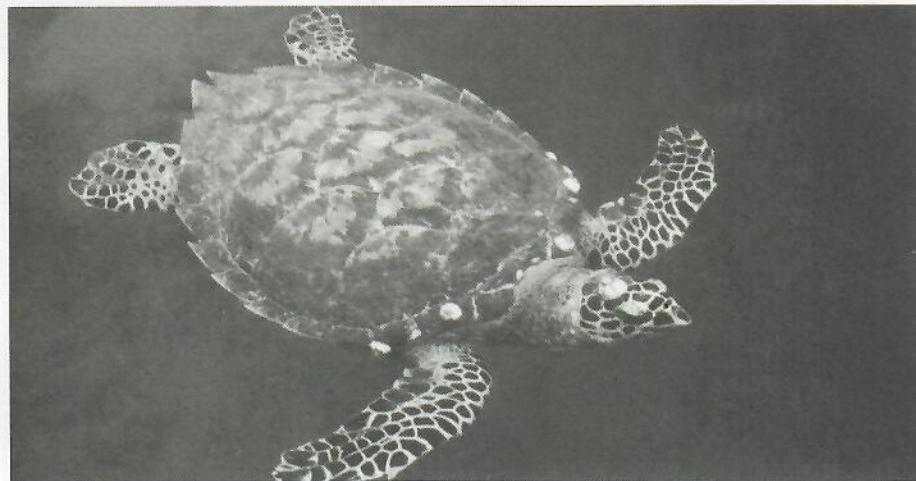


Among green sea turtle populations, only those of the Galapagos and Hawai'i regularly bask on beaches. This warms them and probably protects them from sharks. French Frigate Shoals, Hawai'i. (Susan Scott)

In late spring, some adult green sea turtles migrate to the uninhabited Northwestern Hawaiian Islands, which extend 1,000 miles northwest of Kaua'i. Here, in the protection of the Hawaiian Islands National Wildlife Refuge, females crawl ashore to lay eggs. A few turtles nest on the main islands but this is now rare. People and other predators have driven the turtles away by stealing eggs and harassing turtles on the beaches.

Beach basking is rare among sea turtles but the Hawaiian population of greens has shown a penchant for this in the northwest refuge. Both males and females bask on the sand there to increase body temperatures and probably to avoid sharks.

Hawai'i's other sea turtles, hawksbills, leatherbacks and olive ridleys, are comparatively rare. People occasionally see hawksbill turtles, *'ea*, around the islands of Moloka'i and Hawai'i, but they aren't common. These turtles swim close to coral reefs, where they poke their narrow beaks into crevices for sponges and other invertebrates. The hawksbill is smaller and has a more elongated beak than the green sea turtle. Although their sponge diet makes their meat poisonous, people have slaughtered hawksbills turtles to near extinction for their beautiful shells. This is the familiar tortoiseshell of combs, brushes, buttons and jewelry.



A Pacific hawksbill turtle, now a rarity in Hawai'i. The meat of these turtles is poisonous, but people killed them to near extinction for their beautiful shells. (George Balazs)



A leatherback turtle, which Hawai'i's fishermen sometimes see offshore. These turtles have leathery shells and are deep divers. They are in danger of extinction because people take their eggs. (Jerry Ray)



An olive ridley sea turtle, an occasional visitor to Hawaiian waters. (Lew Consigliere, National Marine Fisheries Service)

Yellow-bellied sea snakes are rare in Hawai'i, but occasionally drift here on unusual currents. These air-breathers aren't particularly aggressive toward humans, but their venom is deadly. (Spencer Tinker)

Leatherback turtles are deepwater animals. Local fishermen occasionally see them beyond the 100-fathom line but still within sight of land. Pacific leatherbacks are the largest of all sea turtles, weighing up to 1,400 pounds. They live in the open ocean, feeding almost exclusively on jellyfish. Adults have black, leathery shells, with white spots on their heads, backs and limbs.

This giant turtle is among the deepest diving of all air-breathing animals; researchers tracked one in the Caribbean at three-quarters of a mile down. Because of their large size, these turtles hold their heat well, making them able to tolerate the cold water of the deep ocean. Leatherback meat is oily and undesirable, but people eat these turtles' eggs, a practice that threatens the species with extinction.

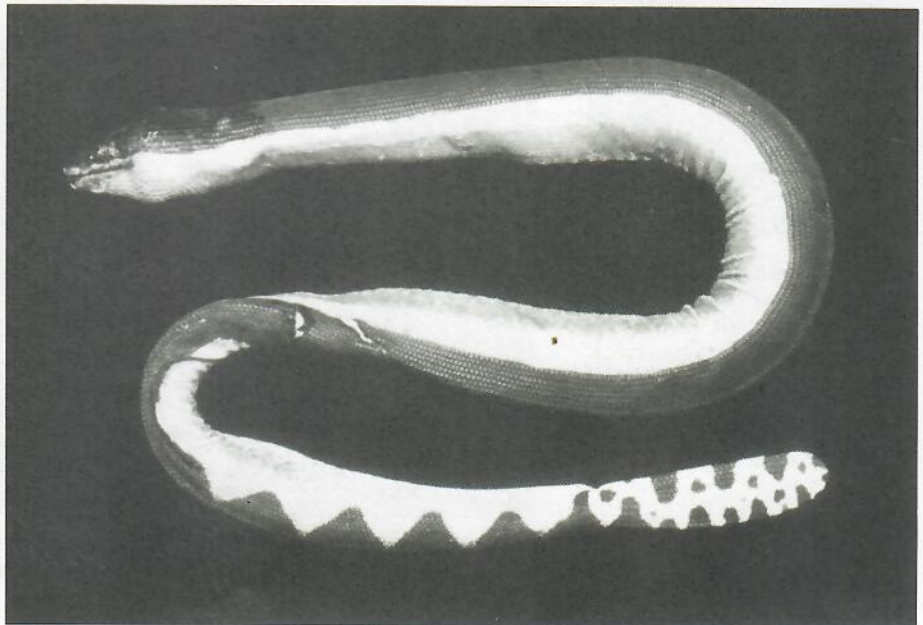
Olive ridley turtles regularly forage and migrate through Hawaiian waters but do not nest here. Sightings of these turtles are rare, perhaps because of their small size.

