SHARKS

OF

SOUTH CAROLINA

DNR

SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES
MARINE RESOURCES DIVISION
Charleston, South Carolina

2004

OUR VALUABLE COASTAL HERITAGE

The coastal and offshore waters of South Carolina are extremely productive in terms of the great diversity and abundance of marine plants and animals found in these ecosystems. Coastal tidelands, with their vast areas of salt marsh grasses interspersed with tidal creeks and mud flats, provide the necessary habitat for many important marine species. A tremendous variety of fish and invertebrates spend all of their lives in the nutrient rich salt marshes and adjoining tidal waters.

Other species enter protected coastal areas only to spawn and then migrate offshore, often great distances out to the Gulf Stream. Most of the recreationally and commercially important species of fish, shellfish, and crustaceans along the South Carolina coast spend all or at least some portion of their lives in the coastal zone. In turn, these animals make up an essential part of the ocean's complex food chain.

The pristine salt marshes and estuarine areas so characteristic of South Carolina represent an integral and irreplaceable part of the coastal zone. Marshes protect valuable coastal property from erosion caused by storm tides and winds. They also serve as great filtering systems, trapping silt and pollutants.

Other aspects of the marine resources of South Carolina are not so easily described. These include the aesthetic values related to simple, natural beauty and a vibrant, healthy environment. The significance of undisturbed marshes, long, white sandy beaches, and clean rolling waves cannot be adequately expressed in words, yet they represent the essence of our valuable coastal heritage. May we use and protect them wisely.

SHARKS

OF

SOUTH CAROLINA

by

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PUBLICATION DESIGN

by

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by

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*The splendid shark illustrations by D. Bryan Stone, III of Charleston, South Carolina, are taken from *The Sharks of North American Waters* and are used with the gracious permission of Dr. José I. Castro of the Mote Marine Laboratory, Sarasota, Florida. The fine illustrations of the sharks' teeth are from *Fishes of the Western North Atlantic, Part I,* by Henry B. Bigelow and William C. Schroeder and are used with permission from the Peabody Museum, Yale University, New Haven, Connecticut. The illustrations of the skates and rays in "Other Common Elasmobranch Fishes of South Carolina" are taken from *Fishes of the Gulf of Mexico, Volume I,* by John D. McEachran and Janice D. Fechhelm and are used with permission from the University of Texas Press, Austin. Additional illustrations are appropriately credited in the Acknowledgements on page xiii.

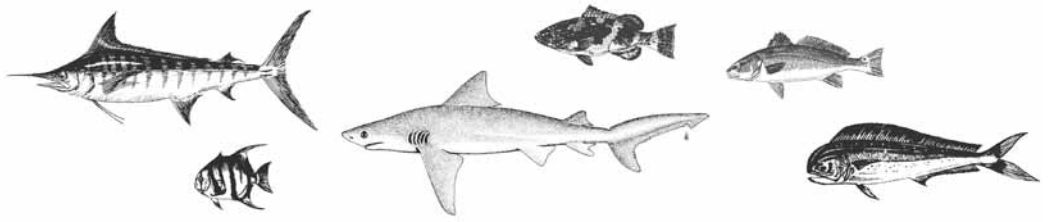
Many people reviewed the material presented in this publication and participated in the lengthy layout, design, and production process. Every attempt has been made to produce a guide to sharks indigenous to the waters of South Carolina that is informative, factually accurate, and easy to use by fishermen in the field or students in the classroom. A concerted effort has also been made to appropriately credit all sources of information and illustrations used throughout the guide and to recognize the contributions of individuals and organizations alike. The above not withstanding, the author is solely responsible for any inaccuracies or failure to properly acknowledge the efforts of each individual involved.

Dedicated
to
Clyde A. Eltzroth
and
Charles M. Bearden

For their collective contributions to the study, conservation, and management of the marine resources of South Carolina, from Bears Bluff to Maybank and Fort Johnson, the likes of which have not been equaled.

When we put to sea, let us do so
as responsible and dedicated stewards of all that live there,
from the lowly urchin to the majestic whale and of course the shark,
whose silent silhouette, imaginary or real, gives us pause.

C.H.F.



SALTWATER RECREATIONAL FISHING CONSERVATION AND ETHICS

This publication was made possible in part with funds from the South Carolina Saltwater Recreational Fishing License Program, which was created in 1992 to manage and conserve the fishery resources of the state. Resident and non-resident anglers who purchase an annual saltwater recreational fishing license support activities such as the stocking of important species of fish like red drum in the wild, the restoration of the state's shellfish resources, providing improved fishing opportunities through the construction and maintenance of artificial reefs in both offshore and inshore waters, research initiatives, promoting a strong conservation ethic through the distribution of information, and conducting educational programs for students, teachers, and the general public.

Although most people once considered ocean resources to be unlimited, recent rapid declines in populations of many recreational species have demonstrated the opposite. Today, more than 100 species of marine fish are regulated by daily size and possession limits. These fish include, but are not limited to, spotted seatrout, black sea bass, cobia, red drum, sheepshead, spadefish, greater amberjack, king mackerel, Spanish mackerel, bluefish, and tarpon, as well as the various species of flounders, tunas, porgies, snappers, groupers, and sharks.

As fishing pressures continue to increase in association with population growth and development along the coast, the regulatory limits imposed on these and other additional species may become more restrictive. The adherence to these essential conservation measures is the responsibility and obligation of every fisherman who is privileged to bait a hook and cast a line in the waters of our state.

Fortunately, many of today's anglers accept and embrace the concept of resource conservation by practicing in increasing numbers the sportsmanship of catch-and-release. The few anglers who continue to be irresponsible and violate the law risk stiff fines and penalties from South Carolina Department of Natural Resources' Law Enforcement officers as well as being ostracized by fellow anglers.

All things considered, the future of the fishery resources of South Carolina and the long cherished tradition of recreational fishing look bright.

SC
South Carolina
Saltwater
Recreational
Fishing License

OPERATION COAST WATCH

1-800-922-5431

"Citizens and Law Enforcement Working Together To Protect Our Coastal Resources"

The South Carolina Department of Natural Resources (SCDNR) developed Operation Coast Watch to better help citizens report violations of saltwater recreational laws, commercial fishing laws, and marine environmental laws.

This program increases stewardship of our coastal resources by empowering concerned citizens who have little tolerance for those who abuse our valuable marine environment. Operation Coast Watch will ensure rapid response and investigation by SCDNR Law Enforcement officers with an incentive of a possible reward for those who call in reports.

The hotline number (1-800-922-5431) is toll-free and is available 24-hours a day. Callers will be assigned a code number and are NOT required to reveal their identity. If an apprehension and conviction are made based upon the information provided, a reward of up to $500 in cash may be offered to the caller.

If you observe suspicious recreational, commercial, or environmental activities anywhere in South Carolina, please call Operation Coast Watch and help protect our natural resources.

SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

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PREFACE

Of all the marine fishes, sharks are perhaps the most fascinating to man. They are also controversial to the general public and poorly understood around the world. Popular books, movies, and documentaries have been written and produced on the lives of sharks and their relationship to ourselves. This relationship has often been reflected in that chilling image of a shipwrecked sailor alone in the water at night and far from the safety of the nearest harbor. Instinctively, we know that the fate of the desperate sailor is sealed in the jaws of the great fish swimming silently below.

It is true that some sharks, especially the larger and more aggressive oceanic species, are unpredictable and potentially dangerous, but many others are small and entirely inoffensive, avoiding human activity altogether.

Scientists and fishermen have looked upon sharks over the years with considerable interest and continue to be amazed by their diversity of form and function. At the same time, people from various walks of life, especially some of those who live by the shore, have developed a fear and sometimes even a hatred of sharks, be they large or small. As a consequence, some communities have attempted from time to time to rid the waters of all sharks wherever they might occur with the indiscriminate use of net and line. Fortunately, the attitude toward this type of unacceptable conduct is beginning to change.

Herein lies the proverbial paradox of good fish versus evil fish, between our perception of the ocean's beneficial predator on one hand and the sea's savage gray raider on the other.

So then, what does the future hold for sharks? That, of course, will depend largely on our commitment to more fully understand and appreciate the role they play in the complex balance of life in the marine environment and our treating them not with disdain but cautious respect. For all their perceived invulnerability and voracity, sharks, like many other top predators, are especially susceptible to population declines resulting from excessive commercial and recreational fishing activities and environmental degradation.

Therefore, it is essential that we educate students and fishermen about the importance of sharks and the need to protect them from over-harvest and wasteful fishing practices. In this effort, each of us also has a fundamental obligation to help keep our marshes, beaches, and ocean waters clean and free of human pollution.

Regrettably, in the time it takes for one to read the pages of this book, many sharks, so wonderfully and beautifully made, will have been caught and destroyed throughout the oceans of the world, only to be viewed as trophies or objects of curiosity and then discarded overboard.

ACKNOWLEDGEMENTS

Much of the material presented in this publication is based on information from *Fishes of the Western North Atlantic, Part I*, by Henry B. Bigelow and William C. Schroeder, 1948, Sears Foundation for Marine Research, Yale University; *Fishes of the Western North Atlantic*, *Part II*, by Henry B. Bigelow and William C. Schroeder, 1953, Sears Foundation for Marine Research, Yale University; *Anglers' Guide to Sharks of the Northeastern United States, Maine to Chesapeake Bay* by John C. Casey, 1964, Bureau of Sport Fish and Wildlife; *Elasmobranch Fishes of South Carolina* by Charles M. Bearden, 1965, Contributions of Bears Bluff Laboratories; *The Life of Fishes* by N. B. Marshall, 1965, Weidenfield and Nicholson Press; *Vertebrate Physiology* by William J. McCawley, 1971, B.W. Sanders and Company; *FAO Species Identification Sheets for Fisheries Purposes*, Western Central Atlantic Fishing Area 31, Volume V, edited by W. Fischer, 1978, Food and Agriculture Organization of the United Nations; *An Anglers' Guide to Sharks of South Carolina* by Charles J. Moore and Charles H. Farmer, III, 1981, South Carolina Wildlife and Marine Resources Department; *The Sharks of North American Waters* by José I. Castro, 1983, Texas A&M University Press; *A Field Guide to Atlantic Coast Fishes of North America* by C. Richard Robins and G. Carleton Ray, 1986, The Peterson Guide Series, Houghton Mifflin Company; *Shark Reproduction: Parental Investment and Limited Fisheries*, *An Overview,* by H. L. Pratt and José I. Castro, 1990, edited by S. H. Gruber, American Littoral Society, Highlands, New Jersey; *Fishes of the Gulf of Mexico*, *Volume One: Myxiniformes to Gasterosteiformes,* by John D. McEachran and Janice D. Fechhelm, 1998, University of Texas Press, Austin; *The Shark Chronicles* by John A. Musick and Beverly McMillian, 2002, Henry Holt and Company, LLC.

The common and scientific names of sharks are the same as those designated by the American Fisheries Society, Special Publication 20, *Common and Scientific Names of Fishes from the United States and Canada* by C. Richard Robins, Reeve M. Bailey, Carl E. Bond, James R. Brooker, Ernest A. Lachner, Robert N. Lea, and W. B. Scott, 1991, U.S. Fish and Wildlife Service.

The illustrations of the teeth of each species were taken from *Fishes of the Western North Atlantic, Part I*, with permission from the Peabody Museum, Yale University, New Haven, Connecticut. The information presented in the "Description" section (pages 55-121) was summarized from the definitive descriptions in *Fishes of the Western North Atlantic, Part I*. The shark illustrations by D. Bryan Stone, III, of Charleston, South Carolina, are used with the gracious permission of José I. Castro and contribute significantly to the overall quality of this work. The illustrations on pages 7, 13, 14, and 15 are also by D. Bryan Stone, III. The illustrations of the skates and rays in "Other Common Elasmobranch Fishes of South Carolina" are used with permission from the University of Texas Press. The illustrations pertaining to "External Shark Anatomy" (pages 31-35) together with those on pages 5 and 19, the map on page 9, and the cover illustration are by Becky Fowler. The photograph on page 9 is by Jennie R. Davis.

I would like to especially thank José I. Castro of the Mote Marine Lab, Sarasota, Florida, for his guidance and support throughout the preparation of this guide and for reviewing the manuscript and providing many valuable suggestions and comments. I am very grateful to Becky Fowler for her tremendous efforts in designing the publication and preparing the final draft and to Lesleigh Patton who conscientiously edited all of the material, the results of which measurably improved the quality of the text.

I would also like to recognize the following individuals from various professional backgrounds who reviewed the preliminary drafts of the publication and offered many useful ideas, changes, corrections, and editorial suggestions: Charles M. Bearden, Dr. B. J. Kelley, David Whitaker, Glenn Ulrich, Marcus Drymon, Mike Arendt, Elizabeth von Kolnitz, Jennie R. Davis, Trey Zimmerman, and David Cupka.

My final acknowledgement is extended posthumously to Douglas "Doug" A. Oakley who reviewed an early draft and encouraged me to emphasize to fishermen the growing need to protect and actively promote the conservation of sharks. Doug was employed by the SCDNR in 1976 and for the following 27 years served as an accomplished yet always unassuming fisheries biologist. He once said to me, "Being on the water is what marine biology is all about. It allows me to get close to what I love to do." Doug died suddenly aboard the Research Vessel *Anita* just offshore of Charleston Harbor in November of 2003, only two days before his 50th birthday. He was working "on the water" with two of his closest colleagues, Glenn Ulrich and Marcus Drymon, tagging and releasing sharks.

ADDENDUM

Additional information presented in this guide is based upon the compilation of scientific collections, study, and field observations of many sharks by the author throughout the coastal and offshore waters of South Carolina over the past 35 years. This information was gathered from a considerable number of animals collected and/or observed aboard SCDNR research vessels (initially the RV *Anita* beginning in the summer of 1969), commercial shrimp trawlers, and recreational fishing boats from the areas of Winyah Bay, North Santee Bay, Bull Bay, Charleston Harbor, North Edisto River, St. Helena Sound, Beaufort River, Port Royal Sound, May River, and Calibogue Sound then seaward to a depth of approximately 800 feet.

The animals observed include the following species: the **Atlantic angel shark**, *Squatina dumeril* (two specimens of about equal size were captured in a shrimp trawl in approximately 35 feet of water off Dufuskie Island); **Atlantic sharpnose shark**, *Rhizoprionodon terraenovae* (more than 400 animals were collected and/or observed throughout coastal waters; many were caught on shrimp trawlers; few exceeded 3 feet in length; the stomachs of the specimens examined contained a wide variety of small fish, shrimp, and other crustaceans; the most consistently abundant species in South Carolina); **Basking shark**, *Cetorhinus maximus* (one animal was observed, measuring approximately 25 feet in length; it was seen swimming on the surface approximately 20 miles off Charleston during November); **Bigeye thresher**, *Alopias superciliosus* (one animal was examined; it was caught at night by a recreational angler fishing

for swordfish in approximately 300 feet of water); **Bignose shark**, *Carcharhinus altimus* (eight animals averaging 6 feet in length were collected on hook and line at night in approximately 180 to 250 feet of water; the stomachs of the animals examined contained squid and unidentified fish remains); **Blacktip shark**, *Carcharhinus limbatus* (more than 200 animals were collected and/or observed throughout coastal waters, including sounds, bays, inlets, rivers, and off beaches; few exceeded 4 feet in length, the longest measuring 6 feet, 4 inches in length; the stomachs of the animals examined contained fish, crabs, shrimp, and squid; one of the most abundant species in South Carolina); **Blue shark**, *Prionace glauca* (two animals were observed; both were taken well offshore in the Gulf Stream; one specimen had an artificial trolling lure embedded in its jaw); **Bonnethead**, *Sphyrna tiburo* (many animals were taken in shrimp trawls in sounds, bays, and along beach fronts; few specimens exceeded 3 feet in length); **Bull shark**, *Carcharhinus leucas* (twelve animals between 4 feet, 4 inches and 6 feet, 7 inches in length were collected on hand lines, all from St. Helena and Calibogue Sounds; three of the twelve specimens examined had one or more stingray spines embedded in either the mouth or the stomach); **Chain catshark**, *Scyliorhinus retifer* (one animal was examined, which was taken in a fish trawl in approximately 300 feet of water off Charleston); **Dusky shark**, *Carcharhinus obscurus* (fourteen animals, all between 7 feet and 10 feet in length, were collected from the bottom using hand lines at night, offshore of Charleston, in 90 to 180 feet of water; the stomachs of the specimens examined contained black sea bass and various groupers); **Finetooth shark**, *Carcharhinus isodon* (more than 100 animals were either collected on hook and line or observed in shrimp trawls; the stomachs of the specimens examined contained shrimp, crabs, and a wide variety of small fish; one of the most abundant species in South Carolina); **Great hammerhead**, *Sphyrna mokarran* (two animals were collected; both exceeded 8 feet in length and were caught over artificial reefs very near the surface at night; the stomach of one of the specimens examined contained an almost whole 3-foot blacktip shark); **Lemon shark**, *Negaprion brevirostris* (nine large animals, all between 7 and 9 feet in length, were collected at night from the bottom within a three-hour period using only four hand lines at the mouth of Calibogue Sound during mid-May; these numbers strongly suggest schooling behavior; none of the animals were well-fed); **Night shark**, *Carcharhinus signatus* (one animal, measuring 5 feet, 2 inches in length, was collected from the bottom on hook and line in approximately 300 feet of water off Charleston in September; the stomach of the specimen examined contained what appeared to be crushed crabs and squid); **Nurse shark**, *Ginglymostoma cirratum* (six animals, averaging 5 feet in length, were collected on hook and line in very shallow water in St. Helena Sound adjacent to Otter Island and in deeper waters of approximately 45 feet in Calibogue Sound; the stomachs of the specimens examined contained mostly crushed crabs); **Oceanic whitetip shark**, *Carcharhinus longimanus* (one animal was examined, which had been caught by a long-line fisherman well offshore of Beaufort; the specimen measured 8 feet, 2 inches in length and had recently fed on squid); **Sandbar shark,** *Carcharhinus plumbeus* (over 100 animals were collected during the day and at night from a wide range of habitats, including sounds, bays, inlets, rivers, along beaches, and farther offshore; animals averaged

approximately 4 feet in length with several large males measuring over 7 feet); **Sand tiger shark**, *Carcharias taurus* (twenty-one specimens were collected throughout the early to mid-1970s on shrimp trawlers and by hook and line; all of the animals exceeded 4 feet in length, including two large pregnant females; the stomachs of the specimens examined contained a variety of small fish; sand tiger sharks are far more rare today); **Scalloped hammerhead**, *Sphyrna lewini* (in general, few hammerheads were collected on hook and line; most animals examined were caught in shrimp trawls; a total of 21 animals averaging about 4 feet in length were recorded; the stomachs of the specimens examined contained numerous fish and small skates and rays); **Shortfin mako**, *Isurus oxyrinchus* (three animals were examined; all were caught offshore on sport fishing vessels trolling natural baits; one specimen had two old hooks with attached leaders embedded in its jaw); **Silky shark**, *Carcharhinus falciformis* (eleven animals were examined; all were taken on hook and line at various locations off local beaches; no animals were examined from trawl catches; this active and fast-swimming species can probably avoid capture in nets; the stomachs of the specimens examined contained shrimp, fish, and squid); **Sixgill shark**, *Hexanchus griseus* (one animal was examined; it was caught by a long-line fisherman on an electric reel in approximately 700 feet of water); **Smooth dogfish**, *Mustelus canis* (many specimens were examined, including 239 animals, all about 2 feet in length; they were taken in a single trawl towing 50-foot nets off Beaufort in early January; the stomachs of the specimens examined contained a variety of crushed invertebrates); **Smooth hammerhead**, *Sphyrna zygaena* (eleven animals averaging 4 to 6 feet in length were recorded; the stomach of one of the specimens examined contained small fish, crabs, stingrays, and several small sharks, including an Atlantic sharpnose); **Spinner shark**, *Carcharhinus brevipinna* (fourteen animals were either collected on hook and line or caught by recreational fishermen; animals averaged about 4 feet in length); **Spiny dogfish**, *Squalus acanthias* (many specimens were examined, including 520 animals, all about 2 feet in length; they were taken in a single trawl towing two 80-foot nets off the Charleston Harbor jetties in December; the stomachs of the animals examined contained small crabs and shrimp); **Thresher shark**, *Alopias vulpinus* (two animals were examined; both were caught at night by recreational fishermen fishing for swordfish approximately 50 miles offshore); **Tiger shark**, *Galeocerdo cuvier* (eighteen specimens were collected during the 1970s and early 1980s; nine large animals, 8 to 10 feet in length, were caught at night offshore on the surface in approximately 120 to 180 feet of water; eight animals, 4 to 7 feet in length, were caught at night on the surface at the mouth of Port Royal and Calibogue Sounds; the stomachs of the specimens examined contained a variety of finfish, the remains of a loggerhead sea turtle, stingrays, one stingray spine protruding through the stomach wall, and a cloth glove; one very large pregnant female, measuring 13 feet, 4 inches, was collected at night on the surface at Hector Wreck off Georgetown; the female had a girth of approximately 7 feet and was carrying 58 pups, which were preserved and provided to colleges, universities, and area high schools for educational purposes); and **White shark**, *Carcharodon carcharias* (one animal was examined that had become entangled in a gill net near the Charleston Harbor jetties; the animal measured 8 feet in length).

INTRODUCTION

Sharks inhabit all the oceans of the world and have been around for millions of years. They form an important part of the marine food chain and are also valuable to man, primarily as food and in the field of medical science. Sharks are abundant in the shallow coastal waters of South Carolina during the summer months and offshore year-round. As a group, they are of considerable interest to the general public, especially recreational anglers, but they are often very difficult to identify, even by the trained professional.

This publication is designed to provide the reader with a general understanding of the biology and natural history of sharks and to make species identification less difficult. This publication also emphasizes the growing need for the conservation of sharks everywhere and attempts to put into some reasonable perspective the dangers sharks may, or more accurately, may not pose to swimmers, divers, and others who enter the water.

Shark populations in South Carolina and throughout the rest of the world have been in decline, especially since the mid 1970s, although recent stock assessments indicate that some local species may have begun to rebound. Most sharks are thought to be long-lived and slow-growing and to have a low reproductive rate. These are all inherent biological factors that make them especially susceptible to over-harvesting where concentrated fishing activities take place. As a result, many species have been regulated through commercial landing quotas as well as recreational size and possession limits in state and federal waters. A number of species are now completely protected and cannot be kept. These regulations were established not only locally, but also nationally and internationally to help prevent the further decline of highly migratory shark populations and to allow for their eventual recovery.

Today, more than ever before, responsible anglers should practice and promote a strong conservation ethic through the catch-and-release of sharks, especially larger individuals, and cultivate the ability to distinguish one species from another. Stiff penalties can be imposed by law enforcement officers of natural resource agencies when state or federal regulations are violated. A summary of the recreational fishing rules and regulations for sharks of South Carolina is provided with this publication and is located in the inside back cover. This information has been provided separately in an effort not to date the guide. It is important to emphasize that the rules and regulations for sharks are provided for informational purposes only and are subject to change at any time. Anglers are responsible for being aware of any regulation changes.

Each year, the South Carolina Department of Natural Resources (SCDNR) publishes *South Carolina Rules and Regulations for Hunting, Fishing and Wildlife Management Areas*. This publication is available free of charge at all SCDNR offices and at tackle shops and sporting good stores around the state. Fishermen are urged to put a reference copy in their tackle boxes before going fishing.

The sharks presented in this guide represent 13 families and 39 species. All of these species, some of which are quite abundant, are known to occur in the shallow coastal waters of South Carolina as well as offshore in the open ocean and are, therefore, the most likely to be

caught or observed by anglers.

Seven of these species are included for reference purposes as possible strays or very rare visitors to our waters based upon their suspected geographical ranges. These species are usually restricted to areas of the deep ocean, and it is unlikely that they would be encountered except perhaps by commercial longline fishermen or through scientific explorations.

The terms "coastal" and "inshore," as used in this guide, are synonymous and generally refer to the waters of estuaries, rivers, bays, inlets, and sounds as well as areas along beaches to approximately 20 miles offshore. The terms "offshore," "oceanic," and "pelagic" are also synonymous and generally refer to the waters of the open ocean in the Gulf Stream and beyond.

Using This Guide

To identify a shark, first refer to the section entitled "A Summary of the Thirteen Families and Thirty-nine Species of Sharks of South Carolina" found on pages 44 through 53. Carefully compare the shark with the general descriptions and illustrations provided. Remember, a number of unique sharks caught, or in some instances observed, in South Carolina can quickly be identified based on only one or two obvious diagnostic features. For example:

- If it is a coastal shark with dorsal spines – it is a spiny dogfish.
- If it is flattened like a stingray – it is an Atlantic angel shark.
- If it has distinct nasal barbels – it is a nurse shark.
- If it has large dorsal fins of equal size, long pointed teeth with small lateral points, and a pointed snout – it is a sand tiger shark.
- If it has large dorsal fins of equal size, long pointed teeth without lateral points, and a broadly rounded snout – it is a lemon shark.
- If it has an extremely long tail that is half the length of the total body – it is either a thresher shark or bigeye thresher.
- If it has a lunate or half-moon shaped tail – it is most likely a white shark, shortfin mako, or longfin mako. The whale shark and the basking shark also have lunate tails but are usually huge in size and easily recognized.
- If it has blunt teeth, dorsal fins of equal size, and no dorsal spines – it is a smooth dogfish.
- If it is huge in size with body ridges and white spots – it is a whale shark.
- If it is huge in size with a gaping mouth and enormous gills – it is a basking shark.

On the other hand, probably 85 percent of sharks caught by anglers in the coastal waters of South Carolina during the summer will fall into the family Carcharhinidae on pages 48 through 51. As you might expect, most of the species in this family are not unique but very similar in appearance and often difficult to identify. To identify these or other "look-alike" sharks, turn to the "Identification Key to Sharks of South Carolina" on pages 36 through 43 and proceed carefully down the list of possible external diagnostic features, referring each time to the

detailed description and illustration given for each species. The Identification Key is designed with the layman in mind and is based upon the concept of identification by elimination. In other words, start with number 1, which describes features unique to the spiny dogfish, if these features do not match those of the shark you are attempting to identify, then move to the next possibility, number 2, which describes features unique to the Atlantic angel shark. Again, if these features do not match your species, move to number 3 and so on down the list of possible sharks. Eventually, the features unique to your shark will match those of the correct species.

Each shark species is presented by family, using the same informational format for simplicity and ease of comparison. The left-hand page for each species includes the accepted common and scientific name followed by a detailed description including teeth, color, size, distinguishing characteristics, similar species, and local distribution and habits. Each corresponding right-hand page includes an illustration of the shark and the ventral view of the snout with distinguishing characteristics clearly numbered.

Every effort has been made to minimize the use of technical terms but a few were unavoidable. Accordingly, technical terms are illustrated under the section entitled "External Shark Anatomy" on pages 31 through 35. It is especially important for the reader to become familiar with this anatomy, as an understanding of these features is essential to correctly identify any shark. For example, the size, shape, and location of fins are some of the most frequently used diagnostic features in the identification process. The index may also be a useful tool for locating technical terms.

The description of the teeth is also very important because their size and shape in both the upper and lower jaws are often extremely helpful in identifying a shark. On the other hand, color is much less reliable because the differences in tones are usually subtle, and even the brighter, more distinct colors fade quickly after death. Nevertheless, a description of color is provided for each species and will be important in identifying some sharks.

GENERAL INFORMATION ON THE BIOLOGY AND NATURAL HISTORY OF SHARKS

The Cartilaginous Fishes

The cartilaginous fishes, including the sharks, skates, rays, and lesser-known chimaeras, comprise the class of marine vertebrates called Chondrichthyes. The most outstanding feature of this group is that the skeleton consists entirely of cartilage and not true bone. This feature distinguishes them from the far more abundant bony fishes called Osteichthyes, which include the flounders, drums, mackerels, herrings, tunas, billfish, and many others. The cartilaginous fishes have evolved highly developed, functional jaws and teeth, which set them apart from the jawless lampreys and hagfishes that represent some of the most primitive marine vertebrates now in existence.

Members of the class Chondrichthyes share many overall common characteristics, but they also differ significantly. Recognizing these diagnostic differences, the Chondrichthyes are separated into two very distinct groups, the Chimaeras and the Elasmobranchs.

The Chimaeras, in the subclass Holocephali, are characterized by having long, thin bodies tapering to a slender tail; a beak-like snout; an upper jaw that is permanently connected, or fused, to the skull; a single external gill opening on each side of the head covered by a flap of skin called an operculum; and flattened, plate-like teeth. Their skin is for the most part smooth and devoid of the rough, scale-like denticles so characteristic of the sharks. Chimaeras are deep-water animals that feed primarily on small fish and crustaceans and are rarely, if ever, caught by anglers. All species are oviparous or egg layers.

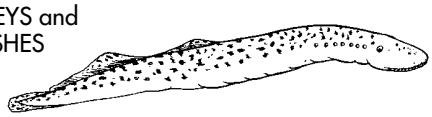
In sharp contrast, the sharks, skates, and rays or Elasmobranchs, in the subclass Elasmobranchii, are characterized by bodies that are cylindrical, elongated, or dramatically flattened; the complete absence of an operculum covering the gills; a protrusible, upper jaw that is not connected or fused to the skull; and teeth that are designed for snaring, cutting, or crushing prey. The skin of skates and rays is generally smooth, while the skin of sharks is covered with rough denticles, or placoid scales.

The Elasmobranchs are further separated into two major groups, the Batoid fishes and the sharks. The skates and rays, or Batoid fishes, have strange bodies that are dorsoventrally flattened (from top to bottom); eyes are located on top of the head; and the enlarged pectoral fins resemble wings or flaps, giving the body a disk-like appearance when viewed from above and below. The pectoral fins are not separated from the head. Their tails are greatly reduced or finely tapered and whip-like. Venomous, blade-like spines with barbs are often present on the tail and can inflict serious and painful injuries to passing swimmers if accidentally stepped upon. The teeth of most species are bluntly flattened or cone-shaped, which is an adaptation for crushing prey. There are always five pairs of gill openings (without an operculum) present on the ventral, or underside, of the body. Water is also taken in through openings called spiracles, located on the dorsal side of the head. Spiracles function as accessory openings to the gills, which is an obvious adaptation to a benthic or bottom type of existence. All of the Batoid fishes lack an anal fin. See illustrations on pages 123 through 128.

Comparative Characteristics of Sharks and Other Marine Animals

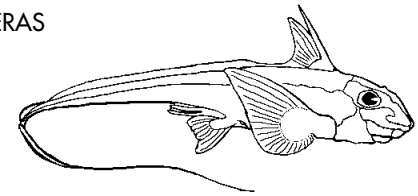
Internal Skeleton Composed of Cartilage

- LAMPREYS and HAGFISHES



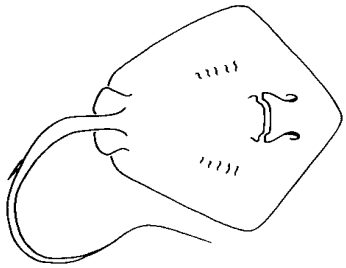
Eel-like fishes with smooth bodies; lacking jaws, bony teeth, and paired fins.

- CHIMAERAS



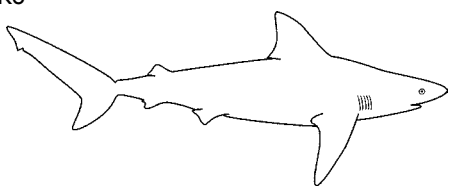
Body long, tapering; beak-like snout; sharp spine in front of dorsal fin; an upper jaw connected to skull; single gill opening on each side of the head covered by an opercular flap of skin; body mostly smooth.

- SKATES and RAYS



Body strongly flattened dorsoventrally (from top to bottom); upper jaw not connected to skull; pectoral fins wing-like and not separated from the head; paired eyes on dorsal side; five paired gill openings on ventral side; gill openings not covered by operculum; teeth generally blunt or flattened; skin mostly smooth.

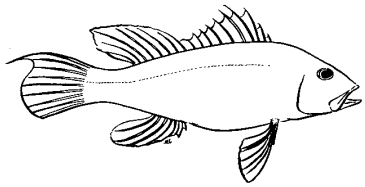
- SHARKS



Body typically cylindrical, stream-lined, and fish-like; not strongly flattened from top to bottom (except for the angel shark); upper jaw not connected to skull; both jaws highly developed with numerous, usually sharp-pointed teeth; eye located on each side of the head; five to seven (but usually five) gill openings situated on each side of the head along the neck; gill openings not covered by an operculum; skin coarse, covered by rough denticles or placoid scales.

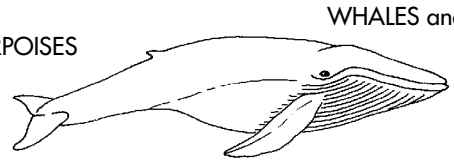
Internal Skeleton Composed of True Bone

- BONY FISHES



Gills covered by an operculum, or gill cover, situated on each side of the head; skin with typical scales.

- WHALES and PORPOISES



Mammals, not fish, possessing lungs instead of gills; skin entirely smooth.

General Taxonomic Classification for Sharks of South Carolina*

Kingdom
(Metazoa)
Animals

Phylum
(Chordata)
Animals with pharyngeal slits or openings in the throat through the neck becoming gills in fish, nerve cord connecting brain with organs, a notochord or cartilaginous structure supporting the nerve cord, and an extended tail

Subphylum
(Vertebratae)
Animals with spinal column composed of bone or cartilage, relatively advanced brain, major nerves, neural ganglia or bundles of nerves, paired eyes, and heart supported by advanced circulatory system

Class
(Chondrichthyes)
Sharks, Skates, Rays & Chimaeras
Cartilaginous fishes lacking true bone

Subclass
(Holocephali)
Chimaeras and Ratfishes
Fishes with upper jaw connected or fused to the skull, gill slits covered by an opercular flap of skin or operculum, and smooth bodies devoid of denticles or placoid scales

Subclass
(Elasmobranchii)
Sharks, Skates & Rays
Fishes with protrusible upper jaw not connected or fused to the skull but supported by strong ligaments, 5 to 7 paired gill slits not covered by an operculum, and bodies either smooth or covered with rough denticles or placoid scales

Batoid Fishes
(Batoidea)
Skates, Rays, Guitarfishes & Sawfishes
Fishes with dorsoventrally flattened bodies (from top to bottom), eyes located on top of the head, five paired gill slits on underside of the body, broadly expanded pectoral fins that are wing-like and not separated from the head, and flattened teeth for crushing prey

Selachian Fishes
(Selachii)
Sharks

Squalomorphs Sharks

- **Order**
  Squaliformes
  Family
  Squalidae - dogfish sharks
- **Order**
  Squatiniformes
  Family
  Squatinidae - angel sharks
- **Order**
  Hexanchiformes
  Family
  Hexanchidae - cowsharks

Galeomorphs Sharks

- **Order**
  Orectolobiformes
  Family
  Ginglymostomatidae - nurse sharks
  Rhincodontidae - whale shark
- **Order**
  Lamniformes
  Family
  Odontaspididae - sand tiger sharks
  Alopiidae - thresher sharks
  Cetorhinidae - basking shark
  Lamnidae - mackerel sharks
- **Order**
  Carcharhiniformes
  Family
  Triakidae - houndsharks
  Carcharhinidae - requiem sharks
  Sphyrnidae - hammerhead sharks
  Scyliorhinidae - catsharks

*This diagram illustrates the general relationship of sharks to other animals and is not intended to represent the evolution of Selachian fishes.

The sharks, or Selachian fishes, have recently been classified into two major groups, which are the Galeomorphs and the Squalomorphs. Both groups are generally cylindrical and streamlined with a more typical fish-like body shape. The mouth is most often ventral but occasionally terminal, or located at the tip of the snout. Gill openings (always without an operculum) range from five to seven pairs, but usually five, and they are elevated on the side of the neck. The dorsal, pectoral, pelvic, anal, and caudal (tail) fins are typically distinct and well-developed.

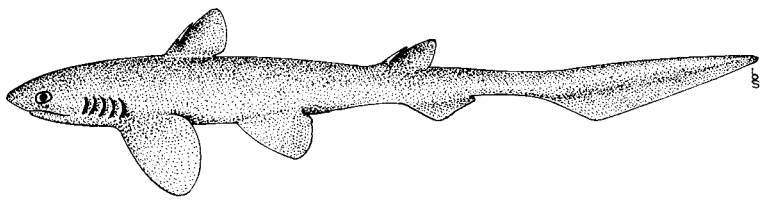
The Atlantic angel shark, described on page 58, is unique among the other sharks found in South Carolina waters and elsewhere because of its stingray-like, flattened body and wing-like pectoral fins. Some other species, like the spiny dogfish on page 56, lack an anal fin, while the cowsharks on page 52 possess only one dorsal fin.

Sharks' teeth are quite varied but usually blade-like and pointed with sharp, serrated edges. The teeth are connected to the gums of the mouth, not the cartilaginous jaws, and are constantly lost and replaced throughout the life of the shark.

Galeomorphs contain some 23 families of sharks found worldwide, 10 of which are described in this guide. They include Ginglymostomatidae (nurse sharks), Rhincodontidae (whale shark), Odontaspididae (sand tiger sharks), Alopiidae (thresher sharks), Cetorhinidae (basking shark), Lamnidae (mackerel sharks), Triakidae (houndsharks), Carcharhinidae (requiem sharks), Sphyrnidae (hammerhead sharks), and Scyliorhinidae (catsharks).

Squalomorphs contain 11 families of sharks worldwide, three of which are described here. They are Squalidae (dogfish sharks), Squatinidae (angel sharks), and Hexanchidae (cowsharks).

As a group, sharks are among the oldest of fishes with a long and interesting evolutionary past. The earliest sharks, which evolved from a common ancestor, first swam the ancient seas of the Devonian period approximately 400 million years ago, prior to the dinosaurs and flying reptiles, and they were firmly established well before the rise of the bony fishes. All of the modern sharks had evolved by the end of the Cretaceous period some 200 million years ago and have changed surprisingly little since that time. Clearly, sharks have been well-equipped for survival in the ever-changing and harsh marine environment.



The early modern sharks like Paleospinax gave rise to the present day sharks.

Perhaps the adaptability of sharks was best put into perspective some years ago by Dr. T. Daniel, zoology professor at the University of California, when he wrote, "Before me are teeth of a form of shark which swam the primitive seas before the formation of our western mountains. Beside them I place the teeth of another which was taken

with hook and line in the ocean but yesterday. The vast stretch of years separating the life of one from the life of the other is beyond the comprehension of man, yet the close similarity of plan binding the one form to the other clearly indicates that this of the present is that of the past projected through the ages."

Geographical Distribution

The distribution of sharks encompasses all the oceans of the world. Approximately 500 species of sharks are known to exist today, compared with some 25,000 species of bony fishes. Most sharks are positioned at the top of the marine food chain, and because they are among the largest of the ocean predators, they have few natural enemies. All species are marine, but the bull shark is known to enter freshwater. The Greenland shark, one of the dogfish species, inhabits the cold waters of the Arctic seas, while the majority of other species roam warmer temperate and tropical oceans. Some sharks frequently swim on or near the surface, pursuing an active existence, and some swim lazily on or near the bottom, while still others are common in both shallow coastal areas and far offshore.

Species like the shortfin mako and the blue shark are pelagic, meaning that they live in the open sea and seldom, if ever, venture close to landmasses. In comparison, many of our common local species like the sand tiger shark, the lemon shark, the bull shark, the sandbar shark, and the hammerhead sharks are generally found living on or near the bottom in shallow coastal waters. In addition, there are some especially intriguing species, like the tiger shark, that frequently move between both shallow inshore waters and far offshore to great depths.

Many coastal sharks frequent beachfronts, sounds, bays, inlets, and larger tidal rivers. They are generally nocturnal predators and will often feed near the surface at night, preying on a wide variety of small marine animals. They can also be observed during the day along shallow mud flats and sandbars with their dorsal fins clearly in view. Sharks also trail shrimp trawlers, feeding on fish by-catch washed overboard.

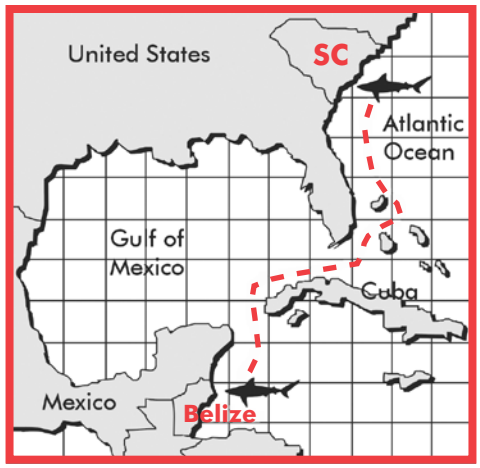
Many sharks are highly migratory or "wanderers." They are strongly influenced by the continuous search for food, the drive to reproduce, and environmental conditions, especially water temperature and salinity. Many coastal species enter shallow water areas in late March and April, as food becomes plentiful, and remain throughout the summer. In the fall of the year, these sharks, also known as "summer residents," migrate southward along the Atlantic coast into Florida coastal waters, the Gulf of Mexico, and the Caribbean Sea, or retreat to deeper waters offshore. Many of the requiem sharks or carcharhinids are summer residents in South Carolina. In comparison, the spiny dogfish and the smooth dogfish are winter residents here during the colder months of December through February. These species migrate northward from South Carolina waters to colder areas off Virginia, Massachusetts, Newfoundland, and the Labrador Coast in the spring.

The South Carolina Department of Natural Resources has conducted an extensive shark tagging program for many years, and these continuing efforts have provided some valuable information. The tagging program is part of COASTSPAN, the "Cooperative Atlantic States Shark Pupping and Nursery Survey," administered by the National Marine Fisheries Service.

SCDNR Photo by Jennie R. Davis

Glenn Ulrich, SCDNR fisheries biologist, measures a sandbar shark before inserting a numbered plastic tag on the first dorsal fin. Valuable information on shark migration has been gained from long-term tagging efforts.

Large coastal sharks tagged off South Carolina have demonstrated the long distances that some of these species can travel over a relatively short period of time. For example, a 6-foot long tiger shark tagged off Charleston was captured just 70 days later by a commercial fisherman in the Dominican Republic. This movement represents a straight-line travel distance of over 900 miles in just more than two years. During the winter months, locally tagged sandbar and blacktip sharks have been known to migrate well into Mexican waters. A dusky shark, one of the largest carcharhinids, was tagged 20 miles east of Charleston and recaptured two years later in extreme southern Mexico, near the Belizean border.



A tagged dusky shark traveled from Charleston to Belize in two years.

Prior to local tagging studies, small coastal sharks in South Carolina were thought to restrict their migrations to inshore and offshore movements, moving offshore in the winter to areas influenced by the Gulf Stream currents, where water temperatures generally stay above 68 degrees Fahrenheit. Tag returns from the Atlantic sharpnose shark, the most common shark in South Carolina waters, demonstrate considerably more "wanderlust" than previously expected, ranging north to the North Carolina/Virginia border and south to Fort Pierce, Florida. Bonnetheads also migrate to Florida waters during the winter but have shown a high degree of original "site-fidelity," returning to the very same estuarine area where they were tagged the year before. Unlike many other species of coastal sharks, some adult bonnethead females spend their summers in upper estuarine areas, while the juveniles appear much more frequently in high salinity areas along the coast. The opposite is true for most other coastal sharks; the adults generally remain in coastal waters, and the pups and young juveniles spend at least their first summer in lower salinity estuaries. The Atlantic sharpnose shark, blacknose shark, finetooth shark, sandbar shark, blacktip shark, and the bonnethead are the dominant species that have been tagged and released in the program.

South Carolina anglers can provide valuable information on migration and growth by reporting the capture of tagged sharks to the SCDNR in Charleston. The SCDNR encourages anglers who catch a tagged shark to record the tag number and take a measurement with a ruler from the tip of the nose to the fork in the tail and then release the shark. Only attempt to measure the shark if it can be done safely, which usually means having a second person to hold the animal securely. Never attempt to hold a captured shark by the tail because it can curl itself into a circle and bite the angler.

Feeding Habits

Sharks are primarily carnivores. Their diet consists chiefly of fish, crabs, shrimp, and squid as well as rays and other sharks, but they also feed upon a wide variety of other marine animals ranging from conchs to sea turtles and mammals. At times when food is scarce, some sharks will inadvertently scavenge upon whatever is available. Tin cans, paper cups, bottles, and even coils of wire have been found in their stomachs. Other unusual objects and materials reportedly taken from large oceanic sharks collected around the world include a goat, a large cat, birds, a six-foot long shark, entire sea turtles, cow vertebrae, a nearly whole reindeer, a rain jacket, a car license plate, bottles of water, a ship's scraper, bottles of beer, and even a handbag containing money.

Larger sharks frequently feed on smaller sharks, even members of their own species. Tiger sharks and bull sharks, together with the great hammerhead and the dusky shark, are capable of taking very large prey. The tiger shark, a large and active predator, has been known to feed on dead whales and on rare occasions, goats, horses, and other domestic animals that most likely fell overboard from ships during oceanic transits. Pelagic species such as the mackerel sharks, the oceanic whitetip shark, and the blue shark are stream-lined for swift-swimming near the surface where they chase down a wide variety of fast-moving fishes like mackerel and tuna. In

comparison, most coastal sharks feed on small fish, crabs, and shrimp as well as squid.

While many of the large sharks commonly feed on larger animals, the shark's size alone does not necessarily determine its type of prey. The basking shark and the whale shark, which grow to 40 feet or more in length, are both filter feeders. These species consume tremendous quantities of small planktonic animals by allowing seawater to pass through their mouths while swimming. The water flows across the gills, which filter and capture food.

Morphology

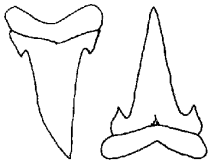
Sharks generally possess a typical array of fins located along the length of their bodies. These usually include a pair of dorsal fins, pectoral fins, pelvic fins, and a single anal fin. The tail is called the caudal fin. Fins are used in swimming and act as rudders and stabilizers. The caudal fin provides most of the propulsion to push the shark forward through the water.

The white shark and the mako sharks have powerful, lunate-shaped caudal fins and are extremely fast swimmers. The thresher sharks have a very unusual caudal fin. The upper lobe is greatly elongated, measuring as much as half of the shark's total body length, and it is used to strike and stun fish. The second dorsal fins of the sand tiger shark and the lemon shark are only slightly smaller than the first dorsal fins, which sets these two species apart from other large sharks. The spiny dogfish has a single spine preceding each dorsal fin, a characteristic that sets it apart from all other sharks in our shallow waters. The spiny dogfish is also unusual in that it lacks an anal fin. The cowsharks are unique as well in that they have only one dorsal fin.

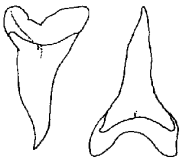
The size, shape, and location of the fins are very important characteristics in identifying sharks. Some sharks, like those mentioned above, are easily recognized based on fin characteristics alone, while other species require a much closer examination.

All sharks have highly developed jaws with specialized teeth that are shaped differently depending on their diet. Their teeth are actually evolutionary modifications of the rough, tooth-like dermal scales that cover their bodies. Sharks have evolved a unique dental system featuring numerous rows of teeth laid down in consecutive series along both the upper and lower jaws. The functional teeth are located on the outermost margins of the jaw and are usually erect. As individual teeth are lost or damaged during feeding, they are rapidly replaced, usually in one or two weeks, by younger teeth of another series positioned behind the first or front tooth. The reserve rows of teeth lie flat along the inner surface of the upper jaw and point upward, while those of the lower jaw are directed backward. The number of rows of teeth varies among sharks, with some species possessing as many as seven rows and up to 50 teeth per row.

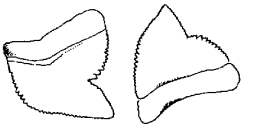
Some sharks possess long, narrow, blade-like teeth, sometimes bordered by secondary cusps, or lateral points near the base of the tooth. The teeth of other sharks may be broadly triangular, flattened, or strongly notched. Some teeth are only serrated near the base, while others are entirely smooth-edged.



canine-like
with lateral points

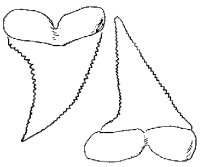


canine-like
without lateral points



broadly triangular
and deeply notched

flattened



serrated edges

smooth edges

Sharks vary from six-inch, fully grown adults, weighing less than one pound, like some dwarf dogfish sharks, to giants like the basking shark and whale shark, which grow to weigh several tons. The whale shark is exceeded in size only by some of the true whales and is reported to reach lengths approaching 45 feet. The majority of the sharks found in South Carolina waters range in size from two to six feet in length. Female sharks tend to grow larger and weigh more than males.

