

NOAA Technical Report NMFS Circular 435



Field Guide to Fishes Commonly Taken in Longline Operations in the Western North Atlantic Ocean

Joseph L. Russo

January 1981

U.S. DEPARTMENT OF COMMERCE
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National Marine Fisheries Service

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400. Fishery publication index, 1965-74. By Mary Ellen Engett and Lee C. Thorson. March 1977, iii + 220 p. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; Stock No. 003-020-00127-1.
401. Fisheries and fishery resources of New York Bight. By J. L. McHugh. March 1977, v + 50 p., 43 figs., 49 tables. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; Stock No. 003-020-00129-7.
402. Guide to the identification of scorpionfish larvae (Family Scorpaenidae) in the eastern Pacific with comparative notes on species of *Sebastes* and *Helicolenus* from other oceans. By H. Geoffrey Moser, Elbert H. Ahlstrom, and Elaine M. Sandknop. April 1977, v + 71 p., 40 figs., 38 tables. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; Stock No. 003-020-00128-9.
403. Marine flora and fauna of the northeastern United States. Sipuncula. By Edward B. Cutler. July 1977, iii + 7 p., 6 figs. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; Stock No. 003-012-00404-0.
404. Revision of the sea basses of the genus *Diplletrum* (Pisces: Serranidae). By Stephen A. Bortone. September 1977, v + 49 p., 15 figs., 9 tables.
405. Marine flora and fauna of the northeastern United States. Echino-
- ermment Printing Office, Washington, DC 20402; Stock No. 003-017-00412-1.
406. Marine flora and fauna of the northeastern United States. Copepoda: Lernaepodidae and Sphyriidae. By Ju-Shey Ho. December 1977, iii + 14 p., 16 figs. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; Stock No. 003-017-00412-1.
407. Distribution of decapod Crustacea off northeastern United States based on specimens at the Northeast Fisheries Center, Woods Hole, Massachusetts. By Austin B. Williams and Roland L. Wigley. December 1977, iii + 44 p., 2 figs., 1 table, 57 charts.
408. Collection of tuna baitfish papers. (20 papers.) By Richard Shomura (editor). December 1977, iii + 167 p.
409. Marine flora and fauna of the northeastern United States. Copepoda: Cyclopoids parasitic on fishes. By Ju-Shey Ho. February 1978, iii + 12 p., 17 figs.
410. The 1976 *Ceratium tripos* bloom in the New York Bight: description and consequences. By Thomas C. Malone. May 1978, iv + 14 p., 1 table.
411. Systematics and biology of the tilefishes (Perciformes: Branchiostegidae and Malacanthidae), with descriptions of two new species. By James K. Dooley. April 1978, v + 78 p., 44 figs., 26 tables.
412. Synopsis of biological data on the red porgy, *Pagrus pagrus* (Linnaeus). By Charles S. Manooch III and William W. Hassler. May 1978, iii + 19 p., 12 figs., 7 tables. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; Stock No. 003-017-00418-0.
413. Marine flora and fauna of the northeastern United States. Crustacea: Branchiura. By Roger F. Cressey. May 1978, iii + 1 p., 1 fig. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; Stock No. 003-017-00419-1.
414. Synopsis of biological data for the winter flounder, *Pseudopleuronectes americanus* (Walbaum). By Grace Klein-MacPhee. No. 1978, iii + 43 p., 21 figs., 28 tables.
415. A basis for classifying western Atlantic Sciaenidae (Teleostei: Perciformes). By Labbish Ning Chao. September 1978, v + 6 p., 1 table.
416. Ocean variability: Effects on U.S. marine fishery resources. (20 papers.) By Julien R. Goulet, Jr. and Elizabeth D. H. Editors. December 1978, iii + 350 p.
417. Guide to the identification of genera of the fish Ophidiiformes with a tentative classification of the order. By D. D.

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U.S. DEPARTMENT OF COMMERCE

Philip M. Klutznick, Secretary

National Oceanic and Atmospheric Administration

Richard A. Frank, Administrator

National Marine Fisheries Service

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Field Guide to Fishes Commonly Taken in Longline Operations in the Western North Atlantic Ocean

JOSEPH L. RUSSO¹

ABSTRACT

Keys and species accounts are provided for 43 species of fishes commonly or potentially taken during longline operations in the western North Atlantic Ocean, including the Gulf of Mexico and the Caribbean Sea. The groups of fishes discussed are sharks, lancetfishes, the opah, pomfrets, dolphins, the barracuda, jacks, snake mackerels, tuna and mackerellike fishes, and billfishes.

INTRODUCTION

This guide is a compilation from the literature that treats fishes commonly (or potentially) taken during surface longline operations for tunas, swordfish, sharks, and other fishes. Several species included in this guide are not normally taken by longline operations because of their commercial potential. The geographic coverage of this guide is limited to the western North Atlantic Ocean, including the Gulf of Mexico and the Caribbean Sea. The keys are designed to facilitate rapid and accurate identification of adults of each species. Characters and structures used to identify groups and species are illustrated for sharks and bony fishes (Fig. 2) or are explained in the text. The

species accounts are presented alphabetically within each group. In most cases the common names used are taken from Fischer (1978) because of their international usage; however, official American Fisheries Society (Bailey et al. 1970) names are indexed.

All characters and statements in this guide (unless otherwise stated) refer strictly to those species listed which occur within the geographic limits of this guide. If a species not listed in this guide is taken, a general reference to fishes of this region should be consulted, i.e., Hildebrand and Schroeder (1928), Bigelow and Schroeder (1953), Miyake and Hayasi (1972), Fischer (1978), or the continuing series, *Fishes of the Western North Atlantic*, published by the Sears Foundation for Marine Research. For general references to longline operations see: Wathne (1959) and Wilson and Bartlett (1967).

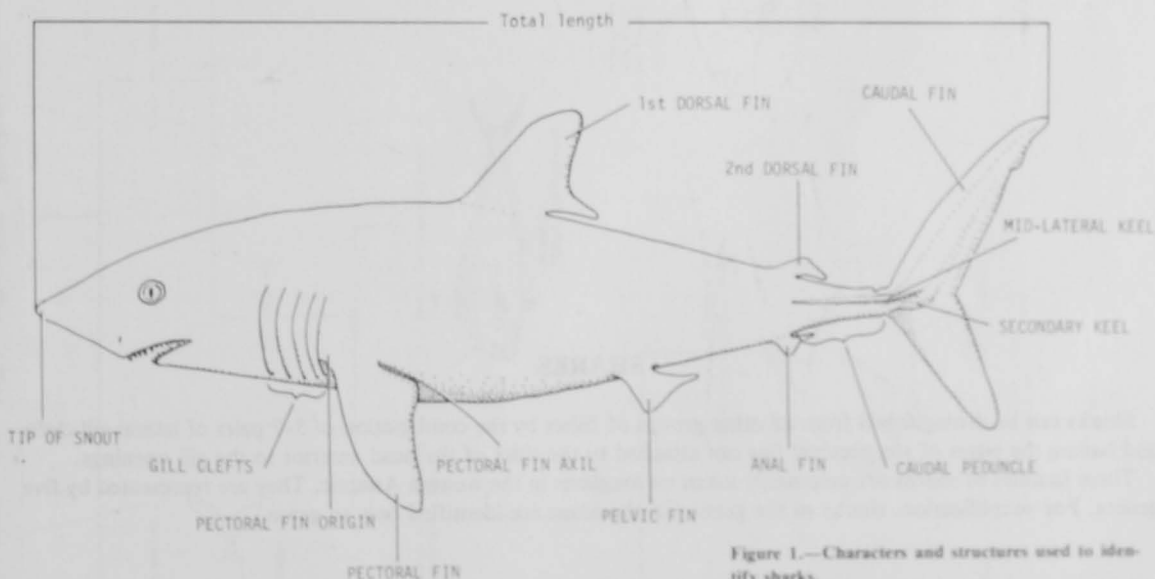


Figure 1.—Characters and structures used to identify sharks.

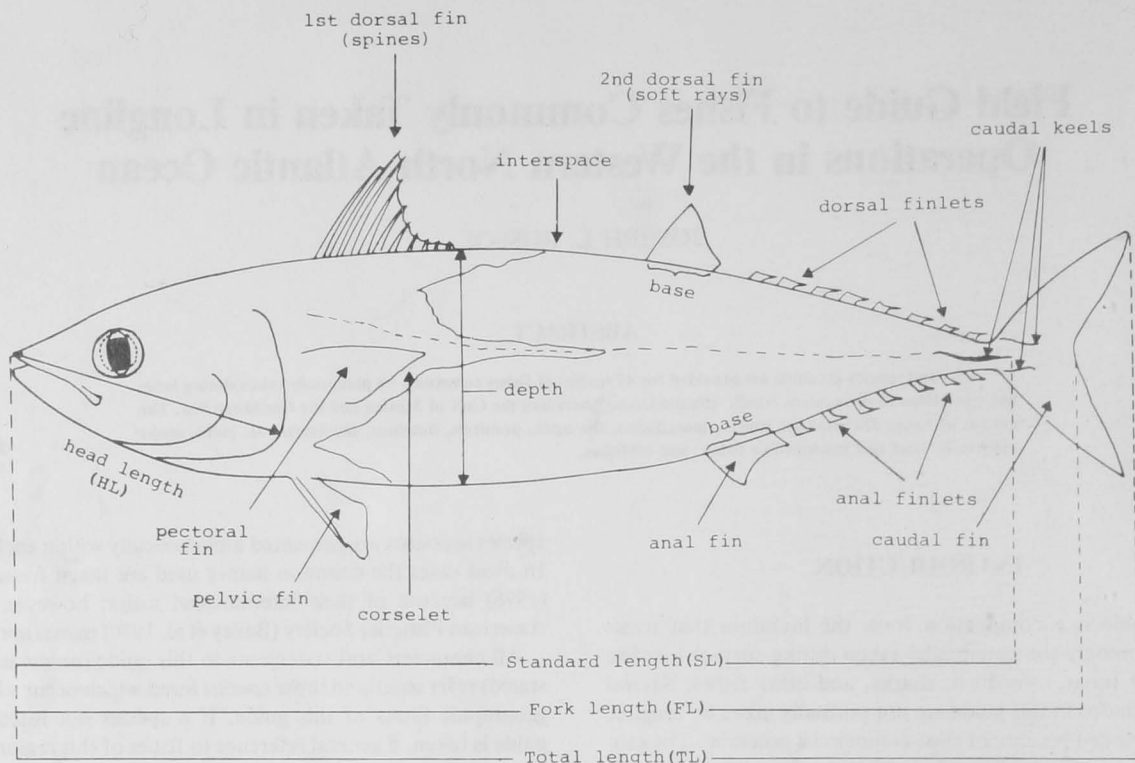


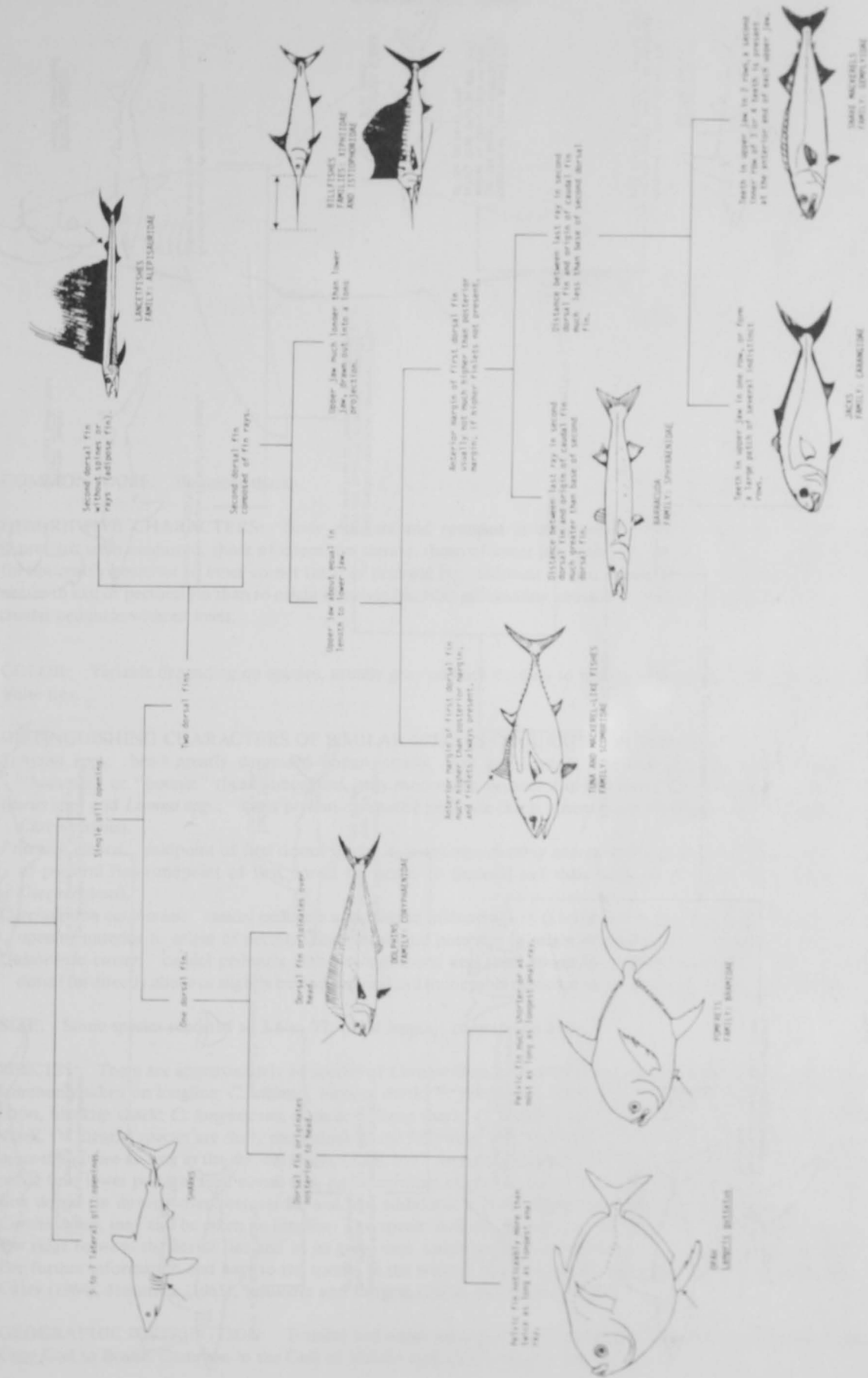
Figure 2.—Characters and structures used to identify bony fishes.

SHARKS

Sharks can be distinguished from all other groups of fishes by the combination of 5-7 pairs of lateral gill clefts and having the edges of the pectoral fins not attached to the sides of the head anterior to the gill openings.

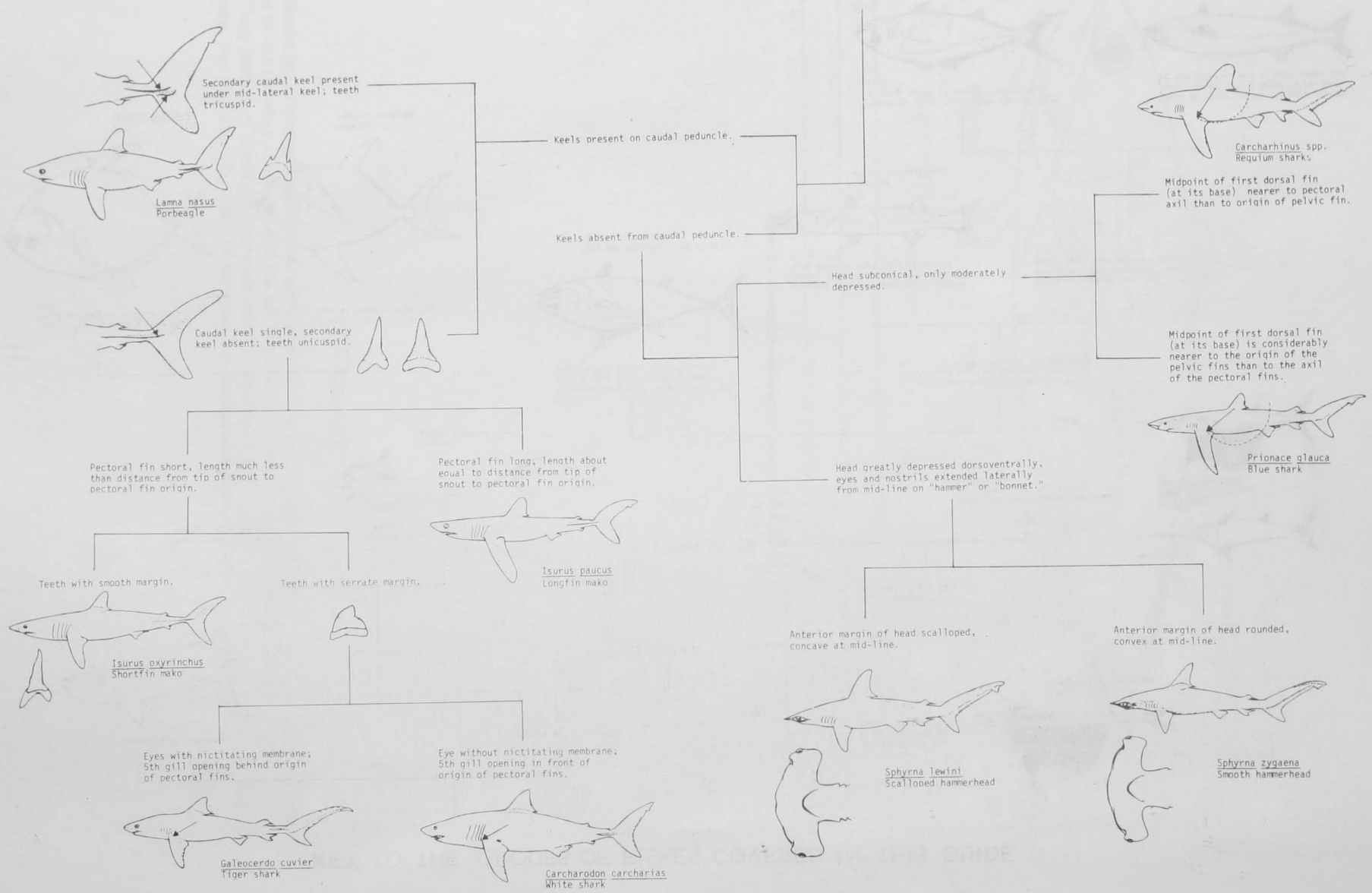
Three families of sharks are commonly taken on longlines in the western Atlantic. They are represented by five genera. For simplification, sharks of the genus *Carcharhinus* are identified only to genus.

KEY TO THE GROUPS OF FISHES COVERED IN THIS GUIDE

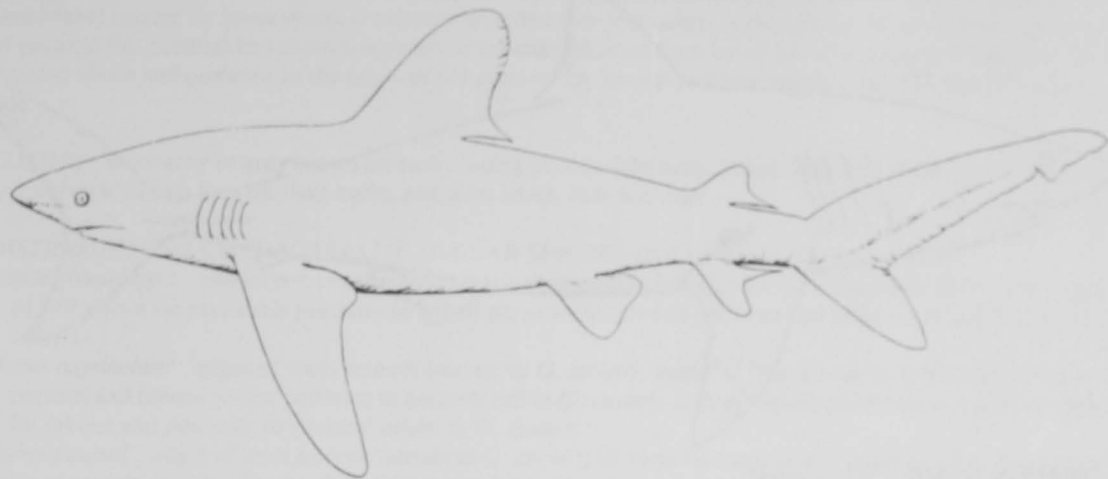


KEY TO THE GROUPS OF FISHES COVERED IN THIS GUIDE

KEY TO THE SHARKS COVERED IN THIS GUIDE



4



COMMON NAME: Requiem sharks.

DESCRIPTIVE CHARACTERS: Body elongate and rounded in cross section; head subconical, moderately depressed; teeth unicuspid, those of upper jaw serrate, those of lower jaw serrate or smooth; origin of first dorsal fin noticeably posterior to inner corner (axil) of pectoral fin; midpoint of first dorsal fin (at its base) considerably nearer to axil of pectoral fin than to origin of pelvic fin; fifth gill opening above and posterior to origin of pelvic fin; caudal peduncle without keels.