Millions of sea turtles once existed. Now, nearly all species are listed as endangered or threatened. It's against both federal and state laws to take sea turtles or turtle eggs for any reason. Divers should never try to ride or even approach turtles. This harassment frightens the timid animals, disturbing their delicate life rhythms.

Sea Snakes

The second type of reptile that people sometimes see in Hawai'i is sea snakes. These animals don't normally live in Hawaiian waters, but occasionally a few yellow-bellied sea snakes show up on wayward currents from the south. People often confuse sea snakes with eels, but the two are easy to tell apart. Snakes breathe air, have scales and swim with flat, paddle-shaped tails. Black bodies with 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 extremely rare in Hawai'i, but if one appears, approach with caution. Although these animals aren't aggressive toward humans and have tiny teeth, one drop of their venom is supposedly powerful enough to kill three people.



INTRODUCTION

I introduce *Plants and Animals of Hawai'i* by answering the question that people asked most often while I was writing the book: "How did you decide which plants and animals to feature in the book?"

These individual decisions went on through the entire writing process, from first outline to final draft. As I interviewed Hawai'i's scientists and explored more of Hawai'i's mountains, valleys and coastlines, my list grew. In the end, I included as many biologically interesting and/or visible species as I could fit into my limited space.

In many cases, my decisions about what to include were personal. Sometimes, I added a type of plant or animal because I like it. Other times, I added a species because it was one I had always wondered about.

I wrote *Plants and Animals of Hawai'i* not just for people but also for Hawai'i's plants and animals. It's my hope that this book will inspire more people to become active in the fight to save Hawai'i's native species, many of which teeter on the edge of extinction.

Susan Scott, 1991

To my friend George,

8/5/91

Do you remember that you helped me write my very first magazine article? (About turtles, of course) I do. I'm glad that we are still working together and hope it continues for a long, long time.

Thanks for use of your photos and your time. With Aloha,
Susan Scott

ACKNOWLEDGEMENTS

This book is the result of the work of many people. My deepest gratitude goes to my friend and husband, Dr. Craig Thomas, who has been science advisor, medical consultant, editor, photographer, and patient companion throughout the making of this book.

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Many other people helped me with my research for this book. Special thanks to the staff of the Bishop Museum Library; Dr. Gary Toyama of the State Department of Health, Vector Control Branch; the staff of the Hawai'i and Pacific Collection of Hamilton Library, University of Hawai'i; and staff of the Army Corps of Engineers, Fort Shafter.

I thank all the people who helped me search for photos and the photographers who generously donated those photos: David Schrichte; Bruce Eilerts and the Hawai'i Audubon Society; The Nature Conservancy staff; Sea Life Park staff; State Department of Land and Natural Resources staff; Dr. Siddique from the University of Hawai'i's School of Tropical Medicine; William Mull; Greg Ambrose of the *Honolulu Star-Bulletin*; Fred Casciano; Mitch Craig, Lew Consiglieri and George Balazs of the National Marine Fisheries Service; John Flanagan; Paul Robinette, Jr.; Mike Yamamoto; Glen Higashi; Judy Wooten; David Wooten; Charles King; Darrell Wong; Dr. Douglas Pratt; Paul Banko; Spencer Tinker; David Arcese; Jerry Ray; Stephen Berendzen; Norman Carlson; Scott Edwards; Tim Burr; Betsy Gagne; Win Anderson; Ron Challengerger; Mike Lee; David Muench; Dr. John Jones; T. Sutterfield.

A special thanks to Dennis Shannon for teaching me to identify Hawai'i's plants. His generous guidance not only helped me write this book but has enriched my life as well.



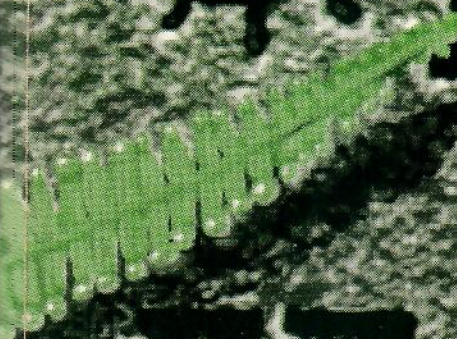
Susan Scott earned a bachelor's degree in biology from the University of Hawai'i in 1985 and is a graduate of the university's Marine Option Program. Scott writes a weekly column, "Oceanwatch," for the *Honolulu Star-Bulletin* and a bimonthly column, "On the Reef," for *Hawaii Magazine*. In 1988, she wrote and published her first book, *Oceanwatcher: An Above-Water Guide to Hawai'i's Marine Life*.

Scott and her husband, Craig Thomas, have been exploring the Hawaiian Islands both on foot and on their 37-foot sailboat, *Honu*, since 1983.

PLANTS



ANIMALS



OF

HAWAII

BY SUSAN SCOTT