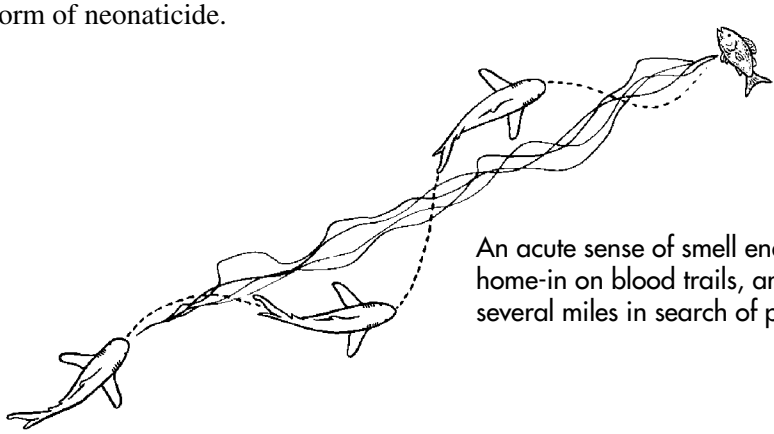
With some exceptions, like the chain catshark and the leopard shark of the Pacific coast, the coloration of most sharks is not nearly as spectacular as the bright and striking tones of many of the bony fishes. Instead, dull and inconspicuous grays, browns, and occasionally blues and light yellows prevail. As stated earlier, coloration is not a very good feature to rely on when identifying sharks because the differences in color are usually subtle, and even the more conspicuous colors tend to fade quickly after the shark is removed from the water. The white shark is not really white, as its name implies, but shaded by variations of light brown and gray becoming white only along the belly.

The tiger shark has unique body markings. The darker tones merge along the trunk and tail to form conspicuous bars or stripes, and prominent spots randomly appear between adjacent stripes and along the fins. However, the tiger shark begins to lose these markings as it grows.

The lemon shark and the blacknose shark have a lemony or pale yellow color that runs the length of the body, but the color certainly is not brilliant. The blacktip shark and the spinner shark have fins that are distinctly black on the tips, while several other species have fins that are less distinctly marked. The oceanic whitetip shark is similarly marked with white-tipped fins. Light yellow spots are spaced irregularly over the body of many sand tiger sharks, although some specimens may lack these spots. The blue shark, an oceanic species, has been described as being so brilliant in color that it matches the clear blue water it inhabits. However, once removed from the sea, the blue tones rapidly fade. The whale shark is strikingly marked with round white or yellowish spots and transverse stripes that are obvious even when observed from some distance away.

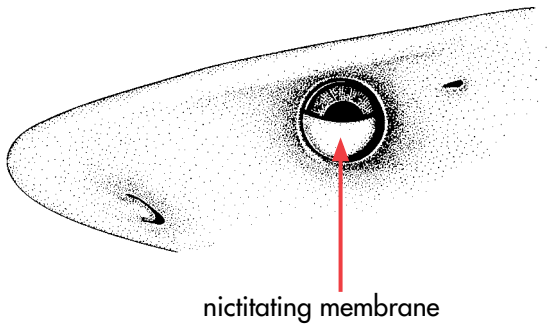
Special Adaptations

A shark's sense of smell is highly developed and important to its survival. Sharks are capable of detecting and tracking fish odors for great distances, swimming in a meandering pattern until they eventually locate the source. They reportedly can go for days without food and are capable of swimming for weeks between large meals. When pregnant females of some species, like the tiger shark, enter their pupping grounds, they often stop feeding until their offspring are born and have a chance to swim safely away. The tiger shark, among other shark species, is known to be cannibalistic and actually will consume her own young. This behavior is a form of neonaticide.



An acute sense of smell enables sharks to home-in on blood trails, and they may travel several miles in search of prey.

Some species of sharks possess what is called a nictitating membrane, which functions very much like a third eyelid. The nictitating membrane, or nictitans, most notable in the requiem sharks, is opaque and dense and automatically pulls across the eye to shield it against injury when the shark bites its prey. Therefore, the nictitans is an important protective structure, especially during feeding.



Unlike most bony fishes, sharks do not possess a "swim bladder," or "air bladder," a complex organ for maintaining buoyancy and desired depth within the water column. Consequently, sharks in general must swim more or less continuously, or they will slowly sink. A relatively large liver makes up as much as 25 percent of the shark's total body weight. This liver is comprised of high density molecules of oil and compensates somewhat for the lack of an air bladder, giving sharks extra buoyancy. Wing-like pectoral fins that act as stabilizers also allow sharks to move up and down in the water column, further compensating for buoyancy.

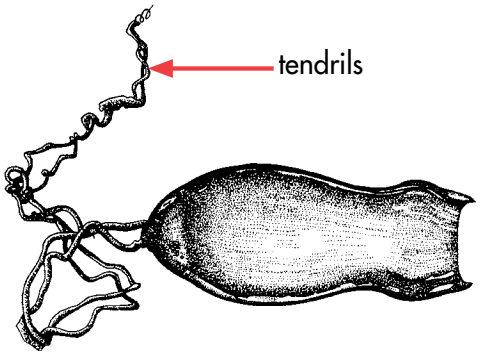
Motion is also important for breathing among sharks. Again, unlike bony fishes, sharks do not constantly pump water through their gills to extract oxygen. Instead, the shark's forward swimming motion forces water to flow through the mouth and across the gills, where the interchange of oxygen occurs. However, nurse sharks and lemon sharks have been reliably observed in groups lying motionless on or near the bottom for short periods of time.

Reproduction

Reproduction among sharks is surprisingly advanced. Fertilization in all species occurs internally, producing small numbers of large, well-developed young. In comparison, fertilization among the majority of bony fishes occurs externally. Consequently, the number of eggs produced by a female shark is much smaller than the tremendous quantity of eggs produced by a bony fish. Some bony fishes may spawn millions of eggs at one time. Brood size, or number of offspring, among sharks varies according to the species. A smooth dogfish may give birth to as few as two pups, while the tiger shark may produce as many as 60 or more young in a single brood.

Sharks have perfected three types of reproductive development. They are called • oviparity, • aplacental viviparity, and • placental viviparity.

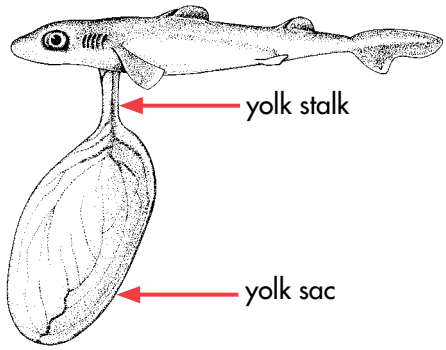
- Oviparity



egg case of oviparous sharks

Oviparity is the most primitive mode of reproductive development among sharks. Following internal fertilization, the developing embryo is enclosed in a protective, leather-like egg case, which the female indiscriminately deposits on the ocean floor. Many egg cases possess tendrils that help attach the case to objects on the sea floor where the egg develops in complete isolation from the parent shark. After a period of time, a fully formed miniature shark hatches ready to feed and fend for itself. The catsharks practice oviparity.

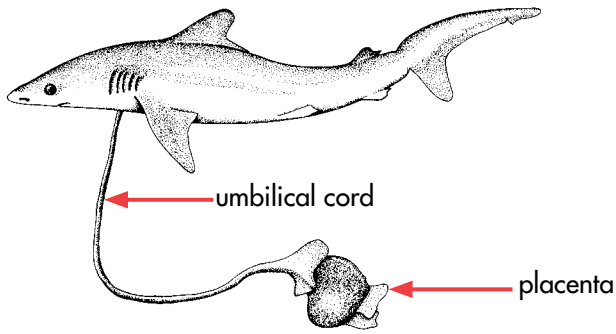
- Aplacental viviparity



aplacental viviparous embryo

Aplacental viviparity is the most common mode of reproductive development among sharks. As the egg develops within the uterus of the mother, it receives most of its nutritional requirements from rich yolk stored in a yolk sac that is connected to the embryo by a yolk stalk. There is no placental connection between the embryo and the mother. Once the young shark is fully developed, it is born and swims away. The sharks that practice aplacental viviparity include the dogfish sharks, the angel sharks, the nurse sharks, the whale shark, the sand tiger sharks, the basking shark, the thresher sharks, the mackerel sharks, the tiger shark, the sixgill sharks, and the sevengill sharks.

- Placental viviparity



placental viviparous embryo

Placental viviparity is the most advanced mode of reproductive development among sharks. The embryo lies within the uterus of the mother and receives most of its nutritional requirements for growth by forming a placental connection with the mother by way of an umbilical cord. Early in the growth process, the embryo is dependent for a short period of time on stored yolk (as described in aplacental viviparity), but the embryo soon develops a placental connection. At birth, the umbilical cord is broken, and the young shark swims away. The smooth dogfish, the large group of requiem sharks, and the hammerhead sharks practice placental viviparity.

Summary of Mode of Reproduction for Sharks of South Carolina

Common Name	Scientific Name	Reproduction
Atlantic angel shark	*Squatina dumeril*	Aplacental viviparity
Atlantic sharpnose shark	*Rhizoprionodon terraenovae*	Placental viviparity
Basking shark	*Cetorhinus maximus*	Aplacental viviparity
Bigeye thresher	*Alopias superciliosus*	Aplacental viviparity
Bignose shark	*Carcharhinus altimus*	Placental viviparity
Blacknose shark	*Carcharhinus acronotus*	Placental viviparity
Blacktip shark	*Carcharhinus limbatus*	Placental viviparity
Blue shark	*Prionace glauca*	Placental viviparity
Bonnethead	*Sphyrna tiburo*	Placental viviparity
Broadband dogfish	*Etmopterus gracilispinis*	Aplacental viviparity
Bull shark	*Carcharhinus leucas*	Placental viviparity
Chain catshark	*Scyliorhinus retifer*	Oviparity
Cuban dogfish	*Squalus cubensis*	Aplacental viviparity
Dusky shark	*Carcharhinus obscurus*	Placental viviparity
Finetooth shark	*Carcharhinus isodon*	Placental viviparity
Great hammerhead	*Sphyrna mokarran*	Placental viviparity
Kitefin shark	*Dalatias licha*	Aplacental viviparity
Lemon shark	*Negaprion brevirostris*	Placental viviparity
Longfin mako	*Isurus paucus*	Aplacental viviparity
Night shark	*Carcharhinus signatus*	Placental viviparity
Nurse shark	*Ginglymostoma cirratum*	Aplacental viviparity
Oceanic whitetip shark	*Carcharhinus longimanus*	Placental viviparity
Porbeagle shark	*Lamna nasus*	Aplacental viviparity
Roughskin spurdog	*Squalus asper*	Aplacental viviparity
Sandbar shark	*Carcharhinus plumbeus*	Placental viviparity
Sand tiger shark	*Carcharias taurus*	Aplacental viviparity
Scalloped hammerhead	*Sphyrna lewini*	Placental viviparity
Sharpnose sevengill shark	*Heptranchias perlo*	Aplacental viviparity
Shortfin mako	*Isurus oxyrinchus*	Aplacental viviparity
Silky shark	*Carcharhinus falciformis*	Placental viviparity
Sixgill shark	*Hexanchus griseus*	Aplacental viviparity
Smooth dogfish	*Mustelus canis*	Placental viviparity
Smooth hammerhead	*Sphyrna zygaena*	Placental viviparity
Spinner shark	*Carcharhinus brevipinna*	Placental viviparity
Spiny dogfish	*Squalus acanthias*	Aplacental viviparity
Thresher shark	*Alopias vulpinus*	Aplacental viviparity
Tiger shark	*Galeocerdo cuvier*	Aplacental viviparity
Whale shark	*Rhincodon typus*	Aplacental viviparity
White shark	*Carcharodon carcharias*	Aplacental viviparity

THE DANGER OF SHARKS

In our mind's eye, there is one universal shark. It is large and powerful with cold, lifeless eyes and rows of razor sharp teeth. Solitary by nature, this shark is assumed to be offensive and calculating, lurking everywhere just below the surface of the sea. It represents the ultimate predator, slowly circling its victim. It is the grim, gray shadow of slow and horrible death and the vicious killer of man. Today, this image is so pervasive that the cry of "shark" is enough to empty the surf of swimmers for miles along any stretch of beach. In reality, nothing could be more misleading or further from the truth. Under normal conditions, man is simply not the habitual prey of sharks, and the probability of unprovoked attacks on swimmers and divers in our area is very remote.

It is certainly possible that a 10-foot long tiger shark could easily single out and fatally injure any one of the thousands of residents and summer visitors who swim in our waters each year. Yet, this kind of event is exceedingly rare even worldwide. A fatal attack has not occurred in South Carolina for at least the past half century.

South Carolina's extensive coastal waters are generally inhabited by sharks that are fish-eaters and pose little if any threat to people. Occasionally, swimmers are "accidentally" bitten by sharks in shallow, turbid waters where visibility is poor. These encounters usually involve a single, quick bite to the individual's hand, leg, or foot, resulting in minor injuries that require only a few stitches.

Based on available records, no encounter has occurred in our area in which a shark aggressively pursued or repeatedly bit a victim and had to be frantically beaten back. A shark will from time to time mistake a swimmer for its normal prey and strike out, but just as quickly, it will retreat and swim away. This "hit and run" behavior strongly suggests that sharks do not instinctively attack or attempt to kill humans who react and probably feel differently from sharks' normal prey.

Still, the reader is reminded that all sharks are unpredictable and potentially dangerous, especially when handled or harassed, and that tragedies, although rare, do occur. In 2001, shark attacks resulted in the deaths of two swimmers in Virginia, one in Florida, and one in North Carolina waters, inciting the unfortunate phrase "the summer of the sharks." Surfers and abalone divers have been attacked and killed off California, Hawaii, and elsewhere by white sharks and tiger sharks over the years. History is also replete with accounts of shark attacks around the world involving the victims of air and sea disasters out in the open ocean that resulted in great loss of life.

All sharks should be treated with caution and respect. A few common sense rules are advisable when entering the water:

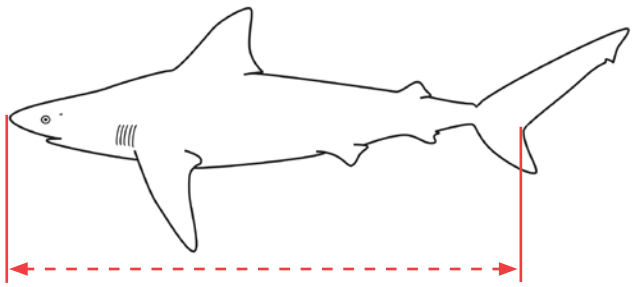
- Never swim at night. This is the cardinal rule for swimmers to remember as many species of sharks are primarily nocturnal feeders.
- Never swim alone. A companion may be helpful in case of an emergency in the water.

- Always stay close to shore. If a shark is spotted, get out of the water immediately.
- Even with a minor bleeding cut, stay out of the water. Blood in very small amounts can attract a shark.
- Do not wear jewelry. Shiny objects may attract sharks in dim, turbid waters.

FISHING FOR SHARKS

Sport fishing for sharks has become increasingly popular in the coastal waters of South Carolina and to a lesser extent offshore. Sounds, inlets, bays, and larger rivers are especially good fishing areas during the summer months with the largest influx of sharks occurring from May through August. Higher salinity areas closer to the ocean are generally better for shark fishing than lower salinity estuaries farther inland. A variety of sharks can also be caught from ocean piers and along beaches; however, shark fishing from some public piers and beaches is prohibited, so check with local officials beforehand. Fishing for sharks can also be quite productive around artificial reefs located along the South Carolina coast, a map of which is provided with coordinates on pages 21 and 22.

An annual South Carolina Saltwater Recreational Fishing License is not required by anglers to fish from shore, piers, licensed charter or head boats, and private docks. However, a license is required when fish are landed from a private boat. For additional information regarding state and federal licenses and permit fishing requirements, as well as recreational size and possession limits, please refer to the *Recreational Fishing Rules and Regulations* provided.



Fork Length (FL): Measurement from tip of snout to fork in tail

- Sharks with size limits must be landed with head and tail intact and can not be dressed in the field.
- Sharks can not be sold, bartered, or traded.
- Sharks may only be landed by rod and reel or hook and line.

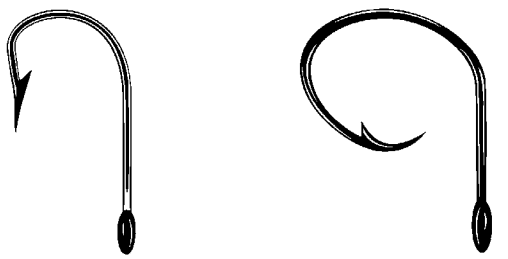
Anglers usually get the best results when fishing on an incoming tide. Tidal currents influence the movement of sharks into shallow areas that are inhabited by many small fish and crustaceans upon which sharks feed. Fishing is also more productive on the bottom and around dawn and dusk, as well as throughout the night. Sharks generally feed less often during the day.

Appropriate baits to catch sharks vary widely. Almost any small to moderate size fish, including mullet, herring, spot, croaker, whiting, etc., will suffice, but live or freshly cut baits are preferred. Oily fish like menhaden also attract sharks. When sliced into strips, the flesh of skates or stingrays is an excellent bait, and it is not easily removed from the hook. Many small sharks like the bonnethead and small blacktip sharks will readily bite dead shrimp or cut crab.

The most active and fast-swimming sharks are usually found farther offshore. Although these species do not normally occur in great numbers, the shortfin mako and the blue shark, for example, are excellent game fish. Unlike most coastal species, these sharks are more likely to be caught on or near the surface while trolling with natural baits, including mullet and ballyhoo, and in some instances by using artificial lures.

Now, a final word on conservation. We have already emphasized the importance of conserving and protecting sharks given the worldwide decline in their populations, but how can the individual angler in South Carolina assist in this effort? The answer is quite simple—avoid killing sharks unnecessarily. Keep only a few that you need for food and release the others unharmed, especially large females. Most sharks will survive capture if they are released shortly after being brought to the boat or dock, even with the hook still attached.

Anglers are encouraged to use circle hooks, which allow sharks to be released unharmed. The circle hook almost always embeds itself in the jaw and not the throat or stomach as is often the case with conventional "J" hooks. Circle hooks are designed to fish effectively; therefore, the angler does not need to "set" the hook, but simply to keep a tight line, and the shark will hook itself as it swims away with the bait.



conventional "J" hook circle hook

Furthermore, you might want to start recording each species you catch, noting pertinent information such as date of capture, estimated length/weight, location, tide stage, bait used, etc. after releasing the shark. Forms have been provided at the end of this guide for such use. You may also want to take a camera along and include a photograph as part of your scrapbook record. Whatever you decide, go out and enjoy the excitement and sport of catching a shark and setting it free.

On July 14, 1964, the all-tackle world record for a tiger shark, as recognized by the International Game Fish Association, was established at Cherry Grove Beach, near Myrtle Beach, South Carolina. The possibility of establishing other world records and especially state records from our region always exists for local anglers. However, as more and more anglers

embrace the philosophy of catch-and-release, the practice of killing larger sharks solely for the purpose of establishing yet another world or state record will become increasingly less acceptable and hopefully discontinued one day.

Commercial shark fishing in the United States has met with disappointment over the years. Fishermen have been hampered by discouraging problems, primarily low prices for the meat and the lack of an inexpensive method of harvesting sharks. For the most part, capture techniques have proved too costly for the small boat operator. The decline in shark populations coupled with the sporadic market for the saleable products and by-products of sharks has further contributed to the limited success and expansion of the shark fishing industry.

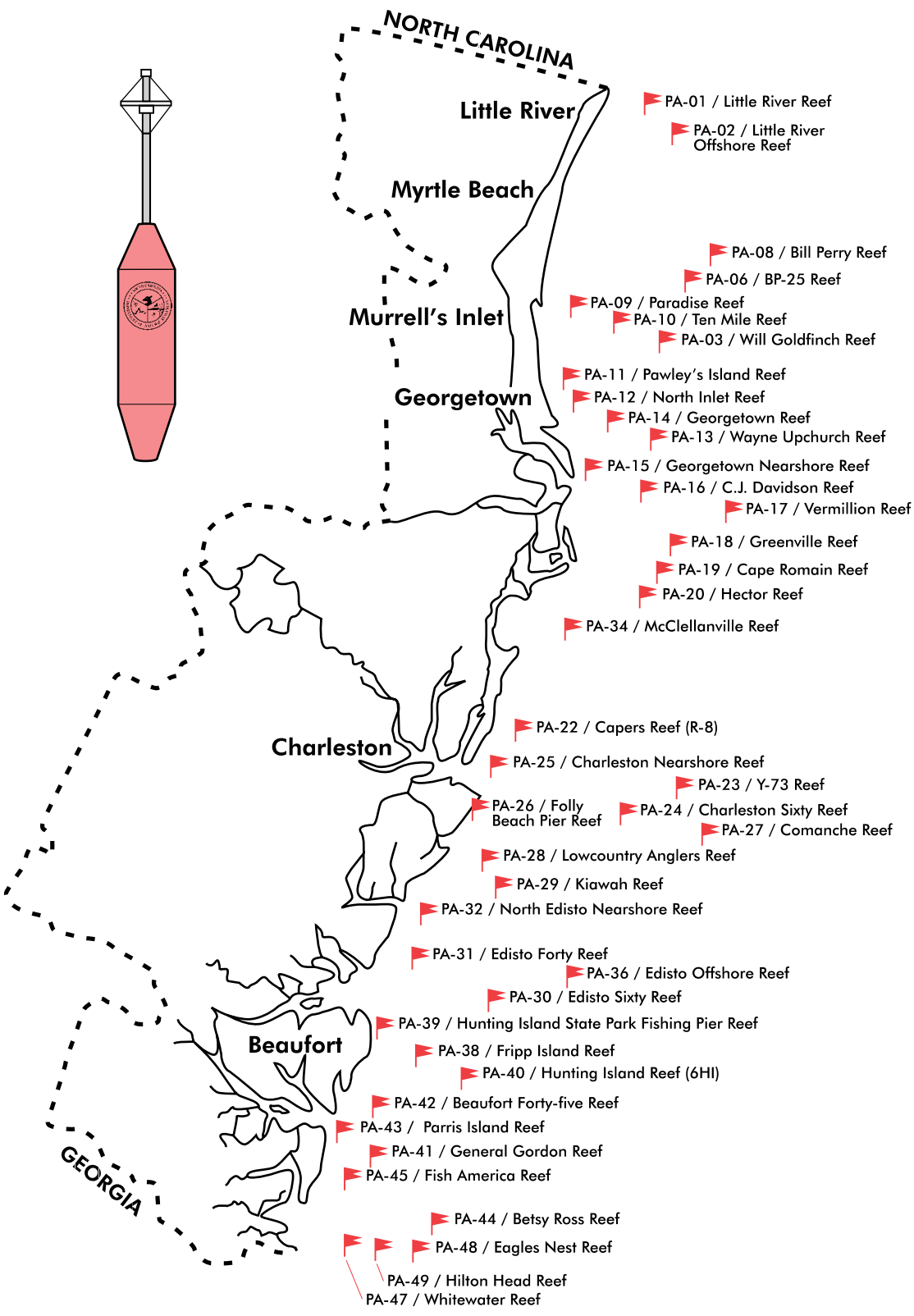
The years between 1930 and 1950 represent the period when shark fisheries in the United States were most lucrative. Landings during this 20-year period were in excess of 30 million pounds annually. The sale of leather goods manufactured from the durable hides of sharks proved profitable, and the meat of preferred shark species was sold at local markets in large quantities for human consumption. During these same years, vitamin A, then extracted from shark livers, was in high demand, but in the early 1950s, a less expensive method of synthetically producing vitamin A was perfected, and the commercial shark industry quickly declined.

South Carolina waters have never supported a commercial shark fishery of any great extent. Other than the sale of small quantities of sharks at local fish houses, the practice of harvesting sharks commercially has been very limited in our state. An annual average of 190,000 pounds of sharks, valued at $95,000, was caught locally throughout the 1980s and 1990s. This amount usually consisted of smaller sharks. The greatest portion of these catches are taken by shrimp trawlers as incidental by-catch and by a few successful commercial shark fishermen along the coast during the summer.

Historically, the practice of utilizing sharks as food has not met with overwhelming appeal in South Carolina or elsewhere in the United States. However, shark meat is becoming increasingly popular. Although few live sharks appear appetizing, most species taken locally are edible, and some are excellent when properly prepared.

Preparation of shark meat does not need to be elaborate. The shark must be fresh and should be skinned and dressed immediately. Soaking the meat in buttermilk, lemon juice, or other acidic marinades provides for a milder and more flavorful dish. Soaking the meat in one of these mild acidic solutions prior to cooking also helps reduce residual urea and ammonia taste in the flesh. Cooking methods may include broiling, grilling, frying, or baking, and the meat may be smoked or served in stews. Sharks can be filleted, or the portion of the shark's body behind the first dorsal fin can be cut into steaks. Other parts of the carcass, especially the fins, can be utilized as well. Most chefs are in agreement that the shortfin mako, Atlantic sharpnose shark, finetooth shark, blacktip shark, blacknose shark, sandbar shark, and the bonnethead are preferred over other shark species. Smaller fish are much more desirable than large ones because they have a milder taste.

LOCATIONS OF SOUTH CAROLINA ARTIFICIAL REEFS

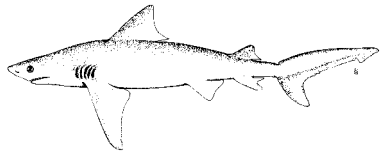
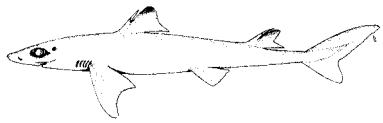
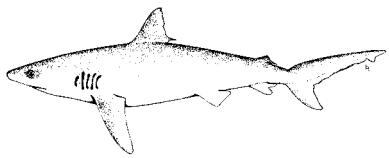
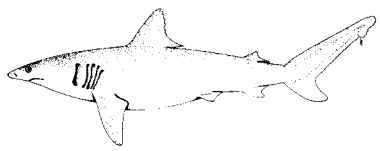
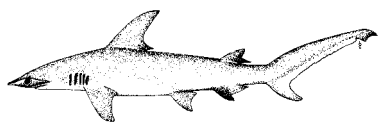
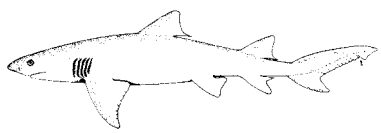
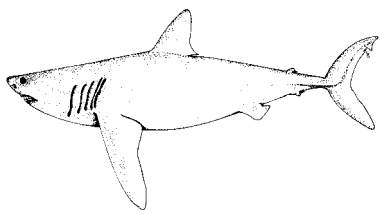


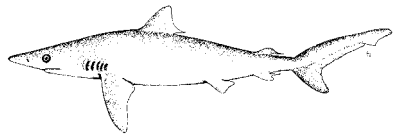
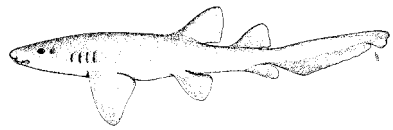
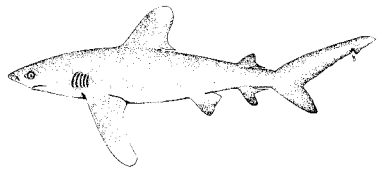
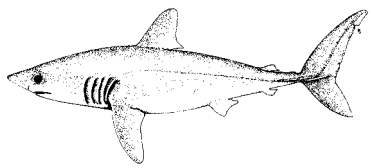
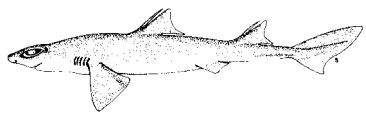
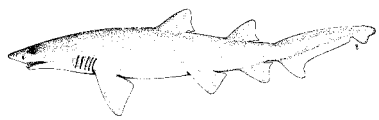
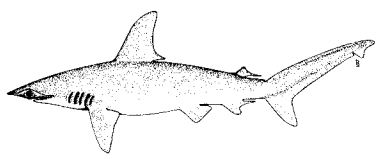
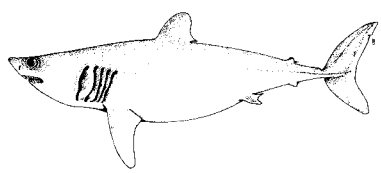
COORDINATES OF SOUTH CAROLINA ARTIFICIAL REEFS

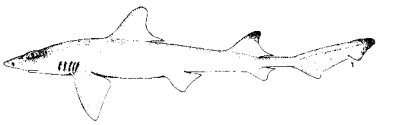
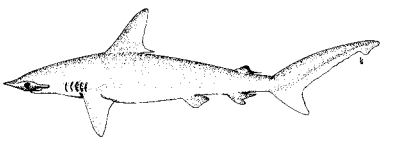
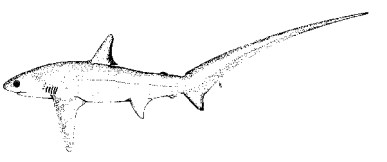
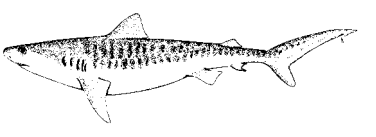
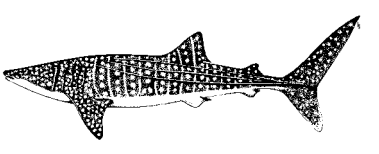
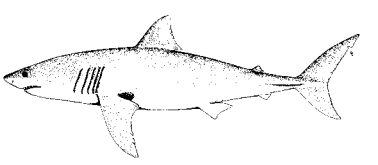
Reef	Latitude	Longitude	Reef	Latitude	Longitude
PA-01	33 48.812	078 30.514	PA-26	Folly Beach Fishing Pier	
PA-02	33 41.957	078 26.639	PA-27	32 27.395	079 19.073
PA-03	33 17.068	078 45.327	PA-28	32 34.265	079 55.172
PA-06	33 21.260	078 25.479	PA-29	32 29.451	080 00.058
PA-08	33 25.694	078 33.201	PA-30	32 21.411	080 05.155
PA-09	33 31.071	078 58.140	PA-31	32 25.318	080 11.734
PA-10	33 26.261	078 52.706	PA-32	32 31.040	080 06.001
PA-11	33 25.993	079 00.718	PA-34	32 51.800	079 22.500
PA-12	33 20.530	079 00.910	PA-36	32 14.958	079 50.545
PA-13	33 08.523	078 50.660	PA-38	32 15.421	080 22.465
PA-14	33 14.332	079 00.143	PA-39	Hunting Island Fishing Pier	
PA-15	33 12.716	079 05.306	PA-40	32 13.055	080 20.494
PA-16	33 05.953	079 00.759	PA-41	32 10.092	080 33.233
PA-17	32 57.548	078 40.051	PA-42	32 07.160	080 29.323
PA-18	32 56.817	078 54.643	PA-43	32 18.865	080 42.520
PA-19	32 59.858	079 02.332	PA-44	32 03.427	080 24.851
PA-20	33 00.100	079 06.100	PA-45	32 08.449	080 41.439
PA-22	32 44.990	079 34.517	PA-47	32 03.089	080 45.003
PA-23	32 32.459	079 18.993	PA-48	32 01.160	080 30.300
PA-24	32 33.147	079 40.249	PA-49	31 59.948	080 35.928
PA-25	32 42.588	079 45.679			

ALPHABETICAL INDEX TO COMMON NAMES

Common Name	Scientific Name	Page
Atlantic angel shark	*Squatina dumeril*	58
Atlantic sharpnose shark	*Rhizoprionodon terraenovae*	110
Basking shark	*Cetorhinus maximus*	70
Bigeye thresher	*Alopias superciliosus*	66
Bignose shark	*Carcharhinus altimus*	86
Blacknose shark	*Carcharhinus acronotus*	108
Blacktip shark	*Carcharhinus limbatus*	102
Blue shark	*Prionace glauca*	96
Bonnethead	*Sphyrna tiburo*	114

Common Name	Scientific Name		Page
Broadband dogfish	*Etmopterus gracilispinis*		53
Bull shark	*Carcharhinus leucas*		100
Chain catshark	*Scyliorhinus retifer*		53
Cuban dogfish	*Squalus cubensis*		53
Dusky shark	*Carcharhinus obscurus*		90
Finetooth shark	*Carcharhinus isodon*		106
Great hammerhead	*Sphyrna mokarran*		118
Kitefin shark	*Dalatias licha*		53
Lemon shark	*Negaprion brevirostris*		98
Longfin mako	*Isurus paucus*		76

Common Name	Scientific Name		Page
Night shark	*Carcharhinus signatus*		92
Nurse shark	*Ginglymostoma cirratum*		60
Oceanic whitetip shark	*Carcharhinus longimanus*		82
Porbeagle shark	*Lamna nasus*		78
Roughskin spurdog	*Squalus asper*		53
Sandbar shark	*Carcharhinus plumbeus*		84
Sand tiger shark	*Carcharias taurus*		64
Scalloped hammerhead	*Sphyrna lewini*		120
Sharpnose sevengill shark	*Heptranchias perlo*		52
Shortfin mako	*Isurus oxyrinchus*		74

Common Name	Scientific Name		Page
Silky shark	*Carcharhinus falciformis*		88
Sixgill shark	*Hexanchus griseus*		52
Smooth dogfish	*Mustelus canis*		80
Smooth hammerhead	*Sphyrna zygaena*		116
Spinner shark	*Carcharhinus brevipinna*		104
Spiny dogfish	*Squalus acanthias*		56
Thresher shark	*Alopias vulpinus*		68
Tiger shark	*Galeocerdo cuvier*		94
Whale shark	*Rhincodon typus*		62
White shark	*Carcharodon carcharias*		72

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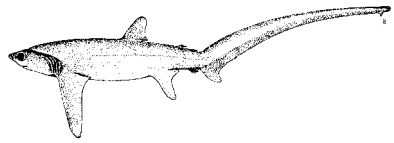
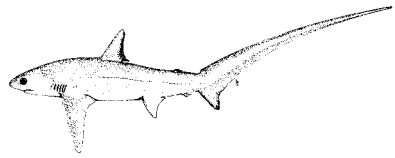
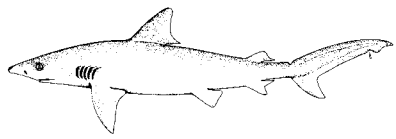
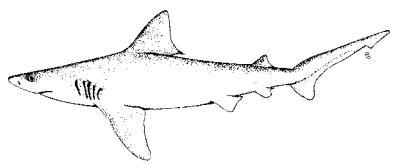
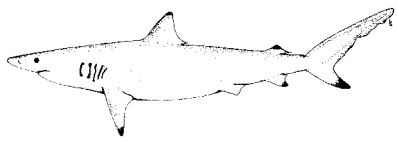
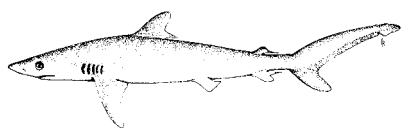
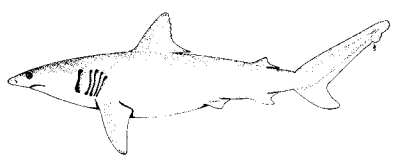
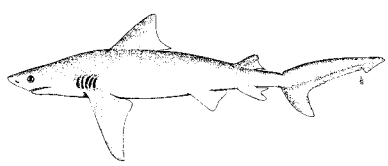
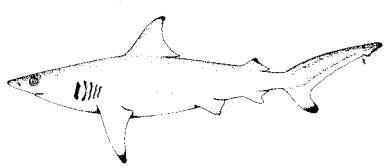
Alopias superciliosus	Bigeye thresher		66
Alopias vulpinus	Thresher shark		68
Carcharhinus acronotus	Blacknose shark		108
Carcharhinus altimus	Bignose shark		86
Carcharhinus brevipinna	Spinner shark		104
Carcharhinus falciformis	Silky shark		88
Carcharhinus isodon	Finetooth shark		106
Carcharhinus leucas	Bull shark		100
Carcharhinus limbatus	Blacktip shark		102

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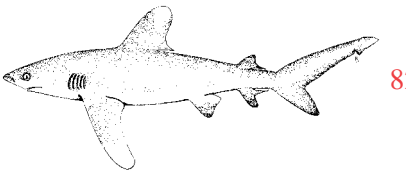
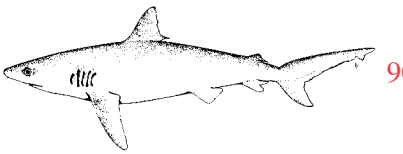
Carcharhinus longimanus	Oceanic whitetip shark		82
Carcharhinus obscurus	Dusky shark		90
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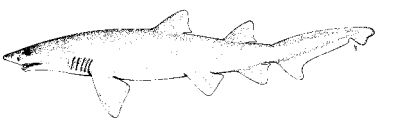
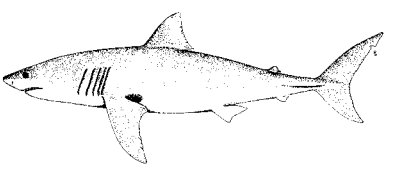
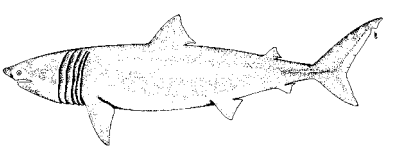
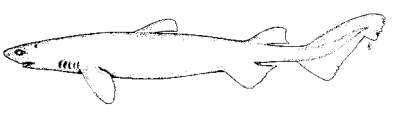
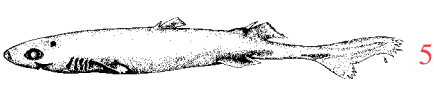
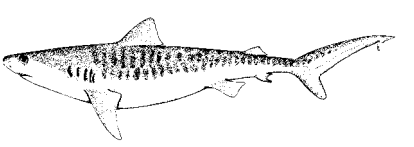
Carcharias taurus	Sand tiger shark		64
Carcharodon carcharias	White shark		72
Cetorhinus maximus	Basking shark		70
Dalatias licha	Kitefin shark		53
Etmopterus gracilispinis	Broadband dogfish		53
Galeocerdo cuvier	Tiger shark		94

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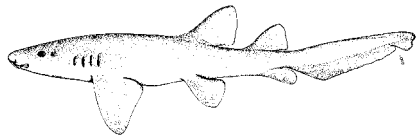
Ginglymostoma cirratum	Nurse shark		60
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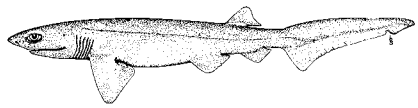
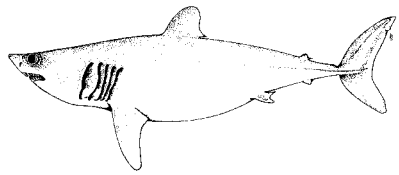
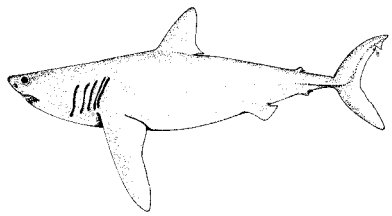
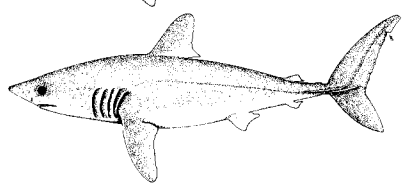
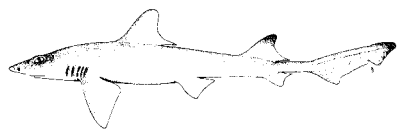
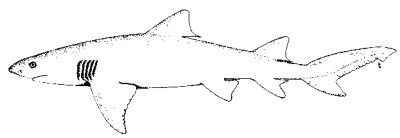
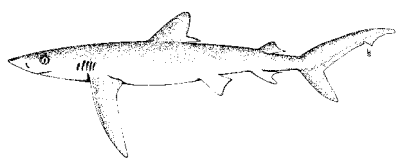
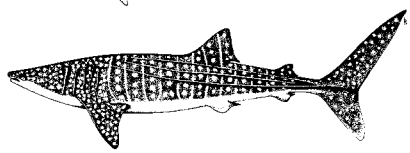
Hexanchus griseus	Sixgill shark		52
Isurus oxyrinchus	Shortfin mako		74
Isurus paucus	Longfin mako		76
Lamna nasus	Porbeagle shark		78
Mustelus canis	Smooth dogfish		80
Negaprion brevirostris	Lemon shark		98
Prionace glauca	Blue shark		96
Rhincodon typus	Whale shark		62

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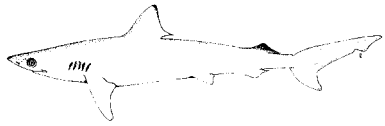
Rhizoprionodon terraenovae	Atlantic sharpnose shark		110
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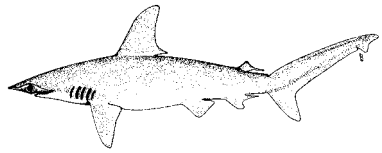
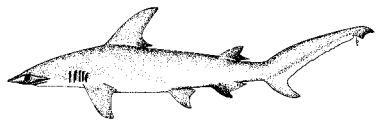
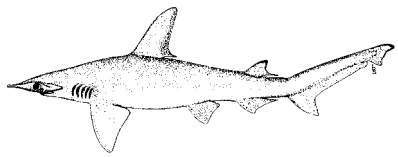
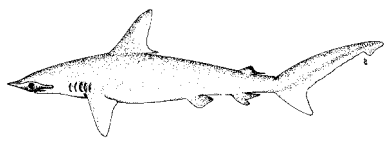
Sphyrna lewini	Scalloped hammerhead		120
Sphyrna mokarran	Great hammerhead		118
Sphyrna tiburo	Bonnethead		114
Sphyrna zygaena	Smooth hammerhead		116
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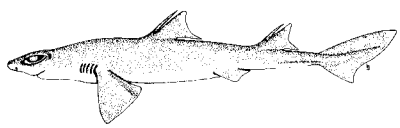
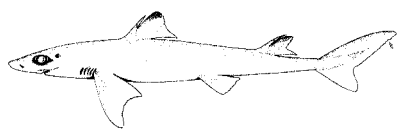
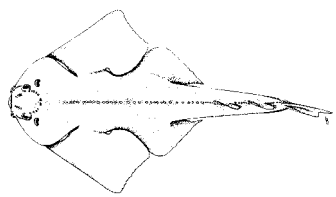
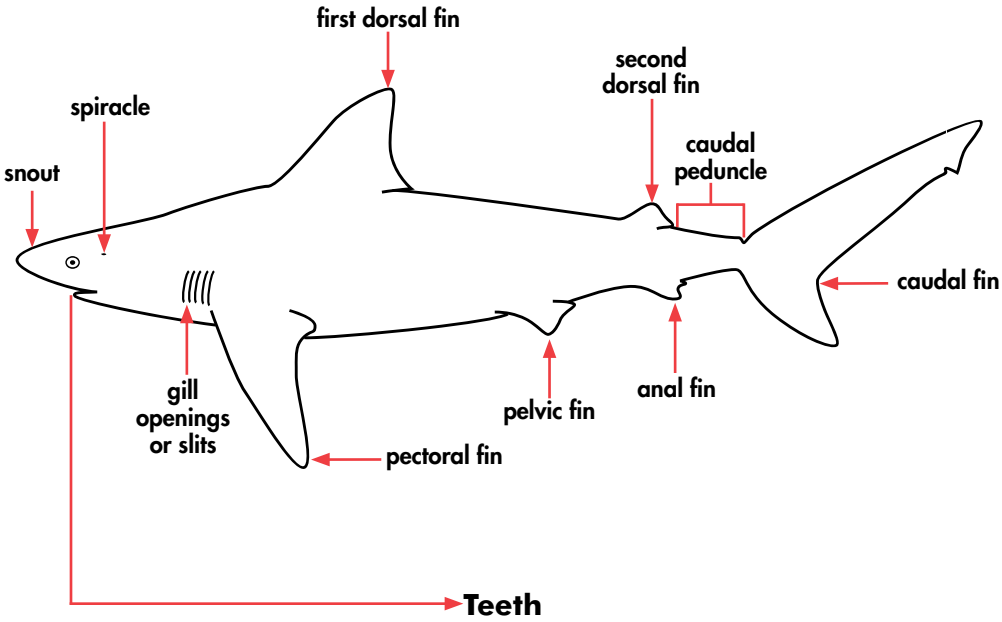
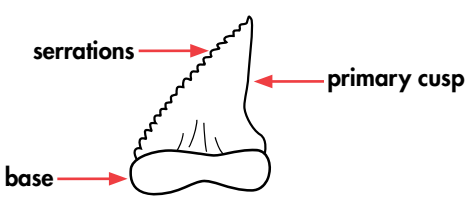
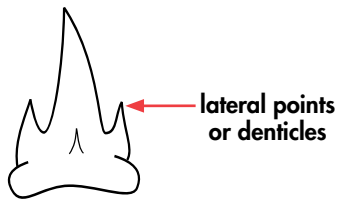
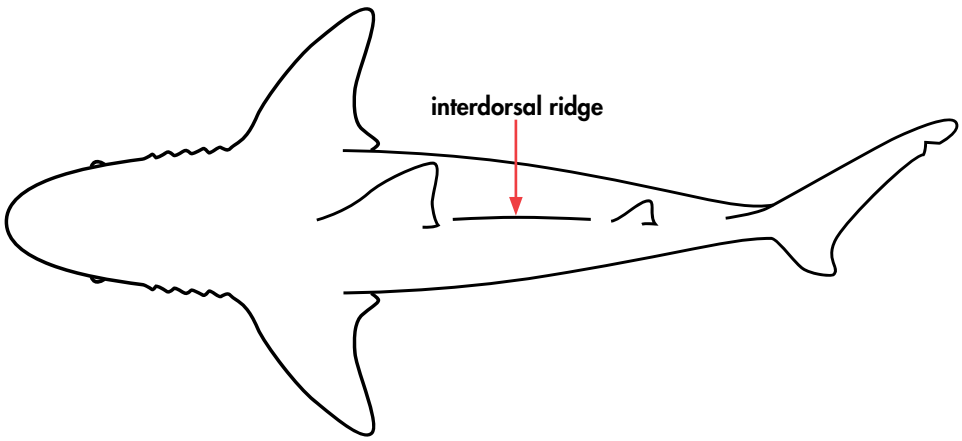
Squalus asper	Roughskin spurdog		53
Squalus cubensis	Cuban dogfish		53
Squatina dumeril	Atlantic angel shark		58

EXTERNAL SHARK ANATOMY

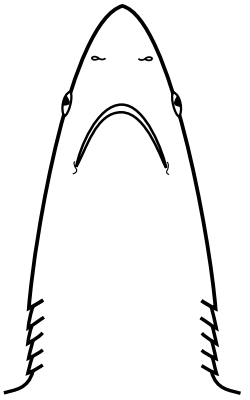




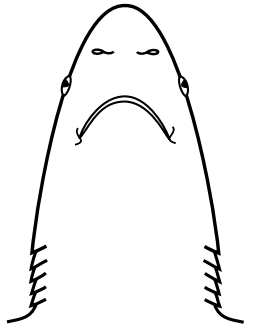




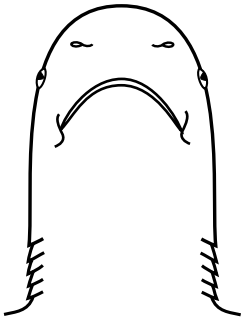
Head and Snout



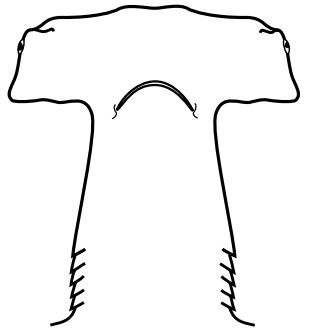
snout very pointed



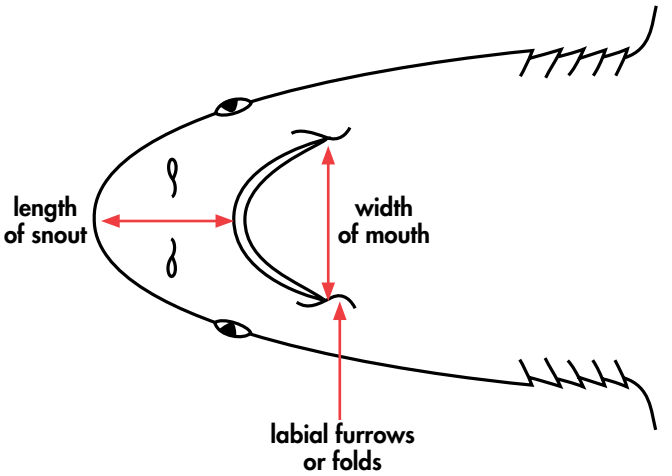
snout narrowly rounded



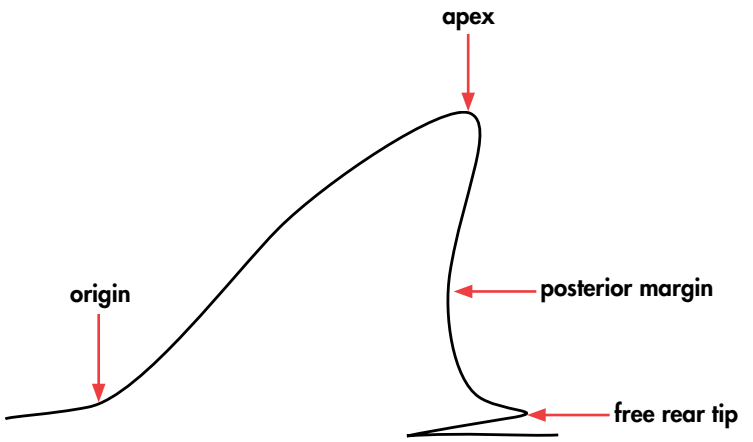
snout broadly rounded

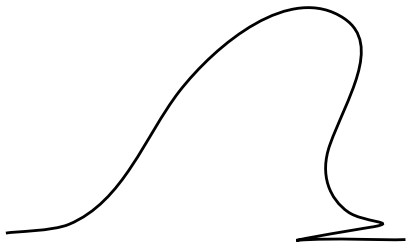


snout hammer-shaped

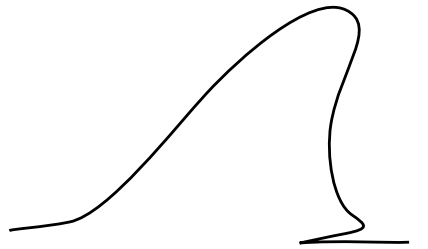


Dorsal Fins

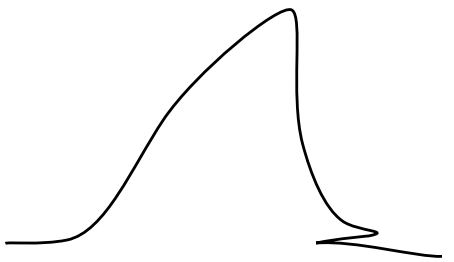




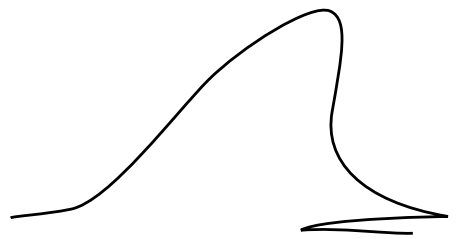
apex broadly rounded



apex narrowly rounded

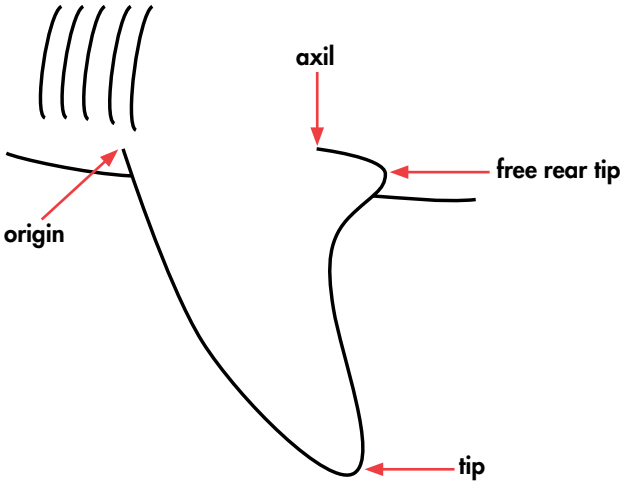


dorsal triangular

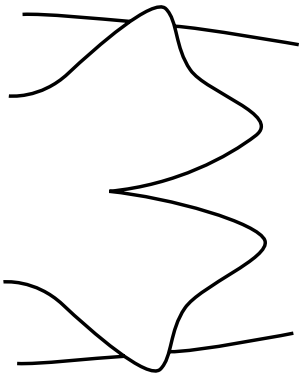


free rear tip extended

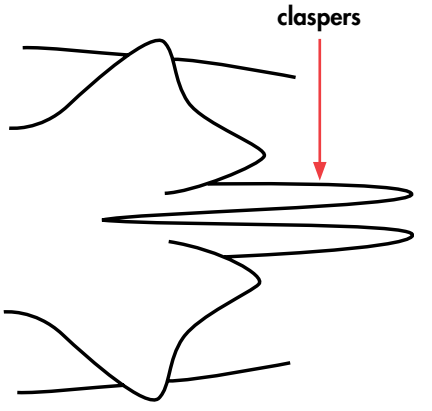
Pectoral Fins



Pelvic Fins

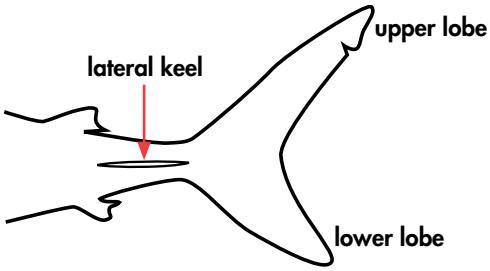


female pelvic fins

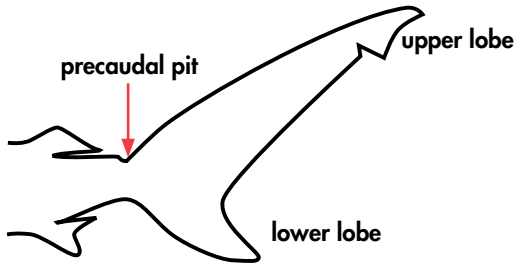


male pelvic fins

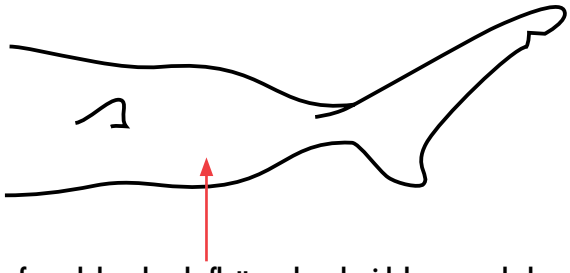
Caudal Fin



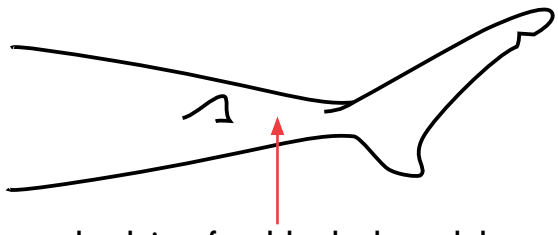
lunate
upper and lower lobes
nearly equal in length



not lunate
upper lobe much longer
than lower lobe



dorsal view of caudal peduncle flattened and widely expanded



dorsal view of caudal peduncle rounded

sickle-like
upper lobe greatly elongated

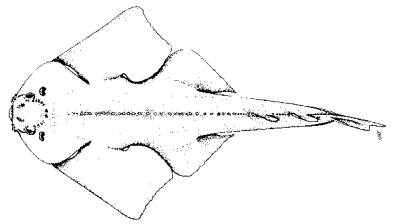
IDENTIFICATION KEY
TO
SHARKS OF SOUTH CAROLINA

Page

1) Anal fin is absent. Distinct, well-fixed spine is present in front of each dorsal fin. Body is often marked with small, white spots. A coastal winter resident only.