COLOR: Variable depending on species, usually gray on back shading to white on belly; fins may have black or white tips.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Sphyrna spp.: head greatly depressed dorsoventrally, eyes and nostrils extended laterally from midline on "hammer" or "bonnet" (head subconical, only moderately depressed in species of *Carcharhinus*).

Isurus spp. and *Lamna* spp.: keels present on caudal peduncle (keels absent from caudal peduncle of species of *Carcharhinus*).

Prionace glauca: midpoint of first dorsal fin (at its base) considerably nearer to origin of pelvic fins than to axil of pectoral fins (midpoint of first dorsal fin nearer to pectoral axil than to origin of pelvic fin in species of *Carcharhinus*).

Carcharodon carcharias: caudal peduncle with distinct midlateral keel (keel absent in *Carcharhinus* spp.); fifth gill opening anterior to origin of pectoral fins (above and posterior to origin of pectoral fin in *Carcharhinus* spp.).

Galeocerdo cuvier: caudal peduncle with low midlateral keel (keel absent in *Carcharhinus* spp.); origin of first dorsal fin directly above or slightly behind pectoral axil (noticeably posterior to pectoral axil in *Carcharhinus* spp.).

SIZE: Some species reported to 3.6 m TL (total length); common to 2 m.

SPECIES: There are approximately 14 species of *Carcharhinus* known from the western Atlantic, 7 of which are commonly taken on longline: *C. altimus*, bignose shark; *C. falciformis*, silky shark; *C. leucas*, bull shark; *C. limbatus*, blacktip shark; *C. longimanus*, oceanic whitetip shark; *C. milberti*, sandbar shark; and *C. obscurus*, dusky shark. Of these, 4 species are easily recognized by the following: in *C. falciformis* free rear corner of second dorsal more than twice as long as the vertical height of fin; in *C. limbatus*, pectoral fins tipped with black; *C. longimanus*, pelvic fins, lower pectoral fins, dorsal fins, and sometimes caudal fin tipped with gray white; *C. milberti*, origin of first dorsal fin directly over pectoral fin axil. An additional species, *Hyproprion signatus*, sometimes referred to *Carcharhinus*, may also be taken on longline. This species is distinguished from the above *Carcharhinus* species by a low ridge between the dorsal fins and by its green eyes. Other species of *Carcharhinus* are not easily recognizable. For further information and keys to the species in the western North Atlantic, see Bigelow and Schroeder (1948), Casey (1964), Heemstra (1965), Schwartz and Burgess (1975), and Fischer (1978).

GEOGRAPHIC DISTRIBUTION: Tropical and warm temperate seas of the world. In the western Atlantic, from Cape Cod to Brazil. Common in the Gulf of Mexico and the Caribbean Sea.

Carcharodon carcharias (Linnaeus)



COMMON NAME: White shark.

DESCRIPTIVE CHARACTERS: Body elongate and rounded in cross section; head subconical, moderately depressed; teeth unicuspid and serrate; origin of first dorsal fin noticeably posterior to inner corner (axil) of pectoral fin; midpoint of first dorsal fin (at its base) considerably nearer to axil of pectoral fin than to origin of pelvic fin; pectoral fin length moderate, much less than distance from tip of snout to pectoral fin origin; fifth gill opening in front of pectoral fin; caudal peduncle with a single midlateral keel on each side.

COLOR: Back and upper sides gray, belly white, in young specimens there may be a black spot in pectoral axil and at tip of pectoral fins.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus spp.: caudal peduncle without keels (caudal peduncle with distinct midlateral keel in *C. carcharias*); fifth gill opening above and posterior to origin of pectoral fin (anterior to origin of pectoral fin in *C. carcharias*).

Isurus oxyrinchus: edges of teeth smooth (serrate in *C. carcharias*).

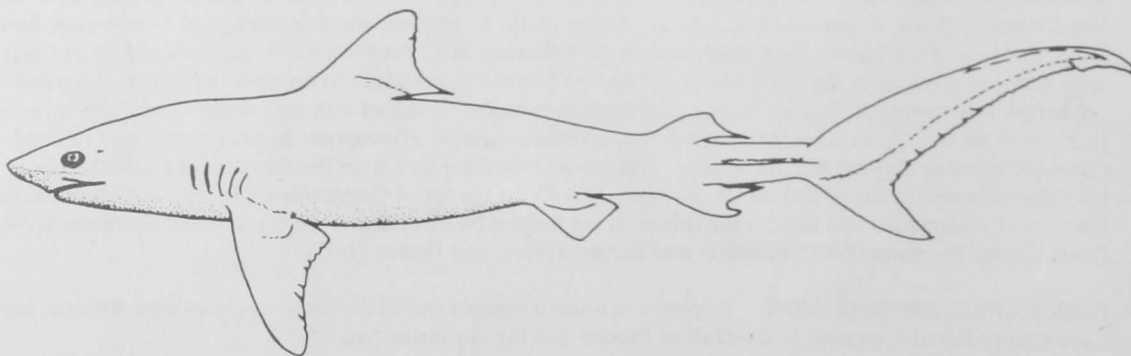
Isurus paucus: edges of teeth smooth (serrate in *C. carcharias*); pectoral fin long, length about equal to distance from tip of snout to pectoral fin origin (much less than distance from tip of snout to pectoral fin origin in *C. carcharias*).

Galeocerdo cuvier: eye with nictitating membrane (membrane absent in *C. carcharias*); fifth gill opening above and behind origin of pectoral fin (in front of origin of pectoral fin in *C. carcharias*).

SIZE: To 11 m TL; common to 5.5 m.

GEOGRAPHIC DISTRIBUTION: Worldwide in tropical and warm temperate seas. In the western Atlantic it occurs as far north as New England, along the east coast of the United States, and throughout the West Indies to northern South America and Brazil.

Galeocerdo cuvier (Peron and Lesueur)



COMMON NAME: Tiger shark.

DESCRIPTIVE CHARACTERS: Body elongate and rounded in cross section; head subconical, snout short and blunt; teeth unicuspid with tips directed to sides and rear of jaws, serrate; a transparent flap of skin (nictitating membrane) present on lower eyelid, which can be pulled over eye; origin of first dorsal fin above inner corner (axil) of pectoral fin; pectoral fins short, length much less than distance from tip of snout to pectoral fin origin; fifth gill opening above and posterior to the origin of the pectoral fin; caudal peduncle with a single low caudal keel on each side.

COLOR: Dark gray or gray brown on back, fading on sides and belly. Young specimens have prominent oblique or transverse brown bars on their backs and sides which fade with age.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Carcharhinus spp.: caudal peduncle without keels (caudal peduncle with a low midlateral keel in *G. cuvier*); origin of first dorsal fin noticeably posterior to axil of pectoral fin (directly above or just posterior to pectoral axil in *G. cuvier*).

Isurus oxyrinchus: edges of teeth smooth (serrate in *G. cuvier*); origin of first dorsal fin noticeably posterior to pectoral axil (above or just posterior to pectoral axil in *G. cuvier*); fifth gill opening anterior to origin of pectoral fin (above and posterior to pectoral origin in *G. cuvier*).

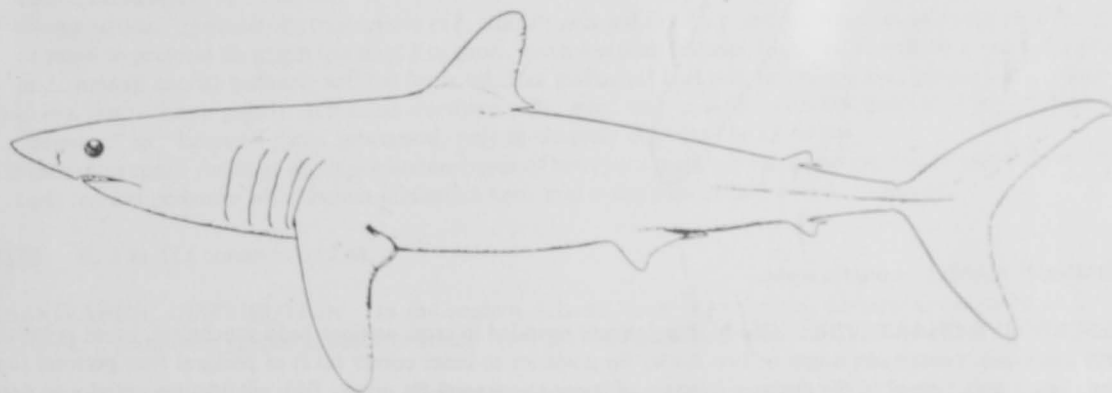
Isurus paucus: edges of teeth smooth (serrate in *G. cuvier*); pectoral fin long, length about equal to distance from tip of snout to origin of pectoral fin (length much less than distance from tip of snout to origin of pectoral fin in *G. cuvier*); fifth gill opening anterior to origin of pectoral fin (above and posterior to pectoral origin in *G. cuvier*).

Carcharodon carcharias: nictitating membrane absent (present in *G. cuvier*); fifth gill opening in front of pectoral fin origin (above and posterior to pectoral origin in *G. cuvier*).

SIZE: To 6.5 m TL; common to 4.7 m.

GEOGRAPHIC DISTRIBUTION: Worldwide in tropical and subtropical waters. In the western Atlantic seasonally as far north as New York along the east coast of the United States, common off Florida and the West Indies, south to Brazil.

Isurus oxyrinchus Rafinesque



COMMON NAME: Shortfin mako.

DESCRIPTIVE CHARACTERS: Body elongate and rounded in cross section; head subconical, snout pointed; teeth unicuspid, nonserrate; origin of first dorsal fin posterior to inner corner (axil) of pectoral fins; pectoral fins short, length much less than distance from tip of snout to pectoral fin origin; fifth gill opening anterior to pectoral fin origin; caudal peduncle with a single long midlateral keel on each side.

COLOR: Deep blue-gray to cobalt blue on back and upper sides with a gradual transition of shades to white on the belly.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

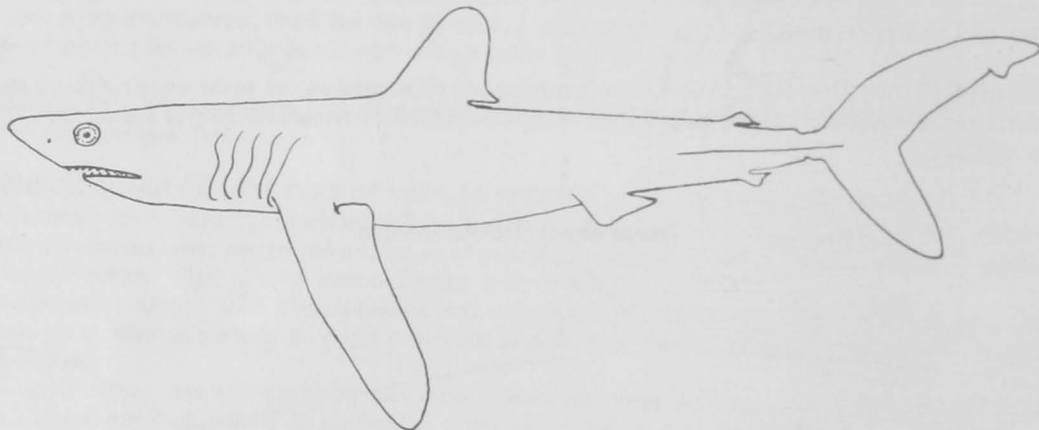
Lamna nasus: teeth multicuspid, a long central cusp with two smaller cusps at its base (unicuspid, no smaller cusps at base in *I. oxyrinchus*); caudal peduncle with a small secondary caudal keel under the posterior part of the midlateral caudal keel (only midlateral keels present in *I. oxyrinchus*).

Prionace glauca: teeth serrate (nonserrate in *I. oxyrinchus*); pectoral fin long, length almost equal to distance from tip of snout to pectoral fin origin (pectoral fin short, length much less than distance from tip of snout to pectoral fin origin in *I. oxyrinchus*); caudal peduncle without keel (midlateral and secondary keels present in *I. oxyrinchus*).
Sphyrna spp.: head greatly depressed dorsoventrally, eyes and nostrils extended laterally from midline on "hammer" or "bonnet" (head subconical, only moderately depressed in *I. oxyrinchus*).
Carcharhinus spp.: teeth of upper jaw serrate (teeth of both jaws nonserrate in *I. oxyrinchus*); caudal peduncle without keels (caudal peduncle with distinct midlateral keel in *I. oxyrinchus*).
Carcharodon carcharias: teeth of both jaws serrate (edges of teeth smooth in *I. oxyrinchus*).
Galeocerdo cuvier: teeth broad with serrate edges (teeth long, narrow, and smooth in *I. oxyrinchus*); origin of first dorsal fin above or just posterior to pectoral axil (noticeably posterior to pectoral axil in *I. oxyrinchus*); fifth gill opening above and posterior to pectoral fin origin (anterior to pectoral fin origin in *I. oxyrinchus*).
Isurus paucus: pectoral fins long, about equal in length to the distance from the tip of the snout to the origin of the pectoral fin (much shorter than the distance from the tip of the snout to the origin of the pectoral fin in *I. oxyrinchus*).

SIZE: To 4.0 m TL; common to 2.7 m.

GEOGRAPHIC DISTRIBUTION: Found throughout the western Atlantic in tropical and subtropical waters from the Gulf of Maine to Brazil.

Isurus paucus Guitart



COMMON NAME: Longfin mako.

DESCRIPTIVE CHARACTERS: Body elongate and rounded in cross section; head subconical, snout pointed; teeth unicuspid, nonserrate; origin of first dorsal fin posterior to inner corner (axil) of pectoral fins; pectoral fins long, length about equal to the distance from tip of snout to pectoral fin origin; fifth gill opening anterior to pectoral fin origin; caudal peduncle with single midlateral keel on each side.

COLOR: Back and upper sides blue to gray black with a gradual transition to shades of white on belly.

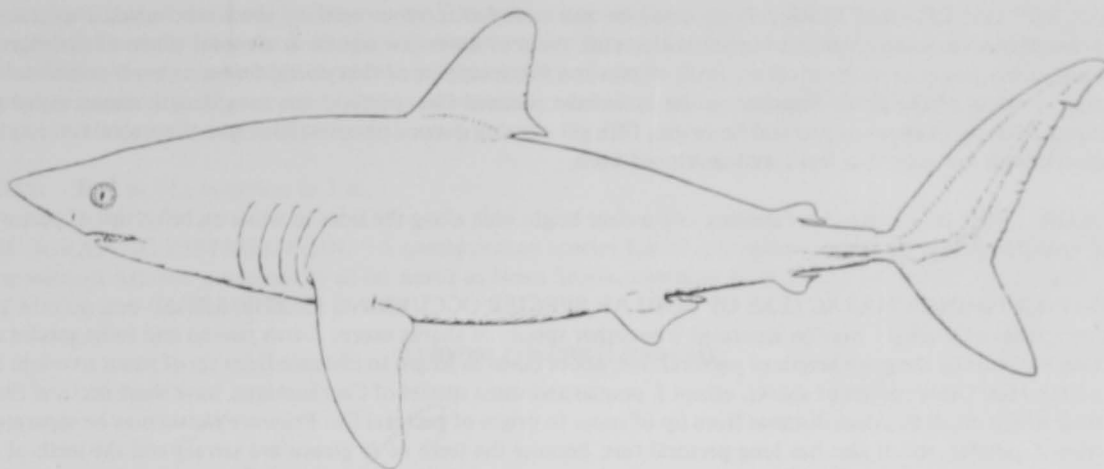
DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other species of sharks: may be separated from other species of sharks except *Prionace glauca* and some species of *Carcharhinus* by the great length of the pectoral fins, about equal in length to distance from tip of snout to origin of pectoral fin. Other species of sharks, except *P. glauca* and some species of *Carcharhinus*, have a short pectoral fin, its length much less than distance from tip of snout to origin of pectoral fin. *Isurus paucus* may be separated from *P. glauca* and species of *Carcharhinus*, which have long pectoral fins, because its teeth have smooth margins, not serrate as in *P. glauca* and *Carcharhinus* spp.

SIZE: To 2.5 m TL; common to 2 m.

GEOGRAPHIC DISTRIBUTION: Apparently a worldwide oceanic species, recorded from the western Atlantic from Cuba and Florida.

Lamna nasus (Bonnaterre)



COMMON NAME: Porbeagle.

DESCRIPTIVE CHARACTERS: Body elongate and rounded in cross section; head subconical, snout pointed; teeth multicuspid, nonserrate, a large central cusp with two smaller cusps at their bases; origin of first dorsal fin over or slightly posterior to inner corner (axil) of pectoral fin; pectoral fins short, length much less than distance from tip of snout to pectoral fin origin; fifth gill opening anterior to pectoral fin origin; caudal peduncle with a small secondary caudal keel under the posterior part of the midlateral caudal keel on each side.

COLOR: Back bluish gray, changing abruptly on the lower sides to white on the belly; pectoral fins dusky on outer half or third; anal fin white to dusky.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Isurus spp.: teeth unicuspid (multicuspid, a large central cusp with two smaller cusps at their bases in *L. nasus*); caudal peduncle without a small secondary caudal keel under posterior part of midlateral caudal keel (secondary caudal keel present in *L. nasus*).

Prionace glauca: teeth serrate (nonserrate in *L. nasus*); pectoral fins long, length almost equal to distance from tip of snout to pectoral fin origin (pectoral fins short, much less than distance from tip of snout to pectoral fin origin in *L. nasus*); caudal peduncle without keels (distinct midlateral keel and secondary keel present in *L. nasus*).

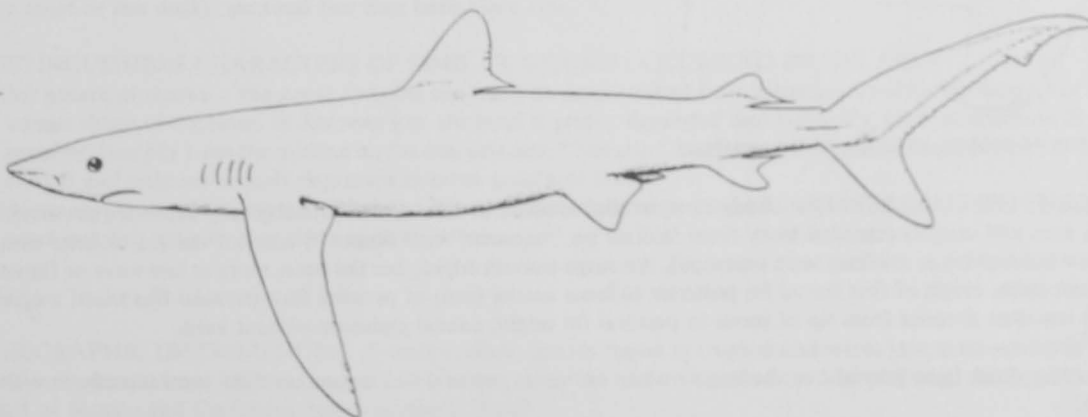
Sphyrna spp.: head greatly depressed dorsoventrally, eyes and nostrils extended laterally from midline on "hammer" or "bonnet" (head subconical, only moderately depressed in *L. nasus*).

Carcharhinus spp.: teeth of upper jaw serrate (teeth of both jaws nonserrate in *L. nasus*); caudal peduncle without keels (caudal peduncle with distinct midlateral keels and a small secondary keel in *L. nasus*).

SIZE: To 3 m TL; common to 2 m.

GEOGRAPHIC DISTRIBUTION: In the western Atlantic from Nova Scotia, perhaps as far south as South Carolina; a cool-water species apparently absent from the Gulf of Mexico and the Caribbean Sea.

Prionace glauca (Linnaeus)



COMMON NAME: Blue shark.

DESCRIPTIVE CHARACTERS: Body elongate and rounded in cross section; head subconical, moderately depressed; teeth unicuspid, those of upper jaw serrate, those of lower jaw serrate or smooth; origin of first dorsal fin noticeably posterior to inner corner (axil) of pectoral fin; midpoint of first dorsal fin (at its base) considerably nearer to origin of the pelvic fins than to the axil of the pectoral fins; pectoral fins long, length almost equal to distance from tip of snout to pectoral fin origin; fifth gill opening over or posterior to origin of pectoral fin; caudal peduncle with low ridge but lacks well-developed keels.

COLOR: Back dark indigo blue shading into a clear bright blue along the sides to white on belly; tips of pectoral and anal fins dusky.

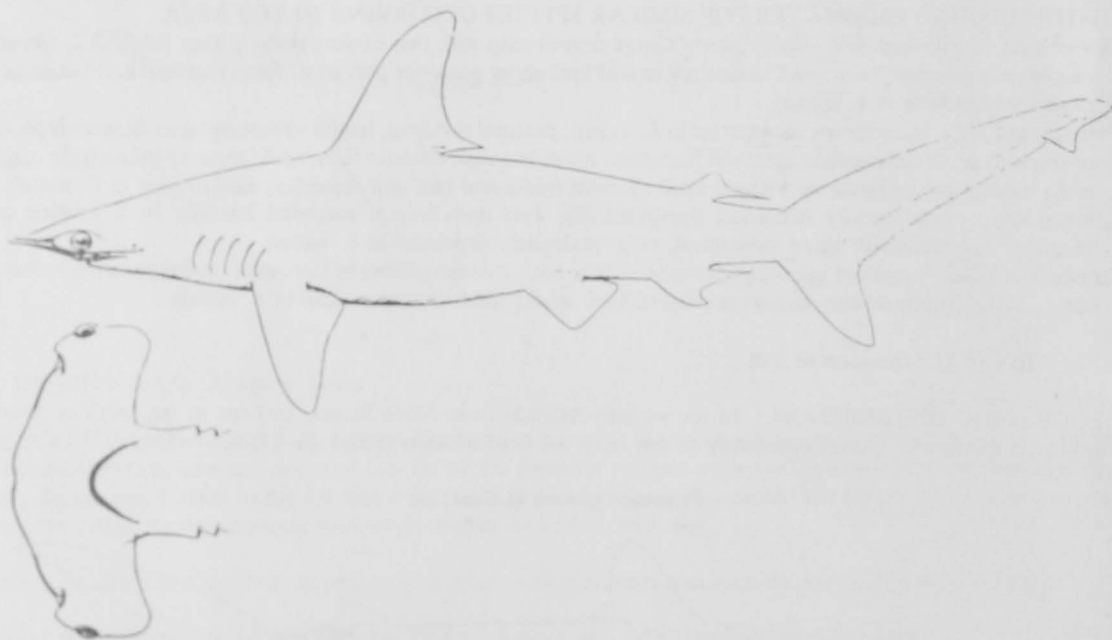
DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other species of sharks: may be separated from other species of sharks except *Isurus paucus* and some species of *Carcharhinus* by the great length of pectoral fins, about equal in length to distance from tip of snout to origin of pectoral fin. Other species of sharks, except *I. paucus* and some species of *Carcharhinus*, have short pectoral fins, their length much less than distance from tip of snout to origin of pectoral fin. *Prionace glauca* may be separated from *I. paucus*, which also has long pectoral fins, because the teeth of *P. glauca* are serrate and the teeth of *I. paucus* have smooth margins. *Prionace glauca* is easily distinguished from species of *Carcharhinus* by the relative position of the first dorsal fin. In *P. glauca* the midpoint of the first dorsal fin (at its base) is considerably nearer to the origin of the pelvic fins than to the axil of the pectoral fins. In *Carcharhinus* spp., the midpoint of the first dorsal fin is nearer to the pectoral axil than it is to the origin of the pelvic fins.

SIZE: To 4 m TL; common to 3 m.

GEOGRAPHIC DISTRIBUTION: A cosmopolitan species found in temperate, tropical, and subtropical waters. Found in the western Atlantic from Nova Scotia to Brazil; absent from the Gulf of Mexico and the Caribbean Sea.

Sphyrna lewini (Griffith and Smith)



COMMON NAME: Scalloped hammerhead.

DESCRIPTIVE CHARACTERS: Body elongate and rounded in cross section; head greatly depressed dorsoventrally, eyes and nostrils extended away from midline on "hammer" or "bonnet"; anterior margin of head with shallow indentation at midline; teeth unicuspid, the cusps smooth edged, but the bases more or less wavy or fluted on some teeth; origin of first dorsal fin posterior to inner corner (axil) of pectoral fins; pectoral fins short, length much less than distance from tip of snout to pectoral fin origin; caudal peduncle without keels.

COLOR: Back light gray above shading to white on belly; pectoral fins tipped on their ventral surfaces with black.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA.

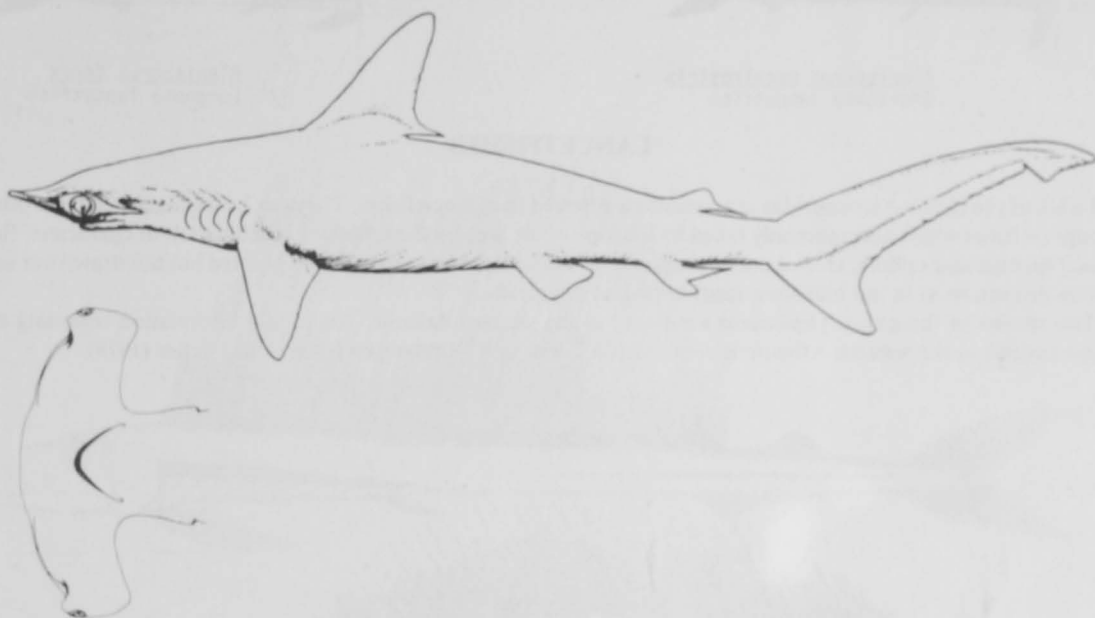
Other genera of sharks: the genus *Sphyrna* can easily be distinguished from other genera of sharks because of the unique shape of the head. In *Sphyrna* spp. the head is greatly depressed dorsoventrally, the eyes and nostrils are extended laterally from the midline on the characteristic "hammer" or "bonnet." The head shape is typically sub-conical and only moderately depressed in other genera of sharks.

Sphyrna zygaena: anterior margin of head rounded, convex at midline (anterior margin of head with a small concave indentation at midline in *S. lewini*).

SIZE: To 4 m TL; common to 3 m.

GEOGRAPHIC DISTRIBUTION: A cosmopolitan species found in tropical and warm temperate waters, in the western Atlantic occasionally as far north as Nova Scotia, common from Cape Cod south through the Gulf of Mexico and Caribbean Sea to Brazil.

Sphyrna zygaena (Linnaeus)



COMMON NAME: Smooth hammerhead.

DESCRIPTIVE CHARACTERS: Body elongate and rounded in cross section; head greatly depressed dorsoventrally, eyes and nostrils extended away from midline on "hammer" or "bonnet"; anterior margin of head rounded, convex at midline; teeth unicuspid, the cusps smooth edged, but the bases more or less wavy or fluted on some teeth; origin of first dorsal fin posterior to inner corner (axil) of pectoral fins; pectoral fins short, length much less than distance from tip of snout to pectoral fin origin; caudal peduncle without keels.

COLOR: Back deep olive to brown gray shading to grayish white on belly; fins of same color as back or sides with tips more or less dusky; pectoral fins may have black tips.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Other genera of sharks: the genus *Sphyrna* can easily be distinguished from other genera of sharks because of the unique shape of the head. In *Sphyrna* spp. the head is greatly depressed dorsoventrally, the eyes and nostrils are extended laterally from the midline on the characteristic "hammer" or "bonnet." The head shape is typically sub-conical and only moderately depressed in other genera of sharks.

Sphyrna lewini: anterior margin of head scalloped with a small concave indentation at midline (anterior margin of head rounded, convex at midline in *S. zygaena*).

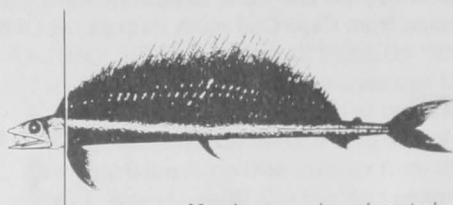
SIZE: To 3 m TL; common to 2.5 m.

GEOGRAPHIC DISTRIBUTION: A cosmopolitan species found in tropical and warm temperate waters in the western Atlantic, from off the coast of New Jersey, along the eastern coast of the United States, throughout the Gulf of Mexico and Caribbean Sea to southern Brazil.

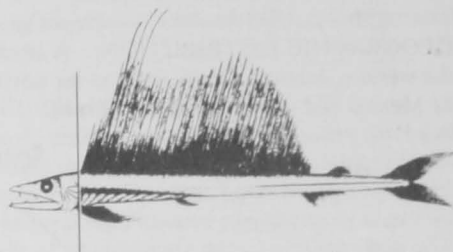
KEY TO THE SPECIES OF LANCETFISHES OCCURRING IN THE AREA

First dorsal fin originates at a point anterior to the posterior margin of the gill opening; snout 40% or less of head length.

First dorsal fin originates at a point above the posterior margin of the gill opening; snout more than 40% of head length.



Alepisaurus brevirostris
Shortnose lancetfish



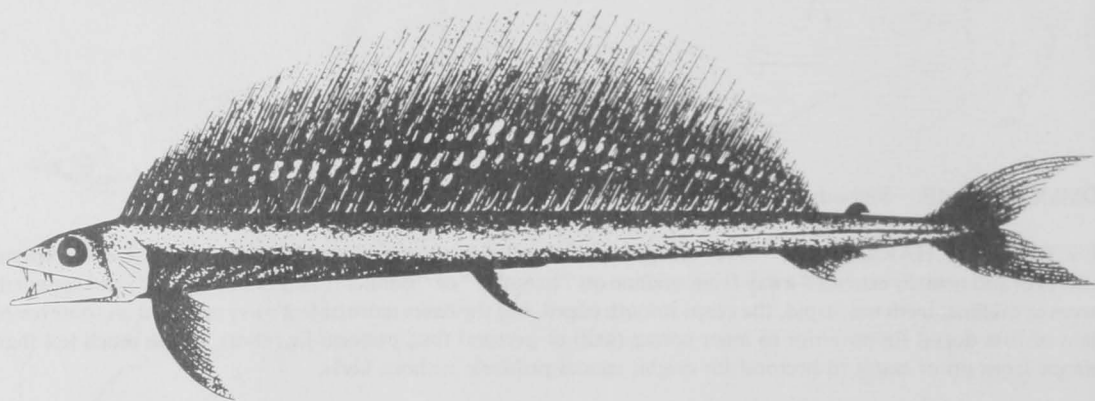
Alepisaurus ferox
Longnose lancetfish

LANCETFISHES

Fishes of the family Alepisauridae are commonly referred to as lancetfishes. They can be distinguished from other groups of fishes which are commonly taken by longline in the area by the following combination of characters: first dorsal fin high and saillike, second dorsal (adipose) fin without spines or rays; snout pointed but not drawn out into a long projection as in the billfishes; teeth large and daggerlike.

Two species of the genus *Alepisaurus* are found in the western Atlantic. Additional information regarding the Alepisauridae in the western Atlantic is contained in Gibbs and Wilimovsky (1966) and Fischer (1978).

Alepisaurus brevirostris Gibbs



COMMON NAME: Shortnose lancetfish.

DESCRIPTIVE CHARACTERS: Body slender, only slightly compressed. Head length 16% or less SL (standard length); snout <40% HL (head length). Two dorsal fins: the first with 40–48 rays, convex margin, originates anterior to the posterior margin of the gill opening and extends to the region above the anal fin; the second in the form of an adipose fin, without rays or spines. Pelvic fins originate near middle of body. Pectoral fins long, slightly longer than head. Usually two pair of strong canine teeth inside an outer row of smaller and numerous upper jaw teeth; teeth of lower jaw variable in size and in a single row.

COLOR: Back metallic blue to black, sides silvery gray with blue-green hue, abdomen may appear striped; dorsal fin metallic blue black often with a horizontal row of white spots on its membrane; caudal and anal fins black, anal fin edged in white; pectoral and pelvic fins blue black above and silvery below.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

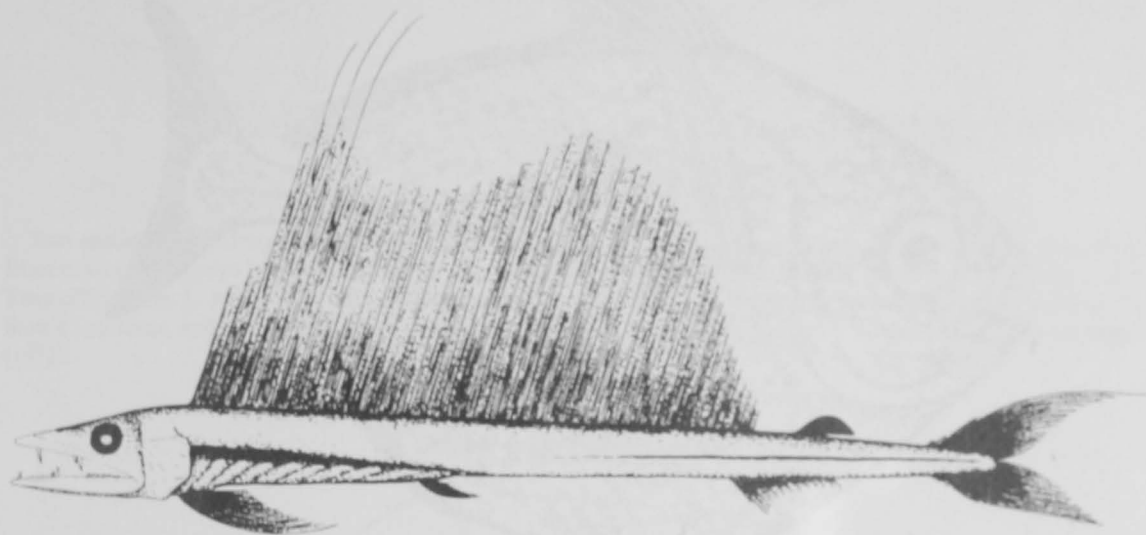
Istiophorus platypterus: snout projected as a long bill (snout pointed but short in *A. brevirostris*); strong canine teeth absent from jaws; dorsal and ventral caudal keels present on caudal peduncle (dorsal and ventral caudal keels absent, a low median ridge is present in *A. brevirostris*).

Alepisaurus ferox: head length 16% or more SL (16% or less in *A. brevirostris*); snout > 40% HL (40% or less in *A. brevirostris*); first dorsal fin originates above the posterior margin of the gill opening (anterior to the posterior margin of the gill opening in *A. brevirostris*); dorsal fin blue black, without white spots, fin margin not convex throughout its length.

SIZE: To 100 cm SL; common to 60 cm.

GEOGRAPHIC DISTRIBUTION: A worldwide species. In the western Atlantic, known only from off the east coast of the United States and Bermuda.

Alepisaurus ferox Lowe



COMMON NAME: Longnose lancetfish.

DESCRIPTIVE CHARACTERS: Body slender, only slightly compressed. Head length 16% or more SL; snout > 40% HL. Two dorsal fins: the first with 36-45 rays, the margin not entirely convex, high anteriorly, originates above posterior margin of the gill openings and extends to the region above the anal fin; the second in the form of an adipose fin, without rays or spines. Pelvic fins originate near middle of body. Pectoral fins long, slightly larger than head. Usually two pair of strong canine teeth inside an outer row of small and numerous upper jaw teeth; teeth of lower jaw variable in size and in a single row.

COLOR: Back metallic blue to black, sides silvery gray with blue-green hue, abdomen may appear striped; dorsal fin metallic blue black and edged in white; pectoral and pelvic fins blue black above and silvery below.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Istiophorus platypterus: snout projected as a long bill (snout blunt in *A. ferox*); pelvic fins originate under pectoral fins (originate near middle of body in *A. ferox*); strong canine teeth absent from jaws; dorsal and ventral keels present on caudal peduncle (dorsal and ventral caudal keels absent, a low median ridge is present in *A. ferox*).

Alepisaurus brevirostris: head length 16% or less SL (16% or more in *A. ferox*); snout 40% or less HL (> 40% in *A. ferox*); first dorsal fin originates at a point anterior to the posterior margin of the gill opening (above the posterior margin of the gill opening in *A. brevirostris*); dorsal fin blue black often with a horizontal row of white spots on its membrane, margin convex throughout its length.

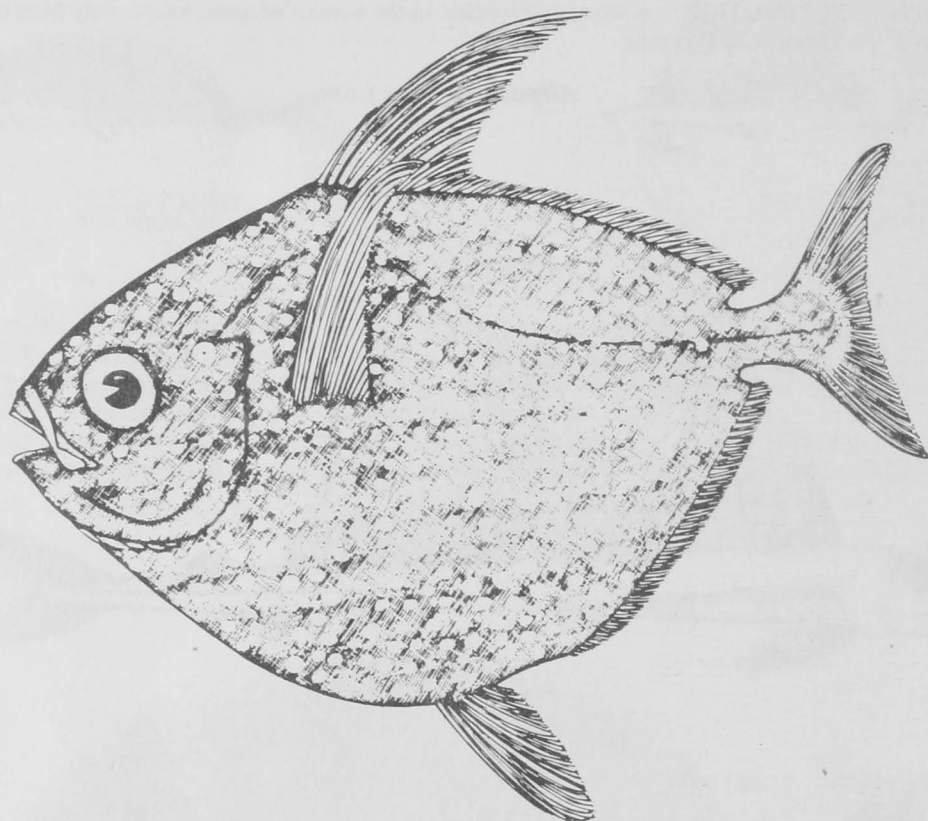
SIZE: To 200 cm SL; common to 150 cm.

GEOGRAPHIC DISTRIBUTION: A worldwide species. In the western Atlantic off the coasts of North and South America, in the Gulf of Mexico, and the Caribbean Sea.

OPAH

Lampris guttatus, the opah, the only member of the family Lampridae, can be distinguished from other fishes in the area because of its very deep body. Its maximum depth is $> 50\%$ SL. The only other deep-bodied species occurring in the area is *Mola mola*, the ocean sunfish. *Mola mola* is seldom taken on longline and is easily distinguished from *L. guttatus* because it lacks pelvic fins and a forked caudal fin. For more information on *L. guttatus* see Gudger (1930), McKenzie and Tibbo (1963), and Fischer (1978).

Lampris guttatus (Brünnich)



COMMON NAME: Opah.

DESCRIPTIVE CHARACTERS: A large, deep, compressed, oval-shaped species, maximum depth $> 50\%$ SL. Mouth small and toothless. Dorsal and anal fins long and single, retractable into deep grooves; the dorsal falcate (sickle-shaped), anterior margin very high, originates posterior to the head; anterior anal rays not notably longer than middle or posterior rays; pectoral fins large and falcate; pelvic fins long, their length greater than twice as long as longest anal rays, and comprised of from 14 to 17 rays. Body covered with small smooth scales.

COLOR: Back steel blue to olive green; upper sides bluish or green with a purple luster, lower sides and belly red; fins bright red; entire body covered with small round silvery spots.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

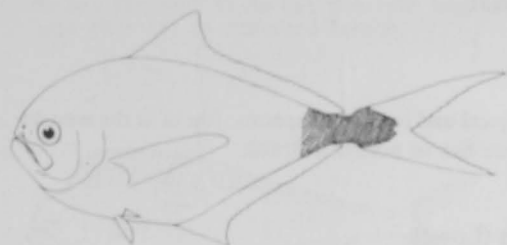
Species of Bramidae: pelvic fins much shorter or at most as long as longest anal ray (noticeably more than twice as long as longest anal ray in *L. guttatus*); pelvic fin usually with 1 spine and 5 soft rays (14-17 rays in *L. guttatus*). Anal fin falcate, anterior rays noticeably longer than middle and posterior rays. No spots on body, and fins not bright red (spots and red fins present in *L. guttatus*).

SIZE: To 185 cm SL; common to 120 cm.