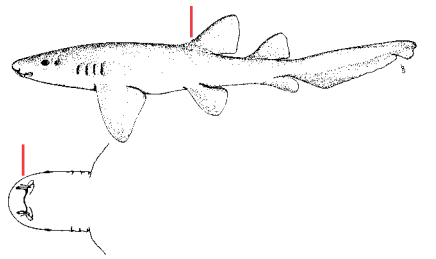
Can only be . . . . . Spiny dogfish 56

2) Body is broadly expanded and greatly flattened like a stingray with eyes on top of the head.



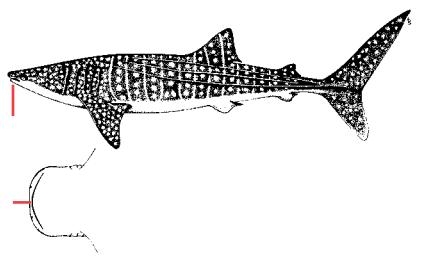
Can only be . . . . . Atlantic angel shark 58

3) A large, fleshy barbel is present on each nostril. The first dorsal fin originates over the pelvic fins. The caudal fin is fan-like and not separated into two distinct lobes.



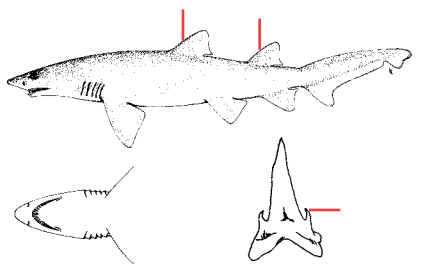
Can only be . . . . . Nurse Shark 60

4) Mouth is located at tip of snout (terminal). Three prominent ridges occur along each side of the trunk. Body is marked with white or yellowish spots and stripes. Usually very large. Strictly a pelagic species.



Can only be . . . . . Whale Shark 62

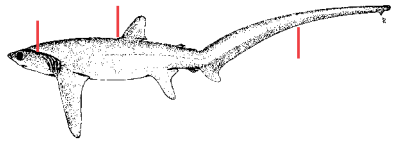
5) Snout is pointed. All five gill openings are located in front of the pectoral fins. Dorsal fins are nearly equal in size. The first dorsal fin originates far back on the trunk. Teeth are long, slender, and smooth-edged with one or two lateral points on each side of the base.



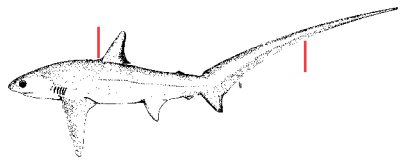
Can only be . . . . . Sand tiger shark 64

6) Caudal fin is enormous, sickle-like, and actually as long as the rest of the body.
Two possibilities:

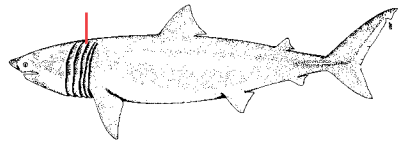
a. Eyes are very large and upward looking. Head marked with distinct groove from above the eye to the gills. The first dorsal fin originates far back on the trunk, and its apex is rounded. A total of 10 to 12 teeth are present on each side of the upper and lower jaws. Usually a pelagic species . . . Bigeye thresher 66

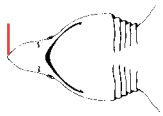


b. Eyes are moderately large. The first dorsal fin originates only slightly behind the free rear tips of the pectoral fins, and its apex is pointed. A total of 20 to 21 teeth are present on each side of the upper and lower jaws. Usually a pelagic species . . . Thresher shark 68

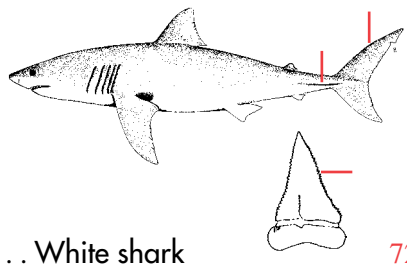


7) Snout is pointed and mouth is very large with numerous, small teeth. Gill openings are extremely large and very long, originating high up on the trunk and extending well under the neck. Generally very large. Usually a pelagic species.
Can only be . . . . . Basking shark 70



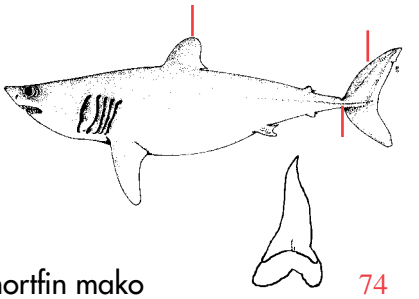


8) Strong lateral keels, or ridges, are located on the caudal peduncle, and the caudal fin is obviously lunate.
Four possibilities:

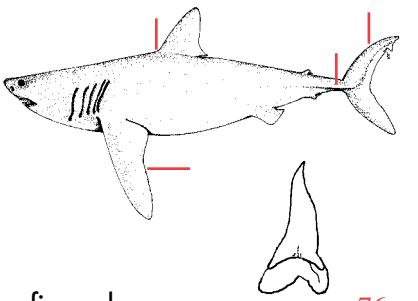


a. Teeth are large, broad-based, and distinctly triangular with strongly serrated, saw-like edges . . . . . White shark 72

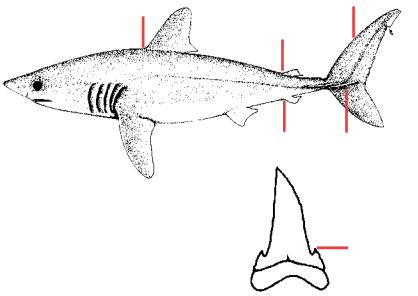
b. The first dorsal fin originates slightly posterior to the free rear tips of the pectoral fins. Apex of first dorsal fin is broadly rounded, becoming more pointed in large adults. Teeth are long, slender, and smooth-edged without lateral points on sides of base. Area under the mouth is white in color. Strictly a pelagic species . . . . . Shortfin mako 74



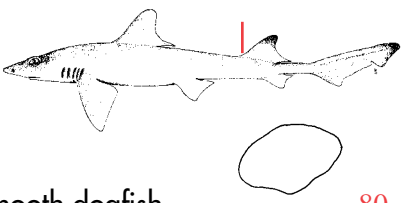
c. The first dorsal fin originates closely over the free rear tips of the pectoral fins. Apex of first dorsal fin is almost pointed. The pectoral fins are very long and narrow, about as long as the measurement from the tip of the snout to the fifth gill opening. Teeth are long, slender, and smooth-edged without lateral points on sides of base. Area under the mouth is dark to dusky in color. Strictly a pelagic species . . . . . Longfin mako 76



d. The first dorsal fin originates over the axil of each pectoral fin. The origins of the second dorsal fin and the anal fin are equal. A secondary lateral keel is present on each side of the caudal fin. Teeth are long, slender, and smooth-edged with a single lateral point on each side of base. Strictly a pelagic species. *Only one doubtful record of this species has been reported from South Carolina waters. It is included in this guide to allow anglers to differentiate it from the more abundant shortfin mako* . . . . . Porbeagle shark 78

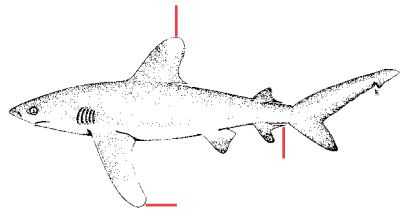


9) Snout is narrowly rounded. The first dorsal fin originates over the free rear tips of the pectoral fins. The second dorsal fin is large, originating well forward of the anal fin. Teeth are flattened with blunt cusps. A coastal winter resident only. Can only be. . . . . Smooth dogfish 80

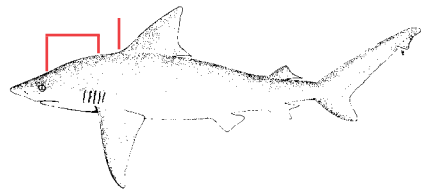


10) An interdorsal ridge is present along the back between the first dorsal fin and the second dorsal fin. Caudal fin is not lunate.
Seven possibilities:

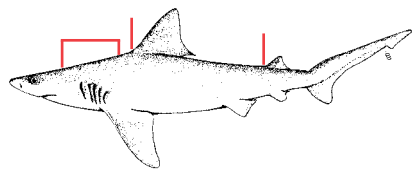
a. Interdorsal ridge noticeably weak, but almost always present. Apex of first dorsal fin is very distinctly rounded. The pectoral fins are noticeably long and narrow, as long as the measurement from the tip of the snout to the fourth gill opening. Tips of dorsal fins, pectoral fins, and lobes of the caudal fin are tipped with white in animals larger than approximately four feet in length. The free rear tip of the anal fin extends nearly to the base of the lower caudal lobe. Strictly a pelagic species . . . . . Oceanic whitetip shark 82



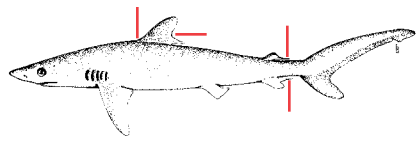
b. Snout shorter than width of mouth. The dorsal profile above gill region is very steeply arched. The first dorsal fin is large and triangular with its origin occurring obviously over or slightly anterior to the axil of each pectoral fin. Upper teeth have finely serrated edges . . . . . Sandbar shark 84



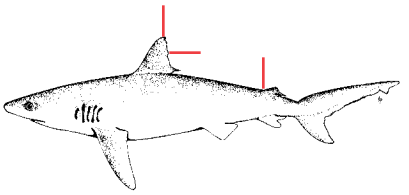
c. Snout moderately long, as long as or longer than width of mouth. The dorsal profile above gill region is not steeply arched. The first dorsal fin is large and triangular with its origin over the axil of each pectoral fin. The second dorsal fin originates slightly anterior to the origin of the anal fin. Upper teeth have serrated edges. . . . . Bignose shark 86



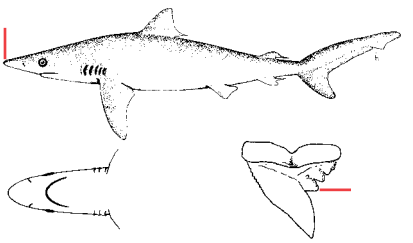
d. Snout is shorter than width of mouth. The first dorsal fin originates posterior to the free rear tips of the pectoral fins, and its rear margin is very deeply concave. The free rear tips of the second dorsal fin and the anal fin are very long, about twice as long as the height of the fin . . . . . Silky shark 88



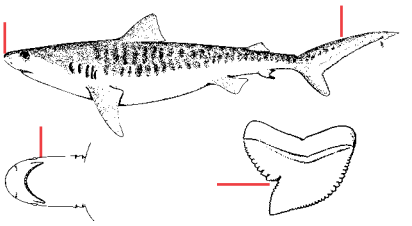
e. Snout is about as long as width of mouth. The first dorsal fin originates over the free rear tips of the pectoral fins and is erect and triangular with pointed apex. Its rear margin is nearly straight-edged and not deeply concave. The second dorsal fin originates slightly posterior to the origin of the anal fin. Usually a pelagic species . . . . . Dusky shark 90



f. Snout is noticeably longer than width of mouth. Eyes are green in color. The first dorsal fin originates slightly posterior to the free rear tips of the pectoral fins. Upper teeth are deeply notched with two to five coarse serrations from notch to base. Strictly a pelagic species. . . . . Night shark 92

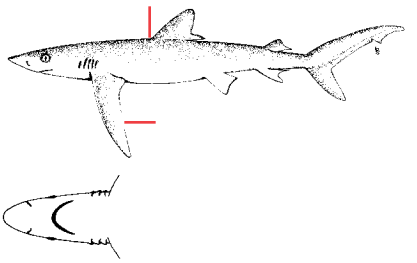


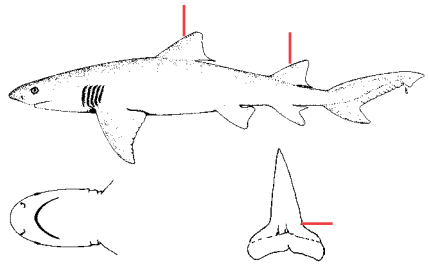
g. Snout is broadly rounded and shorter than width of mouth. Upper labial furrows are very long. Upper lobe of caudal fin is three times longer than lower lobe and tapered. Teeth in both jaws are triangular and very deeply notched. Dark spots and stripes are present along the body . . . . . Tiger shark 94



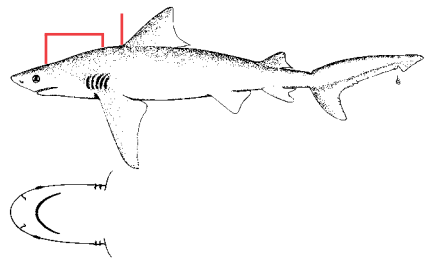
11) An interdorsal ridge is absent along the back between the first dorsal fin and the second dorsal fin. Caudal fin is not lunate. Eight possibilities:

a. Snout is noticeably long, longer than width of mouth. The first dorsal fin originates far back on the trunk, well posterior to the pectoral fins. Pectoral fins are very long and narrow, as long as the measurement from the tip of the snout to the fifth gill opening. Color is brilliant blue. Strictly a pelagic species . . . . . Blue shark 96

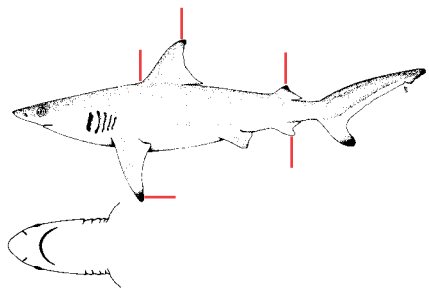




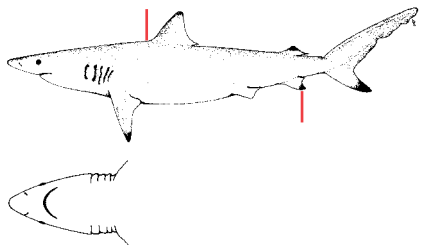
b. Snout is shorter than width of mouth and broadly rounded. Both dorsal fins are large and nearly equal in size. Teeth are smooth without lateral points on each side of base . . . . . Lemon shark 98



c. Snout is shorter than width of mouth and broadly rounded. Dorsal profile above gill region is strongly arched. The first dorsal fin obviously originates over the axil of each pectoral fin . . . . . Bull shark 100



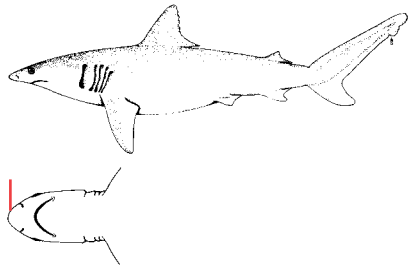
d. Snout is about as long as width of mouth and abruptly tapers forward anterior to nostrils. The first dorsal fin originates closely over the axil of each pectoral fin. The dorsal fins, pectoral fins, and lower lobe of the caudal fin are black-tipped. The anal fin is white. The lower teeth are finely serrated . . . . . Blacktip shark 102



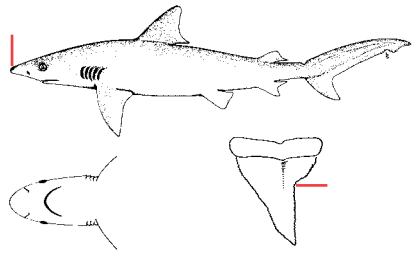
e. Snout is as long as or longer than width of mouth and evenly tapered to a narrowly rounded tip. The first dorsal fin originates above or slightly posterior to the free rear tips of the pectoral fins. The second dorsal fin, pectoral fins, lower lobe of the caudal fin, and the anal fin are black-tipped in animals over 30 inches in length. The lower teeth are perfectly smooth-edged . . . . . Spinner shark 104

Page

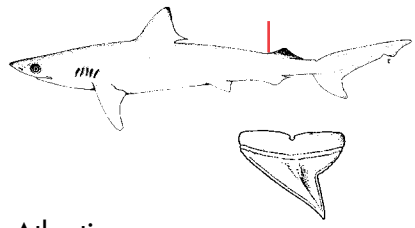
f. Snout is shorter than width of mouth and narrowly rounded to almost pointed. The first dorsal fin originates over the free rear tips of the pectoral fins. Fins are not distinctly black-tipped but may appear a lighter dusky color. Teeth in both jaws are slender, erect, and smooth-edged . . . . . Finetooth shark 106



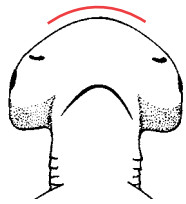
g. Snout is as long as or longer than width of mouth and narrowly rounded. Tip is marked with a dusky blotch. The first dorsal fin originates over the free rear tips of the pectoral fins. Body is noticeably yellowish-copper in color. Fins are not black-tipped. Teeth in both jaws are serrated with the upper teeth being noticeably notched . . . . . Blacknose shark 108



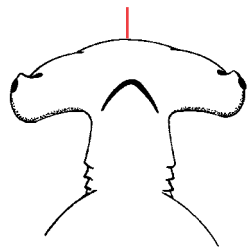
h. The second dorsal fin originates posterior to the origin of the anal fin (actually over the midpoint of base of anal fin). Teeth in both jaws are triangular with deeply notched outer margins. Juvenile and adult specimens have a few distinct white spots along the back and sides . . Atlantic sharpnose shark 110



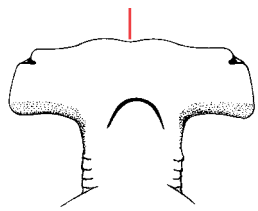
12) Head is strongly flattened and laterally expanded to appear either shovel-shaped or hammer-shaped.
Four possibilities:



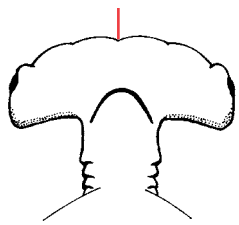
a. Head is shovel-shaped. Anterior margin is evenly and broadly rounded. . . . . Bonnethead 114



b. Head is hammer-shaped. Anterior margin is slightly rounded, scalloped, and not notched at the mid-line . . . . . Smooth hammerhead 116



c. Head is strongly hammer-shaped. Anterior margin is straight-edged and deeply notched at the mid-line. First dorsal fin noticeably large, tall, rudder-like, and backward sloping. Teeth are coarsely serrated. . . . . Great hammerhead 118



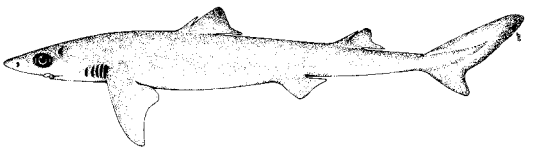
d. Head is hammer-shaped. Anterior margin is slightly rounded, scalloped, and notched at the mid-line. Teeth are smooth-edged . . . . . Scalloped hammerhead 120

A SUMMARY OF THE THIRTEEN FAMILIES AND THIRTY-NINE SPECIES OF SHARKS OF SOUTH CAROLINA

Family Squalidae
Dogfish Sharks

This is a large group of rather "primitive looking" sharks containing at least 80 species worldwide. They are generally characterized by having prominent spiracles, almond-shaped eyes, dorsal fins often with spines, and no anal fin. Most species are small and live in colder or deep ocean waters. This family contains the only species known to inhabit the Arctic seas, the Greenland shark. The spiny dogfish is the most common and well-known species of this family found in South Carolina coastal waters during the winter. Because of its schooling habits, large numbers are occasionally caught incidentally by shrimp trawlers in November and December. They are harmless to man and of little interest to anglers. Spiny dogfish are of considerable commercial importance in other regions of the world.

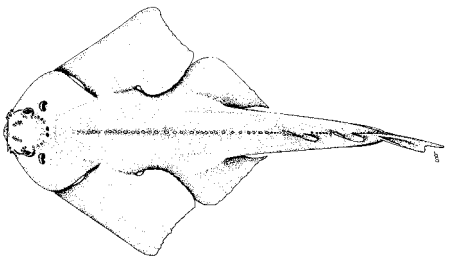
Spiny dogfish, *Squalus acanthias* (p. 56)



Family Squatinidae
Angel Sharks

This is a small group of very unique sharks characterized by a greatly flattened body, terminal mouth, eyes that are located on the top of the head, and broadly expanded, "wing-like" pectoral fins. They are often confused with stingrays. The Atlantic angel shark is the only species of this family to inhabit South Carolina waters, and it is not very common. It lives on the bottom, often camouflaged in the sand or mud, and is harmless unless accidentally stepped upon. Few are caught by anglers in South Carolina.

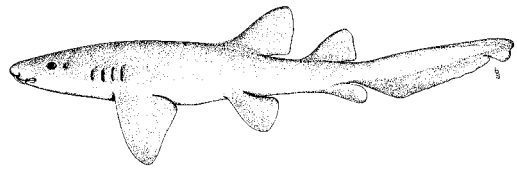
Atlantic angel shark, *Squatina dumeril* (p. 58)



Family Ginglymostomatidae
Nurse Sharks

This group of sharks is characterized by a short, rounded snout, distinct nasal barbels located in front of mouth (often called feelers), small eyes, a fifth gill slit almost hidden by the fourth, a first dorsal fin that originates far back on the body, and a tapering, low profile tail that is not separated into two distinct lobes. These are generally sluggish sharks living on or near the bottom in shallow waters, at times in a resting position. Only one species occurs in the Atlantic Ocean. It is considered harmless to swimmers and divers unless provoked. Few are caught by anglers in South Carolina.

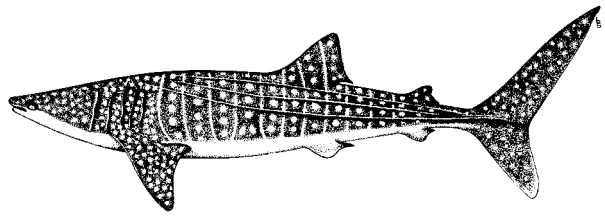
Nurse shark, *Ginglymostoma cirratum* (p. 60)



Family Rhincodontidae
Whale Shark

The whale shark, the only species of this family, is the largest of all the sharks and therefore the largest fish. Only true whales (mammals) grow larger, hence its name. It is truly a unique pelagic species off South Carolina and entirely harmless despite its great size.

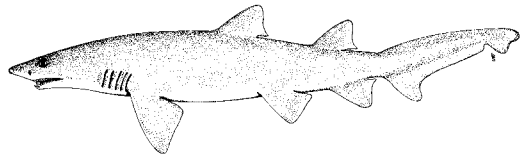
Whale shark, *Rhincodon typus* (p. 62)



Family Odontaspididae
Sand Tiger Sharks

This group of large "ragged-tooth" sharks is characterized by a pointed snout, long and slender canine-like teeth with lateral points or denticles, a first dorsal fin that originates far back on the body, and a large second dorsal fin that is about the same size as the first. Of the eight species recognized throughout the world, only one occurs in South Carolina waters. It is usually a bottom-dwelling coastal species that can be dangerous to swimmers. Occasionally taken by anglers in South Carolina.

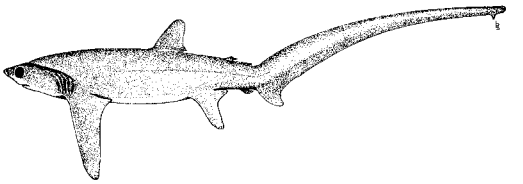
Sand tiger shark, *Carcharias taurus* (p. 64)



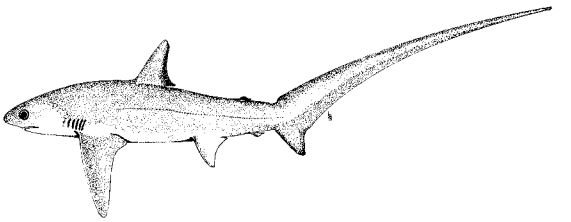
Family Alopiidae
Thresher Sharks

This small family of very distinct sharks contains only three species worldwide. They are characterized by an extremely elongated, "sickle-like" tail that is about half the length of the entire body. The tail is actually used in feeding to strike and stun schooling fish. They are generally pelagic with two species occurring in South Carolina. Very few are caught by anglers.

Bigeye thresher, *Alopias superciliosus* (p. 66)



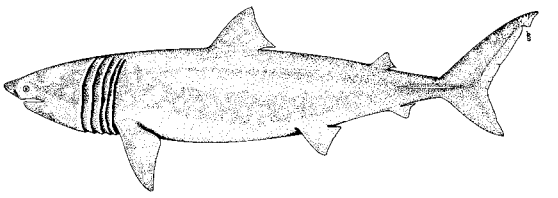
Thresher shark, *Alopias vulpinus* (p. 68)



Family Cetorhinidae
Basking Shark

The basking shark, the only species of this family, is second in size only to the whale shark. It is characterized by a pointed snout, an enormous gaping mouth, small teeth, very long gills, and a lunate tail. It is a harmless plankton feeder occasionally seen swimming lazily on the surface, usually far offshore, as if "basking" in the sun. Some ichthyologists place the basking shark in the family of mackerel sharks.

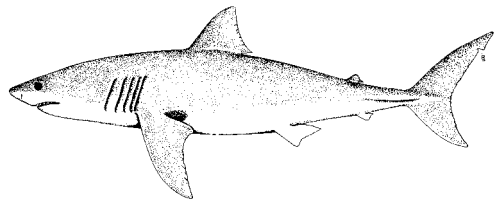
Basking shark, *Cetorhinus maximus* (p. 70)



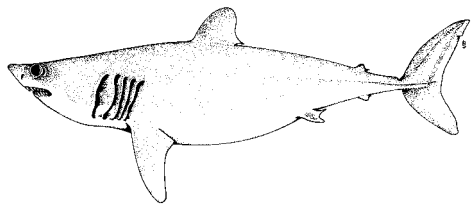
Family Lamnidae
Mackerel Sharks

This small group of large, stream-lined, and fast-swimming sharks is characterized by a conical (cone-shaped) head, very pointed snout, relatively large circular eyes for sight-feeding, large gills that allow for more efficient breathing, a small second dorsal fin that reduces drag, lateral keels reinforcing a thick caudal peduncle, and a powerful, lunate tail. Mackerel sharks are widely regarded as having the perfect body design and therefore tend to be a symbol of all sharks. Five species are widely distributed throughout the world, three of which are found infrequently in South Carolina waters. These include the white shark, the shortfin mako, and the longfin mako. They are mostly pelagic, although several white sharks have been caught in nets or by anglers in shallow coastal waters. The mackerel sharks are aggressive top predators feeding on a variety of large prey, such as marlin, swordfish, dolphin, tunas, and other sharks. They are known to be dangerous to man. A few fatal attacks by white sharks on swimmers, divers, and surfers are known to occur around the world each year. The shortfin mako is especially popular among anglers because of its habit of jumping from the water when hooked. The porbeagle shark is found in the colder northern waters from New Jersey to Newfoundland. Only one doubtful record for this species has ever been reported in South Carolina. It is included in this guide only to allow anglers to differentiate it from the mako sharks.

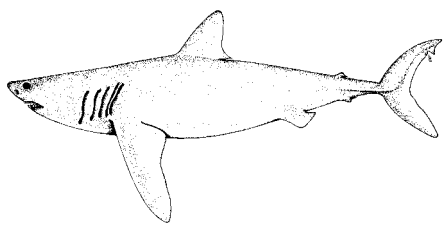
White shark, *Carcharodon carcharias* (p. 72)



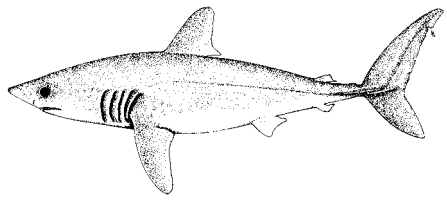
Shortfin mako, *Isurus oxyrinchus* (p. 74)



Longfin mako, *Isurus paucus* (p. 76)



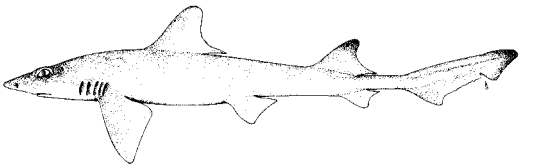
Porbeagle shark, *Lamna nasus* (p. 78)



Family Triakidae
Houndsharks

This is a group of smaller, slender-bodied sharks characterized by a narrowly rounded snout, usually small blunt teeth, the absence of spines preceding the dorsal fins, a large second dorsal fin, and a fan-like tail. Of the two species that occur along the Atlantic coast, only the smooth dogfish is common in South Carolina. The Florida dogfish may occur here but only as a stray. Like the spiny dogfish of the family Squalidae, the smooth dogfish is abundant in local coastal waters only during the winter, migrating northward in early spring each year. It often forms large schools feeding on small fish and a wide variety of crustaceans. They are harmless to man and of no interest to recreational anglers. The smooth dogfish is an excellent food fish and the target of a few local commercial markets in winter.

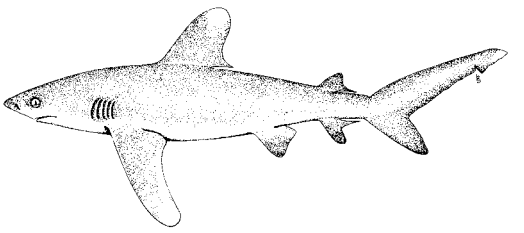
Smooth dogfish, *Mustelus canis* (p. 80)



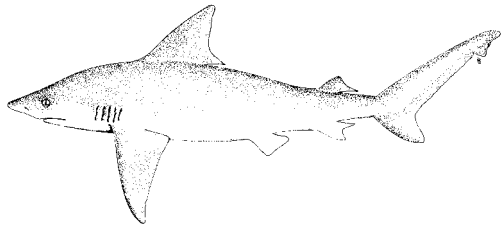
Family Carcharhinidae
Requiem Sharks

The requiem sharks or "carcharhinids" form one of the largest and probably most familiar group of sharks. They are widely distributed throughout the oceans of the world and represent some of the most common species in both the coastal and offshore waters of South Carolina. Many of these species are quite similar in appearance and therefore more difficult to identify. The group is generally characterized by a narrowly rounded to broadly rounded snout that is slightly flattened above; broad, triangular, upper teeth that are serrated; narrow lower teeth that are smooth-edged; a first dorsal fin that is located well forward of the pelvic fins; distinct precaudal pits; and a non-lunate tail. They feed on a wide variety of smaller fish, crustaceans, and squid as well as stingrays, turtles, and other sharks. Some species may be potentially dangerous to swimmers because they often occur in significant numbers along local beaches during the summer season. The larger species are generally found farther offshore, while the smaller species are more abundant in the shallow coastal waters of sounds, bays, larger rivers, and along beach fronts. If an angler catches a shark in South Carolina waters, particularly during the summer months, it is most likely one of the carcharhinids.

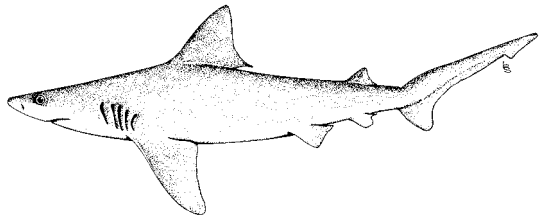
Oceanic whitetip shark,
Carcharhinus longimanus (p. 82)



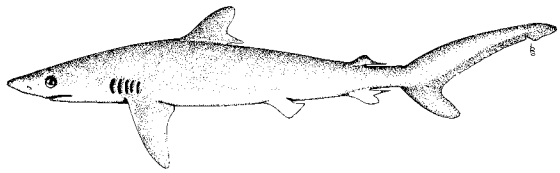
Sandbar shark, *Carcharhinus plumbeus* (p. 84)



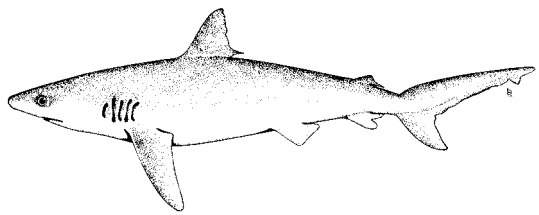
Bignose shark, *Carcharhinus altimus* (p. 86)



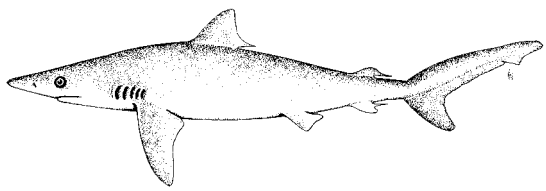
Silky shark, *Carcharhinus falciformis* (p. 88)



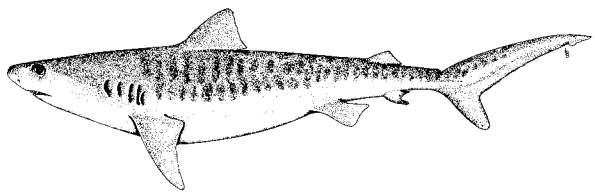
Dusky shark, *Carcharhinus obscurus* (p. 90)



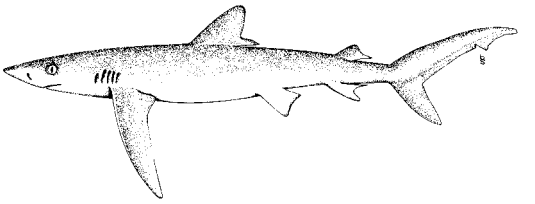
Night shark, *Carcharhinus signatus* (p. 92)



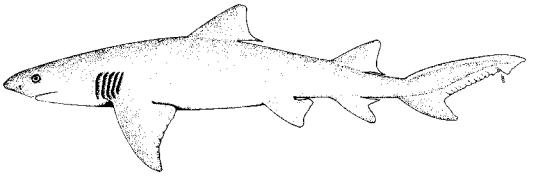
Tiger shark, *Galeocerdo cuvier* (p. 94)



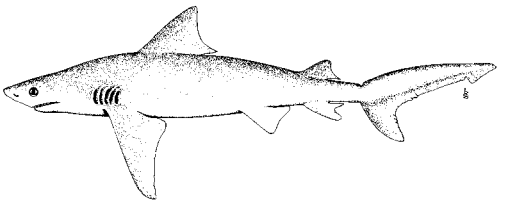
Blue shark, *Prionace glauca* (p. 96)



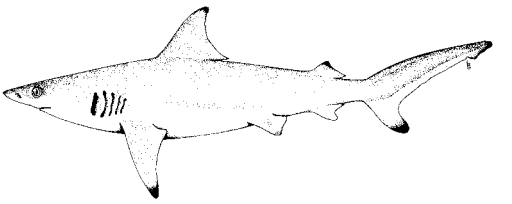
Lemon shark, *Negaprion brevirostris* (p. 98)



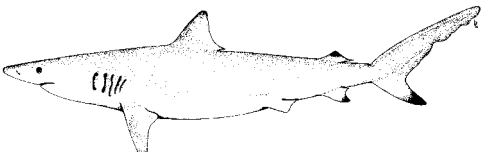
Bull shark, *Carcharhinus leucas* (p. 100)



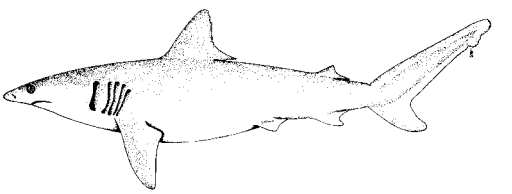
Blacktip shark, *Carcharhinus limbatus* (p. 102)



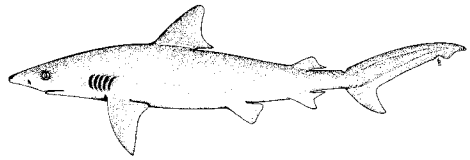
Spinner shark, *Carcharhinus brevipinna* (p. 104)



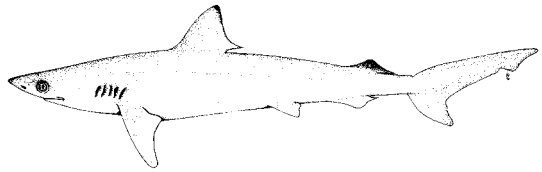
Finetooth shark, *Carcharhinus isodon* (p. 106)



Blacknose shark, *Carcharhinus acronotus* (p. 108)



Atlantic sharpnose shark,
Rhizoprionodon terraenovae (p. 110)

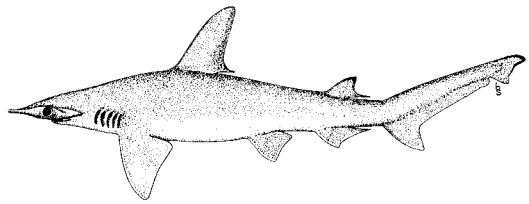


Family Sphyrnidae

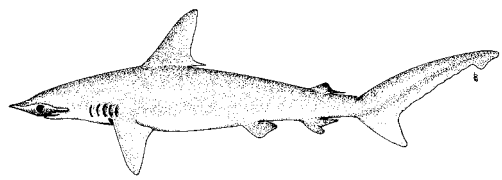
Hammerhead Sharks

The hammerhead sharks form a small and very distinct group. They have a strangely flattened and laterally expanded "shovel-shaped" or "hammer-shaped" head, which separates them from all other sharks. At least nine species are recognized around the world, four of which occur in South Carolina waters. They feed on a wide variety of crustaceans, small fish, and squid, as well as stingrays and other sharks. During migration, they are known to form large schools. Several species grow quite large and are considered dangerous to swimmers and divers. Many are caught by anglers each year. For all their alien appearance, the hammerheads are probably the most advanced of all the sharks, followed by the much larger family of requiem sharks.

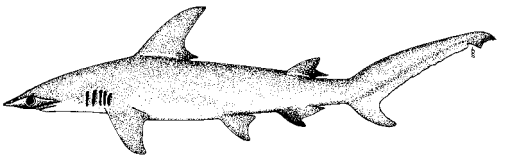
Bonnethead, *Sphyrna tiburo* (p. 114)



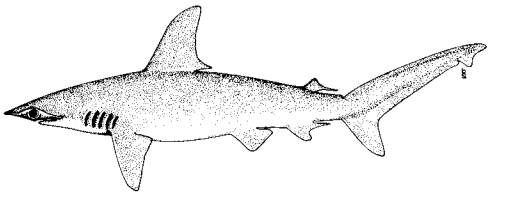
Smooth hammerhead, *Sphyrna zygaena* (p. 116)



Great hammerhead, *Sphyrna mokarran* (p. 118)



Scalloped hammerhead, *Sphyrna lewini* (p. 120)



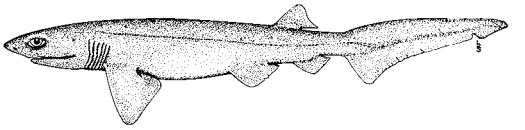
* * * * *

The following seven species of sharks, representing two additional families, are rare in South Carolina waters. They are generally small in size and restricted to deeper ocean areas far from shore, where they are not likely to be encountered. These species probably feed on squid, crustaceans, and a variety of small fish. Anglers, and especially commercial fishermen, are encouraged to freeze or preserve on ice any specimen they might incidentally catch and provide it to the SCDNR, Marine Resources Division in Charleston. Little is known about the biology and habits of these sharks, so any additional information would be of great value.

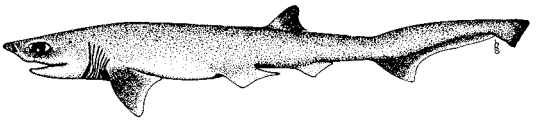
Family Hexanchidae
Cowsharks

This small group of sharks is recognized by having six or seven gill slits and a single dorsal fin set far back on the body behind the pelvic fins. Reproductive development is aplacental viviparous.

Sixgill shark, *Hexanchus griseus*



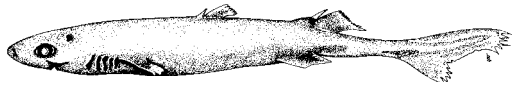
Sharpnose sevengill shark, *Heptranchias perlo*



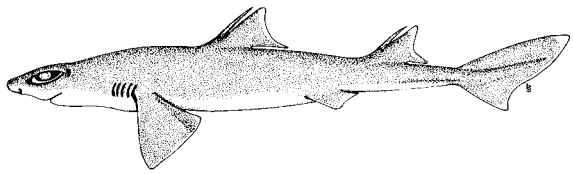
Family Squalidae
Rare Dogfish Sharks

This family is previously described on page 44.

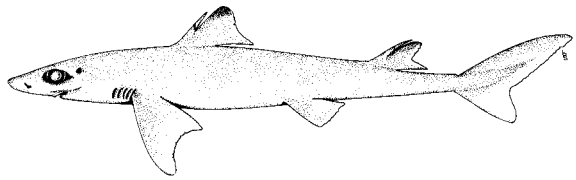
Broadband dogfish, *Etmopterus gracilispinis*



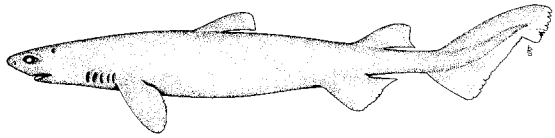
Roughskin spurdog, *Squalus asper*



Cuban dogfish, *Squalus cubensis*



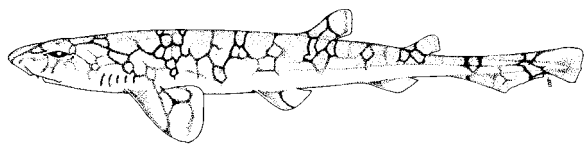
Kitefin shark, *Dalatias licha*



Family Scyliorhinidae
Catsharks

This is a family of small, bottom-dwelling sharks characterized by large oval eyes, two dorsal fins that are positioned far back on the body, and a fan-like caudal fin that is not separated into two distinct lobes. Most species are oviparous.