GEOGRAPHIC DISTRIBUTION: Worldwide in tropical and temperate waters. In the western Atlantic, from Newfoundland south, along Atlantic and Gulf coasts of Florida and the Caribbean Sea.

KEY TO THE SPECIES OF POMFRETS COVERED IN THIS GUIDE

Scales gradually become smaller as they progress from the caudal peduncle onto the bases of the midcaudal rays.



Brama brama
Atlantic pomfret

Scales on caudal peduncle abruptly larger than those on base of caudal fin.

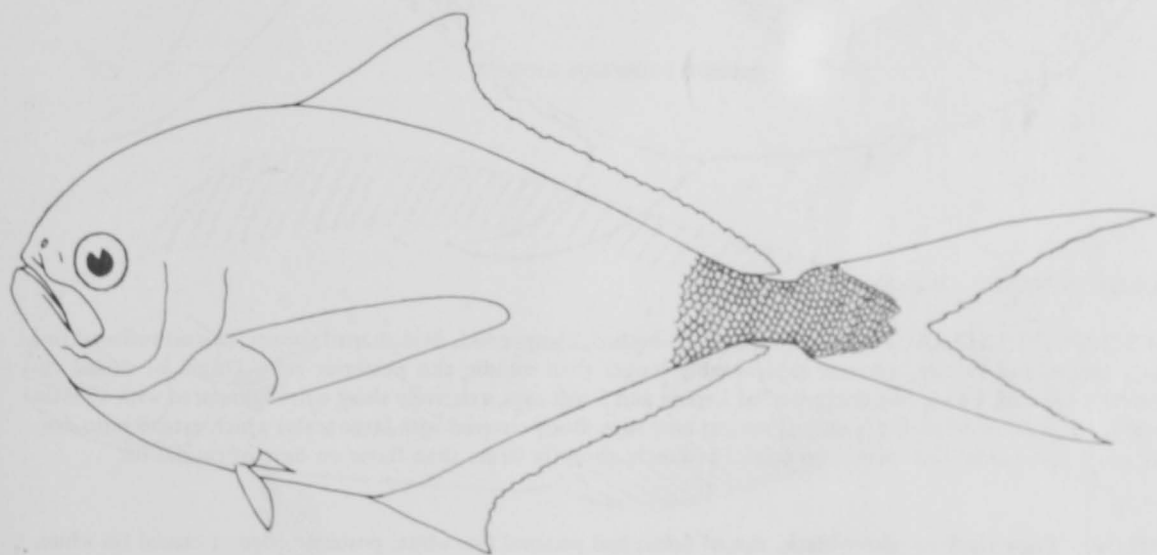


Taractichthys longipinnis
Bigscale pomfret

POMFRETS

Two species of pomfrets (Bramidae) are taken on longline in the western Atlantic; they are easily distinguished from most other groups by their relatively deep bodies, a characteristic they share with *Lampris guttatus* (the opah). They differ from *L. guttatus* by having a falcate (sickle-shaped) anal fin, by having a relatively shorter pectoral fin than *L. guttatus*, and by lacking spots and red fins. For more information about the fishes of this family see Mead (1972).

Brama brama (Bonnaterre)



COMMON NAME: Atlantic pomfret.

DESCRIPTIVE CHARACTERS: A large, deep-bodied, compressed, oval-shaped species. Dorsal and anal fins long, single, and falcate, anterior rays notably longer than middle and posterior rays. Origin of dorsal fin posterior to head. Pelvic fins comprised of 1 spine and 5 soft rays, relatively short when compared with anal fin height, less than or equal to length of longest anal rays. Body covered with large scales which extend onto dorsal, anal, and caudal fins. Scales gradually become smaller as they progress from the caudal peduncle onto the bases of the midcaudal rays.

COLOR: Back and tip of snout black, sides silvery black, tips of caudal and edges of dorsal and anal fins black.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

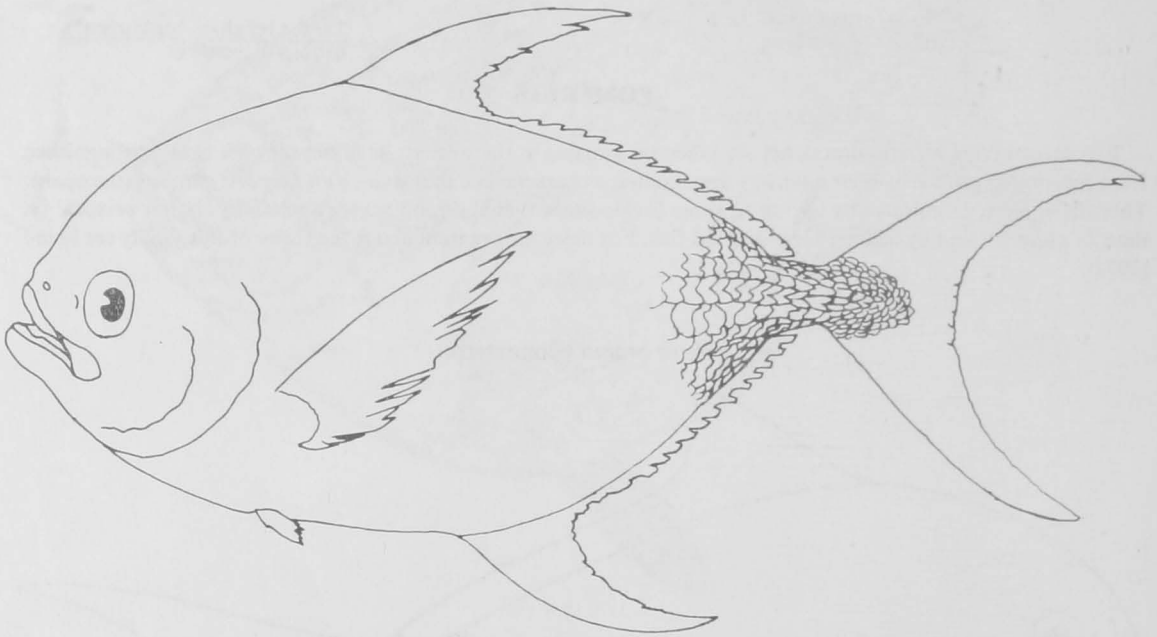
Lampris guttatus: pelvic fins noticeably more than twice as long as longest anal ray (equal to or less than length of longest anal ray in adult specimens of *B. brama*); pelvic fins comprised of 14–17 rays (1 spine and 5 rays in *B. brama*); anterior anal rays not noticeably longer than middle and posterior rays (anal fin falcate with anterior rays longer than middle or posterior rays in *B. brama*); body covered with fine smooth scales (scales relatively large in *B. brama*). Body covered with silver spots and fins red (body silver black and fins black in *B. brama*).

Taractichthys longipinnis: scales on caudal peduncle abruptly larger than those on base of caudal fin rays (gradually become smaller as they progress from the caudal peduncle onto the bases of the midcaudal rays in *B. brama*); anal fin long, longest anterior rays greater than twice the length of the pelvic fin in adult specimens (anterior anal rays as long as or at most twice as long as pelvic fin in *B. brama*).

SIZE: To 66 cm TL; common to 50 cm.

GEOGRAPHIC DISTRIBUTION: Reportedly a worldwide tropical and temperate species, found in the western Atlantic from Nova Scotia south to Florida through the Caribbean Sea to northern Brazil.

Taractichthys longipinnis (Lowe)



COMMON NAME: Bigscale pomfret.

DESCRIPTIVE CHARACTERS: A large, deep-bodied, compressed, oval-shaped species. Dorsal and anal fins long, single, and falcate, anterior rays notably longer than middle and posterior rays. Origin of dorsal fin posterior to head. Pelvic fins comprised of 1 spine and 5 soft rays, relatively short when compared with anal fin height, less than one-half the length of longest anal rays. Body covered with large scales which extend onto dorsal, anal, and caudal fins. Scales on caudal peduncle abruptly larger than those on base of caudal fin.

COLOR: Body black to silvery black, tips of pelvic and pectoral fins white, posterior edge of caudal fin white.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Brama brama: scales on caudal peduncle gradually become smaller as they progress from caudal peduncle onto bases of midcaudal rays (abruptly larger than those on base of caudal fin rays in *T. longipinnis*); anal fin short, longest anterior rays as long as or at most twice as long as pelvic fins in adults (anal fin long, longest anterior rays greater than twice as long as pelvic fin in adult specimens of *T. longipinnis*).

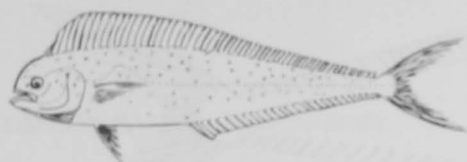
Lampris guttatus: pelvic fins noticeably more than twice as long as longest anal ray (less than one-half length of longest anal rays in adult specimens of *T. longipinnis*); pelvic fins comprised of 14–17 rays (1 spine and 5 rays in *T. longipinnis*); anterior anal rays not noticeably longer than middle and posterior rays (anal fin falcate with anterior rays longer than middle or posterior rays in *T. longipinnis*); body covered with fine smooth scales (scales relatively large in *T. longipinnis*). Body covered with silver spots and fins bright red (body silver black and fins black in *T. longipinnis*).

SIZE: To over 100 cm SL; common to 50 cm.

GEOGRAPHIC DISTRIBUTION: An Atlantic species found in the western Atlantic from Nova Scotia south along the east coast of the United States and the Gulf of Mexico.

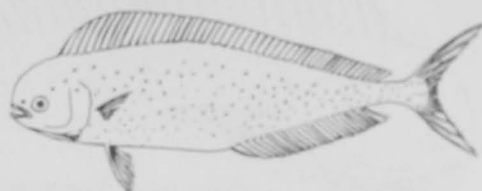
KEY TO THE SPECIES OF DOLPHINS OCCURRING IN THE AREA

Dorsal fin rays 58 to 66; greatest body depth less than 25% of standard length.



Coryphaena hippurus
Common dolphin

Dorsal fin rays 52 to 59; greatest body depth more than 25% of standard length.



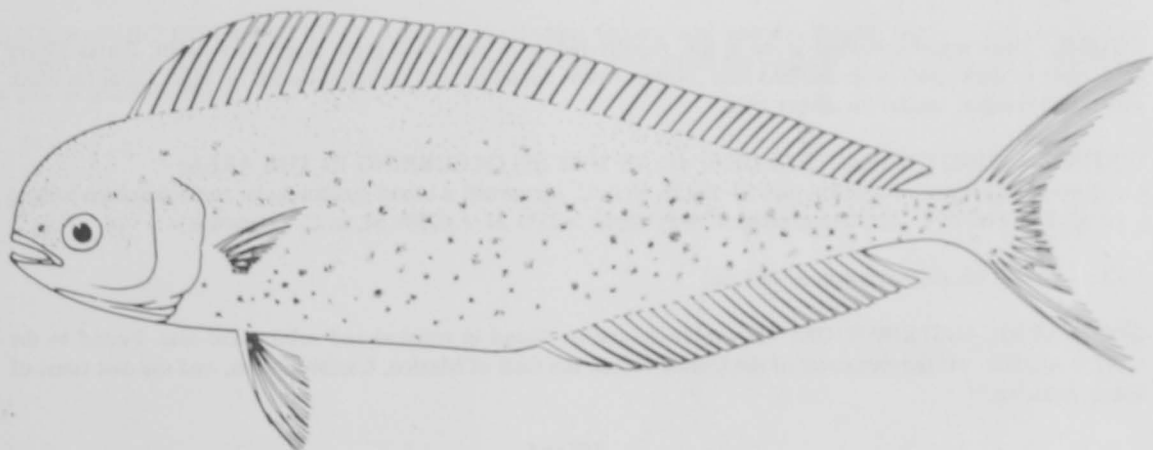
Coryphaena equiselis
Pompano dolphin

DOLPHINS

Dolphins or dolphinfishes are members of the family Coryphaenidae. They can be distinguished from other groups of fishes taken by longline in the area by their single, long-based, dorsal fin, which has no spines, originates above the head, and terminates near the caudal fin.

Two species of the genus *Coryphaena* are found in the western Atlantic. Additional information regarding the coryphaenids of the western Atlantic is contained in Gibbs and Collette (1959) and Fischer (1978).

Coryphaena equiselis Linnaeus



COMMON NAME: Pompano dolphin.

DESCRIPTIVE CHARACTERS: Body elongate and greatly compressed, greatest body depth $> 25\%$ SL; young fish (to 30 cm) have a slightly convex head profile, while in larger males (> 30 cm) the head profile becomes more convex. Dorsal fin single, comprised of 52-59 rays, extending from just behind eye almost to caudal fin. Anal fin with convex margin extends from anus almost to caudal fin. Tooth patch on tongue broad and quadrangular.

COLOR: Back metallic blue to green in life, rapidly fading to gray with green tinge after death; flanks silvery gold with numerous black spots, dorsal fin dark.

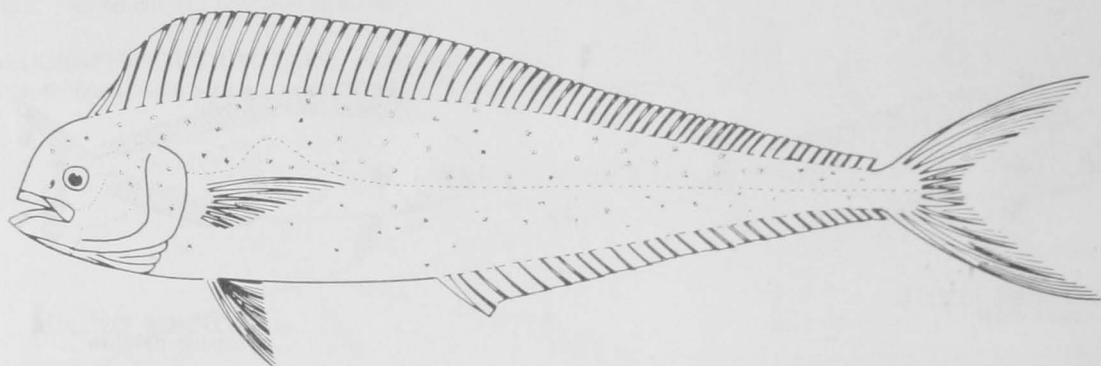
DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Coryphaena hippurus: dorsal fin rays 58–66 (52–59 in *C. equiselis*); greatest body depth <25% SL (>25% SL in *C. equiselis*).

SIZE: To 75 cm FL (fork length); common to 50 cm.

GEOGRAPHIC DISTRIBUTION: A worldwide species found in most tropical seas. Found in the western Atlantic off the east coast of the United States, the Gulf of Mexico, Caribbean Sea, and the east coast of South America.

Coryphaena hippurus Linnaeus



COMMON NAME: Common dolphin.

DESCRIPTIVE CHARACTERS: Body elongate and greatly compressed, greatest body depth <25% SL. Young fish (to 30 cm) have a slightly convex head profile, while in large males (>30 cm) the head profile becomes greatly convex and the snout profile becomes almost vertical. Dorsal fin single, comprised of 58–66 rays, extending from above eye almost to caudal fin. Anal fin with concave margin extends from anus almost to caudal fin. Tooth patch on tongue small and oval.

COLOR: Back metallic blue to green in life, rapidly fading to gray with green tinge after death; flanks silvery gold, rows of dark spots or golden blotches running below dorsal fin and on sides; dorsal fin black; anal fin black with white margin; caudal fin silvery gold.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Coryphaena equiselis: dorsal fin rays 52–59 (58–66 in *C. hippurus*); a broad quadrangular tooth patch on tongue (small and oval in *C. hippurus*); greatest body depth >25% SL (<25% SL in *C. hippurus*).

SIZE: To 200 cm FL; common to 100 cm.

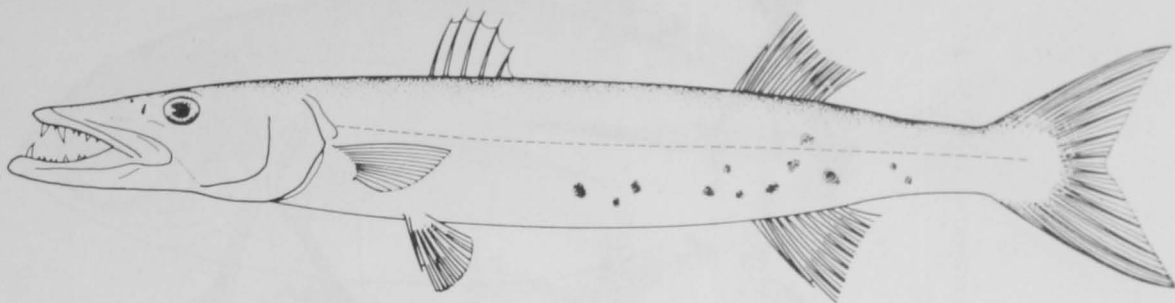
GEOGRAPHIC DISTRIBUTION: A worldwide species found in tropical and subtropical seas. Found in the western Atlantic, off the east coast of the United States, the Gulf of Mexico, Caribbean Sea, and the east coast of South America.

BARRACUDA

Sphyraena barracuda, the great barracuda, is relatively common throughout the area. Large individuals are associated with coastal and offshore waters. The barracudas (family Sphyraenidae) can be distinguished from other families in the area because of its elongate body and strong sharp teeth. Barracudas differ from the lancetfishes (Alepisauridae) in lacking the enlarged saillike first dorsal fin and in having a rayed (as opposed to rayless adipose) second dorsal fin. It is easily distinguished from the scombrids, gempylids, and carangids because the second dorsal fin terminates well in advance of the caudal fin.

Two other species of *Sphyraena* (*S. picudilla* and *S. guachancho*) are found in the western Atlantic. For more information regarding the identification of Sphyraenidae see Fischer (1978).

Sphyraena barracuda (Walbaum)



COMMON NAME: Great barracuda.

DESCRIPTIVE CHARACTERS: Body elongate and slightly compressed. Teeth pointed and sharp, variable in size. Lower jaw extending beyond tip of upper jaw. Two dorsal fins separated by a large interspace. Distance between last ray in second dorsal fin and origin of caudal fin much greater than base of second dorsal fin.

COLOR: Back deep green to gray gradually changing through silver gray and becoming white on the belly, several dark blotches present on posterior sides, tending to concentrate on the lower sides.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Species of Scombridae: caudal keels present (absent in *S. barracuda*); 5 or more dorsal and anal finlets present (finlets absent in *S. barracuda*).

Species of Gempylidae and Carangidae: two dorsal fins separated by a small interspace or contacting each other (interspace at least twice as long as base of first dorsal fin in *S. barracuda*); distance between last ray in second dorsal fin and origin of caudal fin much less than base of second dorsal fin (much greater than base of second dorsal fin in *S. barracuda*).

SIZE: To 200 cm; common to 130 cm.

GEOGRAPHIC DISTRIBUTION: An Atlantic, Indian Ocean, and western Pacific species; common in the western Atlantic, extending as far north as New England and throughout the Gulf of Mexico, the Antilles, and Bermuda to southern Brazil.

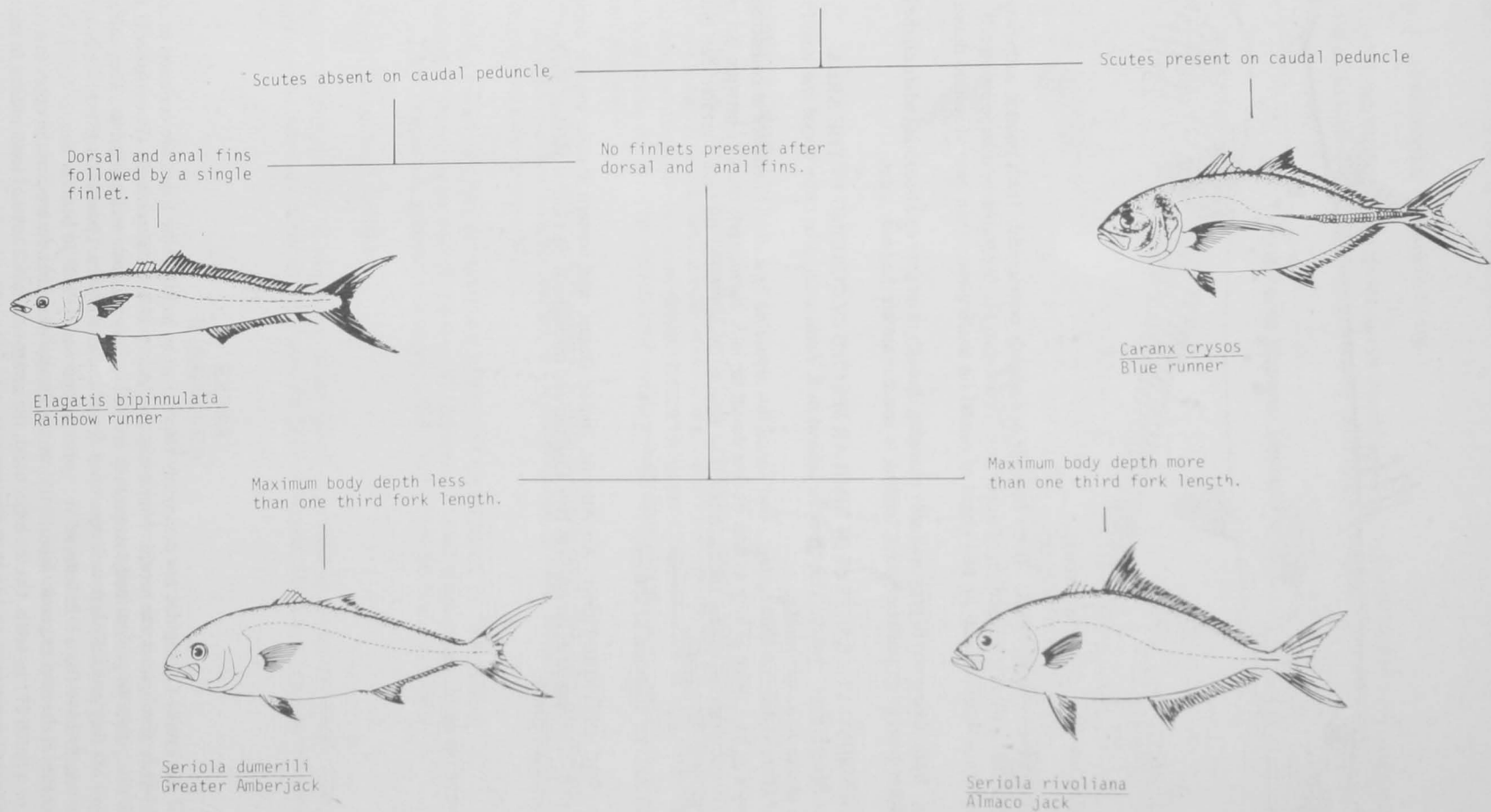
JACKS

Fishes of the family Carangidae are commonly referred to as jacks. These fishes are common in tropical and temperate waters throughout the world. Numerous species are fished commercially. Four Atlantic species are included in this guide. In general body shape they are similar to scombrids and gempylids. They differ from the scombrids in that they generally lack well-developed dorsal and anal finlets. Those carangids which have dorsal and anal finlets usually have from 3 to 8 dorsal fin spines as opposed to 9-27 in Scombridae.

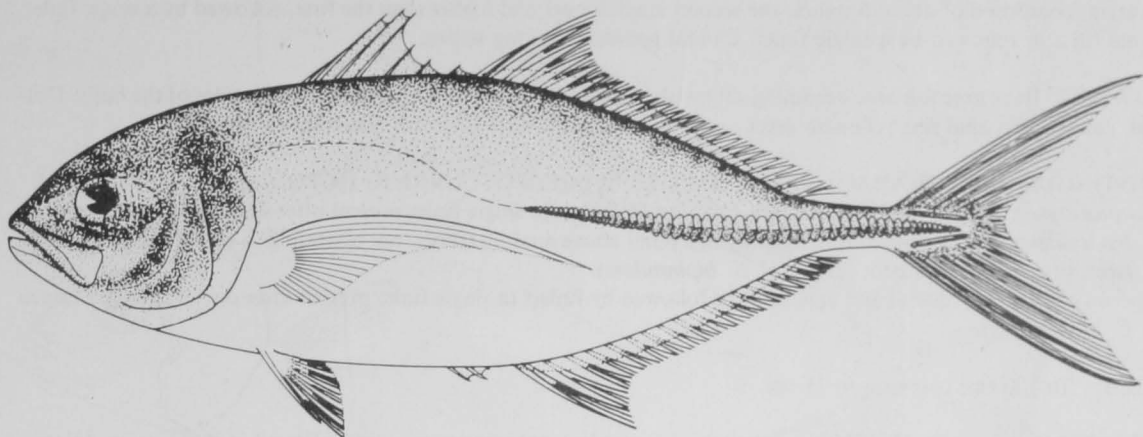
The carangids in the area are easily separated from the gempylids in that the teeth in the upper jaw form either a single row or a patch of fine teeth. On the other hand, the gempylids have 2 rows of teeth present in the upper jaw, the second being formed of 3 or 4 teeth at the anterior end of the upper jaw.

Many other species of carangids occur within the western Atlantic. For more information see Fischer (1978).

KEY TO THE SPECIES OF JACKS COVERED IN THIS GUIDE



Caranx crysos (Mitchill)



COMMON NAME: Blue runner.

DESCRIPTIVE CHARACTERS: Body elongate and moderately compressed. Jaw teeth small, in a single row or narrow band. Adipose (fatty) eyelid present. Dorsal fin divided into 2 parts: first comprised of 8 spines; second comprised of 1 spine and 22-25 soft rays. Distance between last ray of dorsal fin and origin of caudal fin less than base of second part of dorsal fin. Posterior sides of body with a row of scutes (bony keeled scalelike structures) extending to the caudal fin. Pectoral fin long and falcate, extending to a point above the anal fin.

COLOR: Back brown to olive green, turning lighter on the sides and belly; fins dusky to dark and may have light or white margins.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

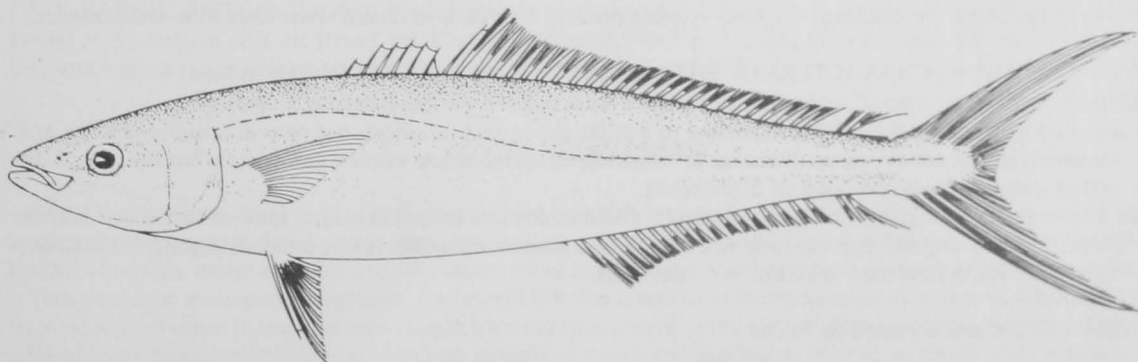
Elagatis bipinnulata: dorsal and anal fins followed by a single finlet (no finlets present in *C. crysos*); pectoral fin short, not extending to anal fin (long, extending to a point above anal fin in *C. crysos*); caudal scutes absent (present in *C. crysos*).

Species of *Seriola*: pectoral fin short, not extending to anal fin (long, extending to a point above anal fin in *C. crysos*); caudal scutes absent (present in *C. crysos*); distinct groove on dorsal and ventral surface of caudal peduncle (grooves absent in *C. crysos*).

SIZE: To 1 m; common to 50 cm.

GEOGRAPHIC DISTRIBUTION: Found in the western Atlantic from Nova Scotia south throughout the Gulf of Mexico and the Caribbean Sea, through the Antilles and Bermuda south along the east coast of South America to São Paulo, Brazil.

Elagatis bipinnulata (Quoy and Gaimard)



COMMON NAME: Rainbow runner.

DESCRIPTIVE CHARACTERS: Body elongate and slightly compressed. Premaxillary teeth small and inconspicuous, arranged in patches not rows. Two dorsal fins: the first short and low with a more or less straight or convex margin, comprised of about 6 spines; the second much longer and higher than the first, followed by a single finlet. Anal fin also followed by a single finlet. Caudal peduncle lacking scutes.

COLOR: Back greenish blue becoming yellowish to white on the belly, 2 blue bands on the sides of the body. Dorsal, caudal, and anal fins yellowish green; pectoral and pelvic fins yellowish sometimes with blue.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

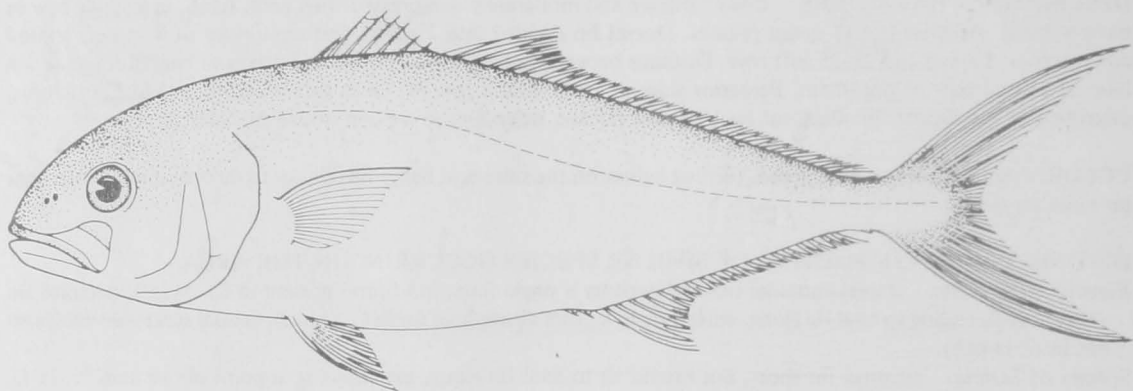
Caranx crysos: dorsal and anal fins not followed by finlets (a single finlet present after dorsal and anal fins in *E. bipinnulata*); pectoral fin long, extending to a point above anal fin (short, not extending to anal fin in *E. bipinnulata*); caudal scutes present (absent in *E. bipinnulata*).

Species of *Seriola*: dorsal and anal fins not followed by finlets (a single finlet present after dorsal and anal fins in *E. bipinnulata*).

SIZE: To 100 cm; common to 75 cm.

GEOGRAPHIC DISTRIBUTION: A worldwide tropical and temperate species. Found in the western Atlantic from New England, throughout the Gulf of Mexico and the Caribbean Sea to northern Brazil.

Seriola dumerili (Risso)



COMMON NAME: Greater amberjack.

DESCRIPTIVE CHARACTERS: Body elongate and moderately compressed. Jaw teeth small in broad patches. Dorsal fin divided into 2 parts: first with 7 spines; second with 1 spine and 29–35 soft rays. Distance between last ray of dorsal fin and origin of caudal fin much less than base of second part of dorsal fin. Pectoral fins short, not reaching a point above the origin of the anal fin. Longest ray of second dorsal fin about twice as long as longest spine of the first dorsal fin in adults. Maximum body depth less than one-third fork length. Grooves present on dorsal and ventral surfaces of caudal peduncle.

COLOR: Back blue or blue green gradually turning silvery to silver brown on the sides. An amber stripe running from the eye along the middle of the body is often present. Fins dark to dusky, sometimes with white margins.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

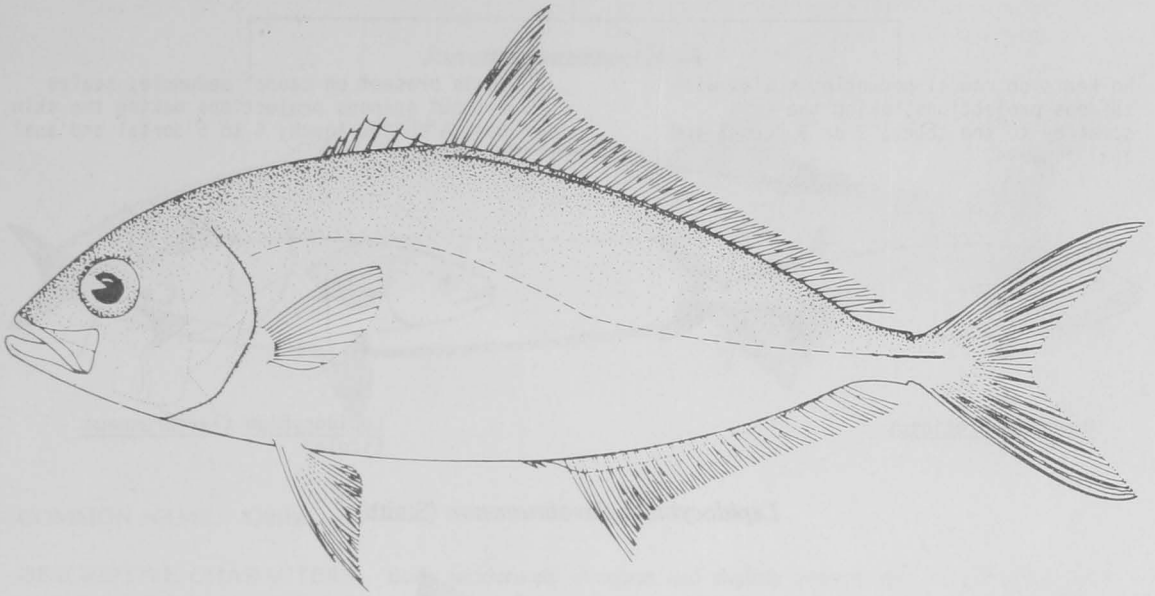
Elagatis bipinnulata: dorsal and anal fins followed by a single finlet (no finlets in *S. dumerili*).

Caranx crysos: pectoral fins long, extending to a point above anal fin (short, not extending above anal fin in *S. dumerili*); caudal scutes present (absent in *S. dumerili*); caudal peduncle without grooves (distinct dorsal and ventral grooves on caudal peduncle of *S. dumerili*).

Seriola rivoliana: longest ray of second dorsal fin about three times as long as longest spine of first dorsal in adults (about twice as long as longest spine in first dorsal fin in adult *S. dumerili*); maximum body depth more than one-third fork length (less than one-third in *S. dumerili*).

SIZE: To 150 cm; common to 70 cm.

GEOGRAPHIC DISTRIBUTION: An Atlantic, Indian Ocean, and western Pacific tropical to temperate marine species found in the western Atlantic as far north as Nova Scotia; along the eastern United States, Bermuda, throughout the Gulf of Mexico, the Caribbean Sea, and south to Brazil.



COMMON NAME: Almaco jack.

DESCRIPTIVE CHARACTERS: Body elongate, moderately compressed. Jaw teeth small, in broad patches. Dorsal fin divided into 2 parts: the first with 7 spines; the second with 1 spine and from 27 to 33 soft rays. Distance between last ray of dorsal fin and origin of caudal fin much less than base of second part of dorsal fin. Pectoral fins short, not reaching a point above the origin of the anal fin. Longest ray of second dorsal about three times as long as longest spine of first dorsal fin in adults. Maximum body depth more than one-third fork length. Grooves present on dorsal and ventral surfaces of caudal peduncle.

COLOR: Back brown to olive green or blue green turning silvery to brown on sides, an amber stripe running from the eye along the middle of the body may be present. Fins dark to dusky usually with light or white margins.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Elagatis bipinnulata: dorsal and anal fins followed by a single finlet (no finlets in *S. rivoliana*).

Caranx crysos: pectoral fins long, extending to a point above anal fin (short, not reaching above anal fin in *S. rivoliana*); caudal scutes present (absent in *S. rivoliana*); caudal peduncle without grooves (distinct dorsal and ventral grooves on caudal peduncle of *S. rivoliana*).

Seriola dumerili: longest ray of second dorsal fin about twice as long as longest spine of first dorsal fin in adults (about three times as long as longest spine in first dorsal fin in *S. rivoliana*); maximum body depth less than one-third fork length (more than one-third in *S. rivoliana*).

SIZE: To 100 cm; common to 80 cm.

GEOGRAPHIC DISTRIBUTION: Predominantly a circumtropical species but may enter some temperate areas. Found in the western Atlantic from Cape Cod throughout the Gulf of Mexico, the Caribbean Sea, and Bermuda, and south along the eastern coast of South America to Argentina.

SNAKE MACKERELS

Snake mackerels or fishes of the family Gempylidae resemble tuna and mackerellike fish (Scombridae) in having moderately elongate and slightly compressed bodies, 2 dorsal fins, the second of which is followed by several finlets. Unlike scombrids, gempylids have a second inner row of 3 or 4 teeth present at the anterior end of each premaxilla.

Gasterochisma melampus Richardson, a scombrid fish that is similar to the snake mackerels, is occasionally taken by longline operations in the Southern Hemisphere and transported to the western North Atlantic. It can be distinguished from the gempylids because of its high number of dorsal and anal finlets (8 or 9), its robust body with large thick scales, and the presence of large pelvic fins which fold back into grooves.

Two gempylid species may be taken by longline in this area. For more information concerning gempylids of the western Atlantic see Bigelow and Schroeder (1953), Matsubara and Iwai (1958), and Fischer (1978).

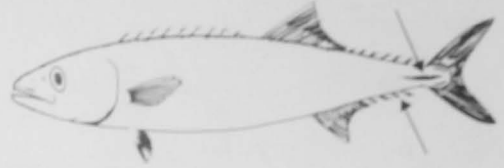
KEY TO THE SPECIES OF SNAKE MACKERELS COVERED IN THIS GUIDE

No keels on caudal peduncle; scales with spinous projections making the skin scratchy to the touch; 2 or 3 dorsal and anal finlets.



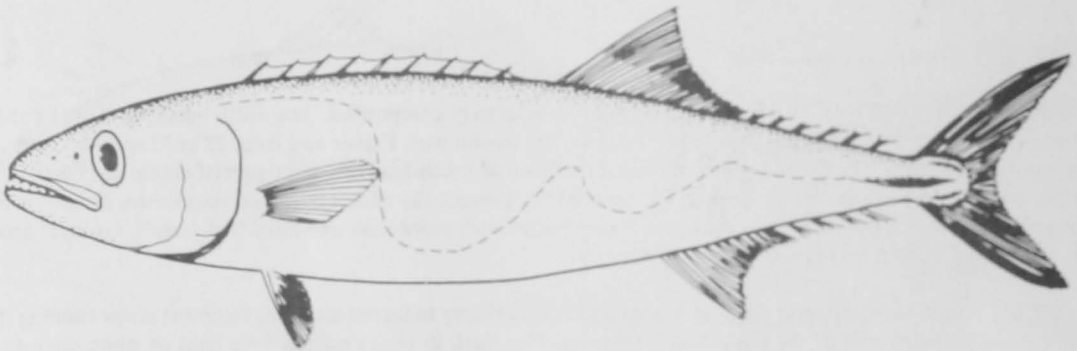
Ruvettus pretiosus
Oilfish

Keels present on caudal peduncle; scales without spinous projections making the skin smooth to the touch; 4 to 6 dorsal and anal finlets.



Lepidocybium flavobrunneum
Escolar

Lepidocybium flavobrunneum (Smith)



COMMON NAME: Escolar.

DESCRIPTIVE CHARACTERS: Body moderately elongate and slightly compressed. Premaxillary teeth uniformly small, conical, and curved inward; a second inner row of 3 or 4 teeth, similar to other jaw teeth, present at the anterior end of each premaxilla; teeth of the lower jaw larger. Two well-separated dorsal fins: the first low with a more or less straight or convex margin comprised of 8 or 9 spines; the second much higher than the first, followed by 4-6 finlets. Anal fin followed by 4 or 5 finlets. Caudal peduncle with well-developed midlateral keels. Lateral line faint, but strongly curved into a sinusoidal path. Scales smooth, not spinous.

COLOR: Uniform dark brown to black.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Elagatis bipinnulata: premaxillary teeth small and inconspicuous, arranged in patches (in 2 rows, large and curved inward in *L. flavobrunneum*); first dorsal fin with 6 spines (8 or 9 in *L. flavobrunneum*); only 1 finlet after dorsal and anal fins (4-6 finlets after dorsal and anal fins in *L. flavobrunneum*); caudal peduncle without keels (present in *L. flavobrunneum*); body coloration greenish blue to yellow and white (a uniform dark brown to black in *L. flavobrunneum*).

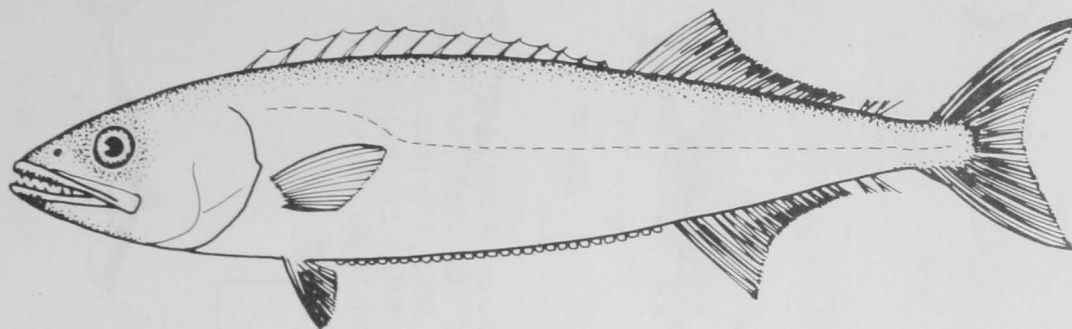
Ruvettus pretiosus: no keels on caudal peduncle; 13-15 spines in first dorsal fin (8 or 9 in *L. flavobrunneum*); 2 or 3 dorsal and anal finlets (4-6 in *L. flavobrunneum*); scales with spinous projections making skin scratchy to touch, scales modified to form a keel on belly; lateral line straight (sinusoidal in *L. flavobrunneum*).