Chain catshark, *Scyliorhinus retifer*



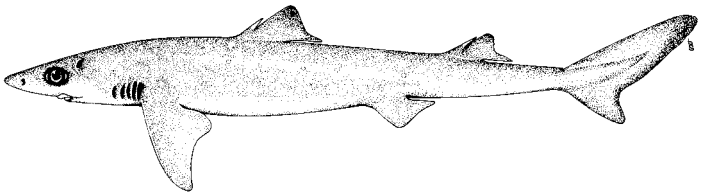
ANGLING ETHICS

- Follow all fishing and boating regulations.
- Limit the number of fish you kill.
- Carefully release the fish you don't intend to keep.
- Properly dispose of all litter.
- Respect the rights of fellow anglers by keeping a reasonable distance from other boats.
- Minimize your time at boat ramps to allow fellow boaters equal access.
- Fish on private property only when you have permission from the owner.
- Always conduct yourself in a safe and courteous manner.

DESCRIPTION OF SPECIES
BY
FAMILY

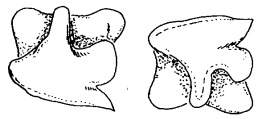
SPINY DOGFISH

Squalus acanthias



DESCRIPTION: Body very slender, greatest depth opposite origin of first dorsal fin; snout narrowly rounded; mouth small; upper labial furrows long, directed forward, lower furrows short; eyes large and oval; gill openings short, inserted low on side of neck. Both dorsals preceded by a single well-fixed spine; first dorsal relatively small, originates well behind pectoral fins; second dorsal fin slightly smaller than first, similar in shape; anal fin absent; caudal peduncle rounded above, flattened below; caudal fin not lunate.

TEETH: Both jaws have small, broad-based, smooth-edged teeth with deeply notched outer margins and cusps pointed so that tips form a continuous cutting edge.



COLOR: Slate gray to grayish-brown above and pale gray to pure white below. A row of irregularly arranged small white spots are often present on sides of body. Spots are most conspicuous in young animals, fading with growth. Spots may be altogether lacking in adults.

SIZE: Averages 2 to 3 feet and seldom exceeds 4 feet in length.

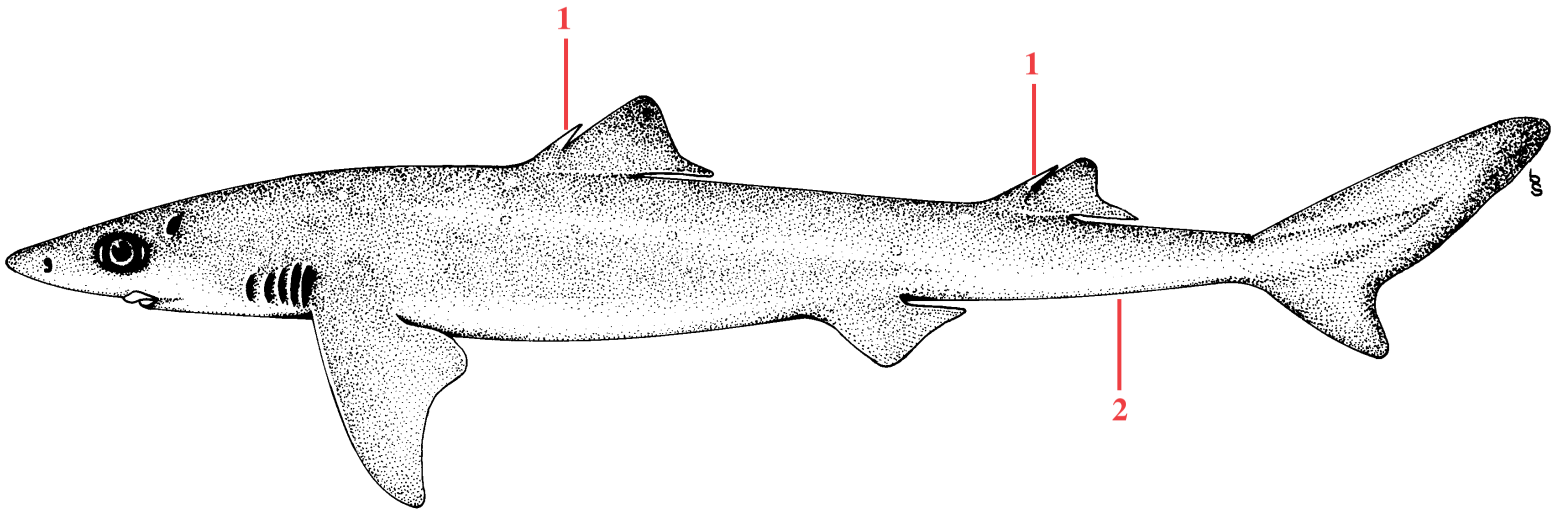
DISTINGUISHING CHARACTERISTICS: Recognized by 1) the presence of a single spine preceding each dorsal fin and 2) the absence of an anal fin. See Identification Key, page 36, number 1.

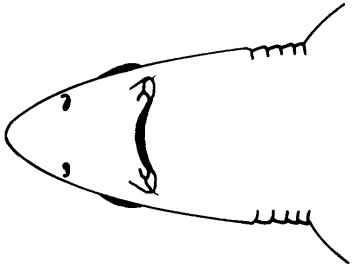
SIMILAR SPECIES: The spiny dogfish and the smooth dogfish are the only resident sharks in shallow coastal waters during the colder winter months. • The smooth dogfish (p. 80) lacks a spine preceding each dorsal fin, and the anal fin is present.

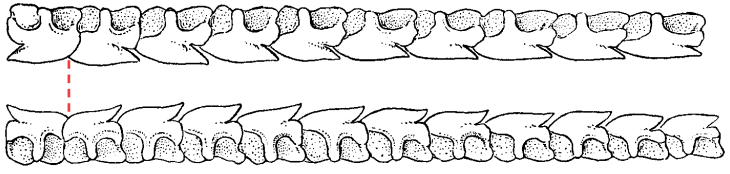
LOCAL DISTRIBUTION AND HABITS: Common in shallow coastal waters during the colder months of November through March. Lives primarily on or near the bottom, often in large concentrations of individuals of nearly the same size and age. Large numbers are often caught by shrimp trawlers late in the season. Migrates northward from South Carolina waters in the spring of the year, spending the summer months off Newfoundland and the Labrador coast. Feeds on squid, shrimp, crabs, and many small fish. Not sought after by anglers. Commercially important in other regions. Collected specimens are used extensively by high school, college, and university students studying biology and vertebrate anatomy. Reproductive development is aplacental viviparous.

Family Squalidae

SPINY DOGFISH

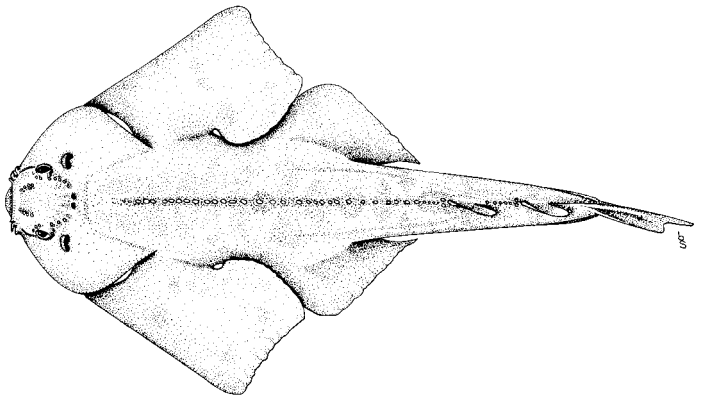






ATLANTIC ANGEL SHARK

Squatina dumeril



DESCRIPTION: Body greatly flattened; head separated from pectoral fins, flat, and broadly rounded; nostrils terminal; mouth terminal; eyes located on top of head; spiracles large, located behind the eyes; gill openings extending well under body. Pectoral and pelvic fins separated, broadly expanded, wing-like; first and second dorsal fins small, similar in shape, originate far back on tail; caudal peduncle expanded laterally; caudal fin not lunate, but fan-like.

TEETH: Both jaws have small, broad-based, erect teeth with narrow, smooth-edged cusps.

COLOR: Light gray to reddish-brown above with dark brown splotches and white below. Head and fin margins tinged with red.

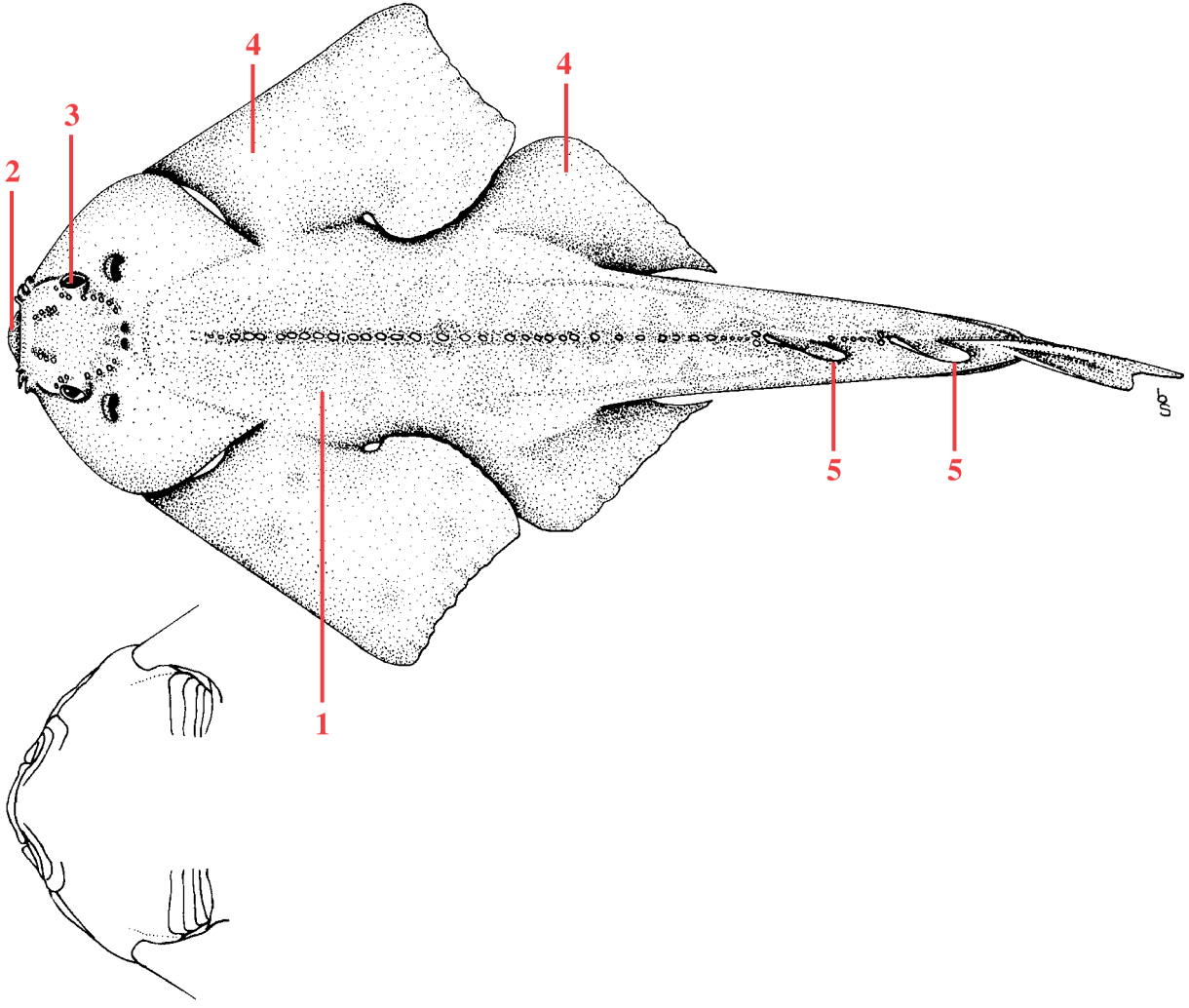
SIZE: Averages 3 to 4 feet and reaches up to 5 feet in length.

DISTINGUISHING CHARACTERISTICS: Recognized by 1) a flattened body (stingray-like), 2) a terminal mouth, 3) eyes located on top of the head, 4) head separated from pectoral fins, pectorals and pelvic fins also separated and expanded into wings, and 5) small dorsal fins that originate far back on tail. See Identification Key, page 36, number 2.

SIMILAR SPECIES: The Atlantic angel shark, also known as the sand devil, is a unique species. A dramatically flattened body and eyes located on the top of the head immediately separate this species from all other sharks. The skates and rays have pectoral fins that are connected to the head (not separated) and a more tapered, or even whip-like tail, often with venomous spines.

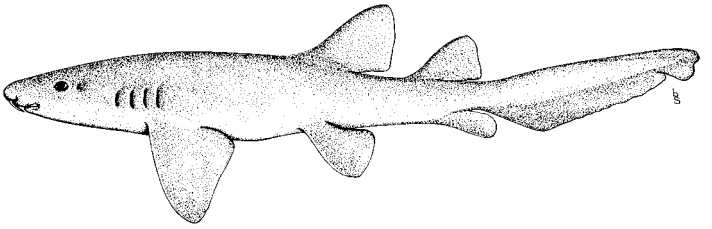
LOCAL DISTRIBUTION AND HABITS: Habits are not well known. Thought to be a shallow water, bottom-dwelling species usually found buried in the sand and mud. Feeds primarily on crustaceans and small fish. Only dangerous to man if accidentally stepped on. Few are reported by anglers each year. Protected in South Carolina and federal waters. Reproductive development is aplacental viviparous.

ATLANTIC ANGEL SHARK



NURSE SHARK

Ginglymostoma cirratum



DESCRIPTION: Body moderately stout, very broad forward, greatest depth above pectoral fins; head slightly flattened above, more so in males than in females; snout very short, broadly rounded; mouth noticeably small, positioned near tip of snout, bordered by thick fleshy labial folds on each corner; single distinct barbel on each nostril; gill openings short, set high on neck, the fourth and fifth narrowly spaced. First dorsal fin large, rounded, originates over pelvic fins; second dorsal fin slightly smaller than first, similar in shape, originates well anterior to origin of anal fin; anal fin narrow, smaller than second dorsal, apex rounded; pectoral fins large, very broad; caudal peduncle strongly compressed laterally; caudal fin broad, tapering rearward, not separated into two lobes.

TEETH: Both jaws have small, sharp-pointed teeth with central triangular cusps flanked by two to three small lateral points or denticles on each side.

COLOR: Yellowish to dark brown above and shading slightly on lower sides and belly. Young specimens may display small dark spots and cross bars on body and fins.

SIZE: Averages 4 to 8 feet in length.

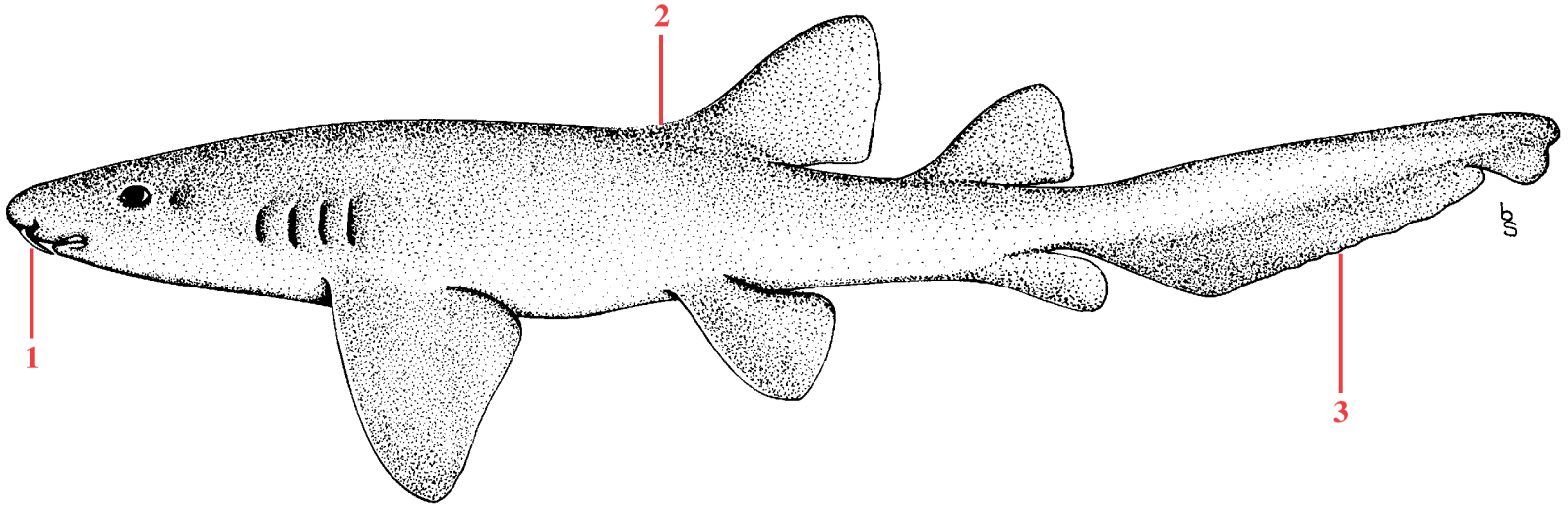
DISTINGUISHING CHARACTERISTICS: Recognized by 1) the presence of distinct nasal barbels, 2) a first dorsal fin that originates above pelvic fins, and 3) a fan-like caudal fin, not separated into two distinct lobes. See Identification Key, page 36, number 3.

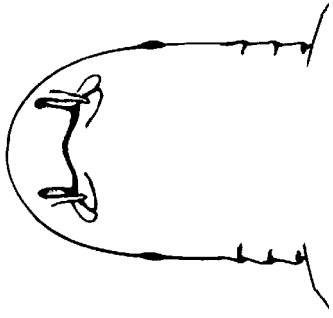
SIMILAR SPECIES: The nurse shark is a unique species. The presence of a long and tapering barbel on each nostril separates it from all other sharks.

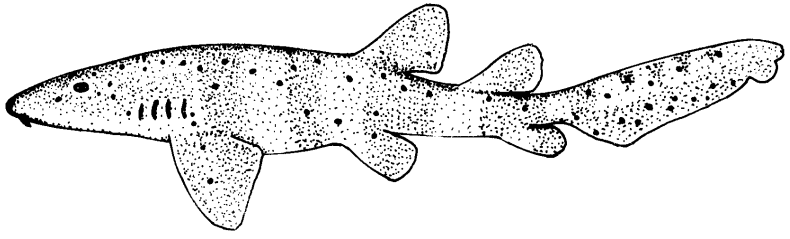
LOCAL DISTRIBUTION AND HABITS: A sluggish shark that lives primarily on or near the bottom usually in shallow coastal waters. Comes into sounds and rivers and often lies completely still on the bottom, sometimes in schools. So sluggish that it can be easily approached by divers, however, this practice is unwise and dangerous as it could provoke an attack. Much more common in southern Florida waters. Feeds on squid, crabs, shrimp, and a wide variety of small fish. Reproductive development is aplacental viviparous.

Family
Ginglymostomatidae

NURSE SHARK



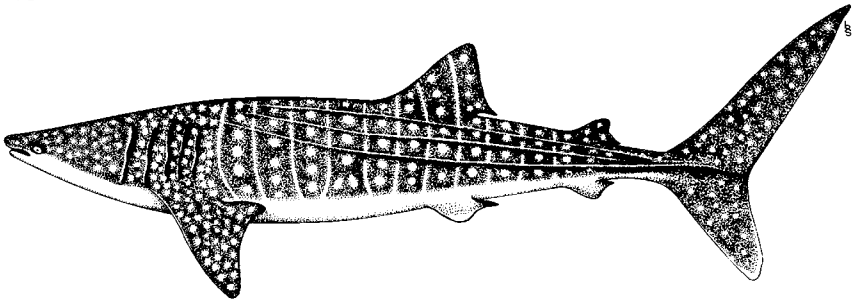




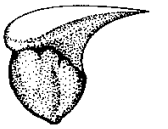
Juvenile

WHALE SHARK

Rhincodon typus



DESCRIPTION: Body very stout, usually huge, greatest depth just behind pectoral fins; three prominent ridges extend along sides of trunk; head strongly flattened above; dorsal profile above gill region steeply raised; snout very short, broadly rounded; mouth terminal, very large; upper labial furrows extremely long, lower furrows short; eyes very small relative to overall body size; gill openings noticeably large and widely separated. First dorsal fin large, triangular, originates well posterior to pectorals; second dorsal small; anal fin similar in size to second dorsal; pectorals broad; caudal peduncle with single lateral keel, an extension of the lowest ridge along trunk on each side; caudal fin noticeably large and lunate.



TEETH: Both jaws have numerous, minute teeth with single, sharp-pointed cusp curved backward.

COLOR: Dark gray to reddish-gray above with round white or yellowish spots and stripes becoming white below.

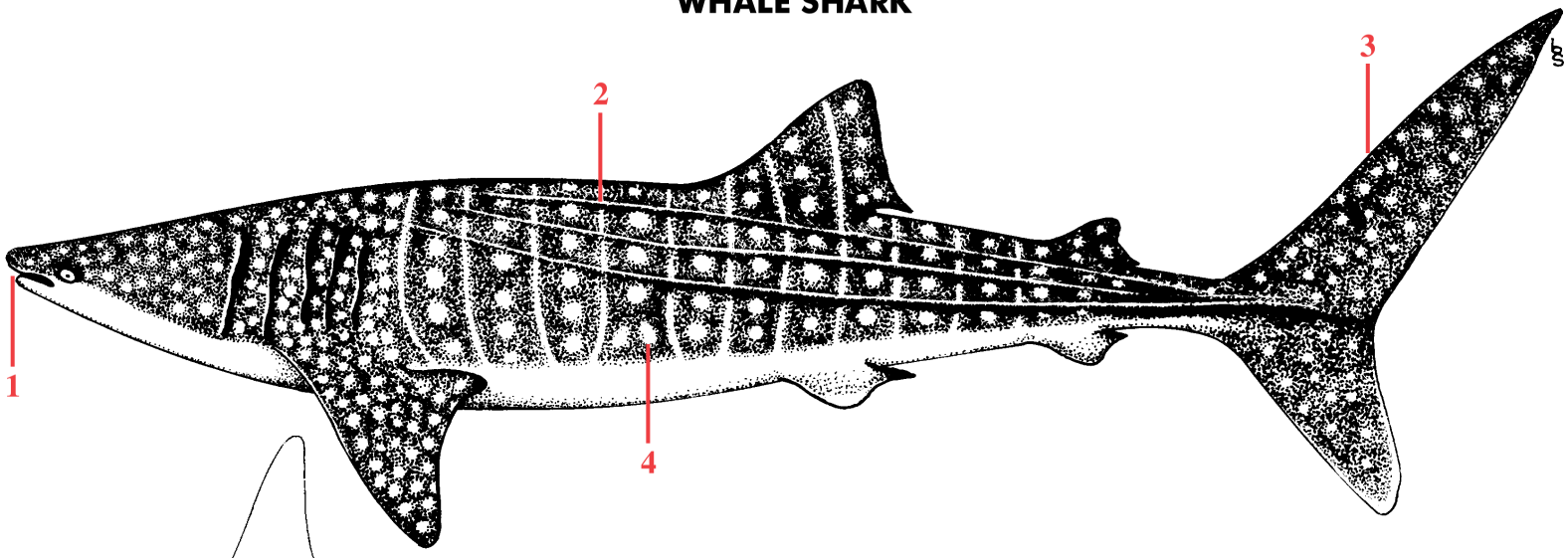
SIZE: The largest shark, reported to reach 45 feet in length. The weight of a 38-foot specimen was estimated to be 27,000 pounds.

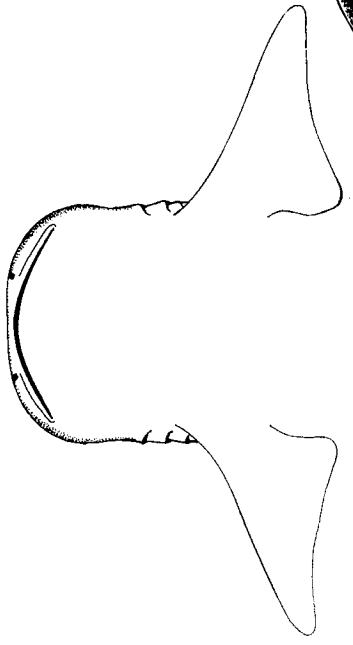
DISTINGUISHING CHARACTERISTICS: Recognized by 1) a terminal mouth, 2) prominent ridges along the trunk, 3) a noticeably large, lunate caudal fin, and 4) the presence of white or yellowish spots and stripes on body. See Identification Key, page 36, number 4.

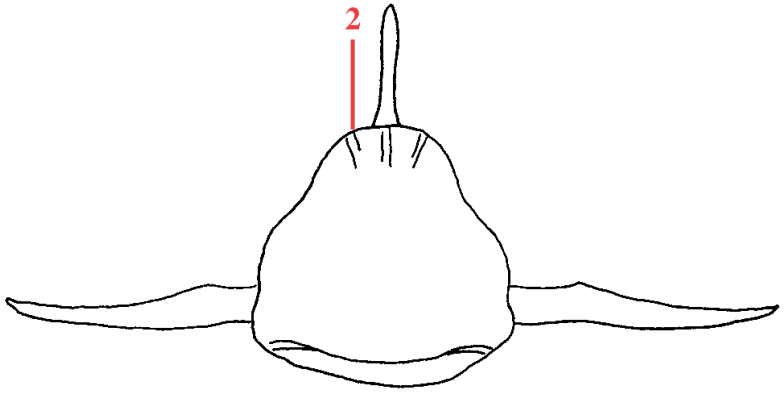
SIMILAR SPECIES: The whale shark is a unique species. The body ridges and coloration together with its usually enormous size sets this species apart from all other sharks.

LOCAL DISTRIBUTION AND HABITS: An extremely large, sluggish shark, usually found far from shore. Reported to gather in schools on the surface to feed. So slow-moving that it may be approached by boats and is occasionally rammed. Feeds by filtering small animals including squid, crustaceans, and schooling fish from the water. Harmless to man. Protected in South Carolina and federal waters. Reproductive development is aplacental viviparous, and young are probably only about two feet in length at birth.

WHALE SHARK

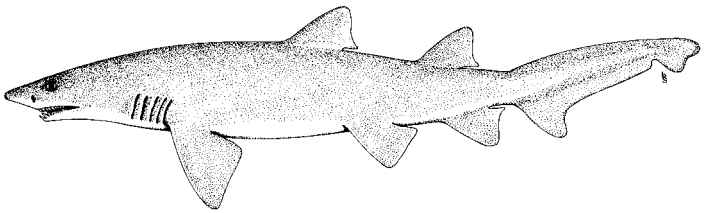






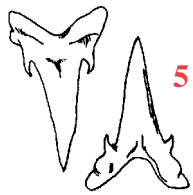
SAND TIGER SHARK

Carcharias taurus



DESCRIPTION: Body moderately stout, greatest depth above pectoral fins; snout pointed with rounded tip; mouth crescent-shaped in front; upper labial furrows short, nearly concealed when mouth is closed, lower furrows long; gill openings relatively large, all five positioned entirely in front of pectorals. Both dorsal fins large and triangular, first dorsal originates well posterior to pectorals; second dorsal only slightly smaller than first, originates noticeably anterior to origin of anal fin; anal fin broad, slightly larger than second dorsal; pectorals broad, larger than first dorsal; caudal peduncle thick, laterally compressed; caudal fin not lunate.

TEETH: A "ragged-tooth" shark. Both jaws have long, narrow, sharp-pointed, smooth-edged teeth with one or less often two small lateral points or denticles on each side of base.



COLOR: Light grayish-brown above and grayish-white below. Sides often marked with distinct yellowish-brown spots that are more prominent in juveniles.

SIZE: Averages 4 to 7 feet and reaches over 10 feet in length.

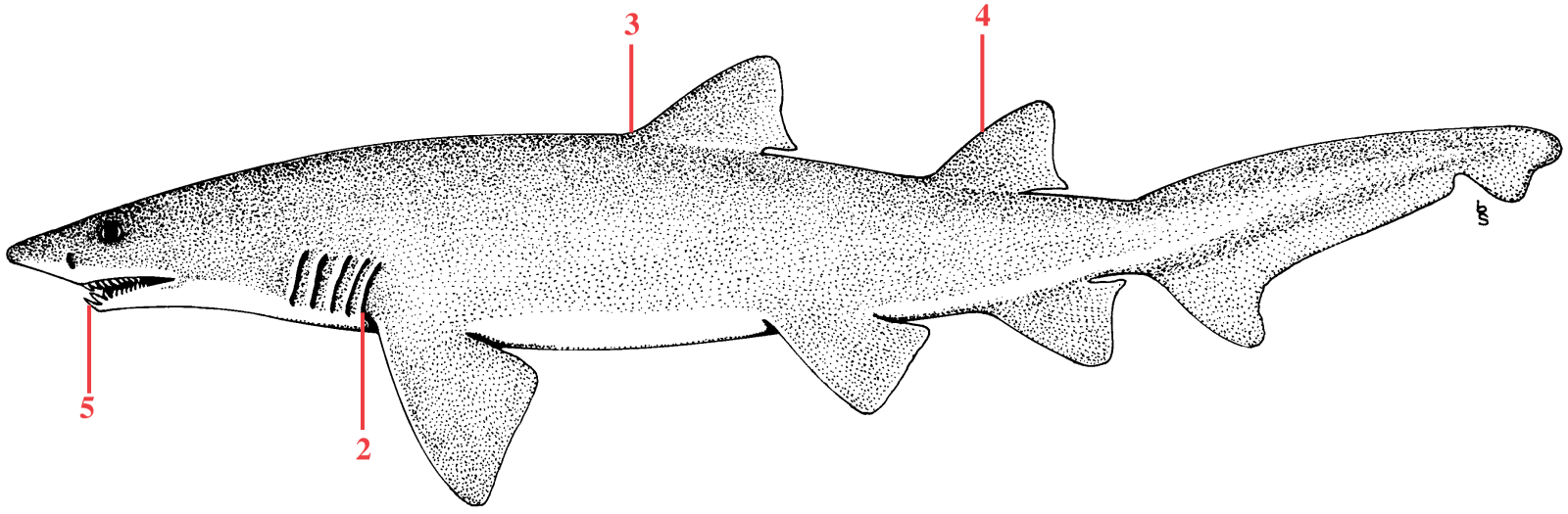
DISTINGUISHING CHARACTERISTICS: Recognized by 1) a pointed snout, 2) all five gill openings positioned in front of pectoral fins, 3) a first dorsal fin that originates far back on trunk, 4) a large second dorsal fin, only slightly smaller than first, and 5) long, narrow, sharp-pointed teeth with lateral points. See Identification Key, page 36, number 5.

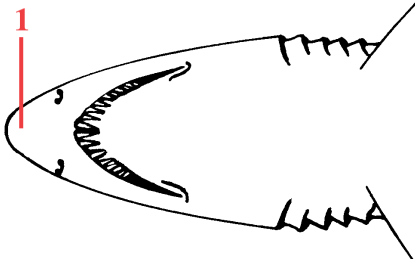
SIMILAR SPECIES: • The lemon shark (p. 98) has a broadly rounded snout, narrow teeth without lateral points, and is yellowish in color. The fourth and fifth gill openings are positioned over the pectoral fins.

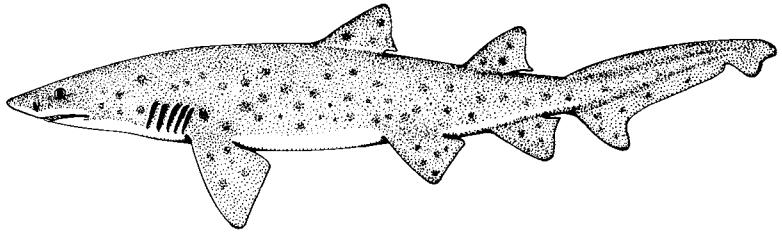
LOCAL DISTRIBUTION AND HABITS: A relatively sluggish shark most often found in shallow coastal waters but also well offshore at considerable depths. Lives primarily on or near the bottom and feeds on crustaceans, squid, and a wide variety of small fish including spot, croaker, mullet, speckled trout, black sea bass, and skates and rays. Feeds primarily at night. Has been reported to rest just off the bottom by maintaining limited buoyancy, which is achieved when the shark swallows air on the surface and holds it in its body for a period of time. Considered potentially dangerous to swimmers and divers and has been implicated in attacks in other regions of the world. Occasionally caught by South Carolina anglers each year, especially on artificial reefs. Protected in South Carolina and federal waters. Reproductive development is aplacental viviparous.

Family
Odontaspididae

SAND TIGER SHARK



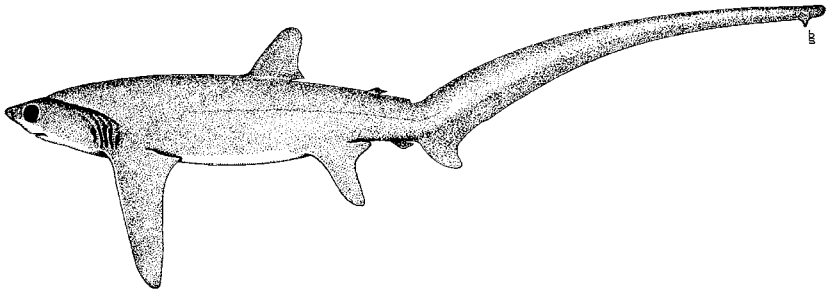




Juvenile

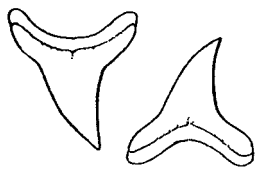
BIGEYE THRESHER

Alopias superciliosus



DESCRIPTION: Body moderately stout, greatest depth above pectoral fins; head marked with distinct groove from above the eye to the gills; snout narrowly rounded; mouth broadly rounded with two upper labial furrows, lower furrows extend around corners of mouth; eyes extremely large, upward-looking. First dorsal fin large, apex rounded, originates far back on trunk; second dorsal fin and anal fin very small, similar in size and shape; second dorsal originates well anterior to origin of anal; pectorals very long and narrow; caudal peduncle thick and strongly compressed laterally without lateral keels, upper pre-caudal pit deeply notched; caudal fin obviously not lunate but sickle-like, upper lobe greatly elongated.

TEETH: Both jaws have broad-based, slender, slightly curved teeth with smooth edges. Only 10 to 12 teeth on each side of upper and lower jaws.



COLOR: Dark brown or grayish-brown above, becoming lighter to pale cream below.

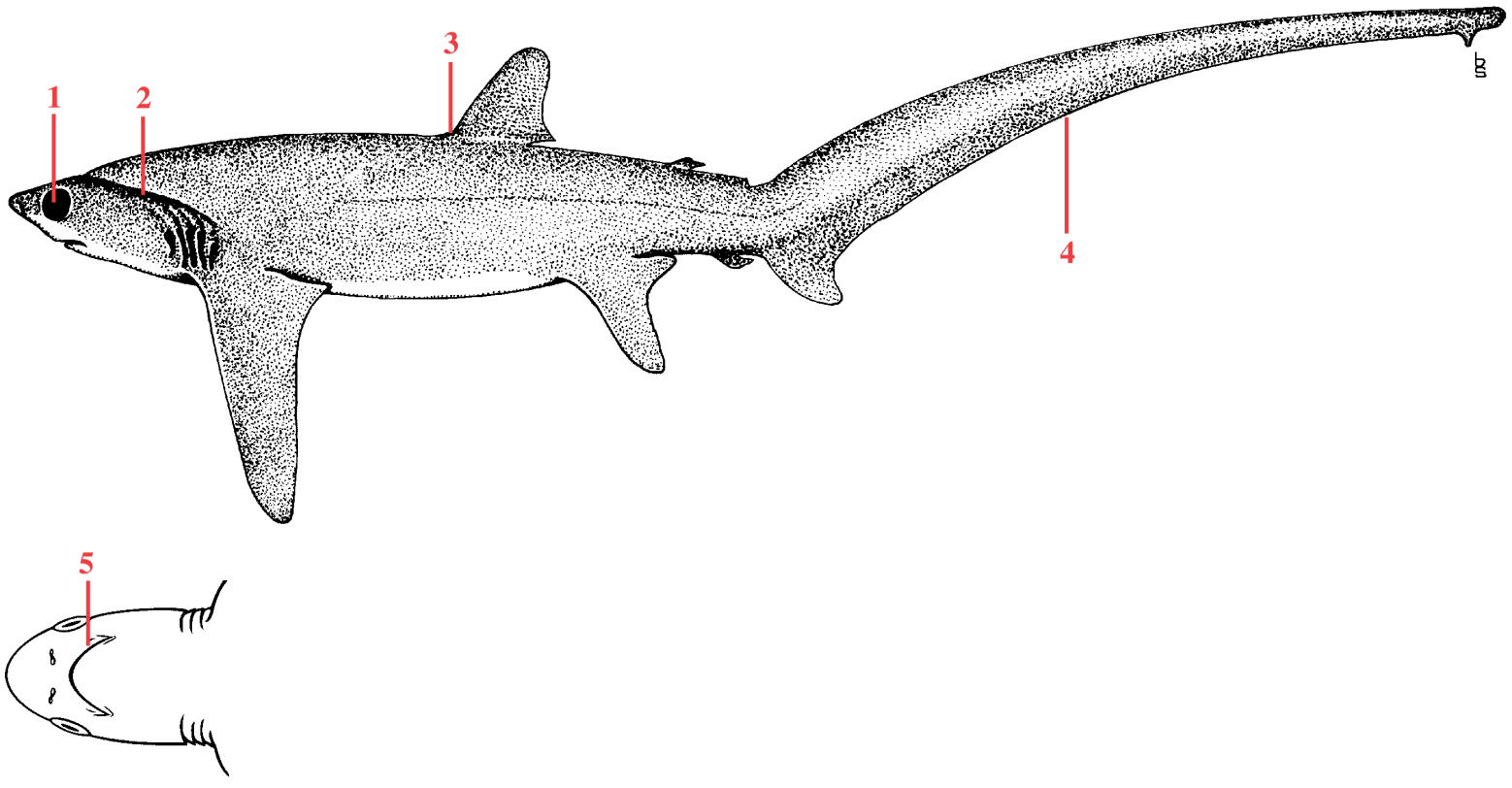
SIZE: Averages 11 to 13 feet and may reach over 18 feet in length.

DISTINGUISHING CHARACTERISTICS: Recognized by 1) extremely large, upward-looking eyes, 2) a distinct groove on each side of the head from above the eye to the gills, 3) a first dorsal fin that originates far back on trunk, 4) an extremely long caudal fin (sickle-like), and 5) only 10 to 12 teeth on each side of upper and lower jaws. See Identification Key, page 37, number 6a.

SIMILAR SPECIES: The bigeye thresher is separated from all other sharks (except the thresher shark) by its extremely long, sickle-like caudal fin. • The thresher shark (p. 68) has smaller eyes, lacks groove on head, the first dorsal fin originates only slightly behind the free rear tips of the pectoral fins, and the apex of the first dorsal fin is pointed.

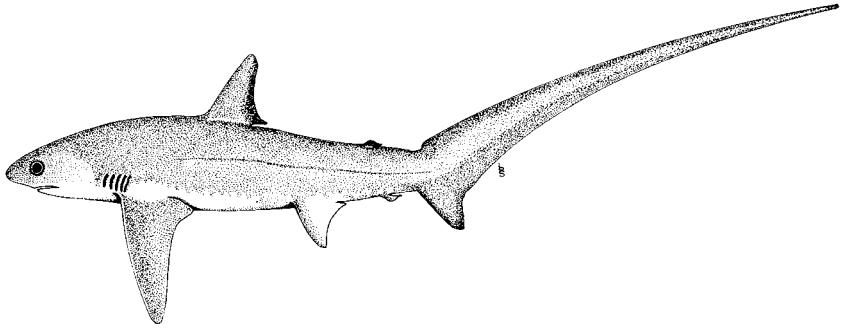
LOCAL DISTRIBUTION AND HABITS: Occurs most often in deep ocean waters but may occasionally venture close to shore. Presence of very large eyes suggests that it is primarily a deep-water shark, but it has occasionally been observed near the surface. Reportedly feeds on a variety of schooling fish, which it strikes and stuns with its thrashing tail. Very little is known about its habits and very few records of it exist in South Carolina. Poses no threat to swimmers and rarely caught by anglers. Protected in South Carolina and federal waters. Reproductive development is aplacental viviparous.

BIGEYE THRESHER



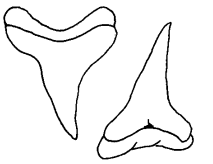
THRESHER SHARK

Alopias vulpinus



DESCRIPTION: Body moderately stout, greatest depth above pectoral fins; snout narrowly rounded; upper labial furrows long, lower furrows short; eyes moderately large, but much smaller than in the bigeye thresher. First dorsal fin large, apex pointed, originates slightly posterior to free rear tips of pectorals; second dorsal fin and anal fin very small, similar in size and shape; second dorsal originates well anterior to origin of anal; pectorals very long and narrow; caudal peduncle thick and strongly compressed laterally without lateral keels, upper pre-caudal pit deeply notched; caudal fin obviously not lunate but sickle-like, upper lobe greatly elongated.

TEETH: Both jaws have broad-based, slender, slightly curved teeth with smooth edges. There are 20 to 21 teeth on each side of upper and lower jaws.



COLOR: Brown to shades of gray or black above and white below.

SIZE: Averages 13 to 16 feet and may reach 20 feet in length.

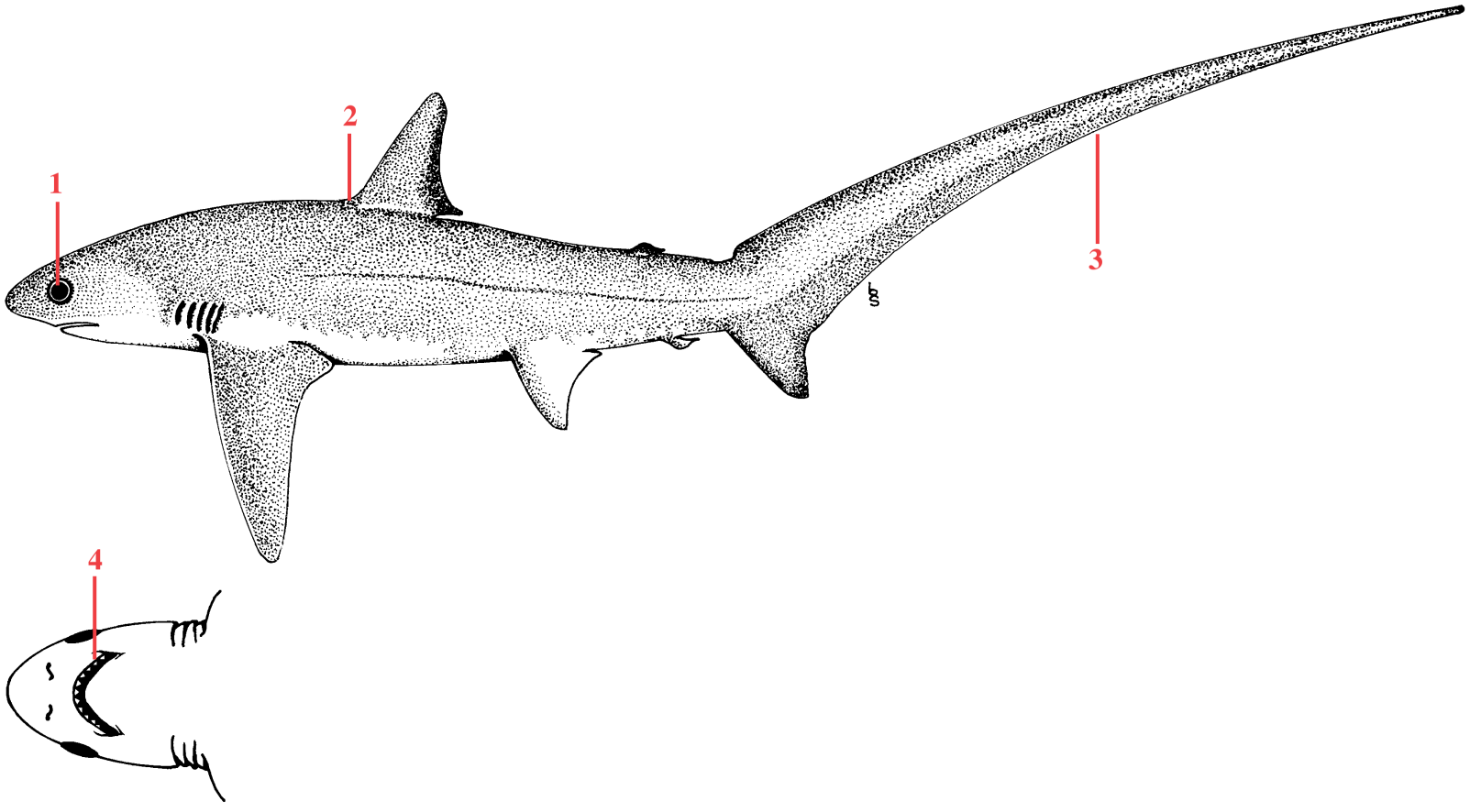
DISTINGUISHING CHARACTERISTICS: Recognized by 1) moderately large eyes, 2) a first dorsal fin that originates slightly posterior to free rear tips of pectoral fins, 3) an extremely long caudal fin (sickle-like), and 4) 20 to 21 teeth on each side of upper and lower jaws. See Identification Key, page 37, number 6b.

SIMILAR SPECIES: The thresher shark is separated from all other sharks (except the bigeye thresher) by its extremely long, sickle-like caudal fin. • The bigeye thresher (p. 66) has extremely large, upward-looking eyes, distinct grooves on the head, the first dorsal fin originates well back on the trunk, and the apex of the first dorsal fin is rounded.

LOCAL DISTRIBUTION AND HABITS: Knowledge of the habits of this elusive shark is limited. Primarily an offshore species but may enter coastal waters. Occasionally observed on the surface but also descends to great depths. Feeds primarily on schooling fish, which it strikes and stuns with its thrashing tail. Poses no threat to swimmers. Few reportedly caught by anglers in recent years. Reproductive development is aplacental viviparous.

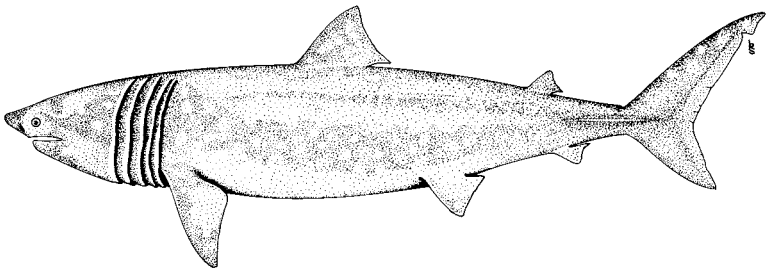
Family Alopiidae

THRESHER SHARK



BASKING SHARK

Cetorhinus maximus



DESCRIPTION: Body very stout, usually huge, greatest depth opposite origin of first dorsal fin; head slightly compressed laterally opposite mouth (more noticeable in small specimens); snout conical, very short; mouth very large; upper labial furrows absent, lower furrows very short; eyes very small relative to overall body size; gill openings extremely long, originating high up on trunk and extending well under neck. First dorsal large, triangular, originates far back from the pectoral fins; second dorsal fin and anal fin small, similar in size and shape; second dorsal originates well anterior to origin of anal; pectorals relatively small; caudal peduncle with well-developed lateral keel on each side; caudal fin lunate.

TEETH: Both upper and lower jaws have very numerous, small teeth with cusps pointing backward.

4

COLOR: Grayish-brown to slate gray or black above, lighter below. Underside of snout, mouth, and trunk often marked with white patches.

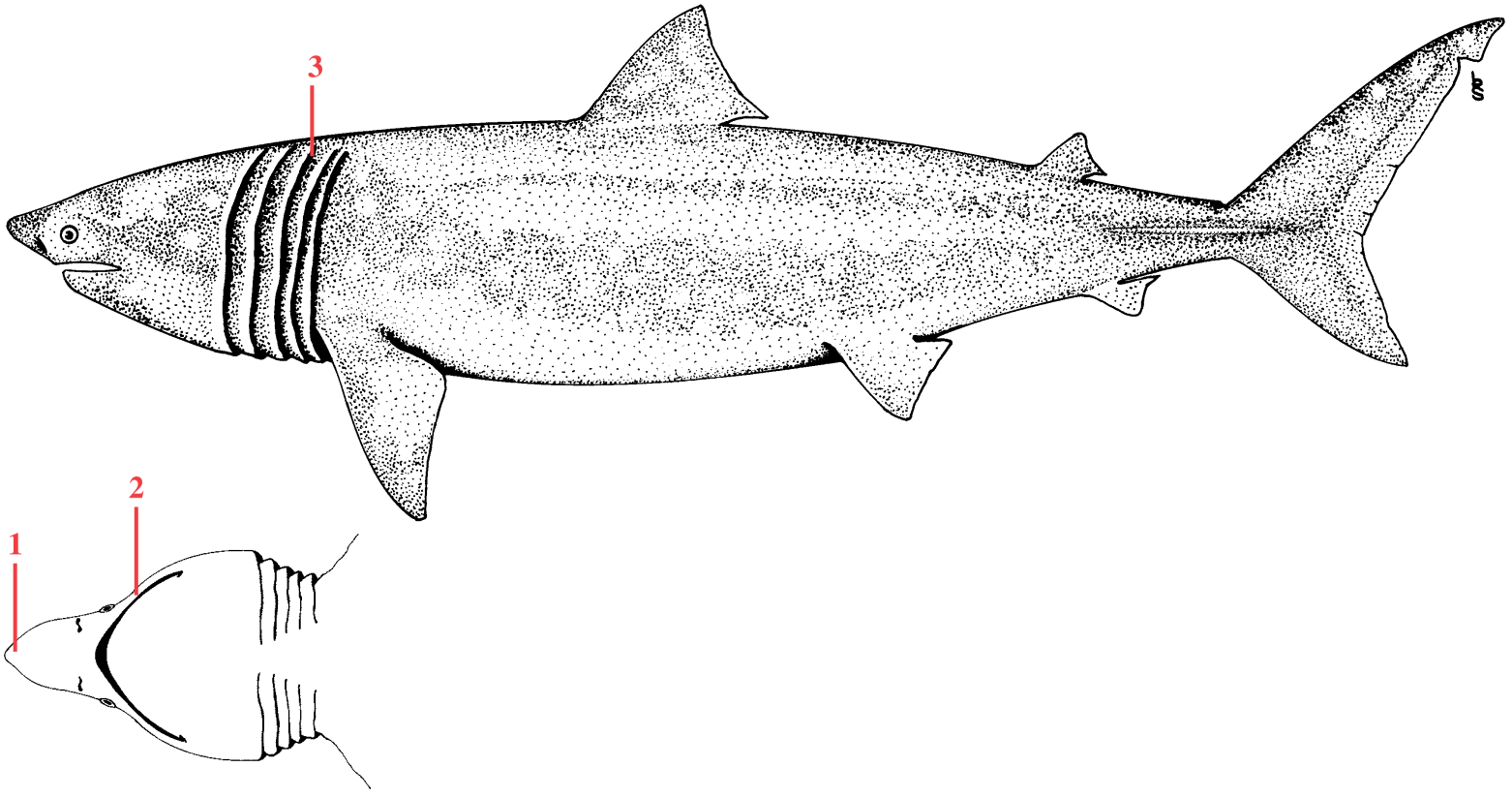
SIZE: Second in size only to the whale shark. Specimens measuring 35 feet in length are not uncommon.

DISTINGUISHING CHARACTERISTICS: Recognized by 1) a conical snout, 2) a very large mouth, 3) very long gill openings, and 4) very small teeth. See Identification Key, page 37, number 7.

SIMILAR SPECIES: The basking shark is a unique species. • However, it may be confused with the whale shark (p. 62), which has a terminal mouth, prominent ridges along both sides of the trunk, and numerous white and yellowish spots. • The white shark (p. 72) has very large triangular teeth and much smaller gill openings.

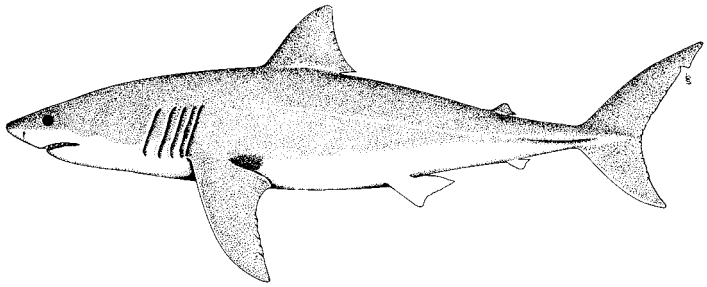
LOCAL DISTRIBUTION AND HABITS: A slow-swimming, sluggish shark usually found in offshore waters. Occasionally observed swimming on the surface "basking" in the sun. Swims with its mouth open, feeding exclusively on plankton filtered from the water by means of gill rakers. Harmless to man. Protected in South Carolina and federal waters. Reproductive development is aplacental viviparous.

BASKING SHARK



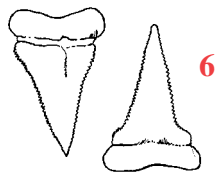
WHITE SHARK

Carcharodon carcharias



DESCRIPTION: Body stout but stream-lined, greatest depth opposite origin of first dorsal fin; head conical; snout pointed; upper and lower labial furrows very short; eyes noticeably large, circular; gill openings large. First dorsal large, triangular, originates above or slightly anterior to free rear tips of pectoral fins; second dorsal fin and anal fin very small, similar in size and shape; second dorsal originates anterior to origin of anal; pectorals large, tips pointed; caudal peduncle strongly flattened above and below, widely expanded with single, well-developed lateral keel on each side; caudal fin lunate.

TEETH: Large, broad-based, triangular teeth with strongly serrated edges. Lower teeth narrower than upper teeth.



6

COLOR: Not entirely white as name implies. Slate gray to almost black dorsally becoming dirty white on belly. Black spot may be noticeable around axil of each pectoral fin.

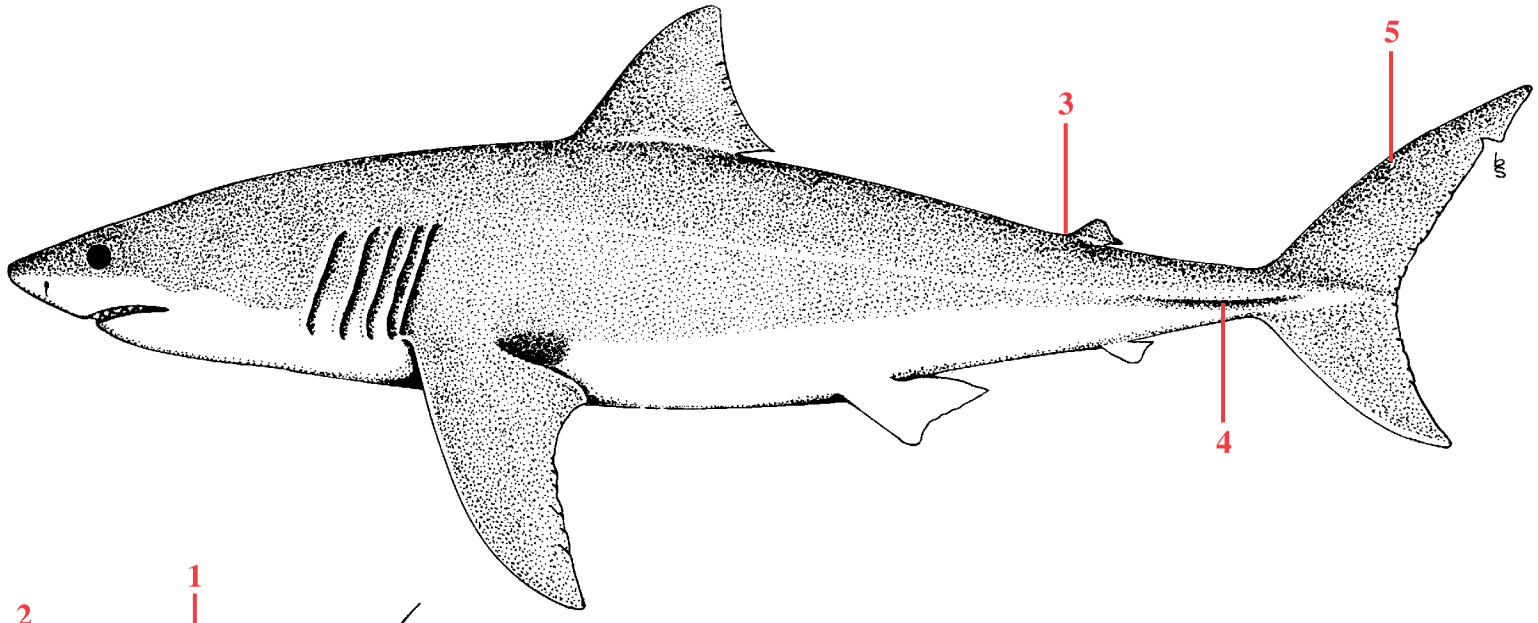
SIZE: Averages 12 to 16 feet and may reach 20 feet in length.

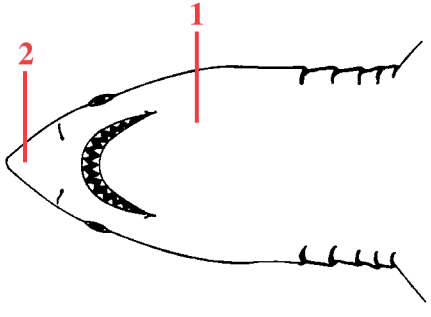
DISTINGUISHING CHARACTERISTICS: Recognized by 1) a conical head, 2) a pointed snout with blunt tip, 3) a second dorsal fin that originates anterior to origin of anal fin, 4) a single, well-developed lateral keel on each side of caudal peduncle, 5) a lunate caudal fin, and 6) large, triangular, serrated teeth. See Identification Key, page 37, number 8a.

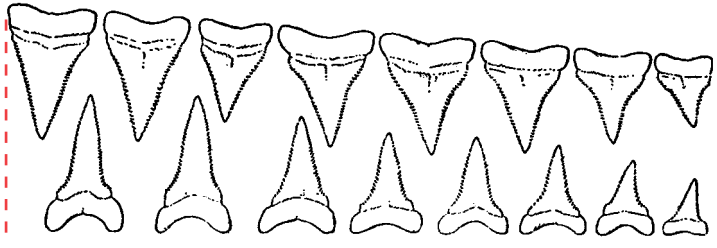
SIMILAR SPECIES: • The shortfin mako (p. 74) and longfin mako (p. 76) have long, slender, smooth-edged teeth. • The porbeagle shark (p. 78) has long, slender, smooth-edged teeth with lateral points and a secondary keel on each side of the caudal fin.

LOCAL DISTRIBUTION AND HABITS: A solitary and powerful shark found most often in cooler waters but nowhere in abundance. Unquestionably very dangerous to man. Due to its scarcity in our area, a local encounter is not likely. Known to attack and kill swimmers, surfers, and abalone divers in shallow waters in other regions. A top predator that feeds primarily on seals, sea turtles, tuna, marlin, and other sharks. It is well-documented that large white sharks off South Africa, the Farallon Islands near San Francisco, and elsewhere propel themselves completely clear of the surface of the water when attacking seals from below, attributing to the phrase “flying white sharks.” Long been considered a prized game fish by anglers to the point that its numbers have been greatly reduced throughout the world. Protected in South Carolina and federal waters. Reproductive development is aplacental viviparous.

WHITE SHARK

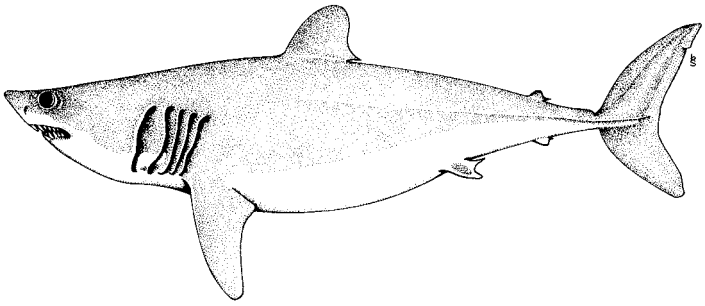






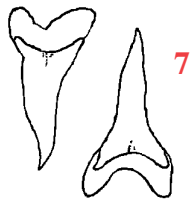
SHORTFIN MAKO

Isurus oxyrinchus



DESCRIPTION: Body stout but stream-lined, greatest depth opposite origin of first dorsal fin; head conical; snout very pointed; mouth noticeably long, broadly rounded in front; upper labial furrows long, lower furrows short and concealed when mouth is closed; eyes noticeably large, circular; gill openings noticeably large. First dorsal short, apex broadly rounded, originates slightly posterior to free rear tips of pectoral fins; second dorsal fin and anal fin very small, similar in size and shape; second dorsal originates anterior to origin of anal; pectorals large, tips narrowly rounded; caudal peduncle strongly flattened above and below, widely expanded with single, well-developed lateral keel on each side; caudal fin lunate.

TEETH: Both jaws have long, slender, inward-curving teeth with smooth edges but without lateral points on the sides of cusps.



7

COLOR: Deep blue to bluish above and snowy white below. Underside of snout and mouth is white. Colors fade rapidly after death.

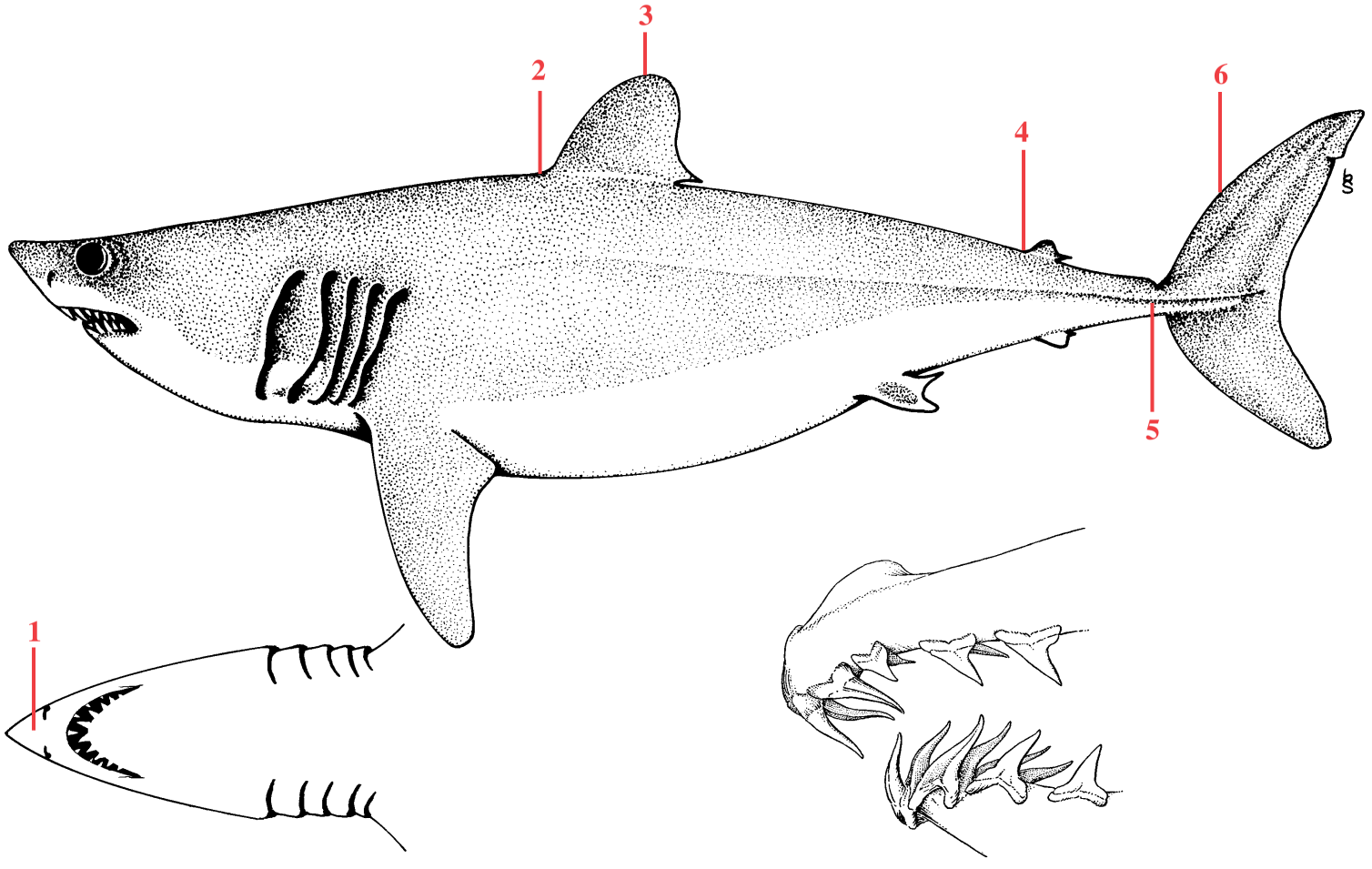
SIZE: Averages 5 to 8 feet and may reach over 12 feet in length.

DISTINGUISHING CHARACTERISTICS: Recognized by 1) a very pointed snout, 2) a first dorsal fin that originates slightly posterior to the free rear tips of the pectoral fins, 3) apex of first dorsal fin broadly rounded in smaller animals, 4) a second dorsal fin that originates anterior to origin of anal fin, 5) a single, well-developed lateral keel on each side of caudal peduncle, 6) a lunate caudal fin, and 7) long, slender, smooth-edged teeth without lateral points on sides of cusps. See Identification Key, page 38, number 8b.

SIMILAR SPECIES: • The white shark (p. 72) has broad, triangular teeth with serrated edges. • The longfin mako (p. 76) has noticeably long pectoral fins, which are as long as the measurement from the tip of the snout to above the gills. The apex of the first dorsal fin is pointed, and the underside of the snout and mouth is dark to dusky in color. • The porbeagle shark (p. 78) has long, slender, smooth-edged teeth with lateral points and a secondary keel on each side of the caudal fin.

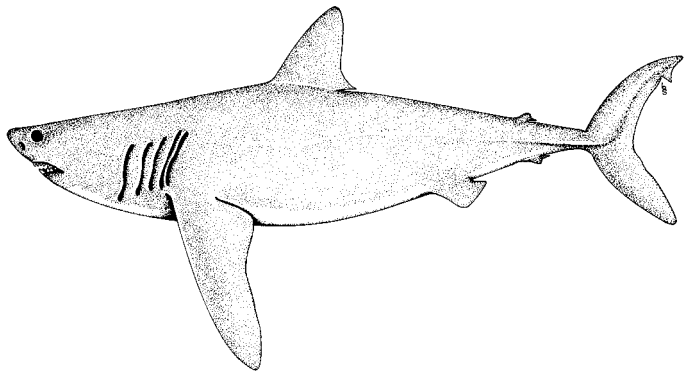
LOCAL DISTRIBUTION AND HABITS: An extremely active and fast-swimming pelagic shark restricted to waters well offshore. Covers great distances in pursuit of prey. Noted for its acrobatics of twisting and jumping from the water. One of the more dangerous species of sharks, however, due to its infrequent occurrence close to shore, the probability of attack on local swimmers is remote. A top predator that feeds on squid, mackerel, tuna, dolphin, marlin, and other sharks. Smaller animals (of legal size) are excellent to eat when properly prepared. A prized game fish often taken on trolling baits. Reproductive development is aplacental viviparous.

SHORTFIN MAKO



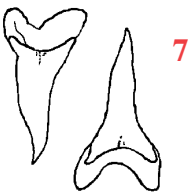
LONGFIN MAKO

Isurus paucus



DESCRIPTION: Body stout but stream-lined, greatest depth opposite origin of first dorsal fin; head conical; snout very pointed; mouth noticeably long, broadly rounded in front; upper labial furrows long, lower furrows short and concealed when mouth is closed; eyes noticeably large, circular; gill openings noticeably large. First dorsal large, triangular, apex almost pointed, originates over the free rear tips of pectoral fins; second dorsal fin and anal fin very small, similar in size and shape; second dorsal originates anterior to origin of anal; pectorals large, noticeably long, about as long as the measurement from the tip of the snout to above the fifth gill opening, tips almost pointed; caudal peduncle strongly flattened above and below, widely expanded with single, well-developed lateral keel on each side; caudal fin lunate.

TEETH: Both upper and lower jaws have long, slender, inward curving teeth with smooth edges but without lateral points on the sides of cusps.



7

COLOR: Dark blue to bluish above, bluish-gray on sides and dusky below. Underside of snout and mouth area is dark to dusky.

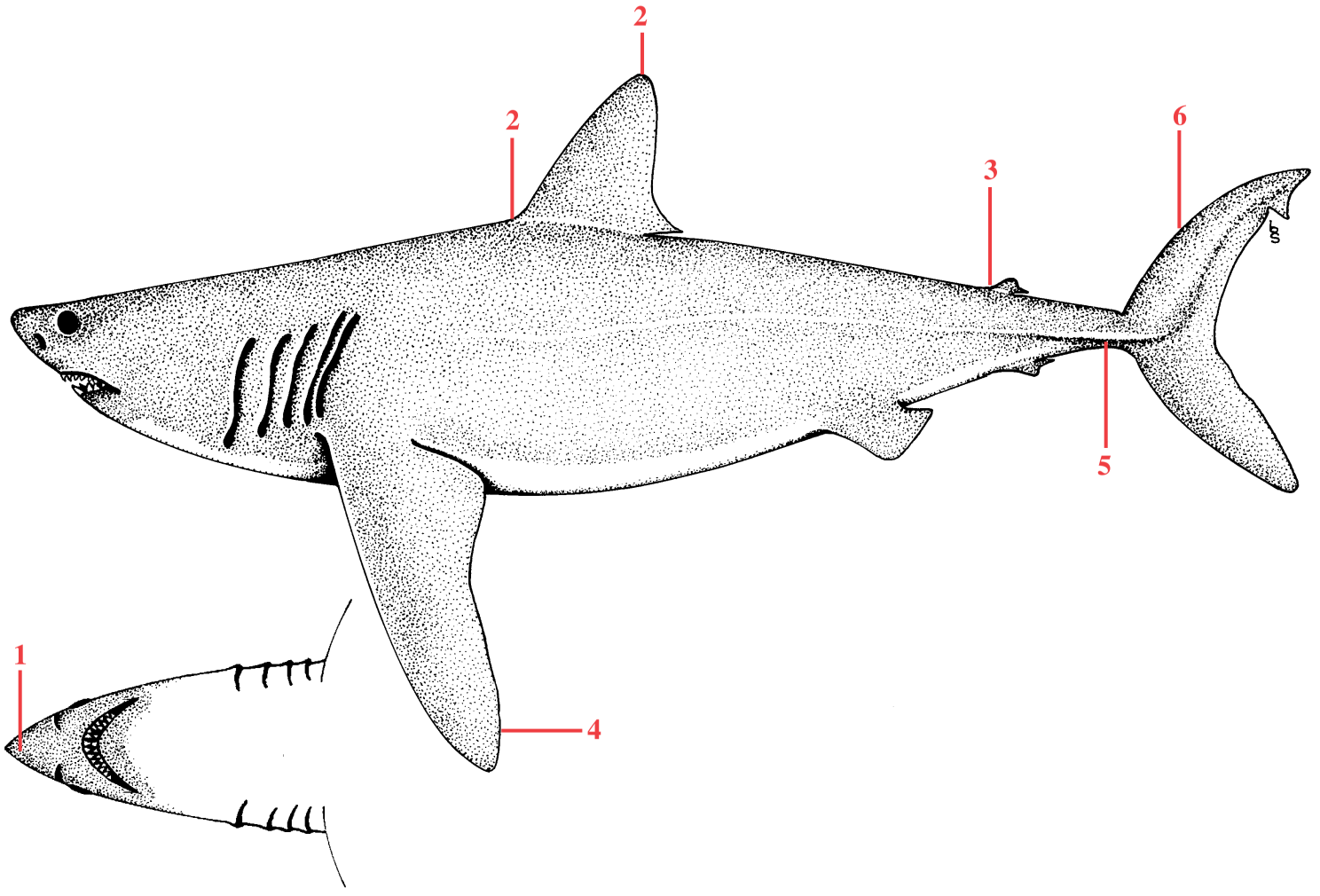
SIZE: Not well known but thought to average 5 to 8 feet and may reach 14 feet in length.

DISTINGUISHING CHARACTERISTICS: Recognized by 1) a very pointed snout, 2) a first dorsal fin that originates over free rear tips of pectoral fins, its apex pointed, 3) a second dorsal fin that originates anterior to origin of anal fin, 4) noticeably long pectoral fins, about as long as the measurement from the tip of the snout to above the fifth gill opening, 5) a single, well-developed lateral keel on each side of caudal peduncle, 6) a lunate caudal fin, and 7) long, slender teeth without lateral points on sides of cusps. See Identification Key, page 38, number 8c.

SIMILAR SPECIES: • The white shark (p. 72) has broad, triangular teeth with serrated edges. • The shortfin mako (p. 74) has much shorter pectoral fins, and the apex of the first dorsal fin is noticeably rounded. The underside of the mouth is not dusky but white in color. • The porbeagle shark (p. 78) has long, slender, smooth-edged teeth with lateral points and a secondary keel on each side of the caudal fin.

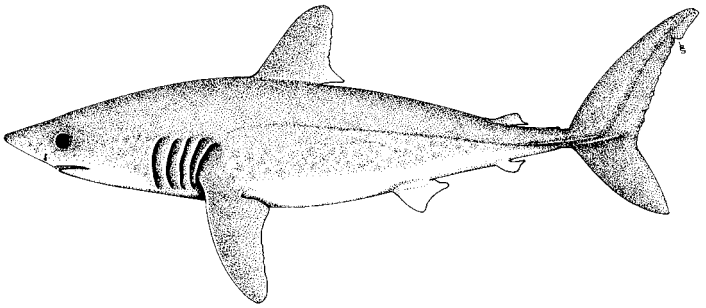
LOCAL DISTRIBUTION AND HABITS: A pelagic shark restricted to waters well offshore. Probably occurs both near the surface and at great depths. Feeds on squid and schooling fish like mackerel and tuna. Little else is known about the longfin mako as it was not discovered until 1966. No records of it exist from South Carolina waters, but it probably occurs here as a stray. Reportedly more common in Florida waters. Protected in South Carolina and federal waters. Reproductive development is aplacental viviparous.

LONGFIN MAKO



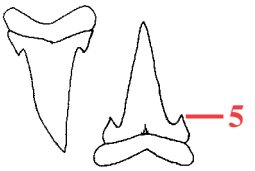
PORBEAGLE SHARK

Lamna nasus



DESCRIPTION: Body stout but stream-lined, greatest depth opposite origin of first dorsal fin; head conical; snout very pointed; upper and lower labial furrows short, nearly equal in length, furrows almost concealed when mouth is closed; eyes noticeably large, circular; gill openings noticeably large. First dorsal large, apex rounded, originates over or slightly posterior to axil of each pectoral fin; second dorsal fin and anal fin small, similar in size and shape with equal origins; pectorals large, tips rounded; caudal peduncle strongly flattened above and below and widely expanded with well-developed primary lateral keel on each side; caudal fin lunate, secondary keel present on each side.

TEETH: Both jaws have long, slender, smooth-edged teeth with single lateral points on the sides of cusps.



COLOR: Dark bluish-gray above becoming white on lower parts.

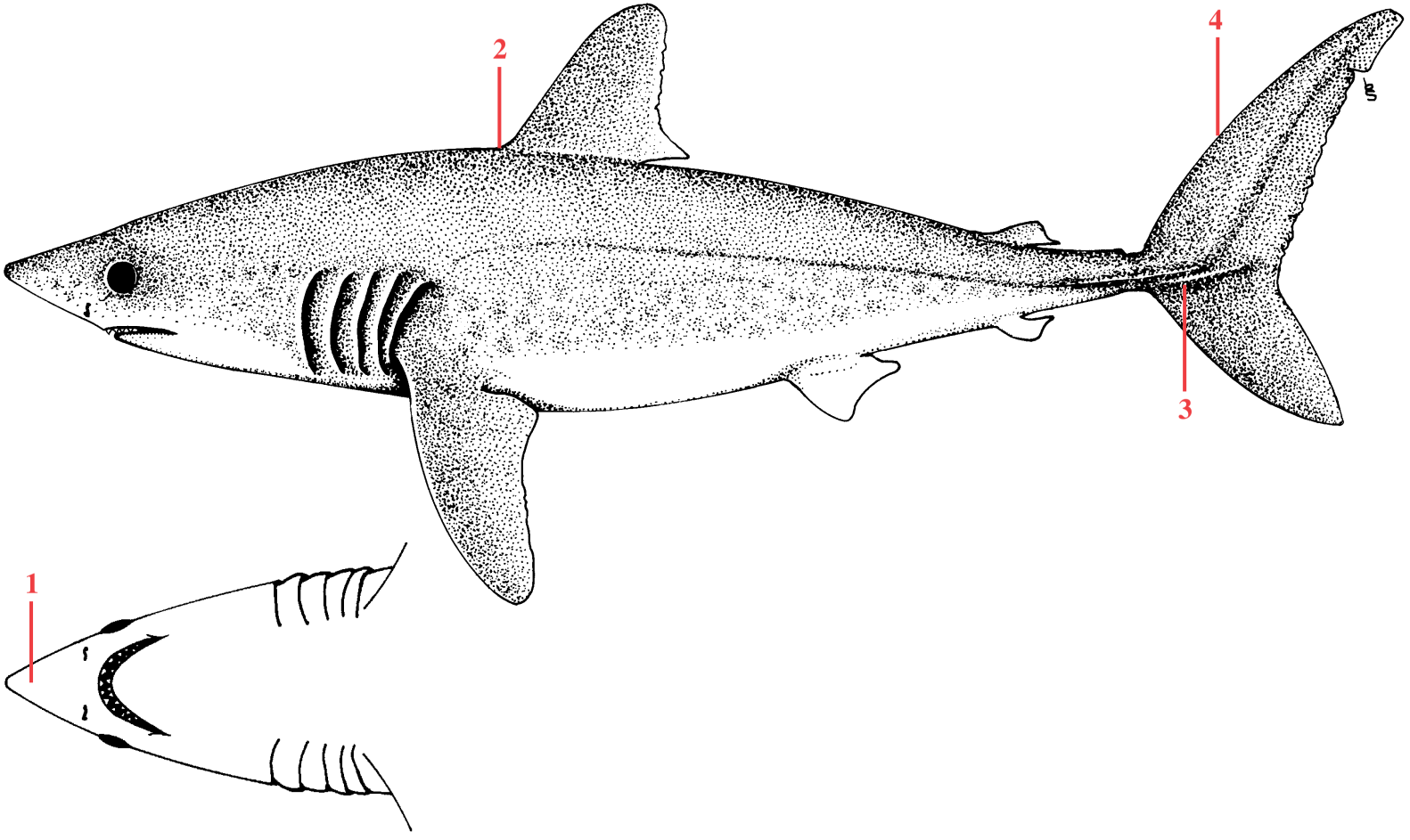
SIZE: Averages 6 to 8 feet and may reach 12 feet in length.

DISTINGUISHING CHARACTERISTICS: Recognized by 1) a very pointed snout, 2) a first dorsal fin that originates over or slightly posterior to axil of each pectoral fin, 3) a secondary lateral keel on each side of caudal fin, 4) a lunate caudal fin, and 5) long, slender teeth with a single lateral point on each side of cusps. See Identification Key, page 38, number 8d.

SIMILAR SPECIES: • The white shark (p. 72) has broad, triangular teeth with serrated edges and a single keel on each side of the caudal peduncle. • The shortfin mako (p. 74) and the longfin mako (p. 76) have long, slender, smooth-edged teeth without lateral points and a single keel on each side of the caudal peduncle.

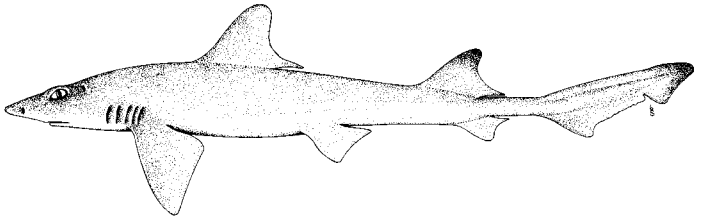
LOCAL DISTRIBUTION AND HABITS: An active and fast-swimming pelagic shark found in waters over the continental shelf. Common far northward in cooler waters from New Jersey to Newfoundland. Swims on the surface and at considerable depths. Feeds on squid and a wide variety of fish including mackerel, flounder, and cod. Very unlikely to be taken by anglers off South Carolina as no reliable record has been reported. Included in this guide to allow anglers to differentiate it from the mako sharks. Reproductive development is aplacental viviparous.

PORBEAGLE SHARK



SMOOTH DOGFISH

Mustelus canis



DESCRIPTION: Body very slender, greatest depth opposite origin of first dorsal fin; a low but distinct dorsal ridge extending from above the gills nearly to the upper caudal lobe; snout narrowly rounded; mouth small; upper labial furrows usually longer than lower furrows but both may be nearly equal; eyes oval; gill openings short. Both dorsal fins large without spines, similar in shape with concave rear margins; first dorsal originates over or slightly anterior to free rear tips of pectoral fins; second dorsal only a little smaller than first dorsal, originates well anterior to origin of anal fin; anal much smaller than second dorsal; pectorals broad, slightly larger than first dorsal; caudal peduncle nearly rounded; caudal fin not lunate but fan-like.

TEETH: Both jaws have small, flattened teeth with low, blunt cusps which are adapted for crushing prey.

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COLOR: Olive gray to grayish-brown above becoming yellowish or grayish-white below. May temporarily take on a paler color by expanding and contracting pigment cells of the skin.

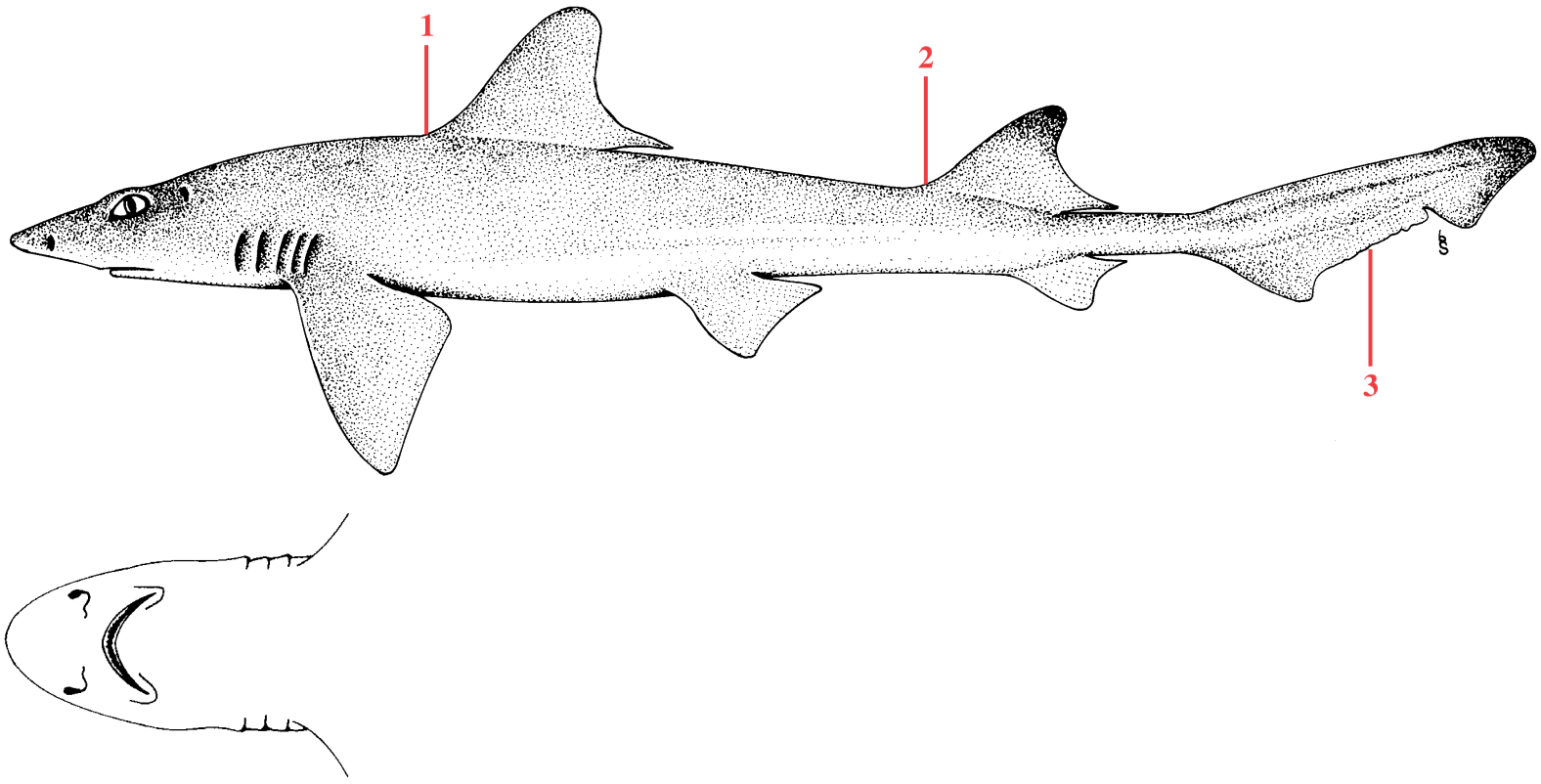
SIZE: Averages 2 to 3 feet and rarely exceeds 5 feet in length.

DISTINGUISHING CHARACTERISTICS: Recognized by 1) a first dorsal fin that originates over free rear tips of pectoral fins, 2) a large second dorsal fin that originates well forward of the much smaller anal fin, 3) a non-lunate caudal fin (fan-like), and 4) very flat, blunt teeth. See Identification Key, page 38, number 9.

SIMILAR SPECIES: The smooth dogfish and the spiny dogfish are the only resident sharks in shallow coastal waters during the cold winter months. • The spiny dogfish (p. 56) has a spine preceding each dorsal fin and lacks an anal fin.

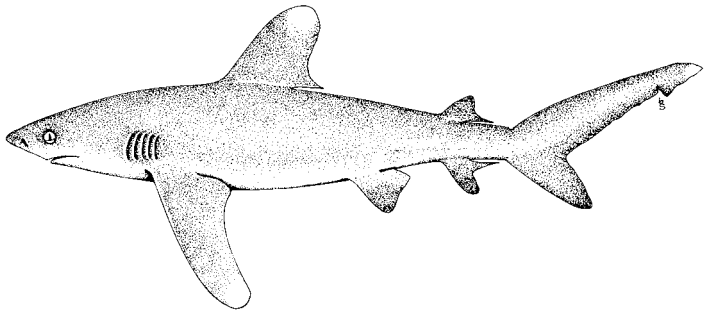
LOCAL DISTRIBUTION AND HABITS: Also known as the dusky smoothhound. A bottom-dwelling species common in shallow coastal waters during the months of November through March. Large numbers are often caught by shrimp trawlers late in the season. Migrates northward from South Carolina in the spring, appearing off Massachusetts and Delaware Bay in June and July. Feeds primarily on squid, shrimp, crabs, and small fish. Not sought after by anglers. Limited commercial importance locally but more so in other regions. Reproductive development is placental viviparous.

SMOOTH DOGFISH



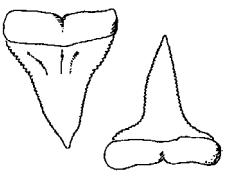
OCEANIC WHITETIP SHARK

Carcharhinus longimanus



DESCRIPTION: Body moderately stout, greatest depth opposite origin of first dorsal fin; weak interdorsal ridge present; snout short, shorter than width of mouth and broadly rounded; upper labial furrows very short, lower furrows absent. First dorsal noticeably large and broad, apex very distinctly rounded, originates slightly anterior to free rear tips of pectoral fins; second dorsal fin small, originates above origin of anal fin; anal similar to second dorsal but slightly larger, its rear margin more deeply concave, its free rear tip extending nearly to origin of lower caudal lobe; pectorals long and narrow, as long as the measurement from the tip of the snout to the fifth gill opening, with rounded tips; caudal peduncle more or less rounded; caudal fin not lunate.

TEETH: Both jaws have erect, triangular teeth with wide bases. Upper teeth broadly triangular with serrated edges. Lower teeth with more slender, finely serrated cusps becoming smooth-edged near base.



COLOR: Olive gray to grayish-brown above fading to yellowish or dingy white below. Dorsal fins, pectoral fins, and upper and lower lobes of the caudal fin are tipped with white in animals longer than about four feet, hence its name.

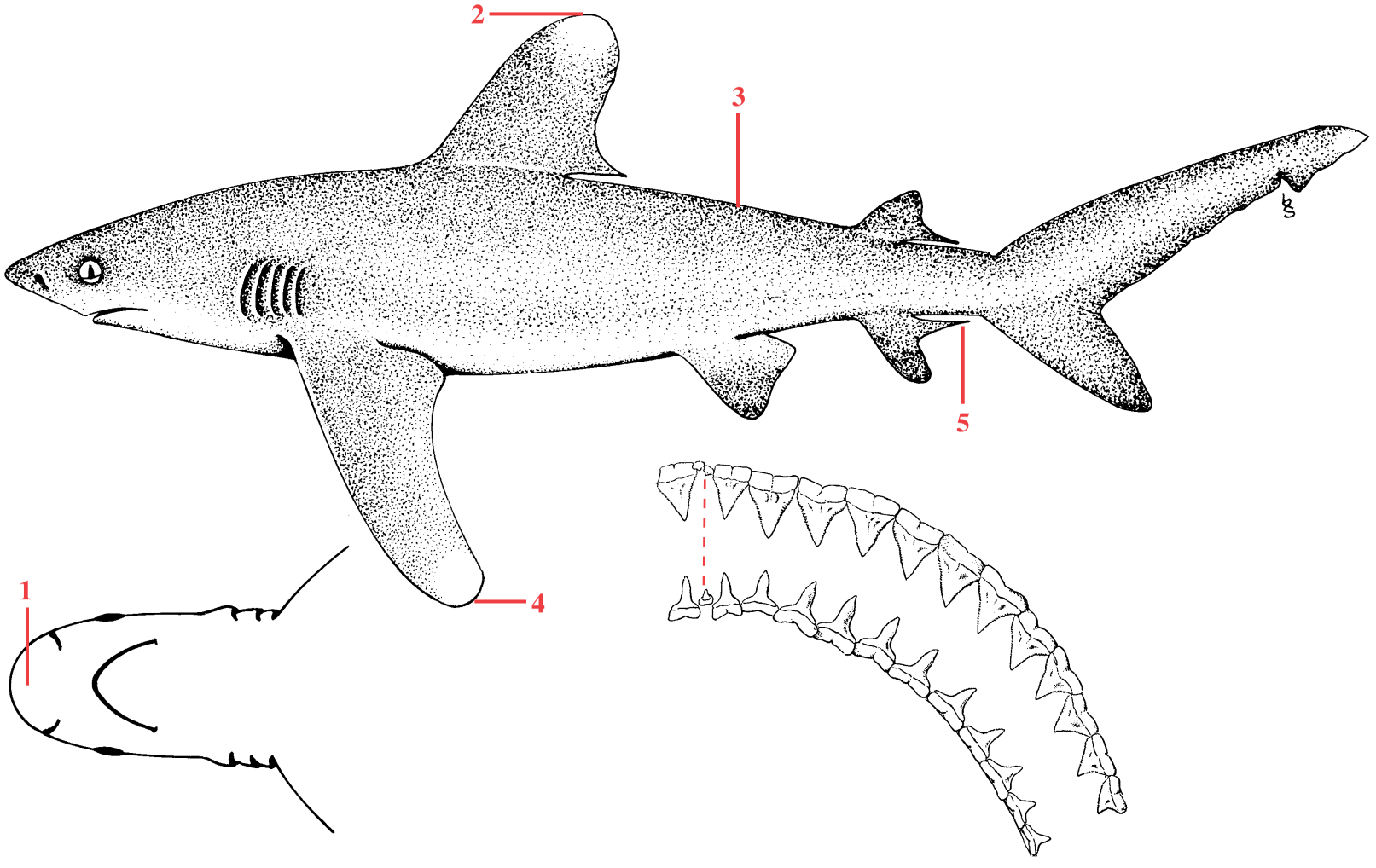
SIZE: Averages 6 to 10 feet and may reach over 13 feet in length.

DISTINGUISHING CHARACTERISTICS: A ridge-backed carcharhinid recognized by 1) a broadly rounded snout, 2) a broadly rounded first dorsal fin, 3) a weak interdorsal ridge present along the back, 4) long pectoral fins, as long as the measurement from the tip of the snout to the fifth gill opening, with rounded tips, and 5) free rear tip of the anal fin extending nearly to the base of lower caudal lobe. See Identification Key, page 39, number 10a.

SIMILAR SPECIES: The oceanic whitetip shark is a unique species. The characteristic broadly rounded first dorsal fin, long pectoral fins, and interdorsal ridge set this species apart from other sharks.

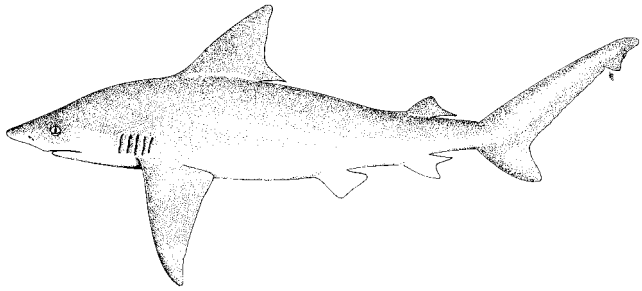
LOCAL DISTRIBUTION AND HABITS: A truly pelagic species found exclusively in waters of the open ocean. One of the most common oceanic sharks off South Carolina. Often feeds at the surface on squid as well as tuna, mackerel, and other fast-swimming fish. A dangerous shark known to attack stranded sailors far out at sea. Occasionally taken by anglers in the Gulf Stream while trolling natural baits for marlin. Reproductive development is placental viviparous.

OCEANIC WHITETIP SHARK



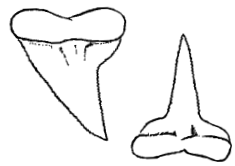
SANDBAR SHARK

Carcharhinus plumbeus



DESCRIPTION: Body noticeably stout, compact, heaviest forward, greatest depth above pectoral fins; weak but unmistakable interdorsal ridge present; head broad; dorsal profile above gill region very steeply arched, so much so as to appear hump-backed; snout fairly rounded, shorter than width of mouth; upper labial furrows very short, lower furrows absent. First dorsal fin noticeably large, triangular, broad-based, about twice as high as length of snout, originates slightly anterior to axil of each pectoral; second dorsal fin small, originates above origin of anal fin; anal similar to second dorsal, its posterior margin more deeply concave; pectorals noticeably large, about twice as long as broad; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper teeth broad, triangular with finely serrated edges. Front teeth more or less erect. Outer teeth oblique with curved margins. Lower teeth have narrow, triangular, erect cusps with more finely serrated edges.



COLOR: Gray or brownish-gray to bronze above and dingy white below. There are no conspicuous markings on fins.

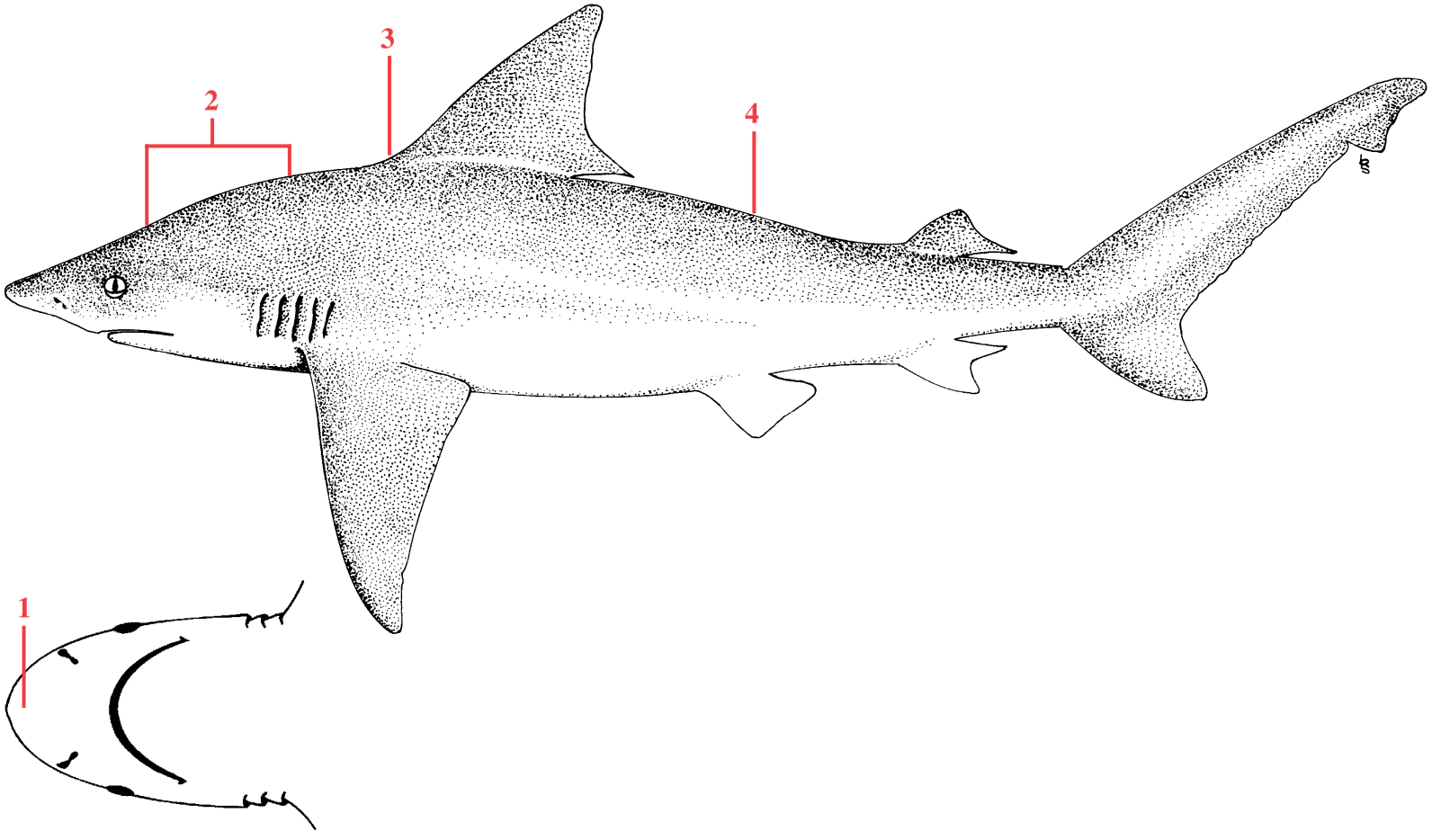
SIZE: Averages 3 to 6 feet and may reach 8 feet in length.