Species of Scombridae: teeth in a single row (a second row of 3 or 4 conical teeth present on anterior end of premaxilla of *L. flavobrunneum*); lateral line may have several small dips or an abrupt dip as in *Scomberomorus cavalla*; however, dips not as pronounced and the abrupt dip is posterior to the first dorsal fin (under first dorsal fin in *L. flavobrunneum*).

SIZE: To 200 cm; common to 150 cm.

GEOGRAPHIC DISTRIBUTION: A worldwide species. In the western Atlantic found off shore along the east coast of the United States, the Gulf of Mexico, Cuba, and the Bahamas.

Ruvettus pretiosus Cocco



COMMON NAME: Oilfish.

DESCRIPTIVE CHARACTERS: Body moderately elongate and slightly compressed. Premaxillary teeth are conical and slightly curved inward; a second row of about 2 enlarged fanglike teeth are present at the anterior end of each premaxilla; lower jaw teeth are similar to the outer row of premaxillary teeth. Two separated dorsal fins: the first low with a more or less convex margin comprised of 13–15 spines; the second higher than the first, followed by about 2 finlets. Anal fin followed by about 2 finlets. No keels on caudal peduncle. Lateral line more or less straight, curving down slightly above the pectoral fin. Scales with spinous projections making the skin scratchy to the touch, modified to form a keel on the belly.

COLOR: A uniform brown with black pectoral and pelvic fin tips, second dorsal and anal fins with white margins in young specimens.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Elagatis bipinnulata: premaxillary teeth small and inconspicuous, arranged in patches (in 2 rows, large and slightly curved inward in *R. pretiosus*); first dorsal fin with 6 spines (13–15 in *R. pretiosus*); only 1 dorsal and anal finlet (dorsal and anal fins followed by 2 finlets in *R. pretiosus*); body covered with smooth scales (scales with spinous projections in *R. pretiosus*); body coloration greenish blue to yellow and white (uniform dark brown to black in *R. pretiosus*).

Lepidocybium flavobrunneum: three pairs of keels on caudal peduncle, 8 or 9 spines in first dorsal fin (no caudal keels and 13–15 dorsal fin spines in *R. pretiosus*); 4–6 dorsal and anal finlets (2 or 3 in *R. pretiosus*); scales smooth without spinous projections, no keel of scales on the belly; lateral line sinusoidal (slightly curved in *R. pretiosus*).

Species of Scombridae: teeth in a single row (a second row of 2 fanglike teeth is present on the anterior end of the premaxilla of *R. pretiosus*); caudal keels present; scales not modified to form a keel on the belly.

SIZE: To 300 cm; common to 150 cm.

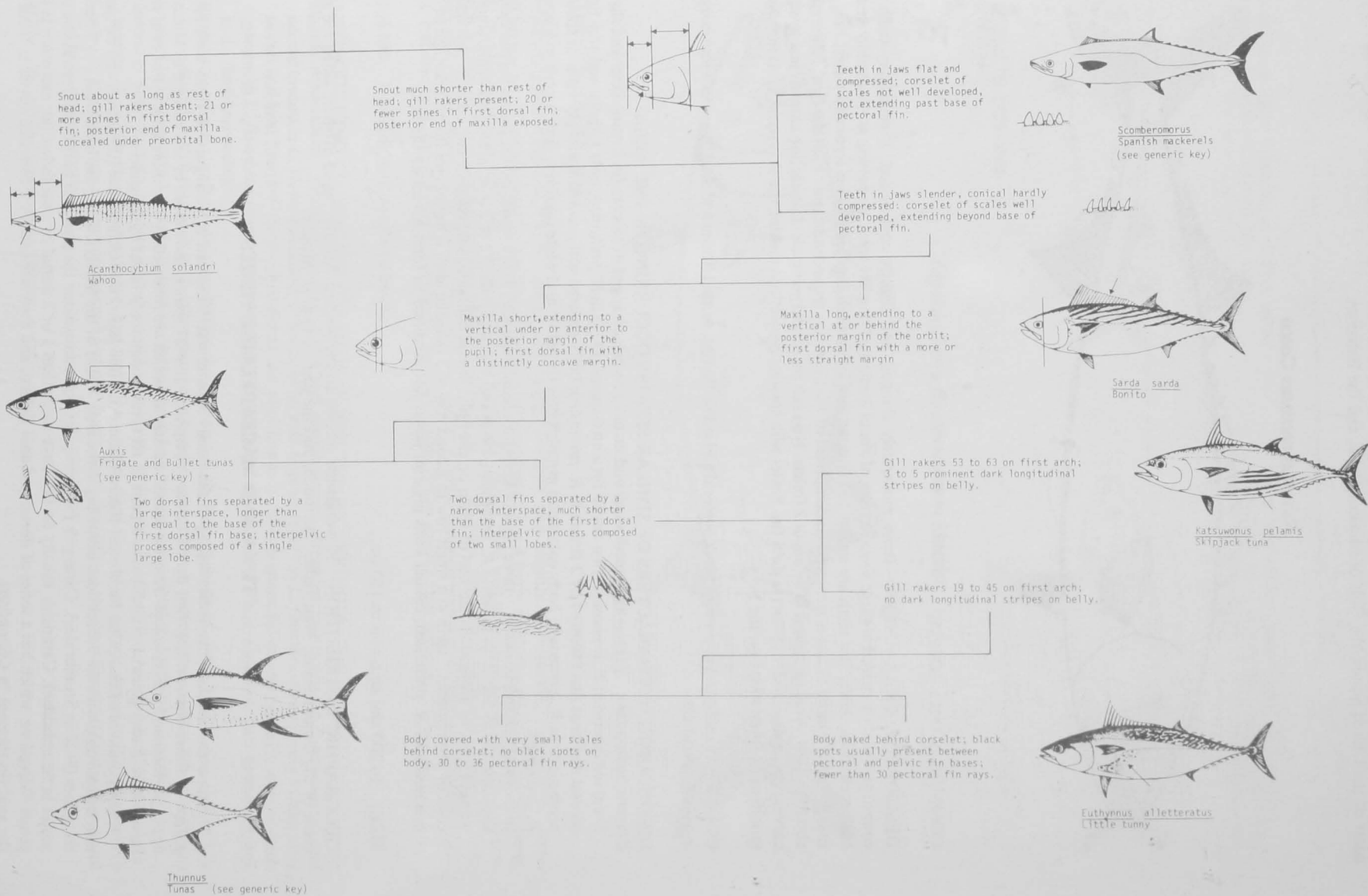
GEOGRAPHIC DISTRIBUTION: A worldwide species. In the western Atlantic found offshore along the east coast of the United States, West Indies, Bermuda, and the eastern Gulf of Mexico.

TUNA AND MACKERELLIKE FISHES

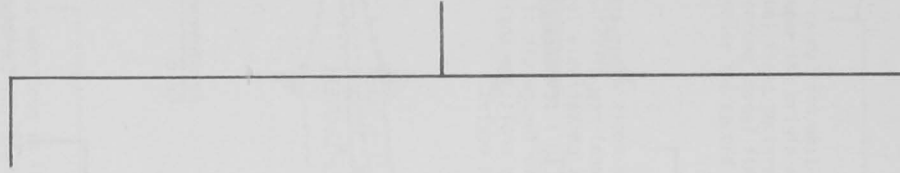
The tuna and mackerellike fishes belong to the family Scombridae. They can be distinguished from most other groups of fishes because their first dorsal fins are comprised of 9–27 spines, have more or less straight or concave upper profiles, and are separated from the second dorsal fins which are followed by 5 or more finlets. Fishes of this family have 2 or 3 pairs of caudal keels; 3 pairs in all species commonly taken by longline.

Representatives of two other families of fishes, Carangidae (the jacks) and Gempylidae (the oilfish and escolar), may be confused with the Scombridae occurring in the area. Fishes of the family Carangidae have from 3 to 8 dorsal fin spines (9–27 in Scombridae). Carangids frequently develop scutes along the posterior part of the lateral line (no scutes in Scombridae). Carangids usually do not have more than 1 or 2 dorsal or anal finlets (an exception is the genus *Oligoplites*, which has a series of dorsal and anal finlets), and there are usually 2 detached spines in front of the anal fin (present in *Oligoplites*).

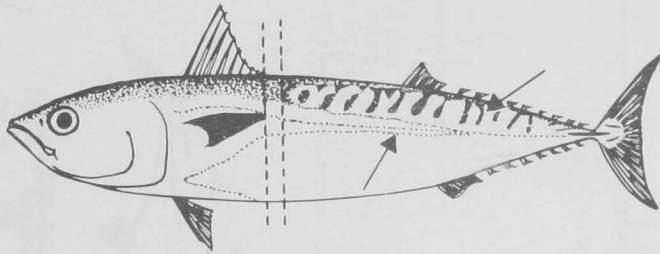
KEY TO THE GENERA OF SCOMBRIDAE COVERED IN THIS GUIDE



KEY TO THE SPECIES OF AUXIS OCCURRING IN THE AREA

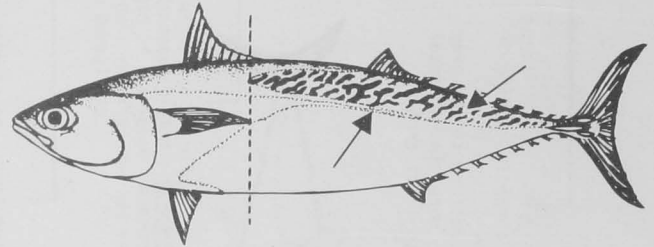


Posterior part of corselet wide, 6 to 20 scales wide under the origin of the second dorsal fin; vertical from scaleless area above corselet not reaching tip of pectoral fin; dark stripes on back nearly vertical.



Auxis rochei
Bullet tuna

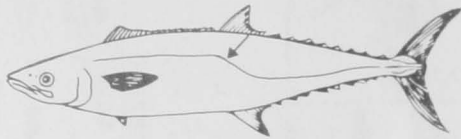
Posterior part of corselet narrow, not more than 5 scales wide under the origin of the second dorsal fin; vertical from scaleless area above corselet reaching tip of pectoral fin; dark stripes on back oblique, not vertical.



Auxis thazard
Frigate tuna

KEY TO THE SPECIES OF SCOMBEROMORUS OCCURRING IN THE AREA

Lateral line abruptly curving downward below second dorsal fin; sides a uniform silver gray in adults; no more than 10 total gill rakers on first arch.

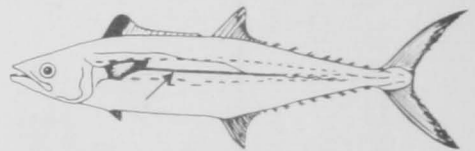


Scomberomorus cavalla
King mackerel

Lateral line gradually curving downward toward caudal keel; yellow spots or dark streaks on sides; usually 10 or more gill rakers on first arch.

Yellow to bronze spots, no streaks or lines, on sides; maxilla extends to a point under or posterior to the fleshy margin of the orbit; pectoral fin scaly only at base.

Yellow to bronze spots above and below a mid-lateral row of streaks or lines of variable length; maxilla extends to a point at or between the posterior margin of the pupil and fleshy orbit; pectoral fin covered with scales.



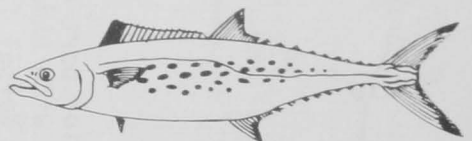
Scomberomorus regalis
Cero

Found in waters off the Atlantic coast of the U. S. and in the Gulf of Mexico; total vertebrae 50 to 53.

Found in waters off the Caribbean coast of Central America and off the Atlantic coast of South America; total vertebrae 47 to 49.



Scomberomorus maculatus
Spanish mackerel



Scomberomorus brasiliensis
Serra spanish mackerel

KEY TO THE SPECIES OF THUNNUS OCCURRING IN THE AREA

Total gill rakers on first arch 33 or less; pectoral fin long, reaching at least to the space between the first and second dorsal fins.

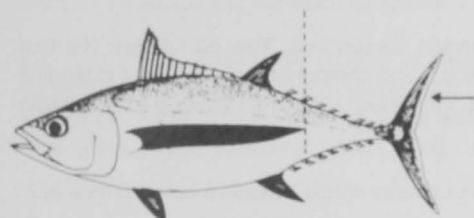
Total gill rakers on first arch 33 to 43; pectoral fin short, not reaching beyond the base of the first dorsal fin.



Thunnus t. thynnus
Bluefin tuna

Posterior margin of caudal fin white; body deepest at a point near the origin of the second dorsal and anal fins; pectoral fin extends beyond the second dorsal fin, usually to a point under the second dorsal finlet.

Caudal fin without a white posterior margin; body deepest at a point anterior to the origin of the second dorsal and anal fins; pectoral fin does not extend past second dorsal fin.



Thunnus alalunga
Albacore

Total gill rakers on first arch more than 25; finlets bright yellow with black margins.

Total gill rakers on first arch 25 or less; finlets dusky with a trace of yellow.



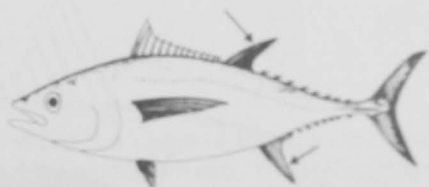
Thunnus atlanticus
Blackfin tuna

Dorsal and anal fins very long in large specimens, becoming well over 20% of fork length; striations not present on ventral surface of liver.

Dorsal and anal fins not very long in large specimens, less than 20% of fork length; striations present on ventral surface of liver.



Thunnus albacares
Yellowfin tuna



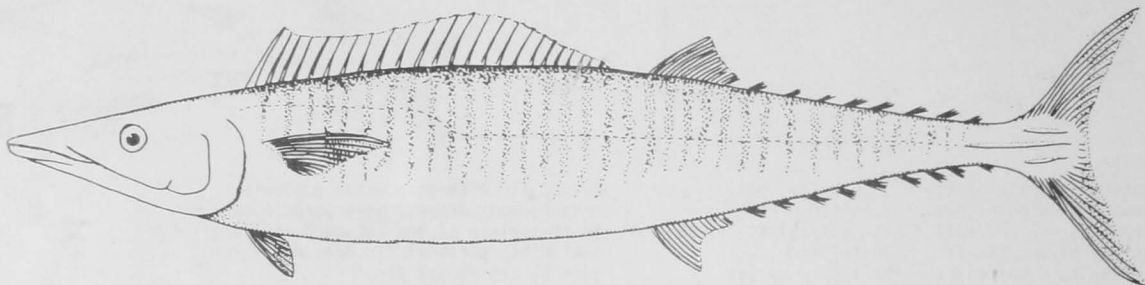
Thunnus obesus
Bigeye tuna



Fishes of the family Gempylidae usually lack distinct markings on the body. With the exception of *Lepidocybium flavobrunneum*, gempylids lack keels on the caudal peduncle. *Lepidocybium* has a deep dip in the lateral line under the anterior portion of the first dorsal fin. Also, the first dorsal fin is low, longest spine less than half the height of the second dorsal, and it is convex in outline (straight or concave in the Scombridae).

Several scombrid genera are taken by longline in the area. The scombrids in this guide represent 15 species in 7 genera. Additional information regarding the species of Scombridae in the western Atlantic is contained in papers by Gibbs and Collette (1967), Miyake and Hayasi (1972), Collette and Chao (1975), Collette et al. (1978), and Fischer (1978).

Acanthocybium solandri (Cuvier)



COMMON NAME: Wahoo.

DESCRIPTIVE CHARACTERS: Body elongate, only slightly laterally compressed. Two dorsal fins: the first with 24–26 spines; the second followed by 9 finlets. Teeth moderate in size and compressed. Corselet not extending past base of pectoral fin. Snout about as long as the rest of the head. Gill rakers absent; posterior part of maxilla completely concealed under preorbital bone.

COLOR: Back, iridescent bluish green; numerous dark vertical bars on sides which extend to below lateral line.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

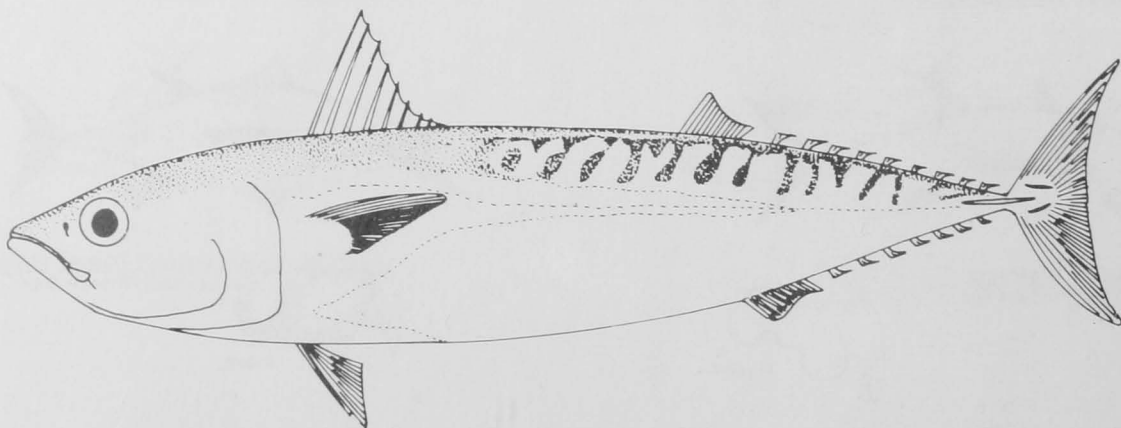
Species of *Sarda*, *Auxis*, *Euthynnus*, *Katsuwonus*, and *Thunnus*: corselet extends past pectoral fin (does not extend past pectoral fin base in *A. solandri*); snout shorter than rest of head (about as long as the rest of the head in *A. solandri*).

Species of *Scomberomorus*: gill rakers present (absent in *A. solandri*); fewer than 24 spines in first dorsal fin (24–26 spines in *A. solandri*); snout much shorter than rest of head (about as long as rest of head in *A. solandri*).

SIZE: To 183 cm FL.

GEOGRAPHIC DISTRIBUTION: A cosmopolitan species usually found offshore throughout the Caribbean Sea, the Gulf of Mexico, the eastern coast of the United States, and the northern and eastern coasts of South America.

Auxis rochei (Risso)



COMMON NAME: Bullet tuna.

DESCRIPTIVE CHARACTERS: Body elongate and rounded. Two dorsal fins separated by large interspace greater than or equal to the length of first dorsal fin base; second dorsal followed by 8 finlets. Vertical line from anterior margin of scaleless area above corselet does not reach past tip of pectoral fin. A single large interpelvic process as long as pelvic fins. Teeth small and conical. Body naked except for the corselet which is well developed and extends beyond the tip of the pectoral fins; corselet wide, 6–20 scales wide under second dorsal fin origin. A well developed median caudal keel present.

COLOR: Back bluish turning to deep purple or almost black on the head; a pattern of 15 or more fairly broad, nearly vertical dark bars in the scaleless area; belly white; pectoral and pelvic fins purple, their inner sides black.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Auxis thazard: posterior part of corselet narrow, not more than 5 scales wide under origin of second dorsal fin (6–20 scales wide in *A. rochei*); pectoral fins reaching vertical from scaleless area above corselet; dark stripes on back more oblique.

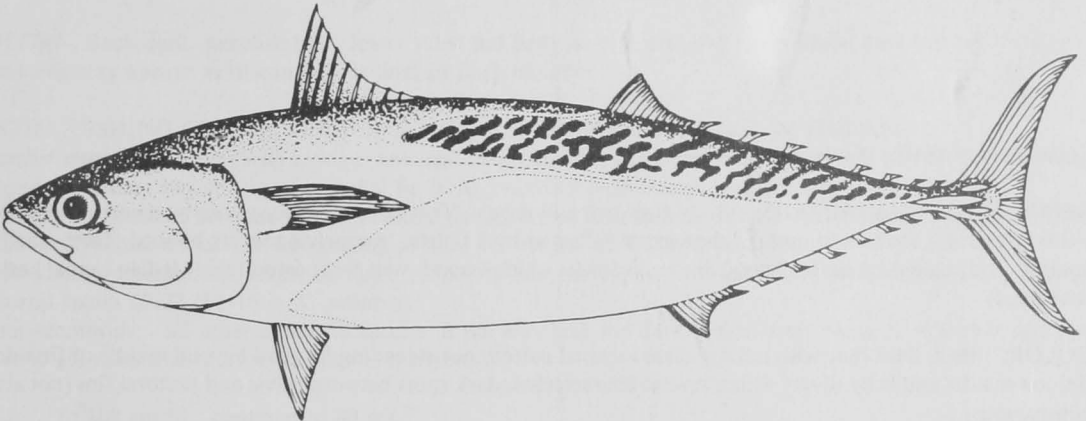
Scomber spp.: scales present all over body, no median caudal keel between 2 small keels on each side of caudal fin base; 5 finlets behind second dorsal and anal fins (8 or 9 in *Auxis* spp.); corselet absent; interpelvic process minute (single and as long or longer than length of pelvic fin in *Auxis* spp.).

Other scombrids: all other scombrid species occurring in this area have both dorsal fins close together (separated by large interspace greater than or equal to the length of first dorsal fin base in *Auxis* spp.).