DISTINGUISHING CHARACTERISTICS: A ridge-backed carcharhinid recognized by 1) a fairly rounded snout that is shorter than width of mouth, 2) dorsal profile above gill region is steeply arched, so much so as to appear hump-backed, 3) a noticeably large first dorsal fin that originates anterior to axil of each pectoral fin, and 4) the presence of an interdorsal ridge. See Identification Key, page 39, number 10b.

SIMILAR SPECIES: • The bull shark (p. 100), the blacktip shark (p. 102), the spinner shark (p. 104), the finetooth shark (p. 106), the blacknose shark (p. 108), and the Atlantic sharpnose shark (p. 110) lack an interdorsal ridge. • The sand tiger shark (p. 64) and the lemon shark (p. 98) have large second dorsal fins. • The bignose shark (p. 86) has a snout that is as long as or longer than width of mouth, the dorsal profile above gill region is not steeply arched, and the second dorsal fin originates slightly anterior to the origin of the anal fin. • The silky shark (p. 88) and the dusky shark (p. 90) have smaller first dorsal fins that originate closely over or posterior to the free rear tips of the pectoral fins.

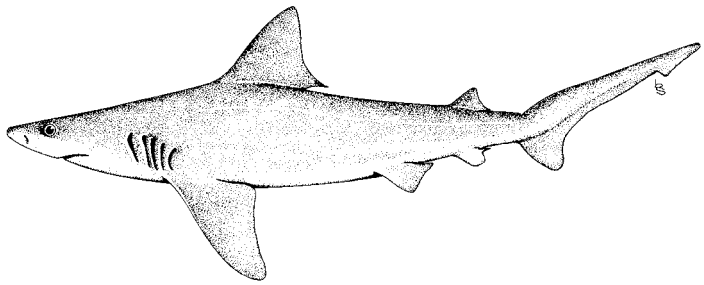
LOCAL DISTRIBUTION AND HABITS: One of the most abundant sharks inhabiting the shallow coastal waters and estuaries of South Carolina from May through September. Does not move into freshwater like the bull shark of similar appearance. Occurs almost always on the bottom occasionally in small schools. Aggressively feeds during the day and night on shrimp, crabs, small stingrays, and other small fish. A strong, stocky species frequently caught by anglers using live or cut bait. Smaller animals (of legal size) are excellent to eat when properly prepared. Reproductive development is placental viviparous.

SANDBAR SHARK



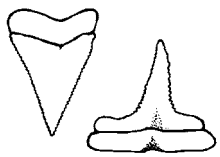
BIGNOSE SHARK

Carcharhinus altimus



DESCRIPTION: Body moderately stout, greatest depth just opposite origin of first dorsal fin; interdorsal ridge present; dorsal profile above gill region only slightly arched; snout narrowly rounded, as long as or longer than width of mouth; upper labial furrows very short, lower furrows absent. First dorsal large, triangular, apex pointed, originates above axil of each pectoral fin; second dorsal fin small, originates slightly anterior to origin of anal fin; anal similar to second dorsal in size, its posterior margin more deeply concave with rounded tip; pectorals large, about twice as long as broad; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper teeth broad, triangular with serrated edges. Lower teeth erect with slender, finely serrated cusps set on broad bases.



COLOR: Dark gray to bronze above becoming whitish below.

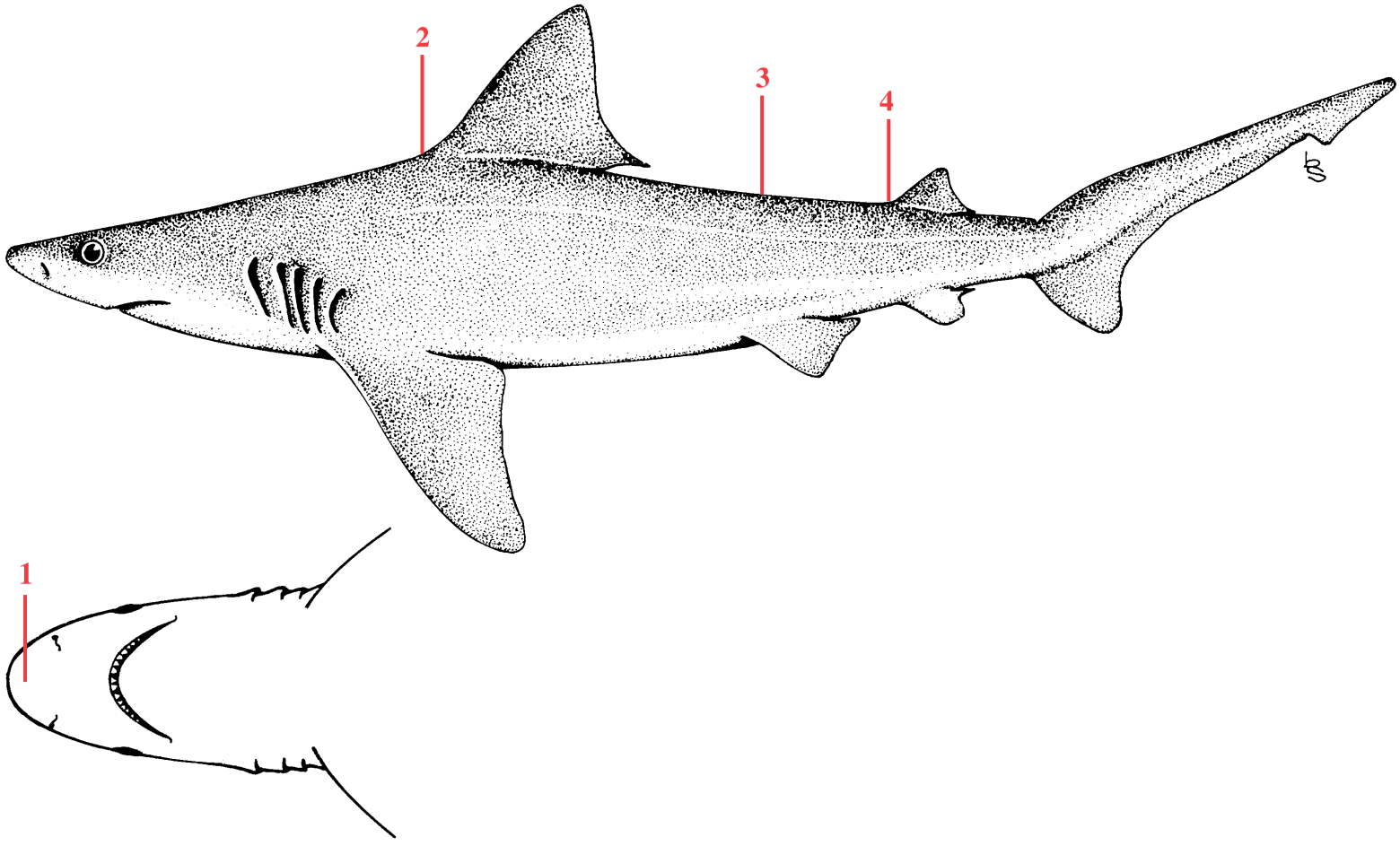
SIZE: Averages 4 to 6 feet and may exceed 9 feet in length.

DISTINGUISHING CHARACTERISTICS: A ridge-backed carcharhinid recognized by 1) a snout that is as long as or longer than width of mouth, 2) a first dorsal fin that originates over axil of each pectoral fin, 3) the presence of an interdorsal ridge, and 4) a second dorsal fin that originates slightly anterior to origin of anal fin. See Identification Key, page 39, number 10c.

SIMILAR SPECIES: • The bull shark (p. 100), the blacktip shark (p. 102), the spinner shark (p. 104), the finetooth shark (p. 106), and the blacknose shark (p. 108) lack an interdorsal ridge. • The oceanic whitetip shark (p. 82) has broadly rounded first dorsal and pectoral fins. • The sandbar shark (p. 84), with which the bignose shark is most often confused, has a snout that is shorter than the width of the mouth, and its dorsal profile above the gill region is steeply arched. • The silky shark (p. 88), the dusky shark (p. 90), and the night shark (p. 92) have a first dorsal fin that originates over or behind the free rear tips of the pectoral fins. • The tiger shark (p. 94) has a short, broadly rounded snout that is much shorter than the width of mouth, and the body is distinctly marked with stripes.

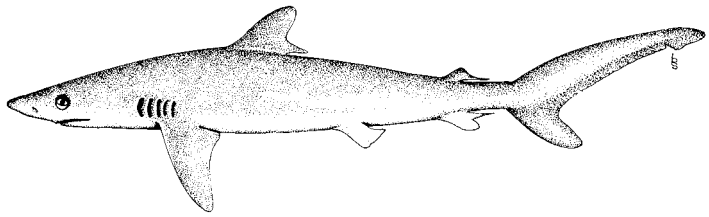
LOCAL DISTRIBUTION AND HABITS: A deep water, pelagic species found along the continental shelf off South Carolina. Feeds on or very near the ocean bottom on a variety of bottom-dwelling fishes, crustaceans, squid, and smaller sharks. Poses no threat to humans. Most often caught by commercial longline fishermen. Only occasionally caught locally by recreational anglers due to its deep water habitat. Protected in South Carolina and federal waters. Reproductive development is placental viviparous.

BIGNOSE SHARK



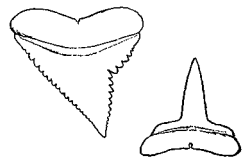
SILKY SHARK

Carcharhinus falciformis



DESCRIPTION: Body slender, greatest depth opposite origin of first dorsal fin; a low but distinct interdorsal ridge present; snout narrowly rounded in front, shorter than width of mouth; upper labial furrows very short, lower furrows absent. First dorsal relatively small, backward sloping, apex rounded, its rear margin deeply concave, the free rear tip rather long and slender, originates slightly posterior to free rear tips of pectoral fins; second dorsal fin small, free rear tip very long (twice as long as height of fin) and slender, originates above origin of anal fin; anal similar to second dorsal in size, its posterior margin much more deeply concave, the free rear tip similar to that of second dorsal; pectorals narrow, about twice as long as broad and about twice as long as height of first dorsal; caudal peduncle slender, rounded; caudal fin not lunate.

TEETH: Upper teeth broad, triangular with notched outer margins and becoming increasingly oblique toward the corners of the mouth. Bases coarsely serrated but less so on cusps. Lower teeth with erect, narrower cusps set on broad bases. Edges smooth or nearly smooth.



COLOR: Grayish-brown to bronze above becoming light gray to grayish-white below.

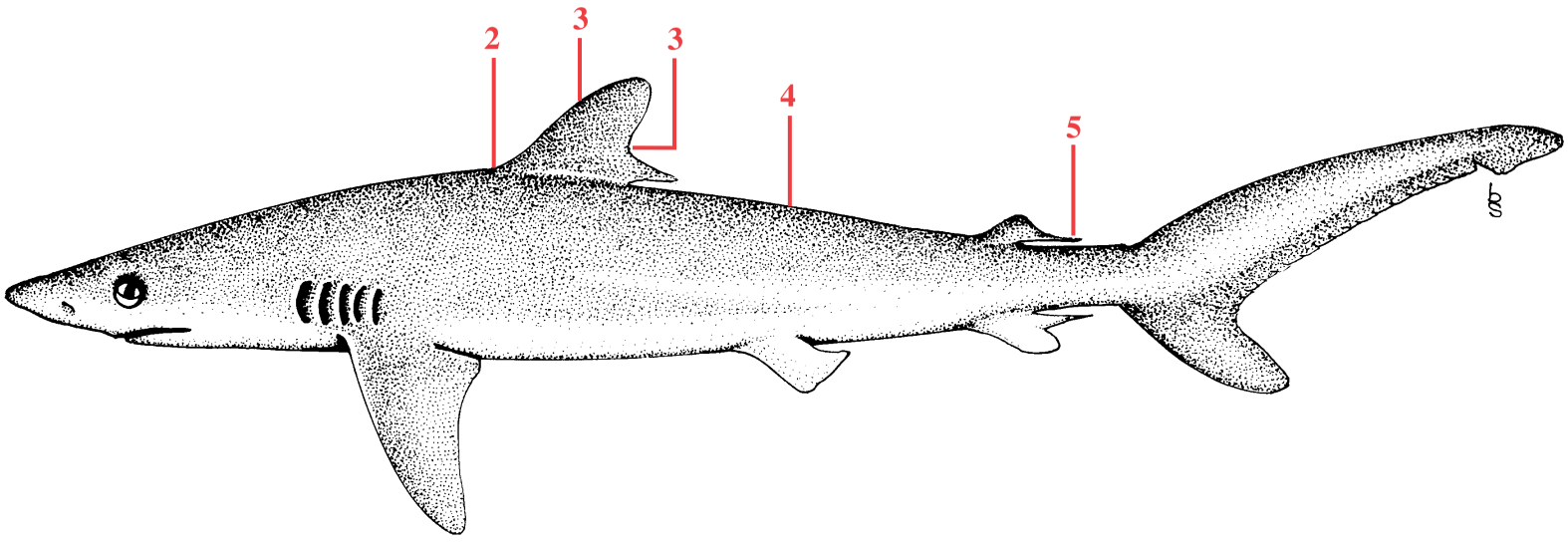
SIZE: Averages 4 to 8 feet and may reach 10 feet in length.

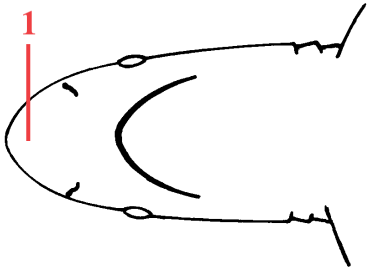
DISTINGUISHING CHARACTERISTICS: A ridge-backed carcharhinid recognized by 1) a snout shorter than width of the mouth, 2) a first dorsal fin that originates slightly posterior to free rear tips of pectoral fins, 3) first dorsal fin that is backward sloping with deeply notched rear margin, 4) the presence of an interdorsal ridge, and 5) a second dorsal fin with free rear tip twice as long as height of fin. See Identification Key, page 39, number 10d.

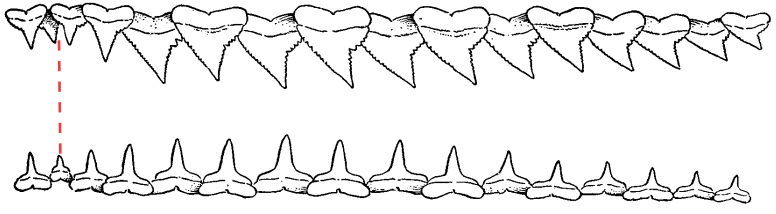
SIMILAR SPECIES: • The bull shark (p. 100), the blacktip shark (p. 102), the spinner shark (p. 104), the finetooth shark (p. 106), the blacknose shark (p. 108), and the Atlantic sharpnose shark (p. 110) lack an interdorsal ridge. • The smooth dogfish (p. 80) has a large second dorsal fin. • The sandbar shark (p. 84) and the bignose shark (p. 86) have a first dorsal fin that originates over the axil of each pectoral fin. • The rear margin of the first dorsal fin on the dusky shark (p. 90) is nearly straight-edged. The free rear tip of its second dorsal fin is shorter than the height of the fin. • The night shark (p. 92) has a noticeably long snout (longer than width of mouth) and green eyes. The rear margin of its first dorsal fin is nearly straight-edged.

LOCAL DISTRIBUTION AND HABITS: A common oceanic shark off South Carolina. An active and swift-swimming species found on or near the surface and at depths of 600 feet or more. Occasionally enters shallow coastal waters during the summer and is not dangerous to swimmers. Feeds primarily on squid and a variety of small schooling fish. Taken by anglers, usually at the surface, on live baits. Smaller animals (of legal size) are excellent to eat when properly prepared. Reproductive development is placental viviparous.

SILKY SHARK

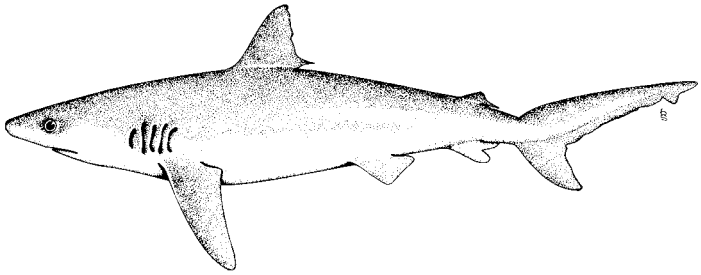






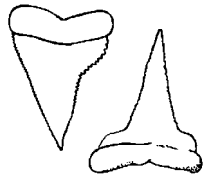
DUSKY SHARK

Carcharhinus obscurus



DESCRIPTION: Body moderately stout, greatest depth opposite origin of first dorsal fin; interdorsal ridge present; snout fairly rounded, about as long as width of mouth; upper labial furrows very short, concealed when mouth is closed, lower furrows absent. First dorsal large, triangular, originates closely over free rear tips of pectoral fins; second dorsal fin small, originates slightly posterior to origin of anal fin (origins may appear about the same); anal similar to second dorsal in size, its posterior margin more deeply concave or notched; pectorals large, relatively narrow; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper teeth broad, triangular with serrated edges. Front teeth erect, the outer teeth slightly oblique. Lower teeth erect with narrow cusps and very finely serrated edges.



COLOR: Dark gray to bluish-gray above becoming white to dingy white below.

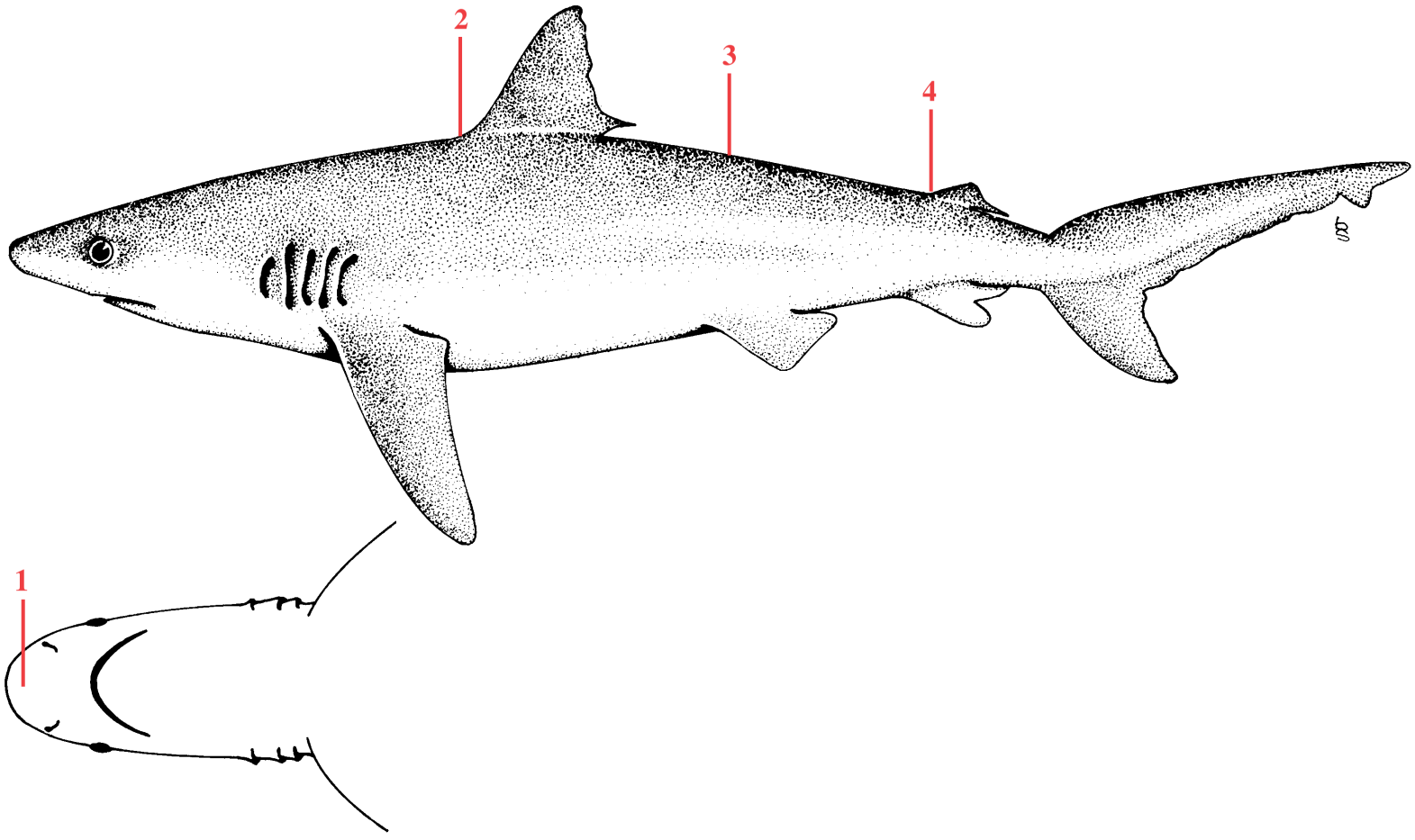
SIZE: Averages 6 to 10 feet and may reach 12 feet in length.

DISTINGUISHING CHARACTERISTICS: A ridge-backed carcharhinid recognized by 1) a snout that is about as long as width of mouth, 2) a first dorsal fin that originates closely over free rear tips of the pectoral fins, 3) the presence of an interdorsal ridge, and 4) a second dorsal fin that originates slightly behind origin of anal fin. See Identification Key, page 40, number 10e.

SIMILAR SPECIES: • The bull shark (p. 100), the blacktip shark (p. 102), the spinner shark (p. 104), the finetooth shark (p. 106), the blacknose shark (p. 108), and the Atlantic sharpnose shark (p. 110) lack an interdorsal ridge. • The oceanic whitetip shark (p. 82) has the characteristic broadly rounded first dorsal and pectoral fins. • The sandbar shark (p. 84), with which the dusky shark is most often confused, has a steeply arched dorsal profile above the gill region, and the first dorsal fin originates over the axil of each pectoral fin. • The bignose shark (p. 86) also has a first dorsal fin that originates over the axil of each pectoral fin. • The silky shark (p. 88) has a deeply notched first dorsal fin and a second dorsal fin with a long free rear tip, twice as long as height of fin.

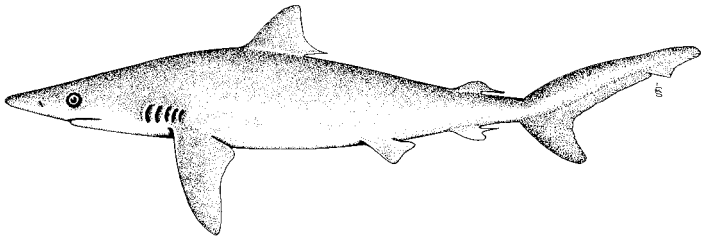
LOCAL DISTRIBUTION AND HABITS: Usually a pelagic species but occasionally ventures into coastal waters. It occurs on the surface and at greater depths. Feeds on a wide variety of fish including black sea bass, grouper, snapper, stingrays, and other sharks. Does not pose a threat to humans because it infrequently enters coastal waters. Occasionally caught by anglers while bottom-fishing, especially over natural reefs and live-bottom areas. Protected in South Carolina and federal waters. Reproductive development is placental viviparous.

DUSKY SHARK



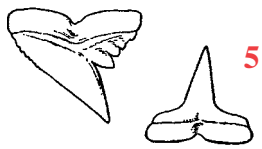
NIGHT SHARK

Carcharhinus signatus



DESCRIPTION: Body slender, greatest depth opposite origin of first dorsal fin; low but unmistakable interdorsal ridge present; snout narrow, noticeably long, longer than width of mouth, tip narrowly rounded; upper labial furrows very short, lower furrows absent; eyes moderately large, circular, and green in color; gill openings noticeably small. First dorsal relatively small, triangular, originates closely over or slightly posterior to free rear tips of pectoral fins; second dorsal fin small, originates over origin of anal fin, its free rear tip very slender and noticeably long; anal similar to second dorsal in size, its posterior margin more deeply concave, free rear tip similar to that of second dorsal; pectorals large, noticeably longer than height of first dorsal; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper teeth triangular with finely serrated edges becoming increasingly oblique toward corners of mouth. Outer margins obviously deeply notched with 2 to 5 coarse serrations from notch to base. Lower teeth are narrow and erect with smooth edges.



COLOR: Bluish-gray above with noticeable black spots and grayish-white below.

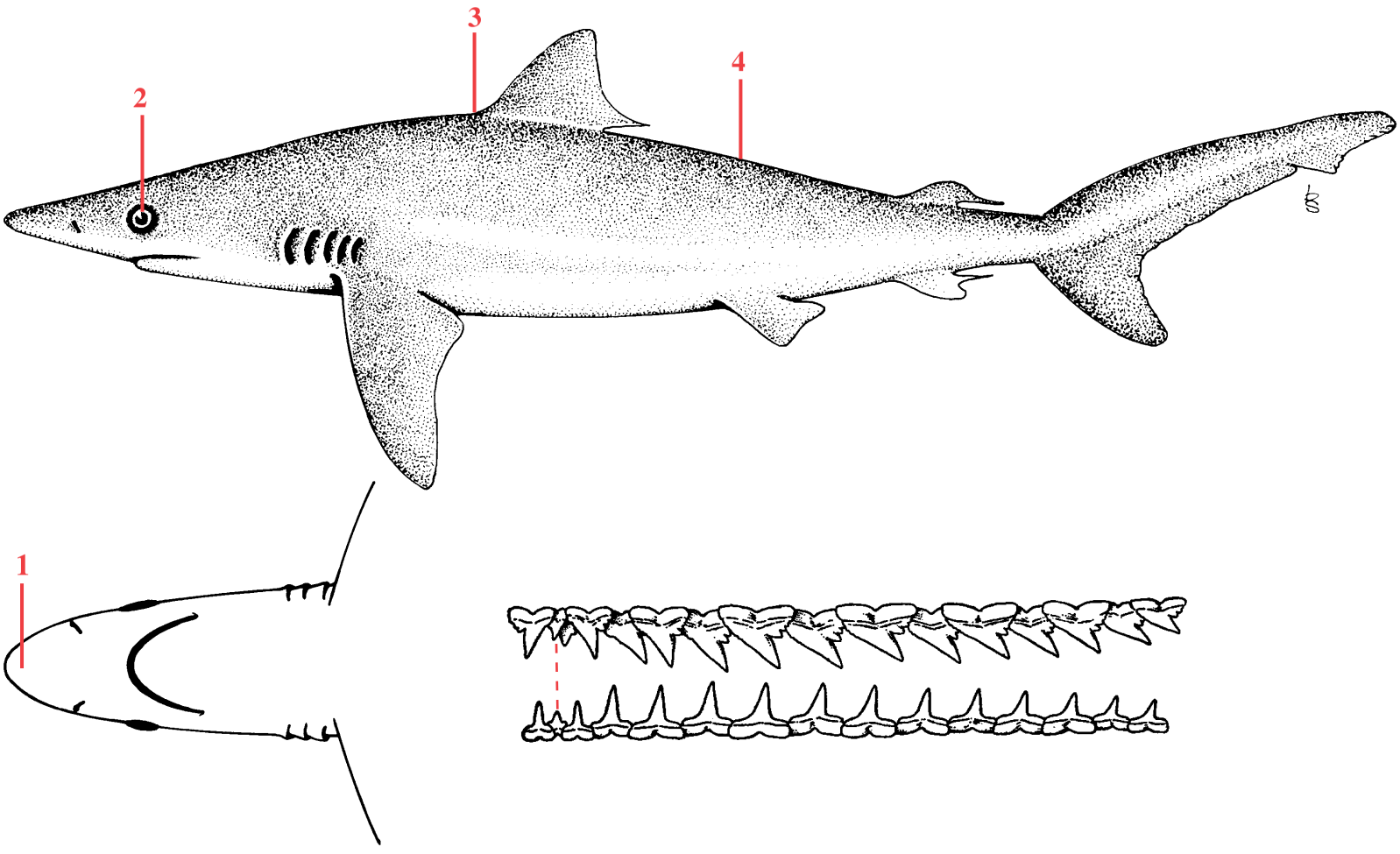
SIZE: Grows to 8 feet or more in length.

DISTINGUISHING CHARACTERISTICS: A ridge-backed carcharhinid recognized by 1) a relatively long, narrow snout that is longer than width of mouth, 2) large green eyes, 3) a relatively small first dorsal fin that originates closely over free rear tips of pectoral fins, 4) a low but unmistakable interdorsal ridge, and 5) upper teeth with 2 to 5 coarse serrations from notch to base. See Identification Key, page 40, number 10f.

SIMILAR SPECIES: • The blacktip shark (p. 102), the spinner shark (p. 104), the finetooth shark (p. 106), the blacknose shark (p. 108), and the Atlantic sharpnose shark (p. 110) lack an interdorsal ridge. • The smooth dogfish (p. 80) has a large second dorsal fin. • The oceanic whitetip shark (p. 82) has a large, broadly rounded first dorsal fin. • The sandbar shark (p. 84) has a noticeably large first dorsal fin that originates over the axil of each pectoral fin. • The bignose shark (p. 86) has a first dorsal fin that originates over the axil of each pectoral fin. • The silky shark (p. 88) has a first dorsal fin with a noticeably concave rear margin. • The dusky shark (p. 90) has a shorter snout, which is only as long as the width of the mouth, and its teeth lack 2 to 5 coarse serrations from notch to base.

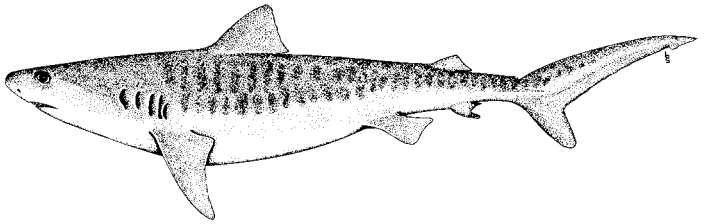
LOCAL DISTRIBUTION AND HABITS: The presence of greenish eyes indicates this is a deep water species, usually found in depths of more than 600 feet. Diet probably consists of fish and crustaceans, taken at the surface and near the bottom usually at night. Not much else is known about this shark as few records for it exist off South Carolina. Rarely caught by anglers. Protected in South Carolina and federal waters. Reproductive development is placental viviparous.

NIGHT SHARK



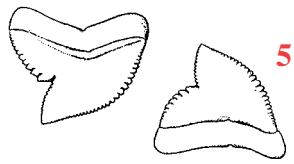
TIGER SHARK

Galeocerdo cuvier



DESCRIPTION: Body stout, especially forward, then tapering, greatest depth opposite origin of first dorsal fin; interdorsal ridge present; head very broad; snout short, much shorter than width of mouth, very broadly rounded and thick-tipped; mouth broad; upper labial furrows noticeably long, lower furrows short. First dorsal large, triangular, originates above or slightly posterior to axil of each pectoral fin; second dorsal fin small, originates well forward of anal fin; anal similar to second dorsal, its rear margin more deeply concave; pectorals about twice as long as broad; caudal peduncle slender, oval, with a reinforcing lateral ridge on each side; caudal fin not lunate, upper lobe long and tapering to slender, pointed tip.

TEETH: Both jaws have large, broad-based, triangular teeth with strongly serrated edges and very deeply notched outer margins. Edges of teeth more finely serrated near tips.



COLOR: Color is very distinct. Bluish-gray to grayish-brown above, lighter on sides and becoming dirty yellow to off-white below. Most animals display dark spots on back, often forming bars or stripes along sides and fins, hence the name "tiger." Stripes often fade in larger sharks but remain distinct.

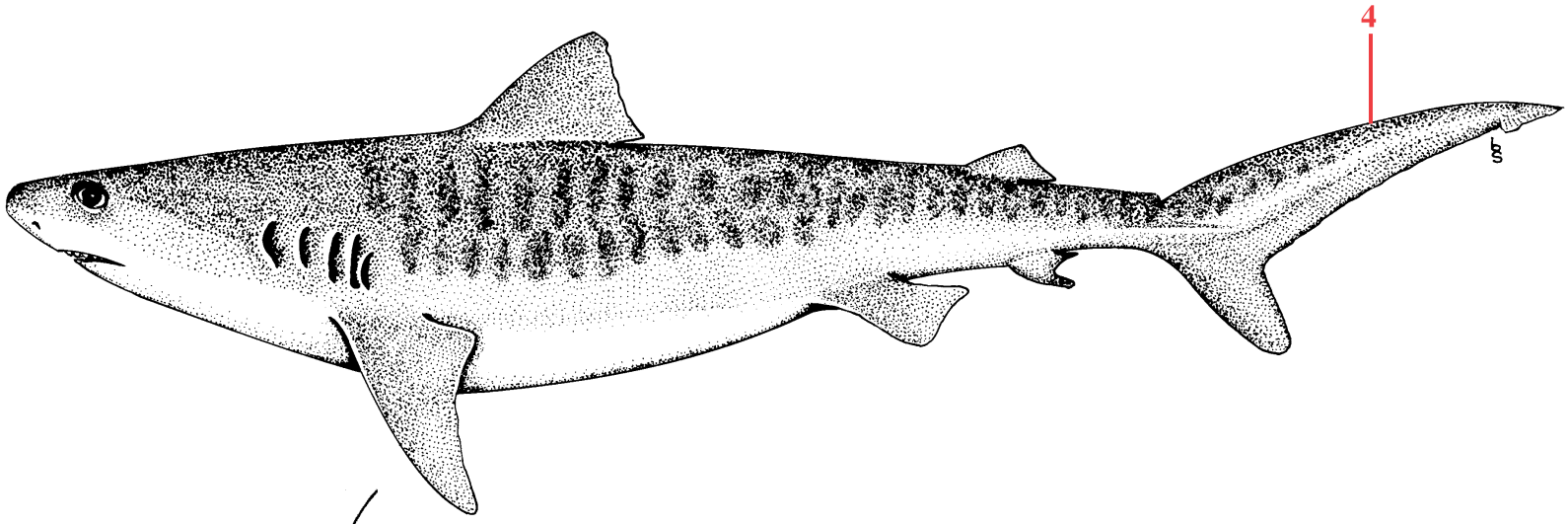
SIZE: One of the largest sharks. Averages 5 to 10 feet and may reach over 15 feet in length and approximately 2,000 pounds.

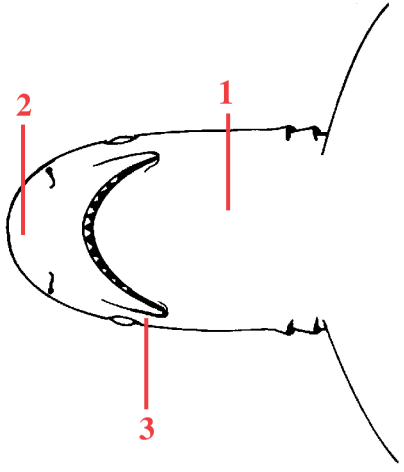
DISTINGUISHING CHARACTERISTICS: A ridge-backed carcharhinid recognized by 1) a very broad head, 2) a short and broadly rounded snout that is much shorter than width of mouth, 3) long upper labial furrows, 4) a long and pointed caudal fin, and 5) triangular teeth that are strongly serrated at the base and very deeply notched. See Identification Key, page 40, number 10g.

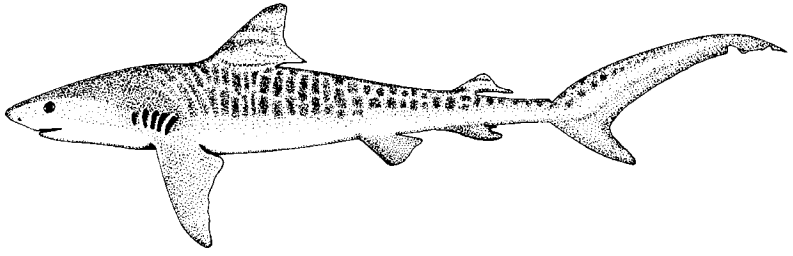
SIMILAR SPECIES: The tiger shark is a unique species. The characteristic teeth and distinct body coloration separate this species from all other sharks.

LOCAL DISTRIBUTION AND HABITS: Widely distributed throughout shallow coastal waters and well offshore in the open ocean. A summer visitor along the South Carolina coast occasionally entering sounds and inlets. A very dangerous shark, especially when aroused. Could pose a threat to swimmers because of its large size and frequent presence along beaches. Feeds indiscriminately on horseshoe crabs, squid, occasional sea turtles, and many species of fish, including skates, rays, and other sharks. A popular game fish, many have been caught and killed in recent years. Anglers are encouraged to release tiger sharks, especially larger individuals, because they form an important part of the breeding population and also are not especially edible. Reproductive development is aplacental viviparous.

TIGER SHARK



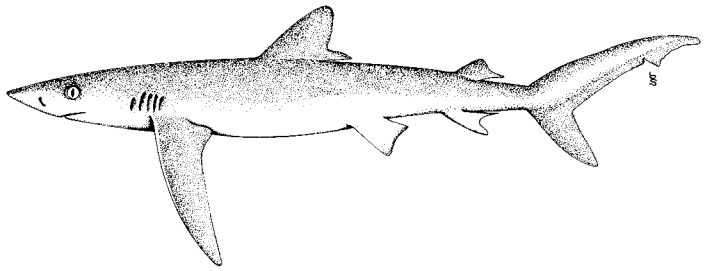




Juvenile

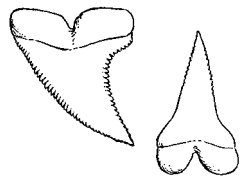
BLUE SHARK

Prionace glauca



DESCRIPTION: Body very slender, almost tube-like, greatest depth opposite origin of first dorsal fin; interdorsal ridge absent; snout noticeably long, longer than width of mouth, tip narrowly rounded; upper labial furrows very short, appearing as a deep pit at corners of jaw, lower furrows absent; eyes moderately large, circular; gill openings noticeably short. First dorsal large, apex narrowly rounded, its posterior margin deeply notched toward base, originates well posterior to pectoral fins; second dorsal fin small, originates over or just posterior to origin of anal fin; anal similar to second dorsal, its rear margin much more deeply concave; pectorals extremely long, much longer than height of first dorsal and as long as the measurement from the tip of the snout to the fifth gill opening, narrow with pointed tips; caudal peduncle slender with weak lateral keels on each side; caudal fin not lunate.

TEETH: Upper teeth broad, triangular with serrated edges and deeply concave outer margins. Lower teeth more erect and slender with finely serrated edges.



COLOR: Dark indigo blue above, light blue on sides, and pure white below. Blue tones fade to gray shortly after death.

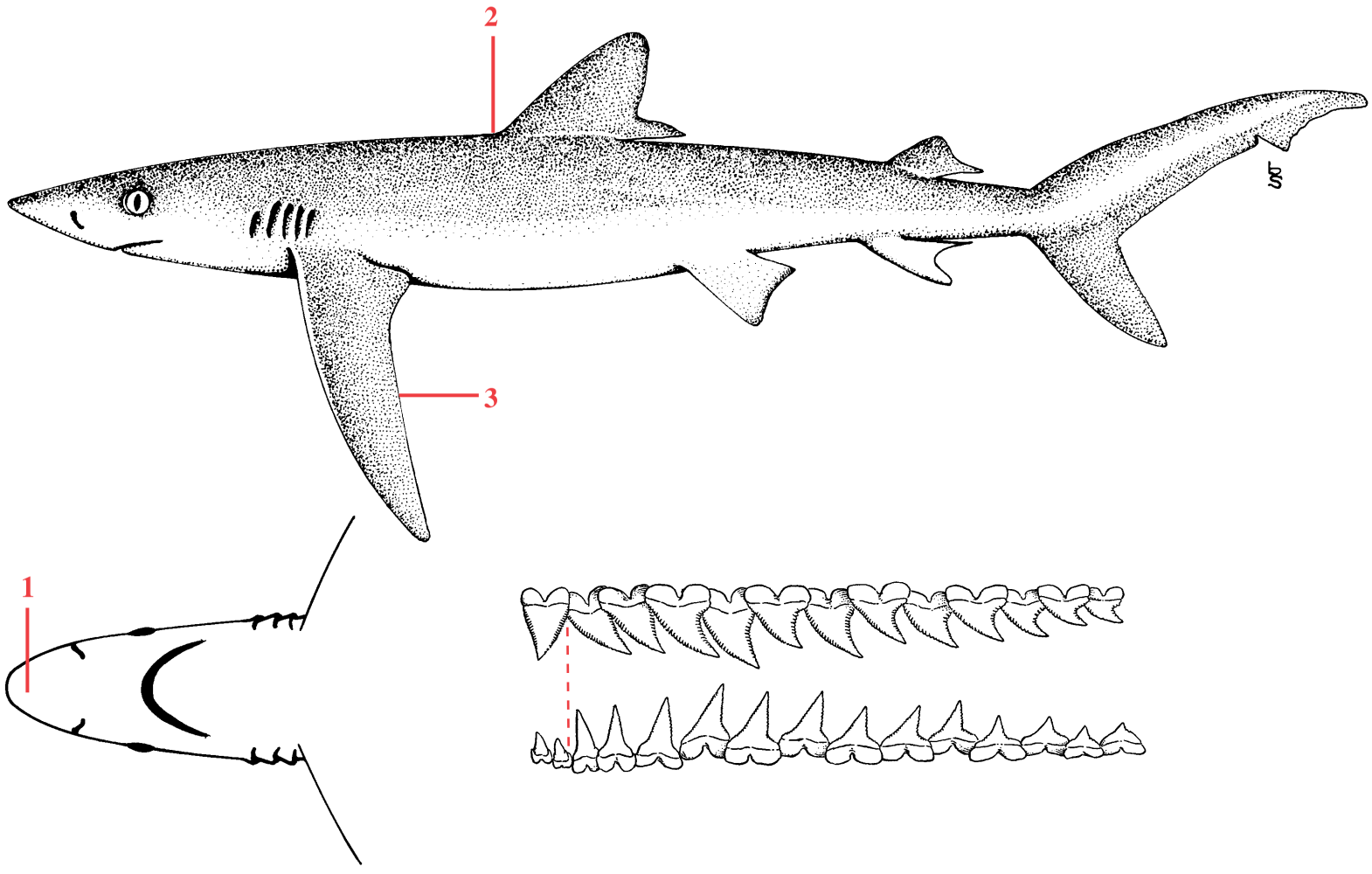
SIZE: Averages 6 to 8 feet and may reach up to 12 feet in length.

DISTINGUISHING CHARACTERISTICS: A smooth-backed carcharhinid recognized by 1) a snout longer than width of mouth, 2) a first dorsal fin that originates well posterior to pectoral fins, and 3) very long and narrow pectoral fins, which are as long as the measurement from the tip of the snout to the fifth gill opening. See Identification Key, page 40, number 11a.

SIMILAR SPECIES: The blue shark is a unique species. The obvious rearward location of the first dorsal fin and the characteristic long pectoral fins set this species apart. • Occasionally confused with the shortfin mako (p. 74) and the longfin mako (p. 76), which are also bluish in color but have long, canine-like teeth.

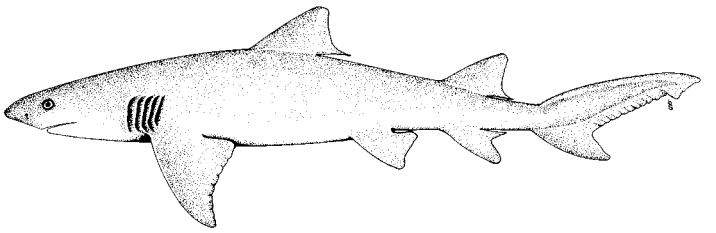
LOCAL DISTRIBUTION AND HABITS: An active, fast-swimming pelagic shark found far out in the open ocean, often near the surface. Considered one of the most numerous of oceanic sharks. Feeds on squid and a variety of smaller schooling fish like mackerel and herring, as well as injured marine mammals when the opportunity arises. A dangerous shark known to attack humans when sea disasters occur. Considered a game fish but few records exist for it off South Carolina. Reproductive development is placental viviparous.

BLUE SHARK



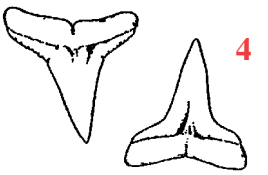
LEMON SHARK

Negaprion brevirostris



DESCRIPTION: Body moderately stout, greatest depth opposite origin of first dorsal fin; interdorsal ridge absent; snout short, shorter than width of mouth and broadly rounded; upper labial furrows short, directed outward to side of head, lower furrows absent; eyes noticeably small. Both dorsals large, similar in size and shape; first dorsal originates slightly posterior to free rear tips of pectoral fins; second dorsal only slightly smaller than first, originates slightly anterior to origin of anal fin; anal smaller than second dorsal, its posterior margin more deeply concave; pectorals large, two-thirds as broad as long; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper teeth have narrow, erect, triangular, smooth-edged cusps set on finely serrated, broad bases. Lower teeth similar to upper but with smooth bases.



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COLOR: Yellowish-brown or dark brown above becoming paler on lower sides and dirty white or yellowish below.

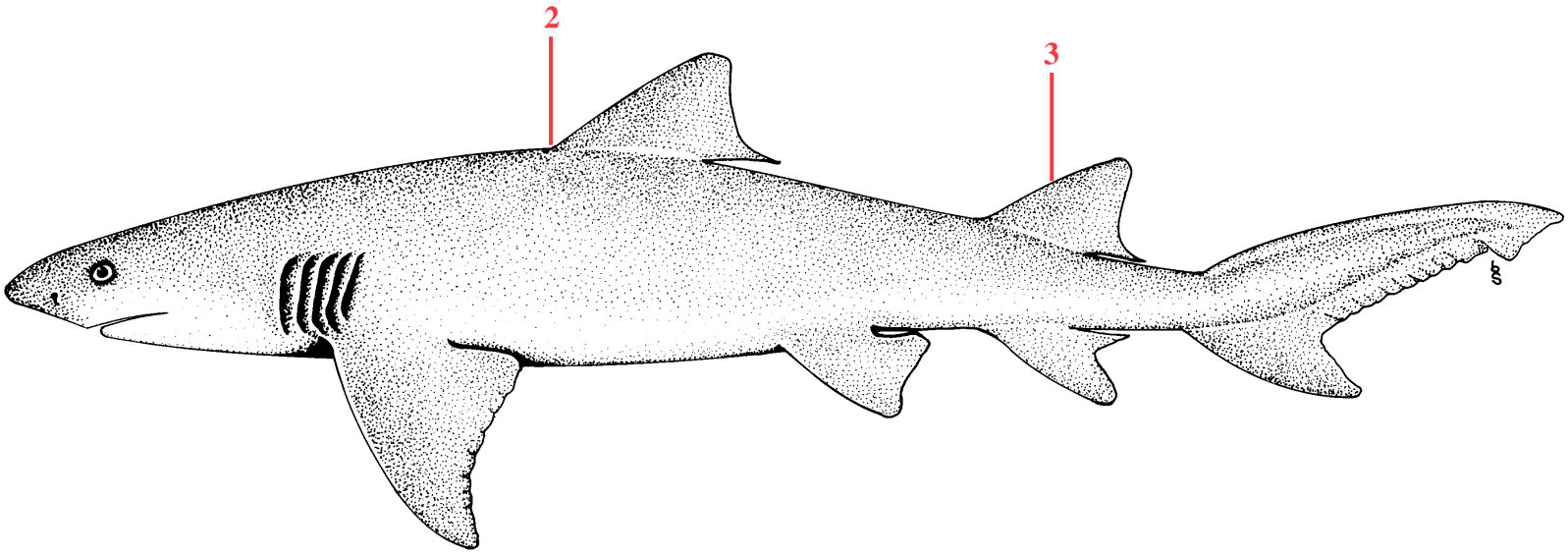
SIZE: Averages 6 to 9 feet and may reach 11 feet in length.

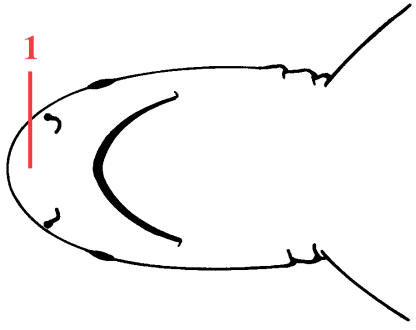
DISTINGUISHING CHARACTERISTICS: A smooth-backed carcharhinid recognized by 1) a broadly rounded snout that is shorter than width of mouth, 2) a first dorsal fin that originates a little posterior to free rear tips of pectoral fins, 3) a second dorsal fin almost as large as first dorsal fin, and 4) somewhat narrow but triangular teeth without lateral points. See Identification Key, page 41, number 11b.

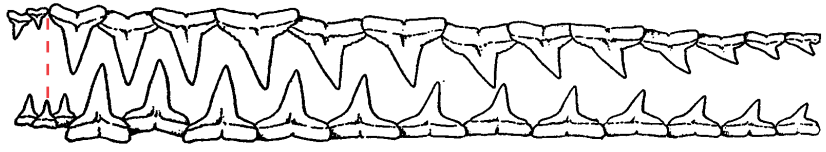
SIMILAR SPECIES: • The sand tiger shark (p. 64), with which the lemon shark is often confused, has a pointed snout, a first dorsal fin that originates well posterior to the pectoral fins, narrow teeth with lateral points, and is often marked with yellowish-brown spots. • The nurse shark (p. 60) also has a large second dorsal fin; however, the first dorsal fin originates over the pelvic fins, and nasal barbels are present.

LOCAL DISTRIBUTION AND HABITS: A sluggish, slow-swimming shark common in shallow inshore waters, most often on or near the bottom. Smaller juveniles occur much less often than larger adults. Inhabits sounds, inlets, and larger rivers, especially in May and June. Large numbers of lemon sharks, some as large as ten feet in length, have been reliably observed lying motionless or swimming slowly over sandy bottom areas off Florida, presumably gathering to breed. Feeds mainly on skates, rays, and other small fish. Generally considered harmless to swimmers and divers. Often caught by anglers fishing at night. Reproductive development is placental viviparous.

LEMON SHARK

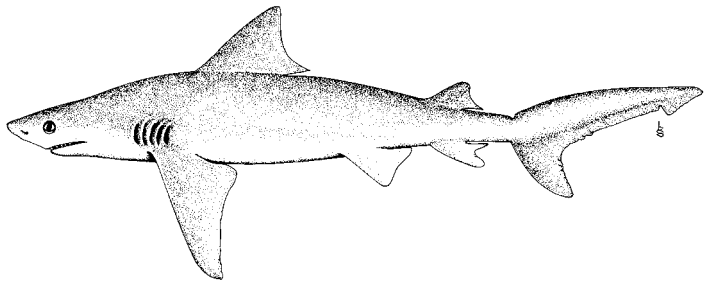






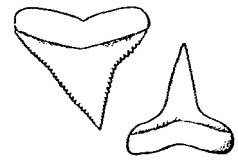
BULL SHARK

Carcharhinus leucas



DESCRIPTION: Body stout, especially forward, greatest depth above pectoral fins; interdorsal ridge absent; head very broad; dorsal profile above gill region noticeably arched, so much so as to appear hump-backed; snout broadly rounded, extremely short, much shorter than width of mouth; upper labial furrows very short, lower furrows absent. First dorsal fin quite large, triangular, apex pointed, originates closely over or slightly anterior to axil of each pectoral; second dorsal fin small, originates slightly anterior to origin of anal fin; anal similar to second dorsal in size, its posterior margin more deeply concave; pectorals noticeably large, about twice as long as broad, anterior margins nearly straight-edged; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper teeth broadly triangular with coarsely serrated edges. Lower teeth more erect with broad bases but narrower cusps and finely serrated edges.



COLOR: Dark gray to light gray above and white below. The fins on smaller sharks are often black-tipped.

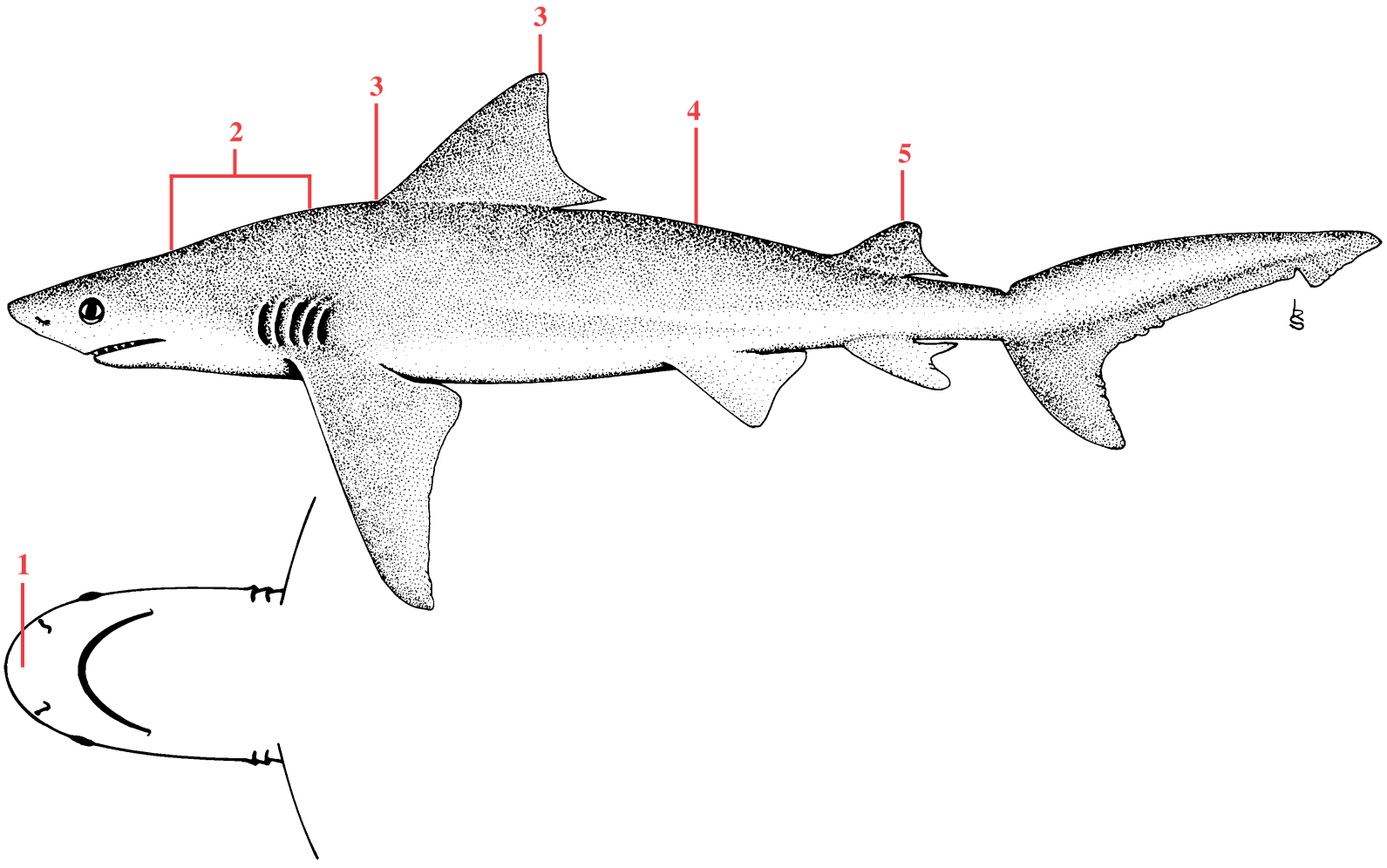
SIZE: Averages 6 to 8 feet and may reach over 10 feet in length.

DISTINGUISHING CHARACTERISTICS: A smooth-backed carcharhinid recognized by 1) a very short, broadly rounded snout that is much shorter than width of mouth, 2) dorsal profile above gill region distinctly arched, so much so as to appear hump-backed, 3) a large first dorsal fin with pointed apex that originates slightly anterior to axil of each pectoral fin, 4) the absence of an interdorsal ridge, and 5) a second dorsal fin much smaller than first. See Identification Key, page 41, number 11c.

SIMILAR SPECIES: • The oceanic whitetip shark (p. 82), the sandbar shark (p. 84), the bignose shark (p. 86), the silky shark (p. 88), the dusky shark (p. 90), and the night shark (p. 92) have an interdorsal ridge. • The sand tiger shark (p. 64) and the lemon shark (p. 98) have a large second dorsal fin. • The blacktip shark (p. 102) and the spinner shark (p. 104) have a snout that is as long as or longer than width of mouth and not broadly rounded but tapered to a rounded tip and a first dorsal fin that originates slightly to obviously posterior to the axil of each pectoral fin. • The finetooth shark (p. 106) and the blacknose shark (p. 108) have a first dorsal fin that originates over or slightly posterior to the free rear tips of the pectoral fins.

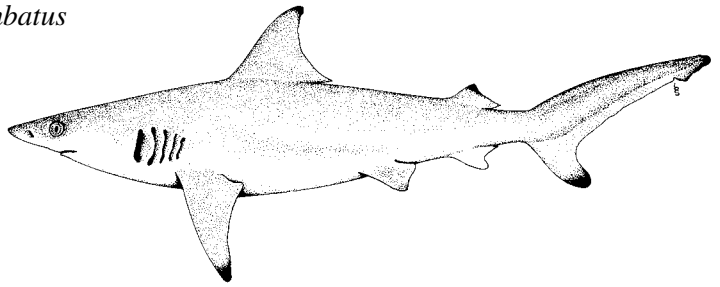
LOCAL DISTRIBUTION AND HABITS: A rather sluggish, bottom-dwelling species that occurs abundantly in South Carolina coastal waters and offshore. Known to swim up rivers into estuaries and even into freshwater. Feeds on crustaceans, stingrays, sharks, and a variety of other small fish. A dangerous shark because of its size and frequent occurrence in areas where people swim. Numerous attacks have been attributed to the bull shark elsewhere with a few probably occurring in South Carolina waters. Frequently caught by anglers throughout the summer months. Reproductive development is placental viviparous.

BULL SHARK



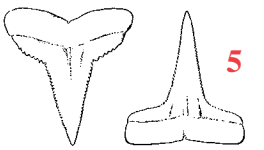
BLACKTIP SHARK

Carcharhinus limbatus



DESCRIPTION: Body moderately stout (stocky), greatest depth opposite origin of first dorsal fin; interdorsal ridge absent; dorsal profile above gill region only slightly arched; snout about as long as width of mouth, not broadly rounded but tapering forward abruptly anterior of nostrils to rounded tip; upper labial furrows very short, lower furrows absent. First dorsal large, triangular with backward curving tip, originates slightly posterior to axil of each pectoral fin; second dorsal fin small, originates closely over origin of anal fin; anal similar to second dorsal in size, its posterior margin more deeply concave; pectorals large, about twice as long as broad; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper teeth broad-based with narrow, triangular cusps and finely serrated edges. Lower teeth with slender, erect cusps and finely serrated edges.



COLOR: Dark gray to light gray or even bronze above and white or yellowish-white below. The lighter sides of the trunk are marked with a noticeable band of darker gray. Bands extend from the pectoral fins to the pelvic fins and merge with white below. The dorsal fins, pectoral fins, and the lower lobe of the caudal fin are tinged with black. The anal fin is white.

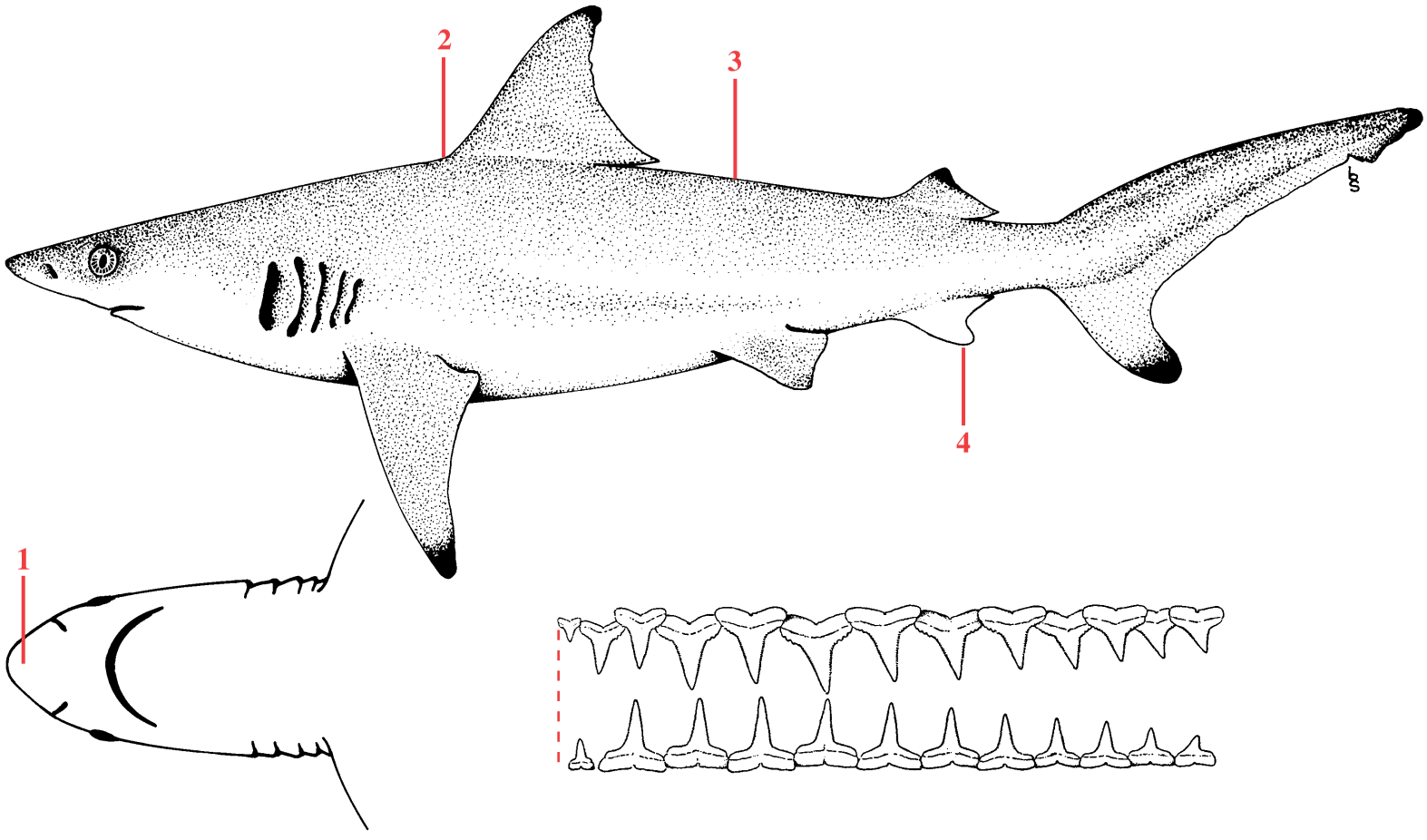
SIZE: Averages 3 to 5 feet and may reach over 6 feet in length.

DISTINGUISHING CHARACTERISTICS: A smooth-backed carcharhinid recognized by 1) a snout that is about as long as width of mouth with rounded tip, 2) a first dorsal fin that originates slightly posterior to axil of each pectoral fin, 3) the absence of an interdorsal ridge, 4) a white anal fin, and 5) narrow, erect, triangular teeth that are finely serrated. See Identification Key, page 41, number 11d.

SIMILAR SPECIES: • The sandbar shark (p. 84), the bignose shark (p. 86), the silky shark (p. 88), the dusky shark (p. 90), and the night shark (p. 92) have an interdorsal ridge. • The sand tiger shark (p. 64) and the lemon shark (p. 98) have large second dorsal fins. • The bull shark (p. 100) has a very short and broadly rounded snout and steeply arched back. • The spinner shark (p. 104), with which the blacktip shark is most often confused, has a first dorsal fin that originates obviously posterior to the free rear tips of the pectoral fins, and it has a black-tipped anal fin. • The finetooth shark (p. 106), the blacknose shark (p. 108), and the Atlantic sharpnose shark (p. 110) have first dorsal fins that originate over or posterior to the free rear tips of the pectoral fins. • The Atlantic sharpnose shark (p. 110) also has a second dorsal fin that originates behind the origin of the anal fin.

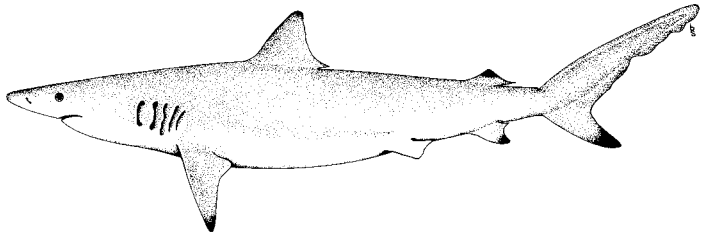
LOCAL DISTRIBUTION AND HABITS: A very common, fast-swimming shark occurring in both shallow coastal waters and offshore near the surface. Known to occasionally leap from the water, probably in pursuit of food. May occur in small schools and feeds primarily on squid, shrimp, small stingrays, and small fish. Often associated with artificial reefs along the coast. A popular game fish, especially when taken on light tackle. In the spring and early summer, small blacktip sharks are commonly taken by anglers from beaches and inlets. Anglers are occasionally bitten when handling this shark. Smaller sharks (of legal size) are excellent to eat when properly prepared. Reproductive development is placental viviparous.

BLACKTIP SHARK



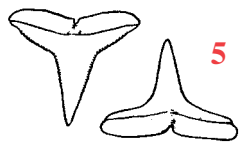
SPINNER SHARK

Carcharhinus brevipinna



DESCRIPTION: Body moderately slender, greatest depth opposite origin of first dorsal fin; interdorsal ridge absent; dorsal profile above gill region not noticeably arched but gradually tapering; snout long, as long as or longer than width of mouth and rather pointed; upper labial furrows short, lower furrows absent; eyes noticeably small; gill openings rather large. First dorsal large, triangular, apex very narrowly rounded, originates above or slightly posterior to free rear tips of pectoral fins; second dorsal fin small, originates closely over origin of anal fin; anal nearly equal to second dorsal in size, its posterior margin slightly more concave; pectorals relatively small and narrow, anterior margins nearly straight-edged; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper teeth erect, broad-based with slender, finely serrated, triangular cusps. Lower teeth set on broad bases with narrower cusps and perfectly smooth edges.



COLOR: Dark gray to light gray or bronze above and white below. Sides marked with gray band extending from pectoral fins to pelvic fins and merging with white below. Sharks larger than two feet in length have the second dorsal fin, anal fin, pectoral fins, and lower caudal lobe tipped with black. Young sharks have unmarked fins.

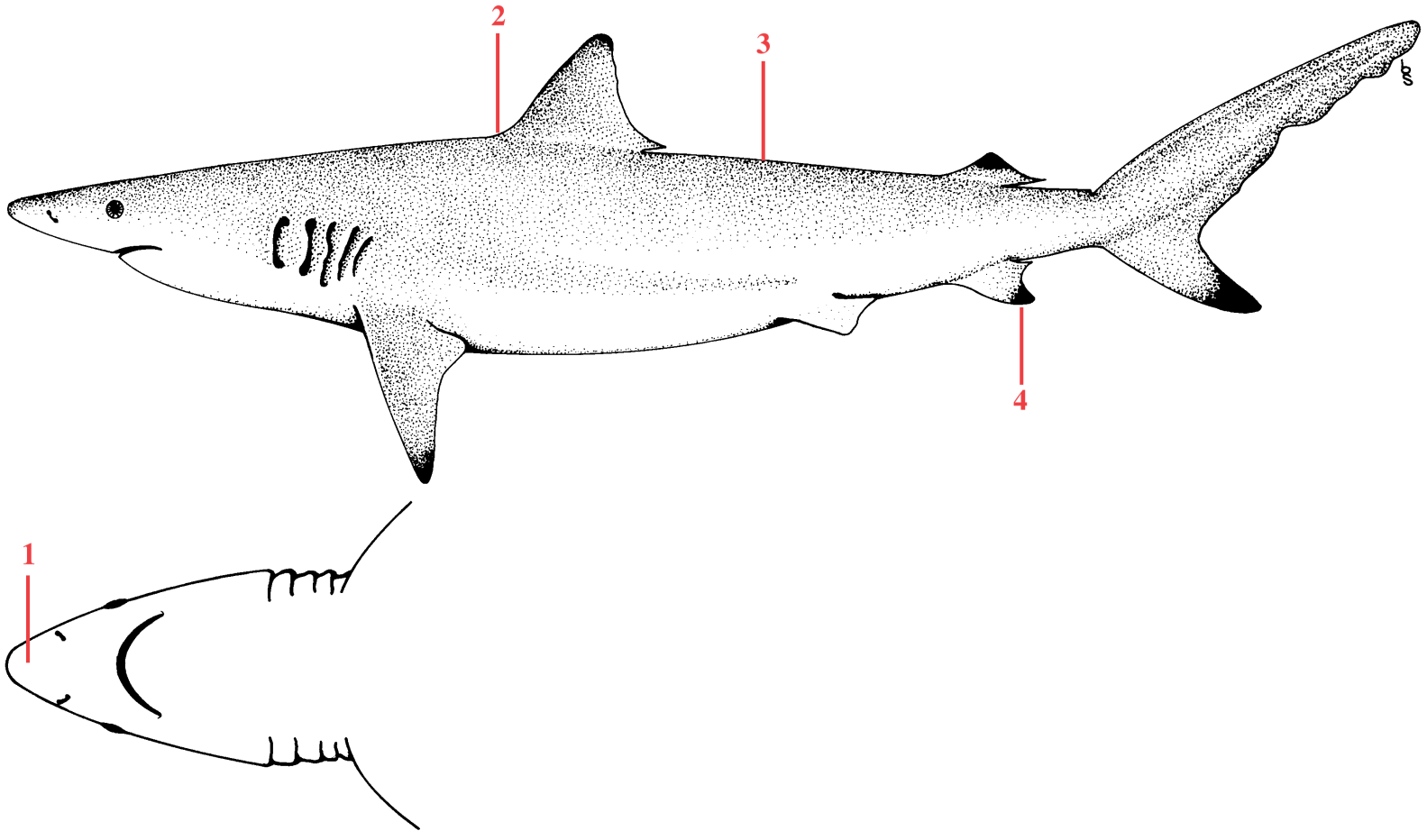
SIZE: Averages 3 to 5 feet and may reach 8 feet in length.

DISTINGUISHING CHARACTERISTICS: A smooth-backed carcharhinid recognized by 1) a snout as long as or longer than width of mouth, 2) a first dorsal fin that originates above or slightly posterior to free rear tips of pectoral fins, 3) the absence of an interdorsal ridge, 4) second dorsal fin, anal fin, pectoral fins, and lower caudal lobe tipped with black in animals above two feet in length, and 5) perfectly smooth lower teeth. See Identification Key, page 41, number 11e.

SIMILAR SPECIES: • The sandbar shark (p. 84), the bignose shark (p. 86), the silky shark (p. 88), the dusky shark (p. 90), and the night shark (p. 92) have an interdorsal ridge. • The bull shark (p. 100) has a very short, broadly rounded snout, and the first dorsal fin originates over the axil of each pectoral fin. The dorsal profile over the gill region is steeply arched. • The blacktip shark (p. 102), with which the spinner shark is most often confused, has a snout only as long as the width of mouth, a white anal fin, and finely serrated lower teeth. The first dorsal fin originates closely over the axil of each pectoral fin. • The finetooth shark (p. 106) has a shorter snout, shorter than width of mouth, smooth-edged upper and lower teeth, and unmarked fins. The snout is more narrowly rounded. • The blacknose shark (p. 108) is characterized by a snout that is black-tipped, upper teeth that are strongly notched, and lower teeth that are finely serrated. • The Atlantic sharpnose shark (p. 110) has a second dorsal fin that originates behind the origin of the anal fin.

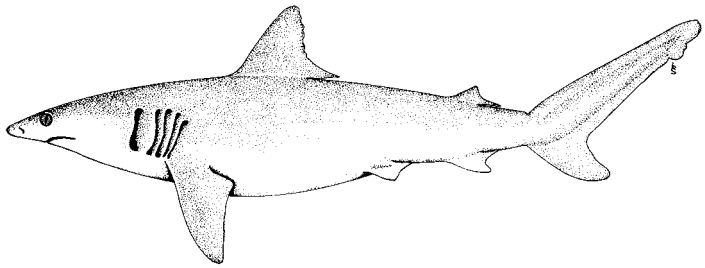
LOCAL DISTRIBUTION AND HABITS: Common in coastal and offshore waters. Like the blacktip shark, it is active and fast-swimming and can be observed leaping and spinning from the water in pursuit of schooling fish. Feeds on squid, stingrays, and other small fish. Sought after by anglers as a prized game fish when caught on light tackle. Only dangerous when being handled. Smaller sharks (of legal size) are excellent to eat when properly prepared. Reproductive development is placental viviparous.

SPINNER SHARK



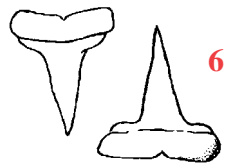
FINETOOTH SHARK

Carcharhinus isodon



DESCRIPTION: Body rather slender, greatest depth opposite origin of first dorsal fin; interdorsal ridge absent; snout shorter than width of mouth, tip narrowly rounded; labial furrows U-shaped around corners of mouth, lower furrows concealed when mouth is closed; gill openings noticeably large. First dorsal large, triangular, apex narrowly rounded, originates closely over the free rear tips of pectoral fins; second dorsal fin small, originates closely over origin of anal fin; anal similar to second dorsal in size, its posterior margin more deeply concave; pectorals large, about twice as long as broad; caudal peduncle rounded; caudal fin not lunate.

TEETH: Both jaws have broad-based, erect teeth with narrow, sharp-pointed cusps and smooth edges.



COLOR: Gray or bronze above and white below. The dorsal fin and the inside of the pectoral fins on some adults may appear slightly dusky, possibly causing confusion with the blacktip shark and the spinner shark.

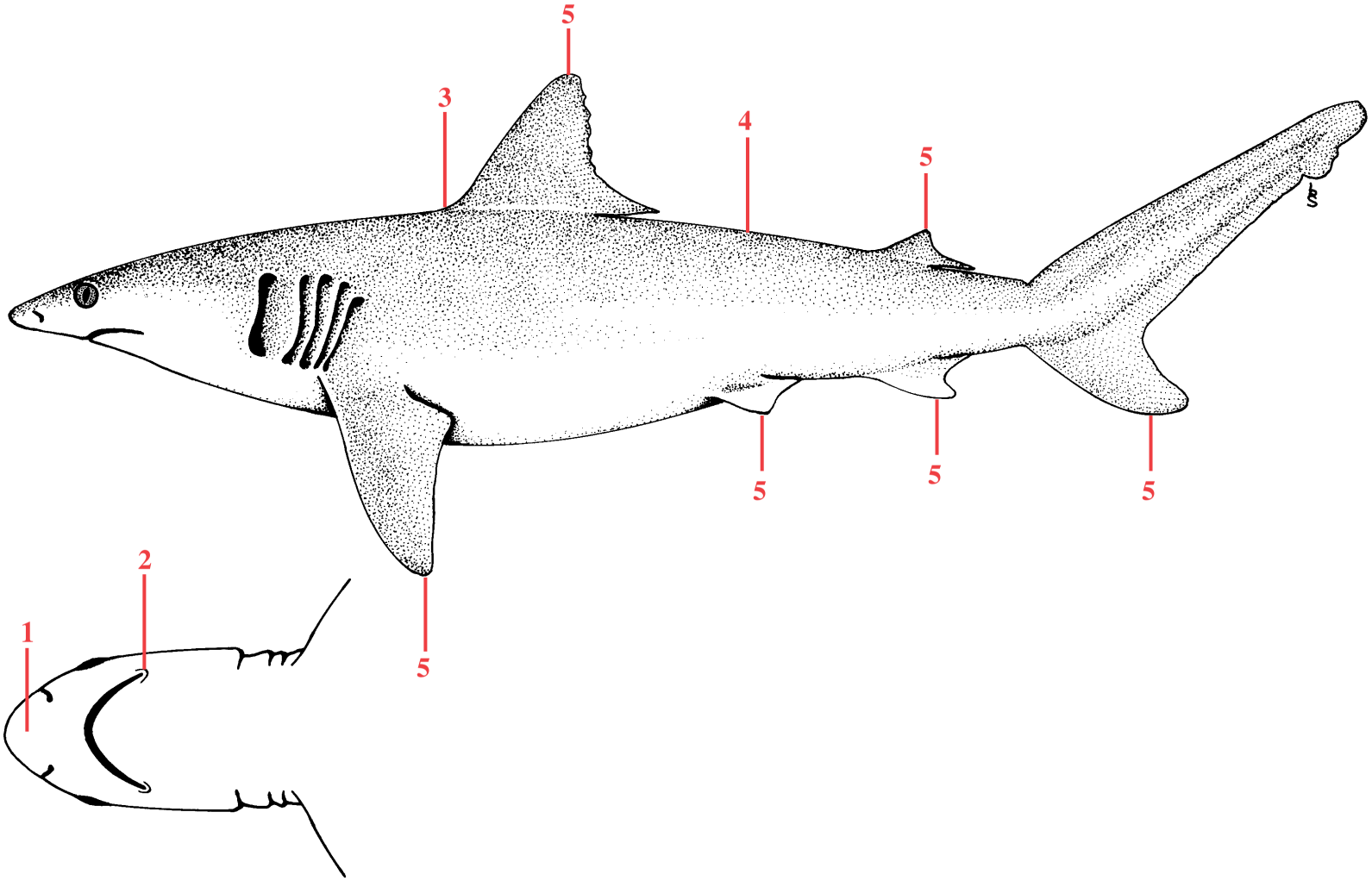
SIZE: Averages 2 to 3 feet and may reach 5 feet in length.

DISTINGUISHING CHARACTERISTICS: A smooth-backed carcharhinid recognized by 1) a snout that is shorter than width of mouth, 2) short, U-shaped labial furrows around corners of mouth, 3) a first dorsal fin that originates closely over the free rear tips of pectoral fins, 4) the absence of an interdorsal ridge, 5) generally unmarked fins, and 6) slender, erect, and smooth-edged teeth in both jaws. See Identification Key, page 42, number 11f.

SIMILAR SPECIES: • The sandbar shark (p. 84), the bignose shark (p. 86), the silky shark (p. 88), the dusky shark (p. 90), and the night shark (p. 92) have an interdorsal ridge. • The bull shark (p. 100) has a broadly rounded snout, and the first dorsal fin originates over or slightly anterior to the axil of each pectoral fin. • The blacktip shark (p. 102) has a snout that is about as long as width of mouth, a first dorsal fin that originates slightly posterior to the axil of each pectoral fin, fins that are tipped black, and finely serrated teeth. • The spinner shark (p. 104) has a pointed snout, which is as long as or longer than width of mouth, and black-tipped fins. • The blacknose shark (p. 108) has a snout that is as long as or longer than width of mouth and triangular, strongly notched upper teeth. • The Atlantic sharpnose shark (p. 110) has a second dorsal fin that originates behind the origin of the anal fin.

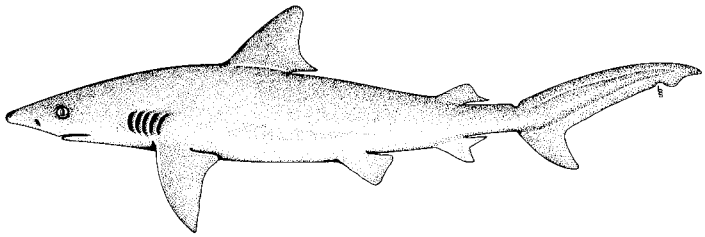
LOCAL DISTRIBUTION AND HABITS: Especially common throughout shallow coastal waters during the long summer. Feeds on shrimp, crabs, squid, and a wide variety of fish found schooling on the bottom. Many are taken by recreational anglers on light tackle using live or fresh-cut bait. Smaller sharks (of legal size) are excellent to eat when properly prepared. Reproductive development is placental viviparous.

FINETOOTH SHARK



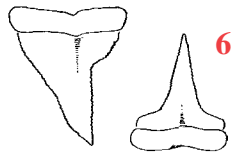
BLACKNOSE SHARK

Carcharhinus acronotus



DESCRIPTION: Body slender, greatest depth opposite origin of first dorsal fin; interdorsal ridge absent; snout long, as long as or longer than width of mouth; upper labial furrows very short, lower furrows absent. First dorsal large, triangular, apex narrowly rounded, originates over or slightly posterior to free rear tips of pectoral fins; second dorsal fin small, originates above origin of anal fin; anal a little longer at base than second dorsal, its posterior margin more deeply concave; pectorals large, about twice as long as broad; caudal peduncle rounded, precaudal pit strongly notched; caudal fin not lunate.

TEETH: Upper teeth broadly triangular, strongly notched on outer margins with serrated edges becoming more coarsely serrated near base. Lower teeth erect, symmetrical with slender, finely serrated cusps.



COLOR: Brown to yellowish-brown or copper above and paler below. Tip of second dorsal fin may appear dusky to black. Tip of snout characterized by dusky blotch that is more distinct in smaller sharks.

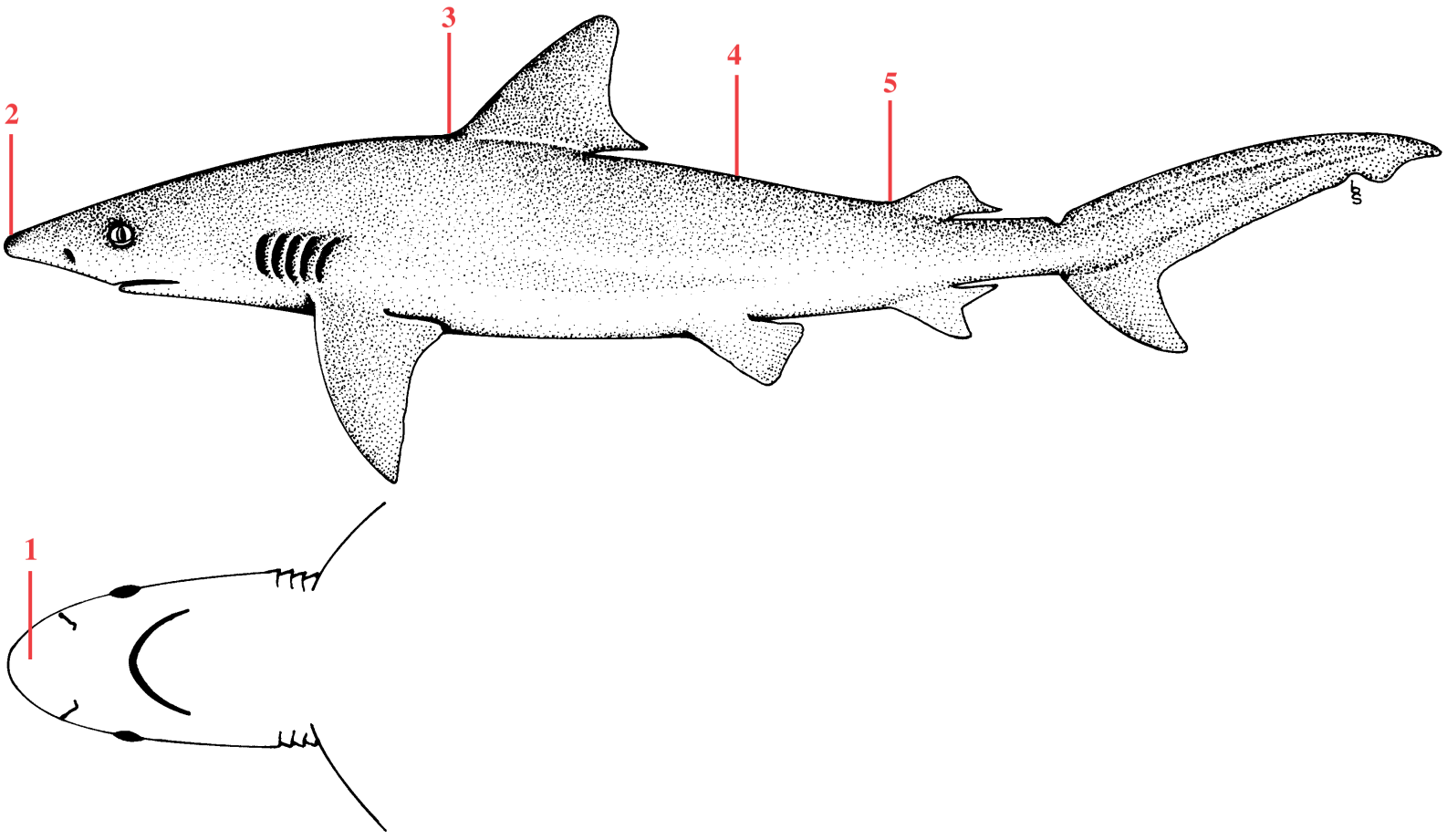
SIZE: Averages 3 to 4 feet and probably seldom exceeds 5 feet in length.

DISTINGUISHING CHARACTERISTICS: A smooth-backed carcharhinid recognized by 1) a snout that is as long as or longer than width of mouth, 2) tip of snout often marked with dark blotch, 3) a large first dorsal fin that originates over or slightly posterior to free rear tips of pectoral fins, 4) the absence of an interdorsal ridge, 5) origins of second dorsal and anal fins are equal, and 6) upper teeth that are strongly notched. See Identification Key, page 42, number 11g.

SIMILAR SPECIES: • The sandbar shark (p. 84), the bignose shark (p. 86), the silky shark (p. 88), the dusky shark (p. 90), and the night shark (p. 92) have an interdorsal ridge. • The bull shark (p. 100) has a very short, broadly rounded snout that is much shorter than width of mouth. • The blacktip shark (p. 102) and the spinner shark (p. 104) have finely serrated upper teeth that are more erect with narrow cusps (not strongly notched) and fins that are black-tipped. • The finetooth shark (p. 106) has upper and lower teeth that are smooth-edged, erect, and not strongly notched, and a snout that is shorter than width of mouth. • The Atlantic sharpnose shark (p. 110) has a second dorsal fin that originates behind the origin of the anal fin.

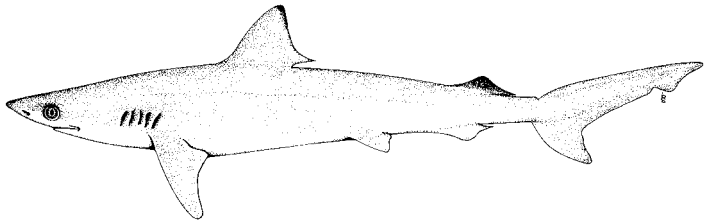
LOCAL DISTRIBUTION AND HABITS: A small shark that is abundant in shallow coastal waters during the spring and summer months. Feeds primarily on small fish and crustaceans and is often preyed upon by larger sharks. Not considered dangerous. Frequently caught by anglers in sounds, bays, and other shallow inshore areas. Smaller sharks (of legal size) are excellent to eat when properly prepared. Reproductive development is placental viviparous.

BLACKNOSE SHARK



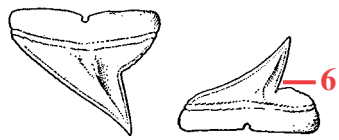
ATLANTIC SHARPNOSE SHARK

Rhizoprionodon terraenovae



DESCRIPTION: Body very slender, greatest depth opposite origin of first dorsal fin; interdorsal ridge absent; snout long, longer than width of mouth, narrowly rounded and thin-tipped; labial furrows long, extending U-shaped around corners of mouth, lower furrows shorter than upper furrows. First dorsal large, triangular, apex pointed, originates posterior to free rear tips of pectoral fins; second dorsal fin small with slender and elongated free rear tip, originates well posterior to origin of anal fin; anal similar in shape to second dorsal with free rear tip terminating well anterior to that of the second dorsal; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper and lower teeth have triangular cusps set on broad bases, outer margin deeply notched. Edges of cusps smooth but may appear slightly wavy at base.



COLOR: Brownish to olive-gray above and white below. Larger juveniles and adults often have a limited number of small but distinct white spots along back and sides. Juveniles may have black-edged dorsal and caudal fins.

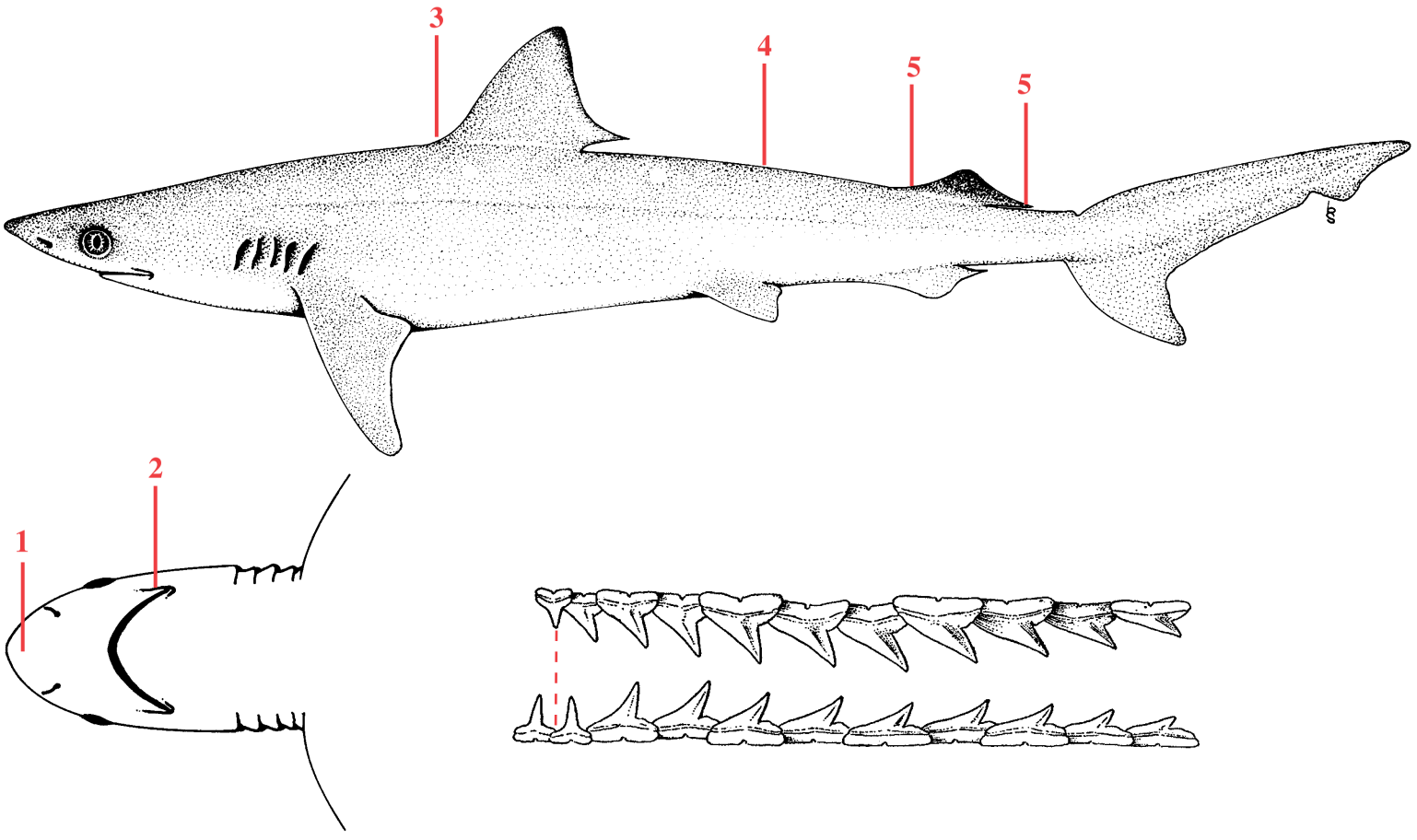
SIZE: Averages 2 to 3 feet and does not exceed 4 feet in length.

DISTINGUISHING CHARACTERISTICS: A smooth-backed carcharhinid recognized by 1) a snout that is longer than width of mouth with a narrowly rounded tip, 2) long labial furrows extending U-shaped around corners of mouth, 3) a first dorsal fin that originates posterior to free rear tips of pectoral fins, 4) the absence of an interdorsal ridge, 5) a second dorsal fin (with slender and elongated free rear tip) that originates well posterior to origin of anal fin, and 6) strongly notched, smooth-edged teeth. See Identification Key, page 42, number 11h.

SIMILAR SPECIES: • The sandbar shark (p. 84), the silky shark (p. 88), and the night shark (p. 92) have an interdorsal ridge. • The spiny dogfish (p. 56) has a conspicuous spine preceding each dorsal fin. • The bull shark (p. 100) and the blacktip shark (p. 102) have a first dorsal fin that originates closely over the axil of each pectoral fin. • The spinner shark (p. 104), the finetooth shark (p. 106), and the blacknose shark (p. 108) have second dorsal fins that originate over the origin of the anal fin.

LOCAL DISTRIBUTION AND HABITS: This is the most abundant shark in coastal waters from April through September. A bottom-dwelling species found throughout sounds, inlets, bays, rivers, estuaries, and along beaches. Often forms schools of animals similar in size. During the winter, also occurs farther offshore in deeper waters of 70 feet or more. Feeds on squid, shrimp, crabs, and a wide variety of small fish. Harmless to swimmers due to its small size. Many are caught by anglers each year. Excellent to eat when properly prepared. Reproductive development is placental viviparous.

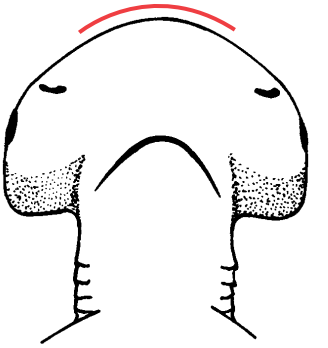
ATLANTIC SHARPNOSE SHARK



Hammerhead Sharks
(Separating Similar Species)

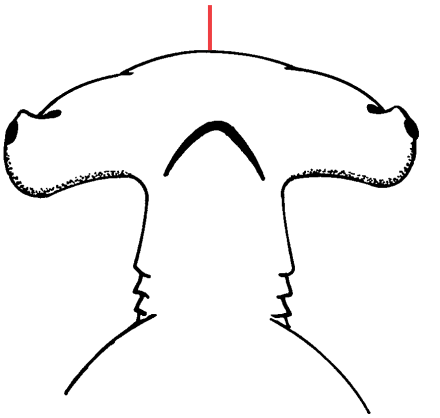
This group of four species is separated from all other sharks by a strongly flattened and laterally expanded "hammer-shaped" or "shovel-shaped" head.

- Separated from the hammerheads by its bonnet or shovel-shaped head (not hammer-shaped)

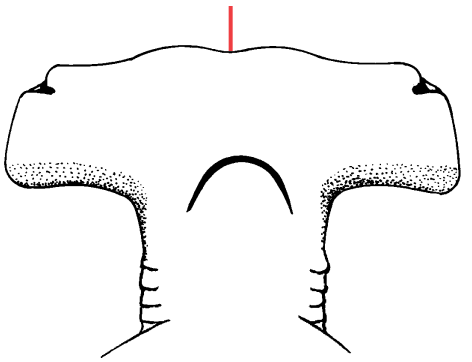


Bonnethead

- Head hammer-shaped
- Anterior margin of head slightly rounded, scalloped, but *not notched at mid-line*
- Teeth smooth-edged

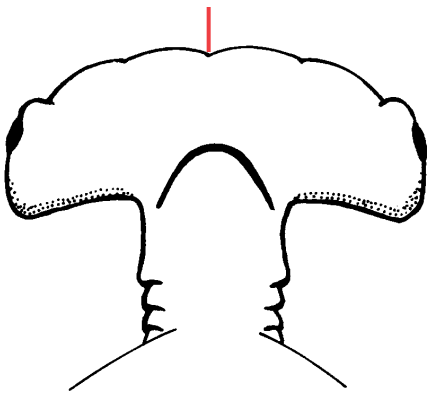


Smooth hammerhead



Great hammerhead

- Head strongly hammer-shaped
- Anterior margin of head *straight-edged* and *deeply notched at mid-line*
- Teeth coarsely serrated

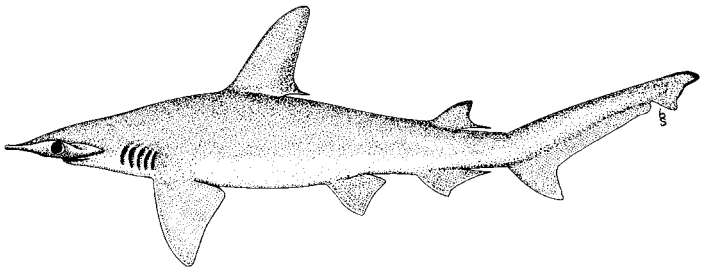


Scalloped hammerhead

- Head hammer-shaped
- Anterior margin of head *slightly rounded and scalloped* with *notch at mid-line*
- Teeth smooth-edged

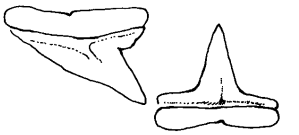
BONNETHEAD

Sphyrna tiburo



DESCRIPTION: Body very slender, somewhat compressed from side to side, greatest depth opposite origin of first dorsal fin; head strongly flattened above and below, shovel-shaped, not hammer-shaped; anterior margin of head noticeably and broadly rounded between the eyes, mid-line smooth, without notch; mouth strongly arched, its corners positioned anterior to rear margin of head; upper labial furrows absent, lower furrows very short. First dorsal large, rudder-like, originates over or slightly anterior to free rear tips of pectoral fins; second dorsal fin small, originates posterior to origin of anal fin; anal larger than second dorsal, its rear margin not deeply concave; pectorals broad; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper teeth triangular with broad bases and narrow cusps, outer margins deeply notched, edges entirely smooth. Lower teeth generally more erect with broad bases, narrower cusps, and smooth edges. Outermost lower teeth becoming flattened crushers.