SIZE: To 40 cm FL; common to 35 cm.

GEOGRAPHIC DISTRIBUTION: A cosmopolitan warmwater species that occurs sporadically throughout the western central Atlantic. Until recently, only one species was recognized in this area, so exact distribution of the two species (*A. rochei* and *A. thazard*) is not well known. *Auxis rochei* appears to be the more common. Adults have been taken largely in inshore waters along the northern and eastern coasts of South America.

Auxis thazard (Lacepède)



COMMON NAME: Frigate tuna.

DESCRIPTIVE CHARACTERS: Body elongate and rounded. Two dorsal fins separated by large interspace greater than or equal to length of the first dorsal fin base; second dorsal followed by 8 finlets. Vertical line from anterior margin of scaleless area above corselet reaching past pectoral fins. A single large interpelvic process, as long as pelvic fins. Teeth small and conical. Body naked except for the corselet which is well developed and extends beyond the tip of the pectoral fins; corselet narrow, no more than 5 scales wide under second dorsal fin origin. A well developed median caudal keel present.

COLOR: Back bluish, turning to deep purple or almost black on head; a pattern of 15 or more narrow, oblique to nearly horizontal, dark wavy lines in scaleless area above lateral line; belly white; pectoral and pelvic fins purple, their inner sides black.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Auxis rochei: posterior part of corselet wider, 6–20 scales wide under origin of second dorsal fin (not more than 5 scales wide in *A. thazard*); vertical from scaleless area above corselet not reaching past pectoral; dark stripes on back nearly vertical.

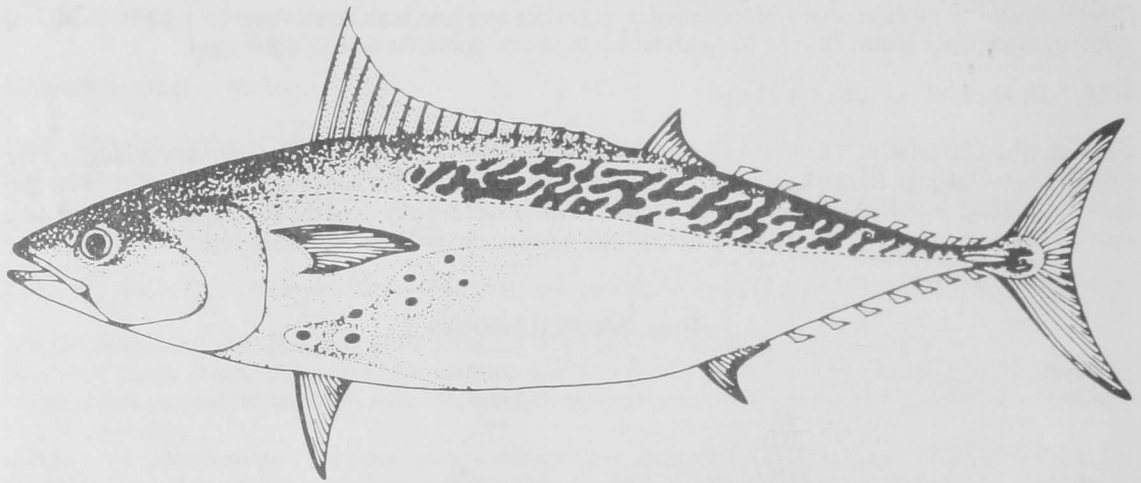
Scomber spp.: scales present all over body, no median caudal keel between 2 small keels on each side of caudal fin base; 5 finlets behind second dorsal and anal fins (8 or 9 in *Auxis* spp.); corselet absent; interpelvic process minute (single and as large or larger than length of pelvic fin in *Auxis* spp.).

Other scombrids: all other scombrid species occurring in this area have both dorsal fins close together (separated by large interspace greater than or equal to length of first dorsal fin base in *Auxis* spp.).

SIZE: To 50 cm FL; common to 40 cm.

GEOGRAPHIC DISTRIBUTION: A cosmopolitan warmwater species that occurs sporadically throughout the western central Atlantic. Until recently, only one species, currently known as *A. rochei*, was recognized in the western Atlantic so that the exact distribution of the two species is not well known. Reported from west of St. Vincent, off Caracas, at Trinidad, and around Margarita Island in eastern Venezuela.

Euthynnus alletteratus (Rafinesque)



COMMON NAME: Little tunny.

DESCRIPTIVE CHARACTERS: Body fusiform and robust. Two dorsal fins separated by a narrow interspace: the first strongly concave in outline; the second followed by 8 finlets. Interpelvic process bilobed. Teeth small and conical. Body naked except for lateral line and corselet which extends well past pectoral fin. Median caudal keel well developed.

COLOR: Back dark blue with a complicated striped pattern not extending forward beyond middle of first dorsal fin; lower sides and belly silvery white; several characteristic dark spots between pelvic and pectoral fins (not always conspicuous).

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Scomberomorus spp.: corselet not developed, enlarged scales not extending past base of pectoral fin (extending past tip of pectoral fin in *Euthynnus alletteratus*); teeth compressed (teeth conical in *E. alletteratus*).

Auxis spp.: dorsal fin interspace at least as long as base of first dorsal fin (interspace short in *E. alletteratus*).

Sarda sarda: stripes on back extending forward under origin of first dorsal fin (more or less mottled, extending only as far as anterior one-third of first dorsal fin in *E. alletteratus*); outline of first dorsal almost straight (strongly concave in *E. alletteratus*).

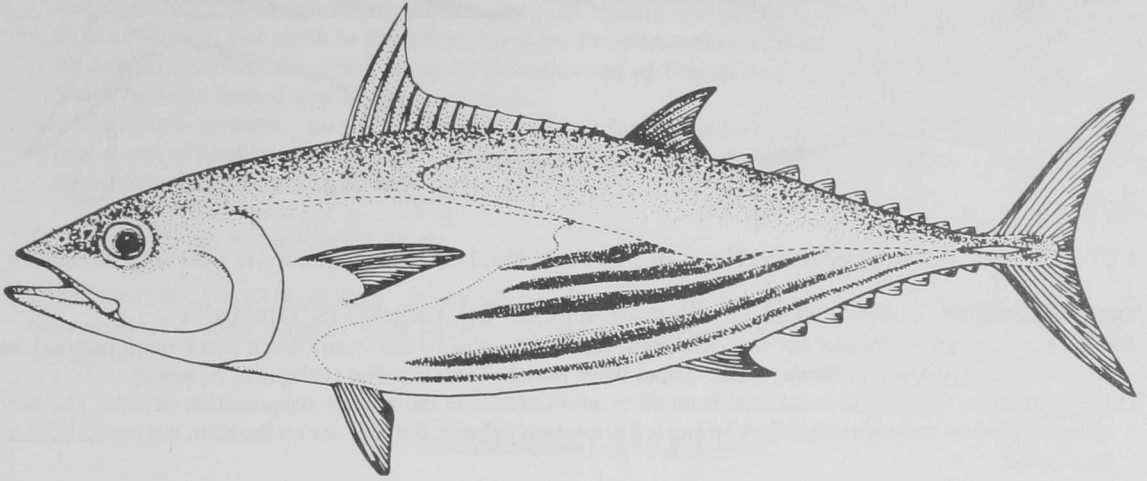
Katsuwonus pelamis: four to six very conspicuous longitudinal dark bands which, in live specimens, may appear as discontinuous lines of dark blotches on belly (only dark spots between pelvic and pectoral fins in *E. alletteratus*); 53–63 gill rakers on first arch (not more than 30 in *E. alletteratus*).

Thunnus spp.: back pigmentation is metallic dark blue to black without striping or mottling (a complicated mottled pattern on the back extending forward beyond middle of first dorsal fin in *E. alletteratus*).

SIZE: To 100 cm FL; common to 75 cm.

GEOGRAPHIC DISTRIBUTION: An Atlantic and Mediterranean species, found in the western Atlantic from New England south throughout the Caribbean, the northern Gulf of Mexico, and the northern and eastern coasts of South America through Brazil.

Katsuwonus pelamis (Linnaeus)



COMMON NAME: Skipjack tuna.

DESCRIPTIVE CHARACTERS: Body elongate and rounded. Gill rakers numerous, 53–63 total on first gill arch. Two dorsal fins separated by a small interspace: the first with 14–16 spines; the second followed by 7–9 finlets. Interpelvic process bilobed. Teeth small and conical. Body scaleless except for the corselet and lateral line; corselet well developed, extends well beyond pectoral fins. A well developed median caudal keel on each side of the caudal fin.

COLOR: Back dark, purplish blue, lower sides and belly silvery, with 4–6 longitudinal dark bands which in live specimens may appear as discontinuous lines of dark blotches.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Scomberomorus spp.: corselet lacking, enlarged scales not extending past base of pectoral fin (corselet well developed, extending beyond tip of pectoral fin in *K. pelamis*); teeth compressed (conical in *K. pelamis*).

Auxis spp.: distance between first and second dorsal fins at least as long as base of first dorsal (distance between first and second dorsal fins not as long as base of first dorsal fin in *K. pelamis*).

Sarda sarda: longitudinal stripes on back (stripes on belly in *K. pelamis*); gill rakers 16–22 (53–63 in *K. pelamis*); dorsal spines 20–23 (14–16 in *K. pelamis*).

Other scombrids: all other scombrid species in the area lack the dark longitudinal bands on the belly and have fewer gill rakers, at most 43 (*Thunnus t. thynnus*).

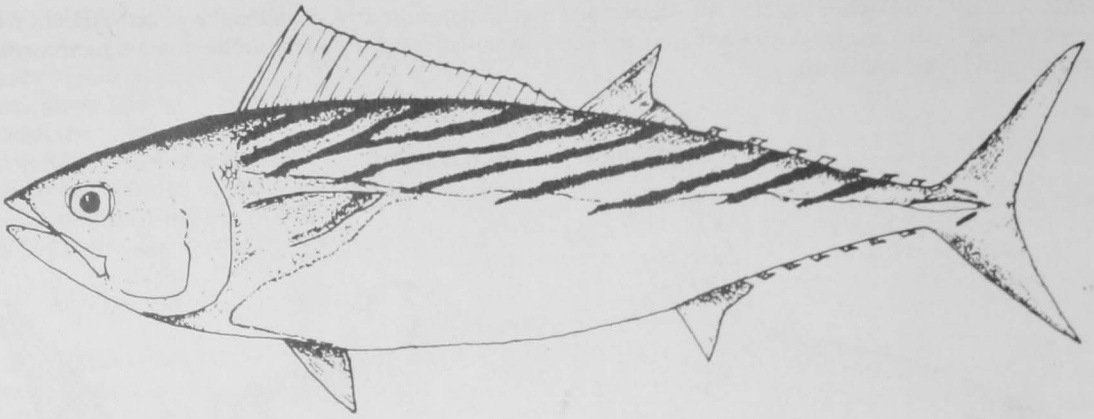
SIZE: To 100 cm FL; common to 80 cm.

GEOGRAPHIC DISTRIBUTION: Cosmopolitan in tropical and subtropical seas. Occurs in large schools in deep waters. Commonly found in mixed schools with blackfin tuna, *Thunnus atlanticus*, in the western North Atlantic; throughout the tropical western Atlantic seasonally from Cape Cod south to Argentina.

Sarda sarda (Blöch)

COMMON NAME: Atlantic bonito.

DESCRIPTIVE CHARACTERS: A small, relatively narrow-bodied species. Mouth large, upper jaw reaching to or beyond hind margin of eye; teeth small and conical. Gill rakers 16–22 on first gill arch. Two dorsal fins separated by a small space: the first with 20–23 spines; the second followed by 7–9 finlets. Interpelvic process bilobed. Lateral line conspicuously wavy. Body entirely covered with scales which are minute except on the well-developed corselet. A well developed median caudal keel present.



COLOR: Back and upper sides steel blue with 5–11 dark, slightly oblique stripes; lower sides and belly silvery.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

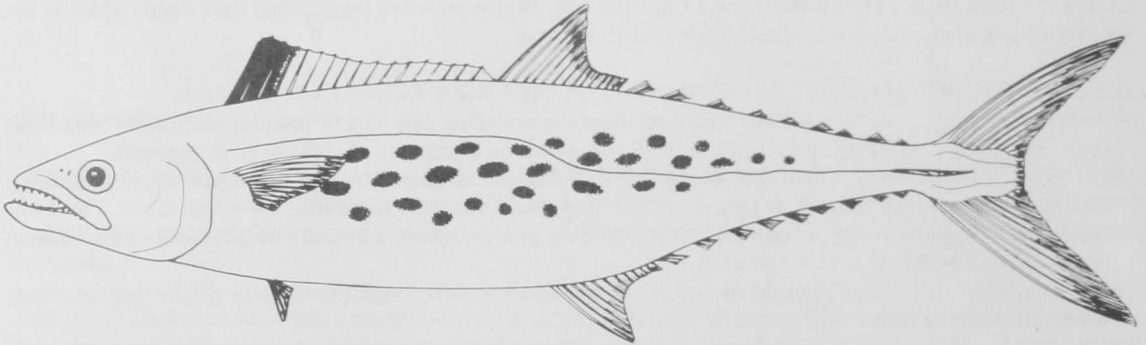
Scomberomorus spp.: corselet not well developed, thickened scales do not extend much past base of pectoral fin (corselet well developed in *Sarda sarda*); stripes when present are horizontal (oblique in *S. sarda*).

Other scombrids: may be distinguished from all other scombrids in the area by pigmentation pattern. The only other scombrid with longitudinal dark stripes is *Katsuwonus pelamis*, but they are on the belly, not on the back as in *S. sarda*.

SIZE: To 85 cm FL; common to 50 cm.

GEOGRAPHIC DISTRIBUTION: An Atlantic and Mediterranean species (including the Black and Adriatic Seas); found in the western Atlantic from the east and Gulf coasts of the United States; common off the coasts of Colombia and Venezuela; absent from most of the Caribbean Sea.

***Scomberomorus brasiliensis* Collette, Russo and Zavala-Camin**



COMMON NAME: Serra Spanish mackerel.

DESCRIPTIVE CHARACTERS: Body elongate, strongly compressed. Two dorsal fins, the second followed by 7–10 finlets. Corselet not extending past base of pectoral fin. Snout much shorter than the rest of the head. Teeth compressed. Many gill rakers on first arch, 1–3 (usually 2 or 3) on upper limb; 9–13 (usually 10–12) on lower limb; total 11–16 (usually 12–15). Lateral line gradually curving downward toward well developed median caudal keel. Pectoral fin with scales only at base. Posterior end of maxilla exposed, extending to a point under or beyond posterior fleshy margin of orbit. Total vertebrae 47–49 (usually 48). Pelvic fin length about 4.5% FL.

COLOR: Back iridescent bluish green, sides silvery with several rows of round yellowish-bronze spots but without any lines or streaks.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Scomberomorus cavalla: sharp dip in lateral line under second dorsal fin; usually 7–10 gill rakers on first arch (usually 12–15 in *S. brasiliensis*); sides silver gray in adults (several rows of spots in *S. brasiliensis*).

S. regalis: pectoral fin scaly (scales present only on base in *S. brasiliensis*); total gill rakers on first arch usually 14–17 (usually 12–15 in *S. brasiliensis*); maxilla extends to a point between the posterior margin of pupil and fleshy orbit (at or posterior to posterior fleshy margin of orbit in *S. brasiliensis*); midlateral row of yellow-orange streaks of variable length, small yellow spots or broken lines above and below streaks (no streaks or broken lines present, spots more or less circular in *S. brasiliensis*).

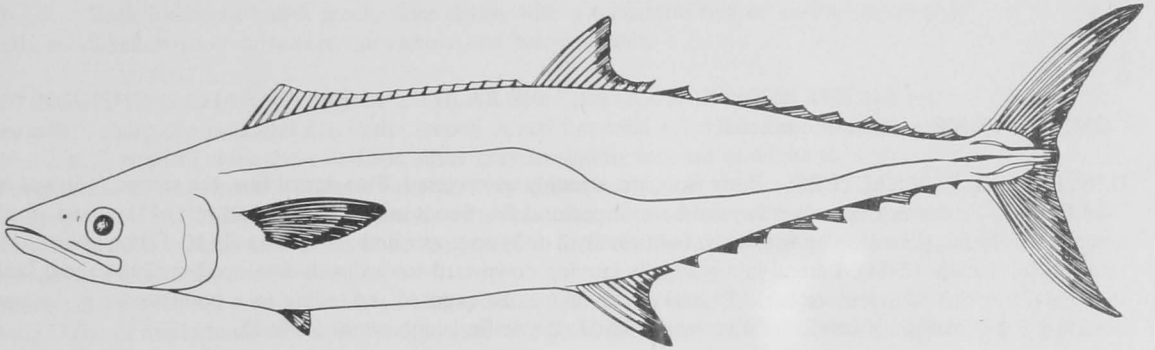
S. maculatus: total vertebrae 50–53, usually 51 or 52 (47–49, usually 48, in *S. brasiliensis*); pelvic fin length about 5.5% FL (4.5% in *S. brasiliensis*). The ranges of these two species are not known to overlap. *Scomberomorus maculatus* is a coastal species and extends along the Atlantic and Gulf coasts of the United States, around the Gulf of Mexico, and south to Progreso, Yucatan. The northernmost record of *S. brasiliensis* is Belize. *Scomberomorus brasiliensis* is present along the Atlantic coast of Central America, south along the Atlantic coast of South America from Colombia through Brazil.

Acanthocybium solandri: no gill rakers; 24–26 spines in first dorsal fin (<24 in *Scomberomorus*); snout about as long as rest of head (much shorter in *Scomberomorus*); posterior end of maxilla concealed under preorbital bone; numerous vertical stripes on sides of body.

SIZE: To 125 cm FL; usually 40–65 cm.

GEOGRAPHIC DISTRIBUTION: A coastal species restricted to the western Atlantic. Ranges along the Caribbean coast of Central America from Belize south along the Atlantic coast of South America from Colombia through Brazil.

Scomberomorus cavalla (Cuvier)



COMMON NAME: King mackerel.

DESCRIPTIVE CHARACTERS: Body elongate, strongly compressed. Two dorsal fins, the second followed by 7–10 finlets. Corselet not well developed, not extending past base of pectoral fin. Snout much shorter than rest of head. Teeth compressed. Gill rakers on first arch few, 1 or 2 on upper limb; 6–9 on lower limb; total 7–13 (usually 8–10). Lateral line abruptly curving downward below second dorsal fin extending to well developed median caudal keel. Pectoral fin with scales only at base. Posterior end of maxilla exposed, extending to a point under or beyond posterior fleshy margin of orbit.

COLOR: Back iridescent bluish green, sides silver gray.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Scomberomorus maculatus and *S. brasiliensis*: lateral line gradually curving downward toward caudal keel (abruptly curving downward below second dorsal fin in *S. cavalla*); usually 12–15 total gill rakers on first arch (usually 8–10 in *S. cavalla*); sides silvery with numerous yellow-orange to bronze spots (sides silver gray in *S. cavalla*).

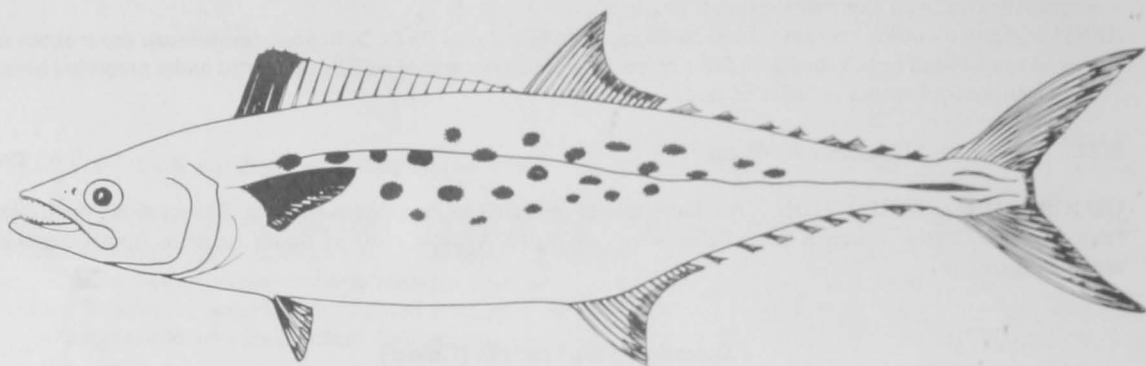
S. regalis: lateral line gradually curving downward toward caudal keel (abruptly curving downward below second dorsal fin in *S. cavalla*); usually 14–17 total gill rakers on first gill arch (usually 8–10 in *S. cavalla*); sides silvery with a midlateral row of yellow-orange streaks of variable length; small yellow spots or broken lines above and below streaks (spots without streaks or lines present only in juvenile *S. cavalla*).

Acanthocybium solandri: no gill rakers; 24–26 spines in first dorsal fin (<24 in *Scomberomorus*); snout about as long as rest of head (much shorter in *Scomberomorus*); posterior end of maxilla concealed under preorbital bone; numerous vertical stripes on sides of body.

SIZE: To 150 cm FL; common to 70 cm.