COLOR: Gray to greenish-brown above and white below. White spots often present on back and sides.

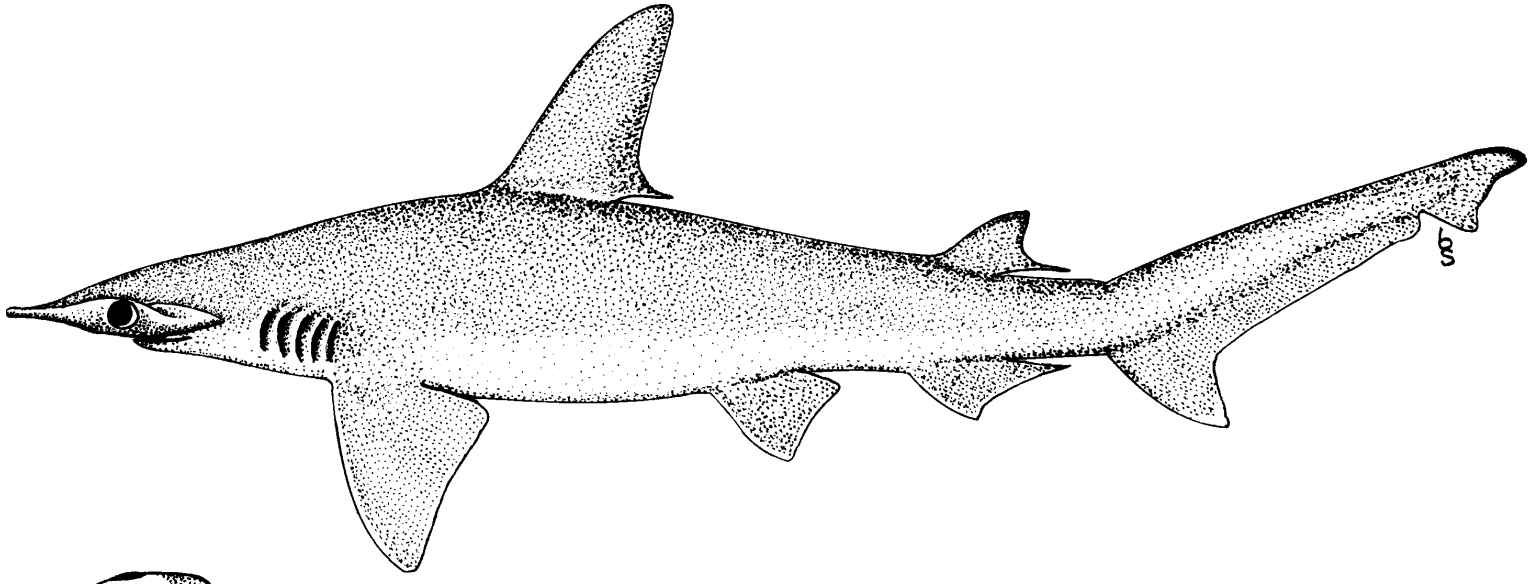
SIZE: Averages 2 to 3 feet in length.

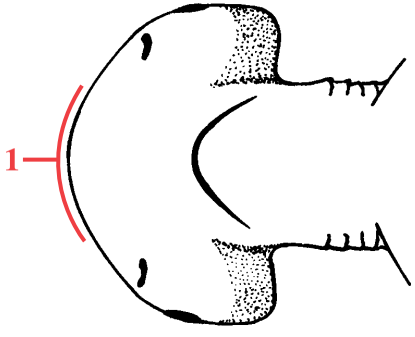
DISTINGUISHING CHARACTERISTICS: Recognized by 1) a "bonnet-shaped" or "shovel-shaped" head (not hammer-shaped) that is evenly rounded between the eyes. See Identification Key, page 43, number 12a.

SIMILAR SPECIES: Separated from all other sharks, including the hammerheads, by the shape of its head. For characteristics on other hammerhead sharks refer to "Hammerhead Sharks" on pages 112 and 113.

LOCAL DISTRIBUTION AND HABITS: During the summer months, occurs abundantly in South Carolina along beaches and in sounds, inlets, rivers, and estuaries. Feeds on squid, shrimp, crabs, and small fish. Harmless to swimmers due to its small size. Frequently caught by anglers on light tackle, primarily on the bottom. Excellent to eat when properly prepared. Reproductive development is placental viviparous.

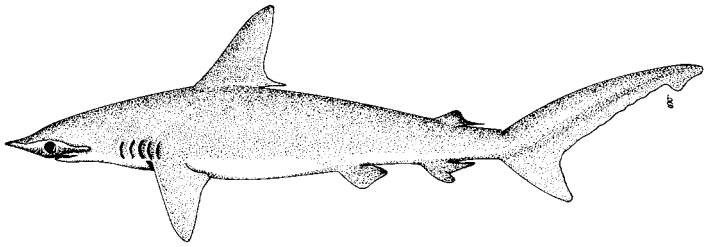
BONNETHEAD





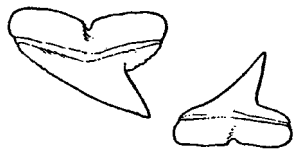
SMOOTH HAMMERHEAD

Sphyrna zygaena



DESCRIPTION: Body moderately stout, noticeably compressed from side to side, greatest depth opposite origin of first dorsal fin; head strongly flattened above and below, broadly expanded laterally, hammer-shaped, anterior margin slightly rounded, scalloped, not notched but smooth at mid-line; mouth strongly arched, corners positioned adjacent to rear margin of head; upper labial furrows absent, lower furrows short. First dorsal large, rudder-like, anterior margin nearly straight-edged to pointed apex, its rear margin concave (but less so than the great hammerhead), originates slightly posterior to axil of each pectoral fin; second dorsal fin small, originates posterior to origin of anal fin to closely above midpoint of base of anal; anal slightly larger than second dorsal, its rear margin more deeply concave; pectorals large, about twice as long as broad; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper and lower teeth triangular, broad-based, with narrow cusps, outer margins becoming increasingly notched toward corners of jaws. Edges of cusps smooth. Some large adults may have weakly serrated cusps.



4

COLOR: Brownish-gray to light gray or olive above and paler to white below. Pectoral fins occasionally dusky or black-tipped.

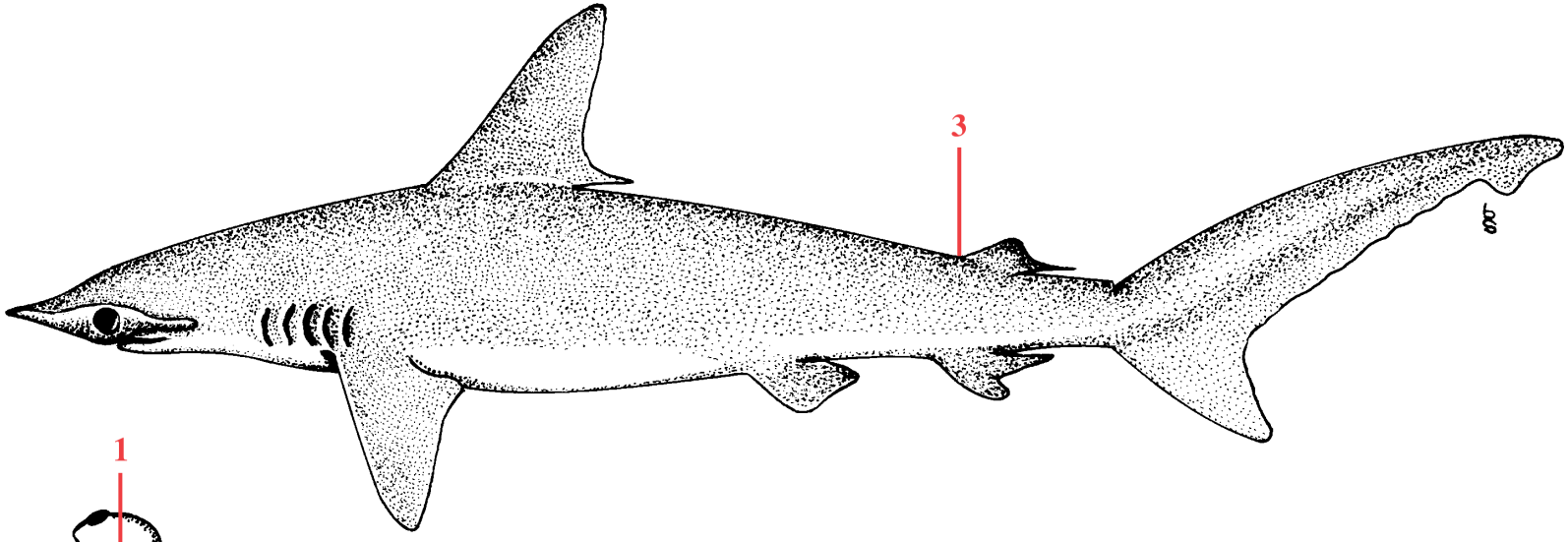
SIZE: Averages 4 to 6 feet and may reach 12 feet in length.

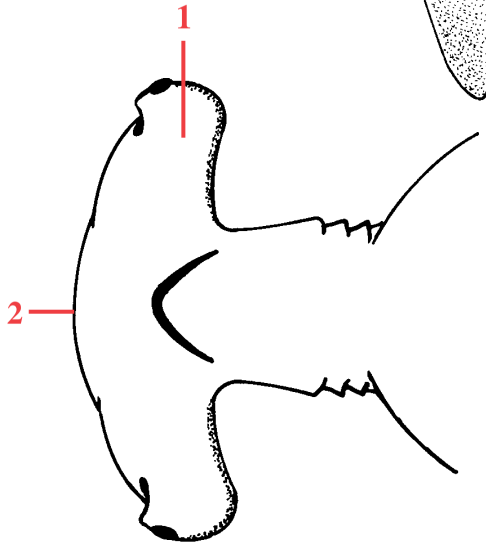
DISTINGUISHING CHARACTERISTICS: Recognized by 1) a distinct "hammer-shaped" head, 2) outer margin of head slightly rounded to appear "scalloped" but not notched at mid-line, 3) a second dorsal fin that originates posterior to origin of anal fin to closely above midpoint of base of anal fin, and 4) upper and lower teeth smooth-edged except in large adults. See Identification Key, page 43, number 12b.

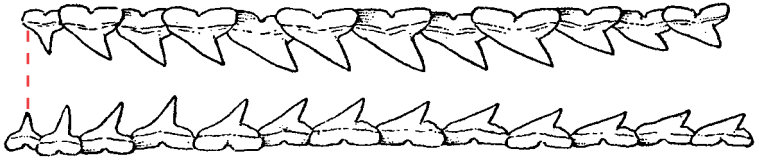
SIMILAR SPECIES: Separated from all other sharks by the shape of its head. For characteristics on other hammerhead sharks refer to "Hammerhead Sharks" on pages 112 and 113.

LOCAL DISTRIBUTION AND HABITS: A strong-swimming shark, only occasionally found in both inshore and offshore waters of South Carolina. During the summer months, small sharks occur infrequently along coastal beachfronts and in rivers while larger adults are most often found farther offshore. Feeds on squid, shrimp, stingrays, small sharks, and a variety of other small fish including mullet, spot, croaker, black sea bass, and flounder. Large adults are potentially dangerous to swimmers. Considered a game fish and occasionally caught by anglers. Small sharks (of legal size) are good to eat when properly prepared. Reproductive development is placental viviparous.

SMOOTH HAMMERHEAD

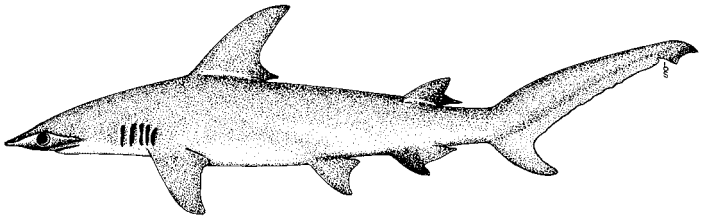






GREAT HAMMERHEAD

Sphyrna mokarran



DESCRIPTION: Body moderately stout, somewhat compressed from side to side, greatest depth opposite origin of first dorsal fin; head strongly flattened above and below, broadly expanded laterally, hammer-shaped, anterior margin very nearly straight-edged, especially in adults, and deeply notched at mid-line; mouth strongly arched, with corners positioned posterior to rear margin of head; upper and lower labial furrows absent. First dorsal large, tall, rudder-like, and noticeably backward sloping, apex noticeably pointed, posterior margin noticeably and deeply concave, originates above axil of each pectoral fin; second dorsal fin small, its posterior margin deeply concave, originates slightly posterior to origin of anal fin; anal a little larger than second dorsal, its rear margin also deeply concave; pectorals large, about twice as long as broad, but noticeably smaller than first dorsal; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper and lower teeth triangular, broad-based with narrow cusps. Edges coarsely serrated with outer margins becoming increasingly notched toward corners of jaws.

3

COLOR: Grayish-brown to dark olive above and white below. Fins often dusky on tips.

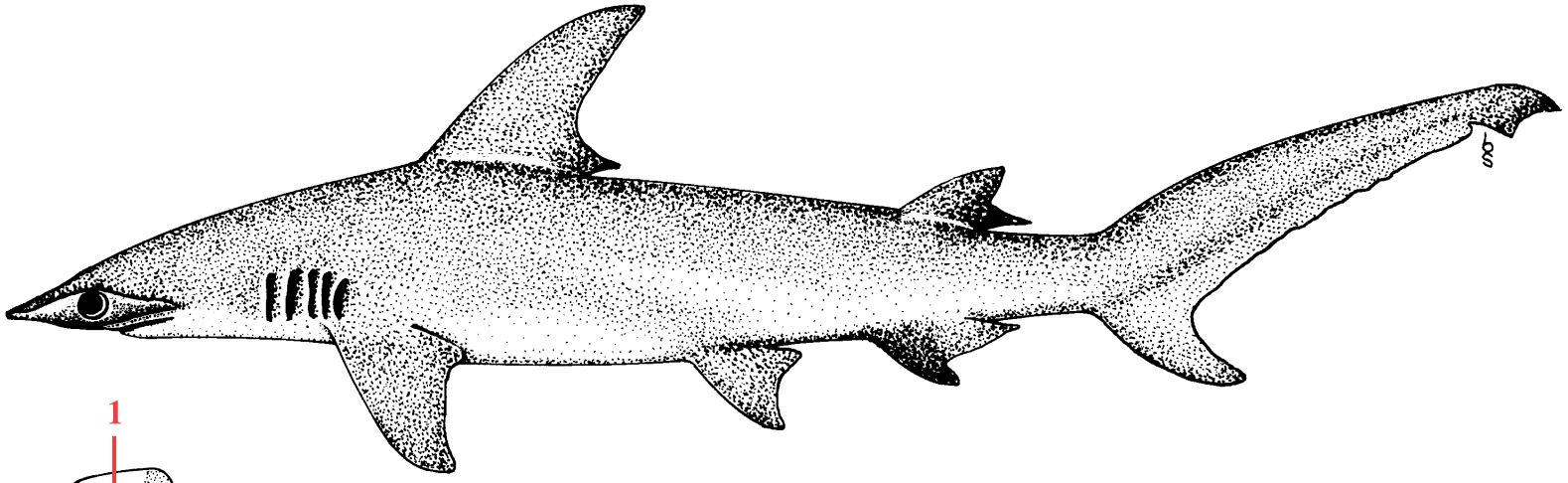
SIZE: The largest of the hammerhead sharks. Averages 8 to 12 feet and reported to reach up to 15 feet in length.

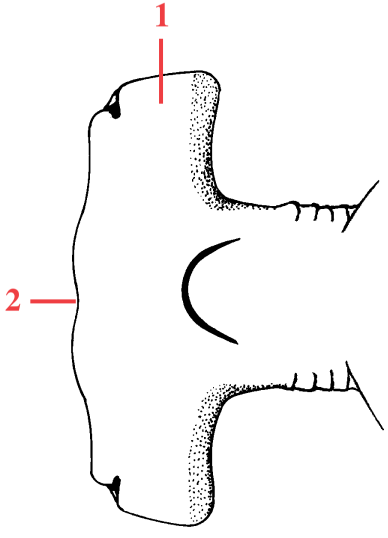
DISTINGUISHING CHARACTERISTICS: Recognized by 1) a distinct "hammer-shaped" head, 2) anterior margin of head nearly straight-edged with deep notch at mid-line, and 3) coarsely serrated upper and lower teeth. See Identification Key, page 43, number 12c.

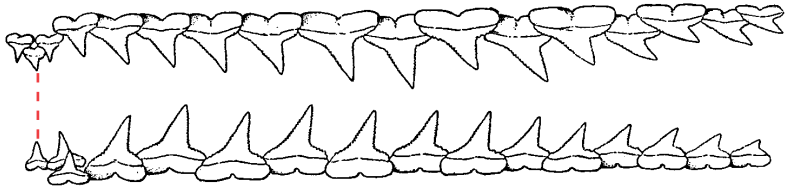
SIMILAR SPECIES: Separated from all other sharks by the shape of its head. For characteristics on other hammerhead sharks refer to "Hammerhead Sharks" on pages 112 and 113.

LOCAL DISTRIBUTION AND HABITS: A large shark that frequents inshore and offshore waters. Occasionally observed swimming at the surface off beaches and over artificial reefs. Feeds on stingrays, sharks, and a wide variety of other smaller fish. A potentially dangerous shark capable of attacking swimmers. Responsible for fatalities in other parts of the world. Considered a game fish and frequently sought by anglers using heavy tackle. Large sharks are not especially edible and should be released. Reproductive development is placental viviparous.

GREAT HAMMERHEAD

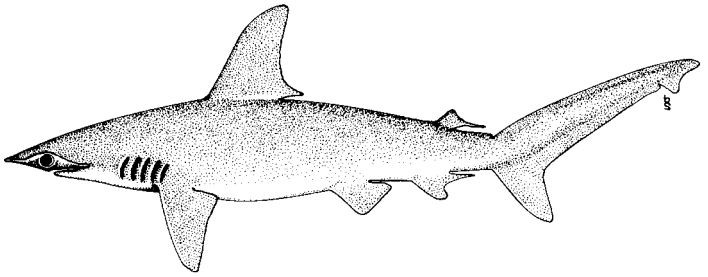






SCALLOPED HAMMERHEAD

Sphyrna lewini



DESCRIPTION: Body moderately stout, noticeably compressed from side to side, greatest depth opposite origin of first dorsal fin; head strongly flattened above and below, broadly expanded laterally, hammer-shaped, anterior margin slightly rounded, scalloped, and noticeably notched at mid-line; mouth strongly arched, with corners positioned posterior to rear margin of head; upper labial furrows absent, lower furrows very short and concealed when mouth is closed. First dorsal large, rudder-like, with concave rear margin (but less so than the great hammerhead), originates slightly posterior to axil of each pectoral fin; second dorsal fin small and long, about twice as long as height, its free rear tip almost reaching precaudal pit, originates well posterior to origin of anal fin; anal larger than second dorsal, its posterior margin more deeply concave; pectorals large, about twice as long as broad; caudal peduncle rounded; caudal fin not lunate.

TEETH: Upper teeth triangular, broad-based with narrow, deeply notched cusps. Lower teeth with narrower cusps, erect toward center of jaws. Upper and lower teeth smooth-edged.

COLOR: Olive to brownish-gray above and white below. Tips of pectoral fins often dark gray to black on lower surfaces.

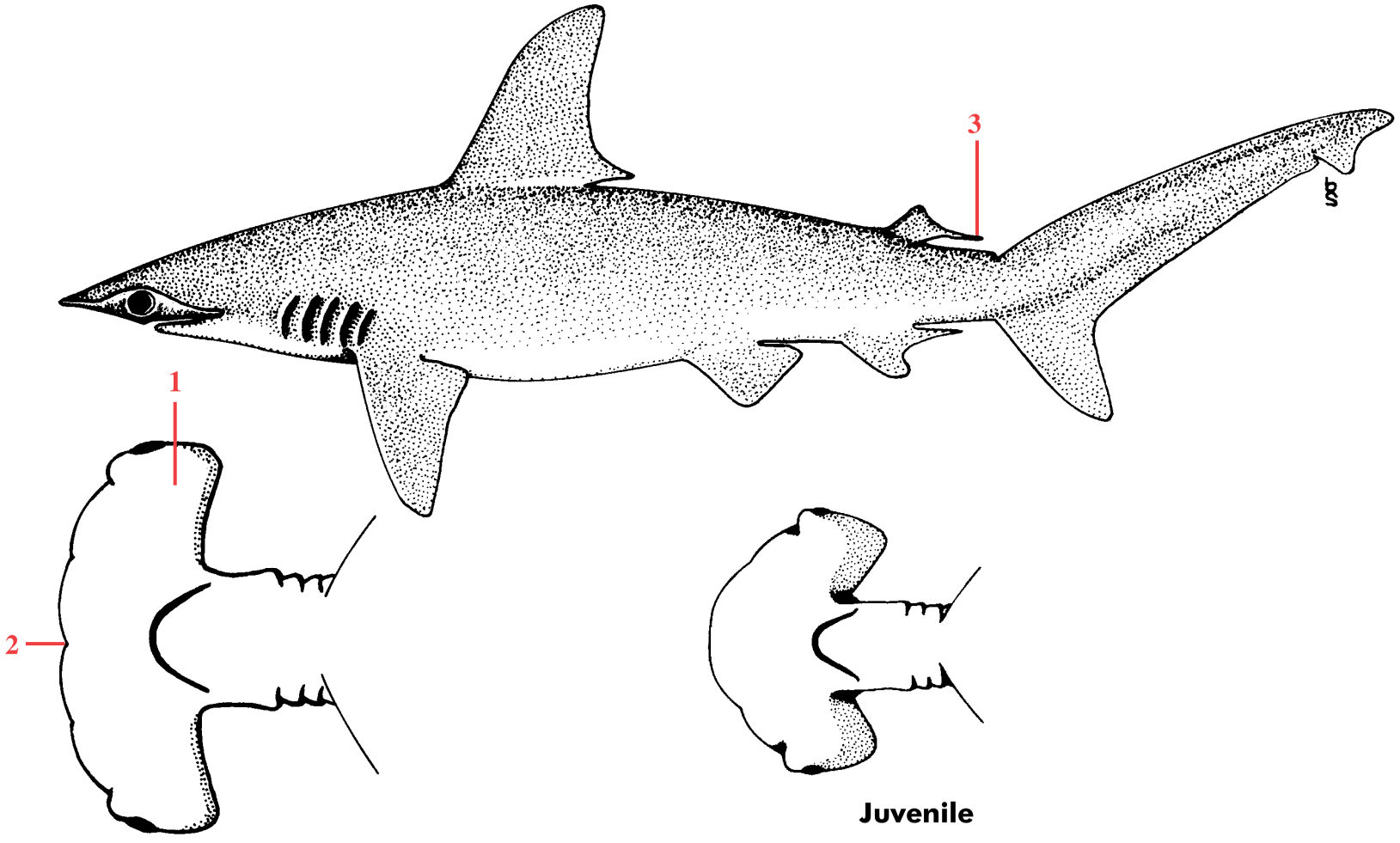
SIZE: Averages 4 to 8 feet and may reach up to 10 feet in length.

DISTINGUISHING CHARACTERISTICS: Recognized by 1) a distinct "hammer-shaped" head, 2) anterior margin of head slightly rounded to appear "scalloped" and notched at mid-line, 3) a long second dorsal fin with its free rear tip almost reaching precaudal pit, originates well behind origin of anal fin, and 4) upper and lower teeth smooth-edged. See Identification Key, page 43, number 12d.

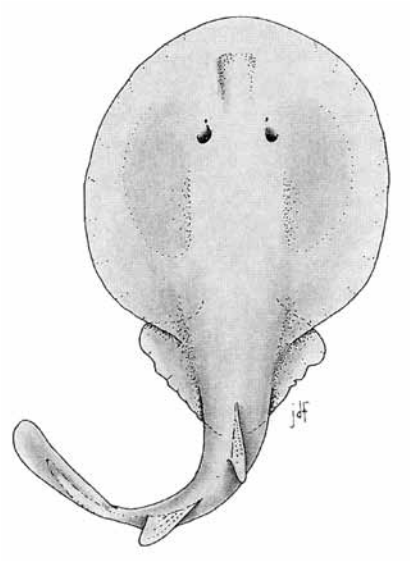
SIMILAR SPECIES: Separated from all other sharks by the shape of its head. For characteristics on other hammerhead sharks refer to "Hammerhead Sharks" on pages 112 and 113.

LOCAL DISTRIBUTION AND HABITS: Except for the bonnethead, the most common hammerhead in inshore and offshore waters. Smaller sharks most frequently occur close to shore and in sounds, inlets, bays, and rivers. Found on the bottom but will occasionally surface, often with its dorsal fin visible. Feeds on squid, shrimp, stingrays, small sharks, and other small fish. Large adults are potentially dangerous to swimmers. Considered a game fish, often taken by anglers throughout the summer. Smaller sharks (of legal size) are good to eat when properly prepared. Reproductive development is placental viviparous.

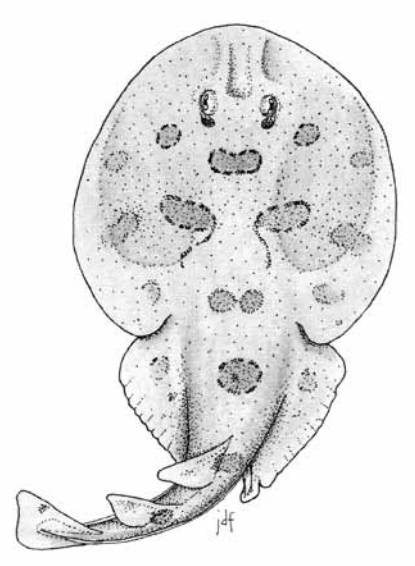
SCALLOPED HAMMERHEAD



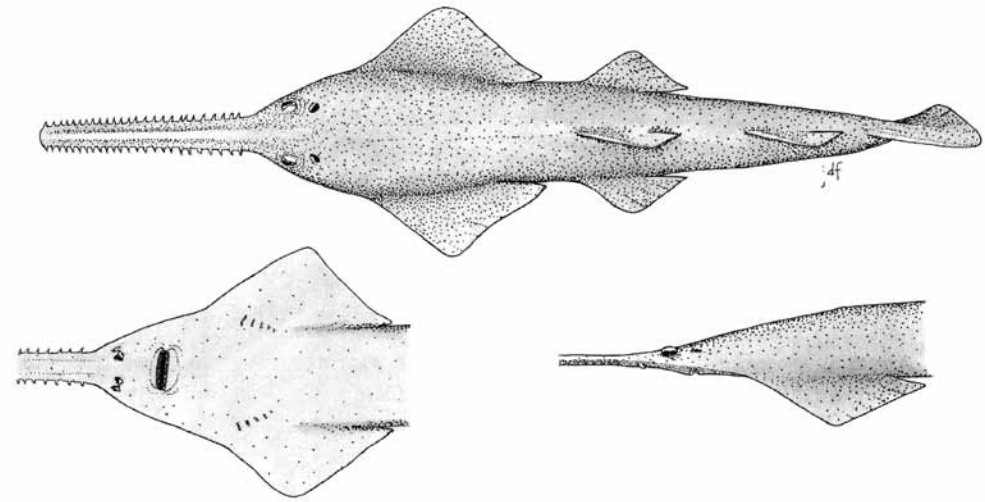
*OTHER COMMON ELASMOBRANCH FISHES OF SOUTH CAROLINA



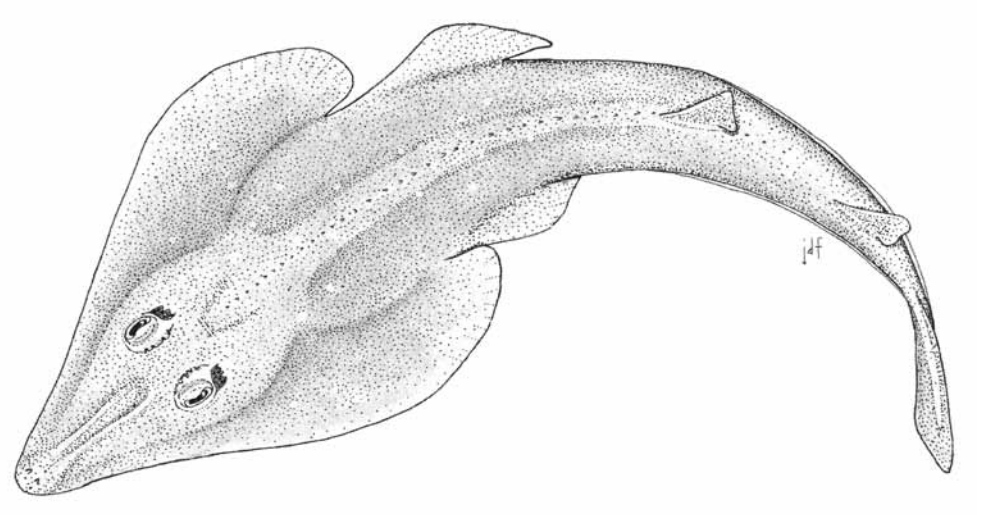
DEEP-SEA ELECTRIC RAY



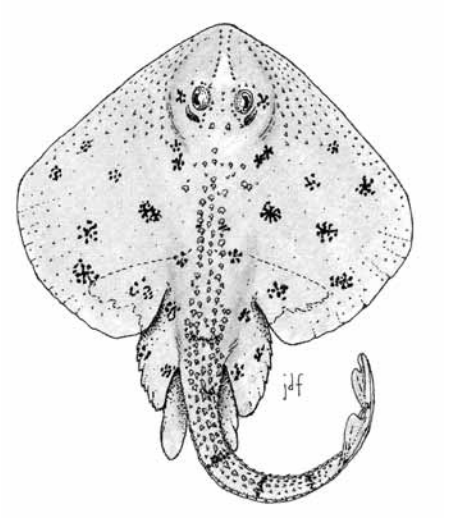
LESSER ELECTRIC RAY



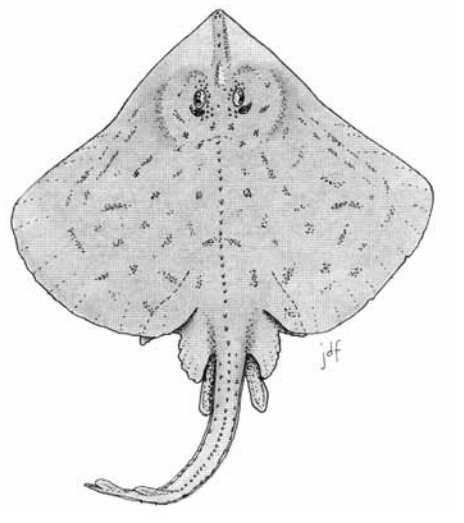
SMALLTOOTH SAWFISH



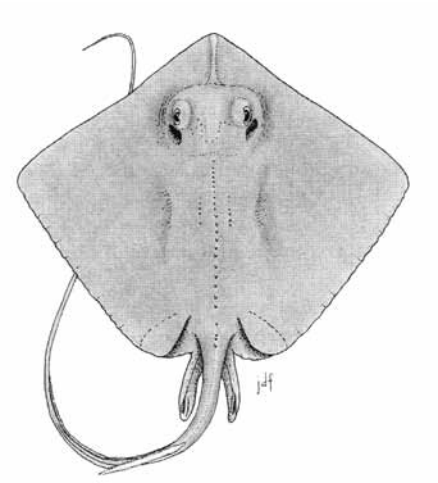
ATLANTIC GUITARFISH



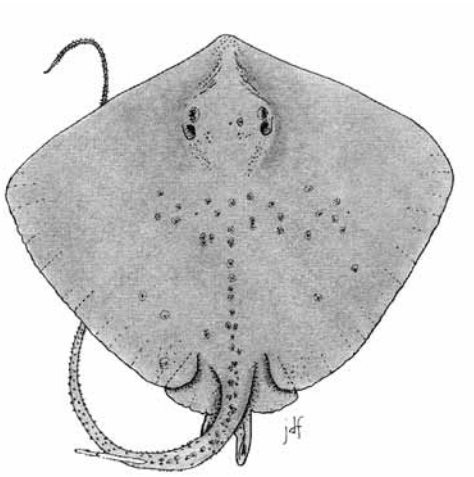
ROSETTE SKATE



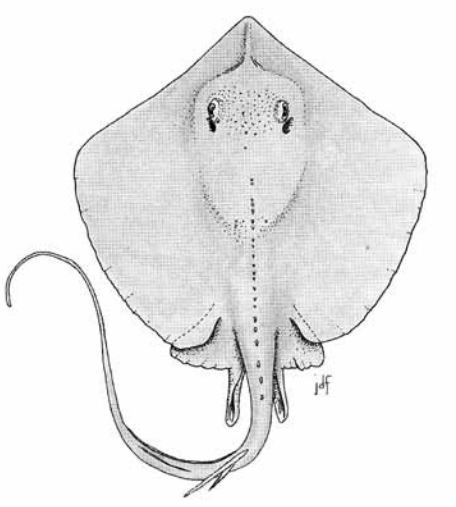
CLEARNOSE SKATE



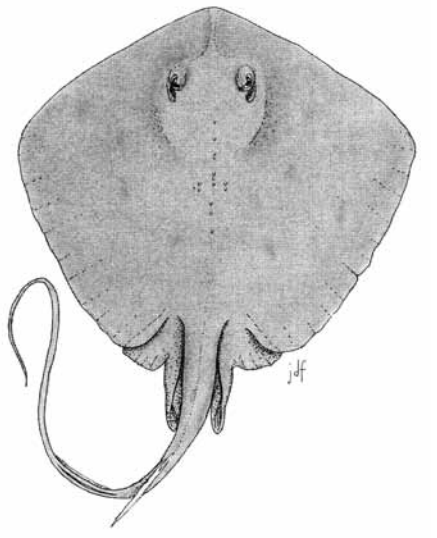
SOUTHERN STINGRAY



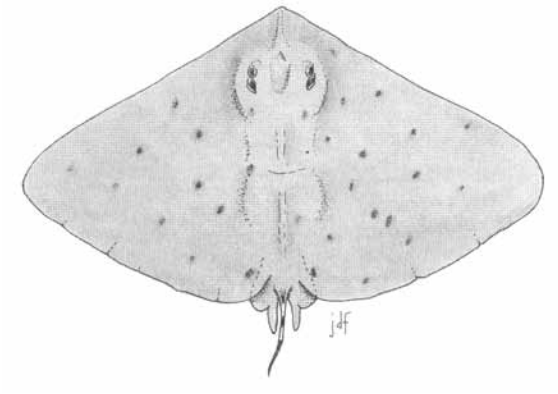
ROUGHTAIL STINGRAY



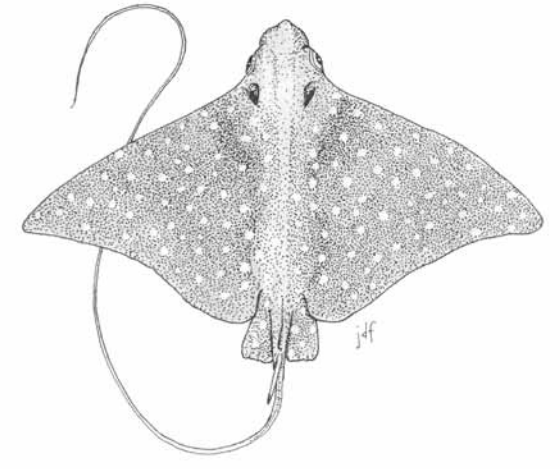
ATLANTIC STINGRAY



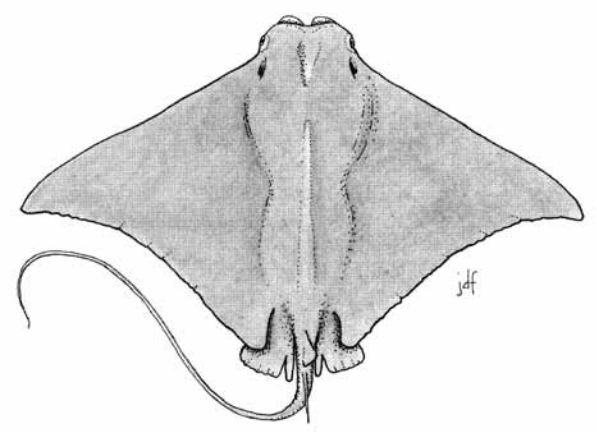
BLUNTNOSE STINGRAY



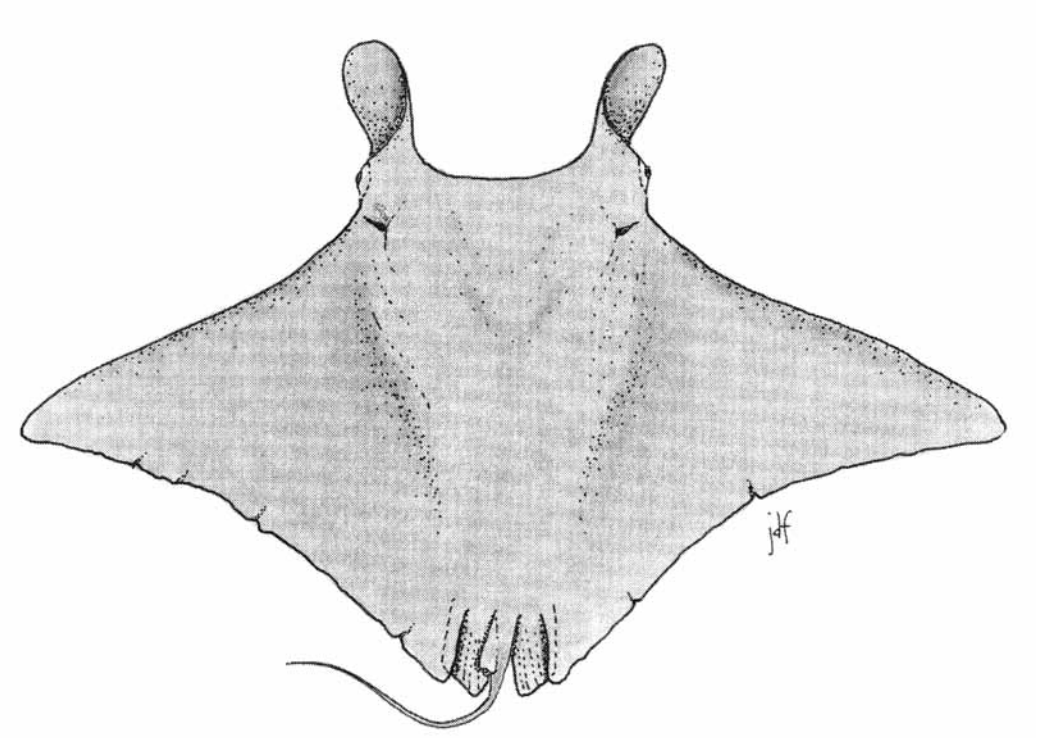
SMOOTH BUTTERFLY RAY



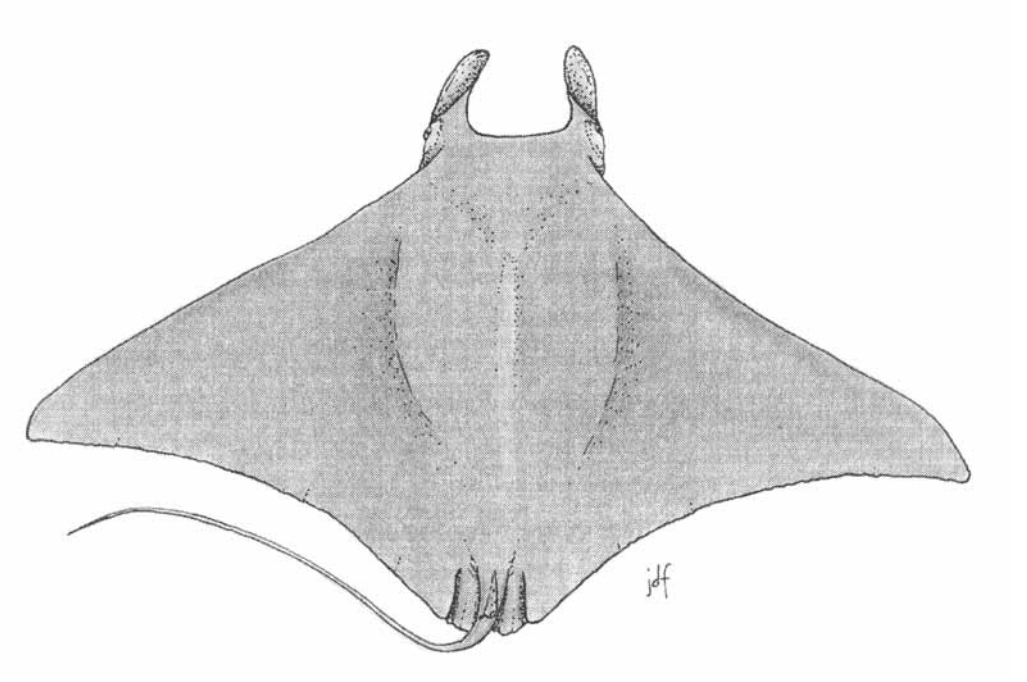
SPOTTED EAGLE RAY



COW-NOSED RAY



ATLANTIC MANTA RAY



GIANT DEVIL RAY

* The illustrations of the skates and rays in "Other Common Elasmobranch Fishes of South Carolina" are taken from *Fishes of the Gulf of Mexico, Volume I,* by John D. McEachran and Janice D. Fechhelm and are used with permission from the University of Texas Press, Austin.

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Page numbers in *italics* depict a picture, while page numbers in **bold** depict the pages in the "Description of Species by Family" section.

RECOMMENDED INFORMATION RESOURCES

- The Center For Shark Research
  http://www.mote.org/~rhueter/sharks/shark.phtml
- ElasmoWorld
  http://www.elasmoworld.org/conservation/index.shtml
- Florida Marine Research Institute
  http://www.floridamarine.org/
- The Florida Museum of Natural History
  http://www.flmnh.ufl.edu/fish/Sharks/sharks.htm
- Guide to Sharks, Tunas & Billfishes of the Atlantic and Gulf of Mexico
  http://www.aoml.noaa.gov/general/lib/shark.html
- Monterey Bay Aquarium
  http://www.mbayaq.org/efc/efc_hp/eqf_sharks.asp
- Mote Marine Laboratory Center for Sharks
  http://www.mote.org/~rhueter/sharks/shark.phtml
- National Geographic
  http://www.nationalgeographic.com/kids/creature_feature/0206/sharks.html
- National Marine Fisheries Service Apex Predators Program
  http://na.nefsc.noaa.gov/sharks/
- NMFS Atlantic Highly Migratory Species
  http://www.nmfs.noaa.gov/sharks/
- The Ocean Conservancy
  http://www.oceanconservancy.org/dynamic/learn/wildlife/sharks/sharks.htm
- Pelagic Shark Research Foundation
  http://www.pelagic.org/
- Shark Foundation
  http://www.shark.ch/home.shtml
- Shark Population Assessment Group
  http://www.sefscpanamalab.noaa.gov/shark/
- Shark Research
  http://www.sefscpanamalab.noaa.gov/shark/
- Shark Trust
  http://www.sharktrust.org/sharkconservation.html

B-SAF
BOATING SAFETY ACTION FORCE

Boating and fishing go hand-in-hand. Before going out on the water, take a free boating safety course offered by the South Carolina Department of Natural Resources.

Call 1-800-277-4301 to sign up today and remember to boat responsibly!

Pre-Departure Checklist

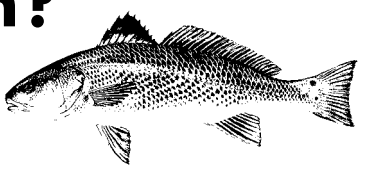
To ensure an enjoyable time while operating your boat, perform this pre-departure check:

- Leave your float plan with a responsible person.
- Check for proper operation of steering.
- Make sure the throttle control is operating properly.
- Check for any fuel leaks from the tank, fuel lines, or carburetor.
- Check the engine compartment for oil leaks.
- Check hose connections for leaks or cracks and make sure hose clamps are tight.
- Drain all water from the engine compartment and be sure the bilge plug is replaced and secure.
- Check to be sure the fire extinguisher is fully charged.
- Make sure that any other plugs are secure in your boat.
- Fill the gas tank(s) before departure.
- Make sure you have the required number of personal flotation devices (PFD's) and that they are in good condition.

Life Jackets Float - You Don't. Wear Them!

Take a boating safety course 1-800-277-4301

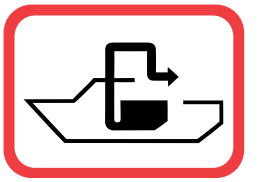
Remember When You Caught Your First Fish?



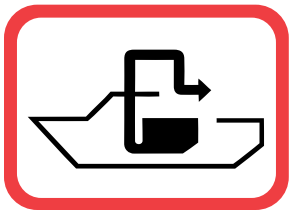
Our children will not experience the same thrill unless we keep this country's waterways pollution-free. Sewage pollution poses a serious threat to the aquatic environment. Almost 75 percent of all recreationally and commercially important marine species spend all or part of their lives in the estuarine waters of our coast. If these habitats are damaged by pollution, it will have devastating effects on fish and shellfish. Using pumpout and dump stations is something we can all do to protect our waters.

Support the Clean Vessel Act!

SPORT FISH RESTORATION



U.S. Fish and Wildlife Service
South Carolina Department of Natural Resources



Keep Our Waters Clean- Use Pumpouts!

- NEVER discharge raw sewage in U.S. territorial waters.
- Use onshore restrooms.
- When underway, use approved Marine Sanitation Devices (MSD's).
- NEVER discharge treated or untreated sewage in designated No Discharge Zones (NDZ's).
- Avoid discharging Type I or Type II MSD's near swimming areas, marinas, anchorages, or oyster beds.
- Use Type III MSD's (holding tanks) whenever possible.
- Establish a regular maintenance schedule for your MSD based on manufacturer's recommendations.
- Pump out and rinse tanks regularly.
- Use enzyme-based products to control odor and reduce solids in holding tanks.
- Avoid holding tank products that contain quaternary ammonium compounds (QAC) and formaldehyde.

For Information on
Pumpout and Dump Stations,
Call
1-800-ASK-FISH

SHOW YOUR SUPPORT FOR
SOUTH CAROLINA'S MARINE RESOURCES

Attention fishermen, boaters, conservationists, and everyone who loves the water: The South Carolina Department of Natural Resources is proud to announce the creation of a Saltwater Conservation Vehicle License Plate. The "Gone Fishing" license plate features South Carolina's most popular saltwater game fish, the red drum. The license plate portrays the importance of saltwater recreational fishing in South Carolina and serves as a symbol of fisheries conservation. Funds from the sale of the plate will help protect South Carolina's marine resources and provide additional fishing opportunities through programs such as Red Drum Stock Enhancement, construction of Marine Artificial Reefs, and Oyster Recycling/Restoration.

To purchase this one-of-a-kind license plate contact your local South Carolina Department of Public Safety's Division of Motor Vehicles or visit www.scdmvonline.com. The cost of the plate is $75.00 in addition to the regular registration fee.

South Carolina citizens are encouraged to purchase this special license plate to ensure the sustainability of our coastal resources for future generations.

Make a Difference, Order Your
Saltwater Conservation Vehicle License Plate Today!

South Carolina Department of Natural Resources

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____

Personal Record Form

Common name: _____

Scientific name: _____

Date captured or observed: _____

Location: _____

Offshore: Latitude: _____ Longitude: _____

Depth of capture: _____ feet

Method of capture: _____ Bait: _____

Total length: _____ Estimated length: _____

Total weight: _____ Estimated weight: _____

Sex: Male _____ Female _____

General remarks: _____