GEOGRAPHIC DISTRIBUTION: A western Atlantic species, found along the Atlantic coast of the United States seasonally, from Massachusetts south along both coasts of Florida, throughout the Bahamas and Antilles to South America from Venezuela southward to Rio de Janeiro.

Scomberomorus maculatus (Mitchill)



COMMON NAME: Spanish mackerel.

DESCRIPTIVE CHARACTERS: Body elongate, strongly compressed. Two dorsal fins, the second followed by 7-10 finlets. Corselet not extending beyond base of pectoral fin. Snout much shorter than rest of the head. Teeth compressed. Many gill rakers on first arch, 1-4 (usually 2 or 3) on upper limb; 9-13 (usually 10-12) on lower limb; total 11-16 (usually 12-14). Lateral line gradually curving downward toward well developed median caudal keel. Pectoral fin with scales only at base. Posterior end of maxilla exposed, extending to a point under or beyond posterior fleshy margin of orbit. Total vertebrae 50-53. Pelvic fin length about 5.5% FL.

COLOR: Back iridescent bluish green, sides silvery with numerous yellow to bronze spots but without any lines or streaks.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Scomberomorus cavalla: sharp dip in lateral line under second dorsal fin; usually 7-10 gill rakers on first arch (usually 12-14 in *S. maculatus*); sides are silver gray in adults.

S. regalis: pectoral fin scaly (scales present only on base in *S. maculatus*). Total gill rakers on first arch usually 14-17 (usually 12-14 in *S. maculatus*); maxilla extends to a point under the region between the posterior margins of the pupil and the fleshy orbit (at or posterior to the posterior fleshy margin of the orbit in *S. maculatus*). Midlateral row of yellow-orange streaks of variable length, small yellow spots or broken lines above and below streaks (no streaks or broken lines present, spots more or less circular in *S. maculatus*).

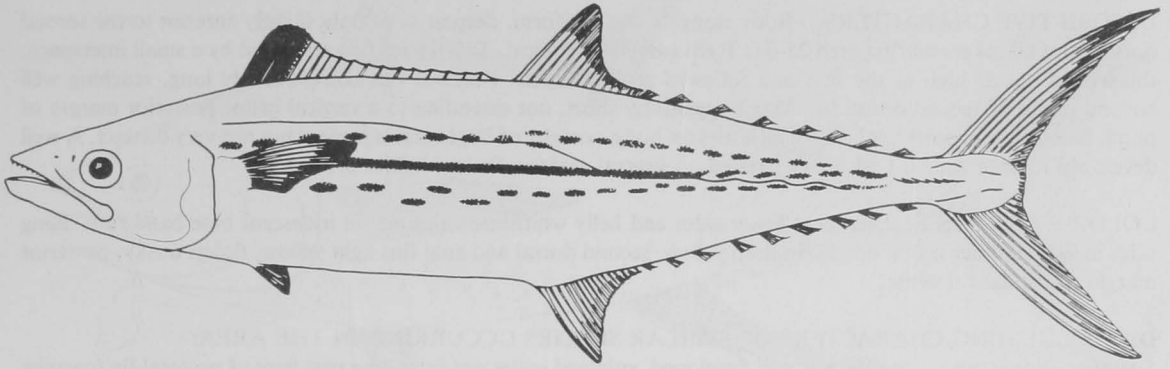
S. brasiliensis: total vertebrae 47-49, usually 48 (50-53, usually 51 or 52 in *S. maculatus*); pelvic fin length about 4.5% FL (5.5% in *S. maculatus*). The ranges of these two species are not known to overlap. The northernmost record of *S. brasiliensis* is Belize. *Scomberomorus brasiliensis* is present along the Caribbean coast of Central America, south along the coast of South America from Colombia to southern Brazil. *Scomberomorus maculatus* is a coastal species and is found along the Atlantic coast of the United States through the Gulf of Mexico to Progreso, Yucatan.

Acanthocybium solandri: no gill rakers; 24-26 spines in first dorsal fin (< 24 in *Scomberomorus*); snout about as long as rest of head (much shorter in *Scomberomorus*); posterior end of maxilla concealed under preorbital bone; numerous vertical stripes on sides of body.

SIZE: To 70 cm FL; common to 50 cm.

GEOGRAPHIC DISTRIBUTION: A coastal species restricted to the western North Atlantic. Ranges from Massachusetts south along the eastern coast of the United States to Florida, around the cape of Florida and along the Gulf coast of the United States and Mexico, south to Progreso, Yucatan. Occasionally found around the coast of Bermuda, but absent from the West Indies.

Scomberomorus regalis (Blöch)



COMMON NAME: Cero.

DESCRIPTIVE CHARACTERS: Body elongate, strongly compressed. Two dorsal fins, the second followed by 7-10 finlets. Corselet not extending past base of pectoral fin. Snout much shorter than rest of head. Teeth compressed. Many gill rakers on first arch, 2-4 on upper limb, 11-14 on lower arch, total usually 14-17. Lateral line gradually curving downward toward well developed median caudal keel. Pectoral fin covered with scales. Posterior end of maxilla exposed, extending to a point at or between posterior margins of pupil and fleshy orbit.

COLOR: Back iridescent bluish green, sides silvery with a midlateral row of yellow-orange streaks of variable length; small yellow spots or broken lines above and below streaks.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

S. cavalla: sharp dip in lateral line under second dorsal fin; total gill rakers on first arch usually 7-10 (usually 14-17 in *S. regalis*); sides are a uniform silver gray to slightly mottled in adults (*S. regalis* has the distinctive midlateral streak or streaks); pectoral fin scaly only at base.

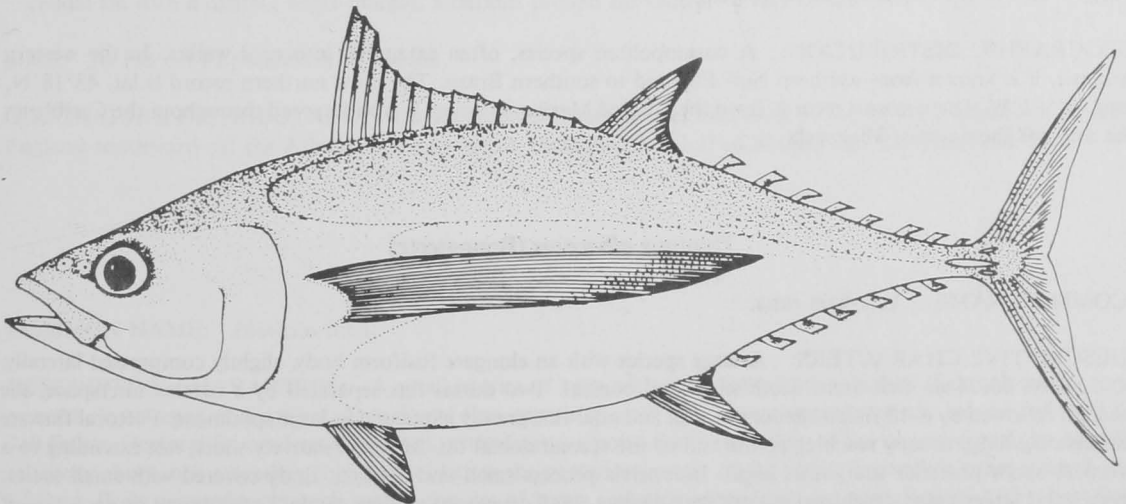
S. maculatus and *S. brasiliensis*: sides of body with numerous round yellow to bronze spots; pectoral fin scaly only at base; maxilla extends to a point under or posterior to fleshy margin of orbit (between pupil and posterior margin of fleshy orbit in *S. regalis*).

Acanthocybium solandri: no gill rakers; 24-26 spines in first dorsal fin (<24 in *Scomberomorus*); snout about as long as rest of head (much shorter in *Scomberomorus*); posterior end of maxilla concealed under preorbital bone; numerous vertical stripes on sides of body.

SIZE: To 80 cm; common to 45 cm.

GEOGRAPHIC DISTRIBUTION: A western Atlantic species found off southeastern Florida and the Bahamas, south through the Antilles and along the Atlantic coast of South America from Venezuela to Brazil. Especially common in the West Indies.

Thunnus alalunga (Bonnaterre)



COMMON NAME: Albacore.

DESCRIPTIVE CHARACTERS: Body elongate and fusiform, deepest at or only slightly anterior to the second dorsal fin. Gill rakers on first arch 25–31. Teeth small and conical. Two dorsal fins separated by a small interspace, the second not as high as the first and followed by 7–9 finlets. Pectoral fins conspicuously long, reaching well beyond origin of second dorsal fin. Maxilla relatively short, not extending to a vertical below posterior margin of pupil. Interpelvic process bilobed. Small scales on body, corselet of larger scales present but not very distinct. A well developed median caudal keel. Liver striated on ventral surface. Swim bladder present.

COLOR: Back metallic dark blue, lower sides and belly whitish; a faint lateral iridescent blue band runs along sides in live specimens; first dorsal fin deep yellow, second dorsal and anal fins light yellow, finlets dusky; posterior margin of caudal fin white.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Scomberomorus spp.: corselet not well developed, enlarged scales not extending past base of pectoral fin (corselet present but not very distinct in *Thunnus* spp.); maxilla long, at least extending to a vertical under posterior margin of pupil (maxilla short, not extending to a vertical under posterior margin of pupil in *Thunnus* spp.).

Auxis spp.: dorsal fin interspace at least as long as base of first dorsal fin (interspace short in *Thunnus* spp.); interpelvic process composed of a single large lobe (small and bilobed in *Thunnus* spp.).

Sarda sarda: stripes on back extending forward under origin of first dorsal fin (back is a more or less uniform metallic dark blue gradually turning silvery to whitish on the sides and belly in *T. alalunga*); outline of first dorsal fin almost straight (outline of first dorsal fin strikingly concave in *Thunnus* spp.).

Katsuwonus pelamis: four to six conspicuous longitudinal dark bands which in live specimens may appear as discontinuous lines of dark blotches on belly (belly uniform silvery white in *T. alalunga*); 53–63 gill rakers on first arch (25–31 in *T. alalunga*).

Euthynnus alletteratus: complicated mottled pattern of lines or bars on back, extending forward beyond middle of first dorsal fin (back is a more or less uniform metallic dark blue to black in *Thunnus* spp.).

Other species of *Thunnus*: can be distinguished from all other species of *Thunnus* because the pectoral fin extends beyond the second dorsal usually to a vertical under the first or second finlet (pectoral fin does not extend as far back as second dorsal fin in other species of *Thunnus*; however, in young specimens of *T. alalunga*, < 30 cm, the pectoral fins are about equal in length to similar-sized specimens of *T. albacares* and *T. obesus*). Other species of *Thunnus* are deepest more anteriorly, usually at level of first dorsal fin origin and lack the white margin to the caudal fin. Further distinguishing characters of other species of *Thunnus* are as follows:

Thunnus albacares: no striations on ventral surface of liver; belly frequently crossed by about 20 broken, nearly vertical lines; second dorsal and anal fins greatly elongated in adults; dorsal and anal finlets yellow with a narrow black margin (finlets dusky without black margin in *T. alalunga*).

Thunnus obesus: dorsal and anal finlets bright yellow, with distinct black margins (finlets dusky without black margins in *T. alalunga*).

Thunnus atlanticus: no striations on ventral surface of liver; 19–25 (usually 23 or fewer) gill rakers on first arch (25–31 in *T. alalunga*).

Thunnus thynnus: pectoral fins short, never reaching the space between the dorsal fins; second dorsal fin reddish brown; gill rakers 34–43 on first arch (25–31 in *T. alalunga*).

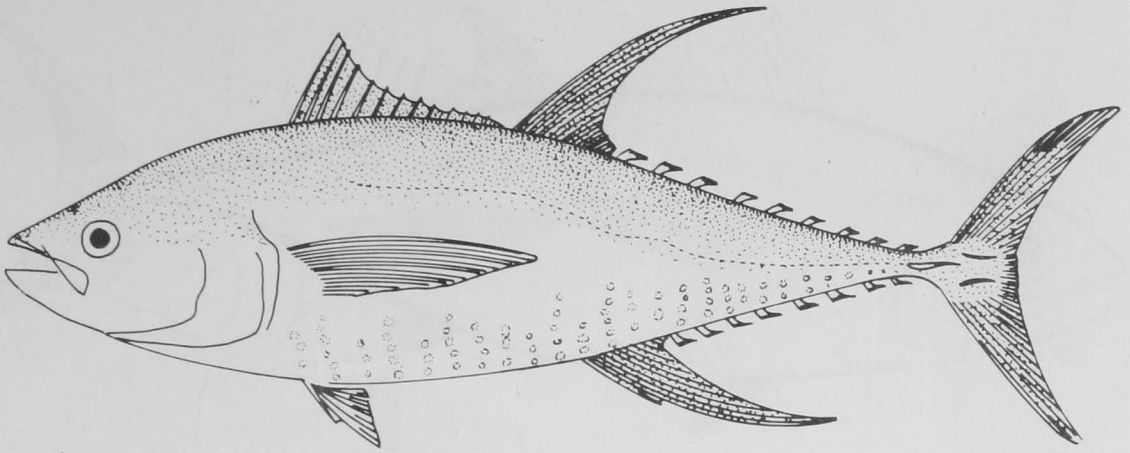
SIZE: To 140 cm FL; common to 100 cm.

GEOGRAPHIC DISTRIBUTION: A cosmopolitan species, often extending into cool waters. In the western Atlantic, it is known from southern New England to southern Brazil. The most northern record is lat. 43°18' N, long. 64°02' W. There are no records from the Gulf of Mexico although it is widespread throughout the Caribbean Sea and off the coast of Venezuela.

Thunnus albacares (Bonnaterre)

COMMON NAME: Yellowfin tuna.

DESCRIPTIVE CHARACTERS: A large species with an elongate fusiform body, slightly compressed laterally. Gill rakers 26–34 on first arch. Teeth small and conical. Two dorsal fins separated by a narrow interspace, the second followed by 8–10 finlets. Second dorsal and anal fins greatly elongated in large specimens. Pectoral fins are moderately long, usually reaching to the end of the second dorsal fin. Maxilla relatively short, not extending to a vertical below posterior margin of pupil. Interpelvic process small and bilobed. Body covered with small scales; corselet of larger scales developed but not very distinct. Well developed median caudal keels present on each side of



caudal peduncle. Ventral surface of liver not striated, right lobe longer than center and left lobes. Swim bladder present.

COLOR: Back metallic dark blue gradually changing through yellow to silver on belly which is frequently crossed by about 20 broken, nearly vertical lines; dorsal and anal fins, bright yellow; finlets, bright yellow with a narrow black border.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Scomberomorus spp.: corselet not developed, enlarged scales not extending past base of pectoral fin (corselet present but not very distinct in *Thunnus* spp.); maxilla long, at least extending to a vertical under posterior margin of pupil (maxilla short, not extending to a vertical under posterior margin of pupil in *Thunnus* spp.); teeth compressed (conical in *Thunnus* spp.).

Auxis spp.: dorsal fin interspace at least as long as base of first dorsal fin (interspace short in *Thunnus* spp.); interpelvic process composed of a single large lobe (small and bilobed in *Thunnus* spp.).

Sarda sarda: stripes on back extending forward under origin of first dorsal fin (back is a more or less uniform metallic dark blue gradually changing through yellow to silver on belly in *T. albacares*); outline of first dorsal fin almost straight (outline of first dorsal fin strikingly concave in *Thunnus* spp.).

Katsuwonus pelamis: four to six conspicuous longitudinal dark bands which in live specimens may appear as discontinuous lines of dark blotches on belly (belly crossed by about 20 nearly vertical lines in *T. albacares*); 53-63 gill rakers on first arch (26-34 in *T. albacares*).

Euthynnus alletteratus: a complicated mottled pattern of lines or bars on back, extending forward beyond the middle of the first dorsal fin (back is a more or less uniform metallic dark blue to black in *Thunnus* spp.).

Thunnus obesus: striations present on ventral surface of liver; second dorsal and anal fins not elongate. In specimens of similar size, *T. obesus* is generally heavier, deeper, and has a larger eye than *T. albacares*.

Thunnus atlanticus: gill rakers on first arch 19-25, usually 23 or fewer (26-34 in *T. albacares*); dorsal and anal fins dusky, not bright yellow with black margins as in *T. albacares*.

Thunnus alalunga: pectoral fins much longer in adults (but not in juveniles up to 30 cm), usually reaching to second dorsal finlet, greatest body depth near origins of second dorsal and anal fins instead of more anteriorly; caudal fin with a distinct white margin; striations present on ventral surface of the liver.

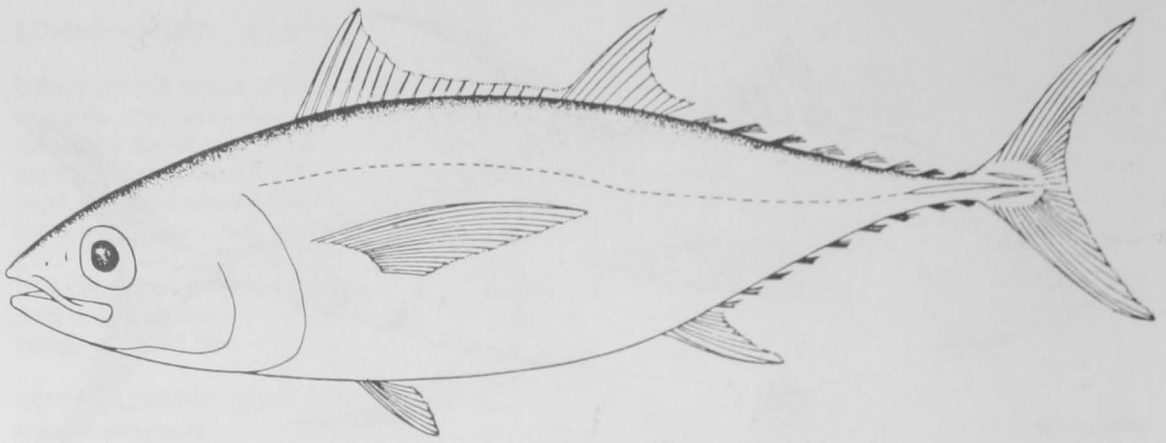
SIZE: To 195 cm FL; common to 150 cm.

GEOGRAPHIC DISTRIBUTION: A pantropical offshore species occurring in the western Atlantic from New England southward off the Atlantic coast to Brazil, including the Gulf of Mexico and the Caribbean Sea.

***Thunnus atlanticus* (Lesson)**

COMMON NAME: Blackfin tuna.

DESCRIPTIVE CHARACTERS: A small species of tuna with a fusiform body which is slightly laterally compressed. Teeth small and conical. Two dorsal fins, separated only by a narrow interspace, the second followed by 7-9 finlets. Pectoral fin moderate in length, extending to a point under the origin of the second dorsal fin. Maxilla relatively short, not extending to a vertical below the posterior margin of the pupil. Interpelvic process small and bilobed. Body covered with small scales; corselet of larger scales developed but not very distinct. Gill rakers few,



19–25 on first arch. A well developed median caudal keel on each side of caudal peduncle. Ventral surface of liver not striated, right lobe longer than center and left lobes. Swim bladder present.

COLOR: Back metallic dark blue, lower sides silvery gray, belly whitish; first dorsal fin dusky, second dorsal and anal fins dusky with a silvery luster; finlets dusky with a trace of yellow.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Scomberomorus spp.: corselet not developed, enlarged scales not extending past base of pectoral fin (corselet present but not very distinct in *Thunnus* spp.); maxilla long, at least extending to a vertical under posterior margin of pupil (maxilla short, not extending to a vertical under posterior margin of pupil in *Thunnus* spp.); teeth compressed (conical in *Thunnus* spp.).

Auxis spp.: dorsal fin interspace at least as long as base of first dorsal fin (interspace short in *Thunnus* spp.); inter-pelvic process composed of a single large lobe (small and bilobed in *Thunnus* spp.).

Sarda sarda: stripes on back extending forward under origin of first dorsal fin (back is more or less uniform metallic dark blue gradually becoming silvery on sides of *T. atlanticus*); outline of first dorsal fin nearly straight (outline of first dorsal fin strikingly concave in *Thunnus* spp.).

Katsuwonus pelamis: four to six conspicuous longitudinal dark bands which in live specimens may appear as discontinuous lines of dark blotches on belly (belly a uniform white in *T. atlanticus*); 53–63 gill rakers on first arch (19–25 in *T. atlanticus*).

Euthynnus alletteratus: a complicated mottled pattern of lines or bars on back, extending forward beyond middle of first dorsal fin (back is a more or less uniform metallic dark blue to black in *Thunnus* spp.).

All other species of *Thunnus*: more gill rakers on first arch, 24–43 (19–25, usually 20–23, in *T. atlanticus*). Only a few Atlantic specimens of *T. obesus* and *T. alalunga* have been recorded with as few as 25 gill rakers. Further distinguishing characters of other *Thunnus* spp. are as follows:

Thunnus albacares: a larger species with greatly elongated second dorsal and anal fins in adults; finlets bright yellow with black margins (finlets dusky in *T. atlanticus*); belly frequently crossed by about 20 broken, nearly vertical lines (uniform white in *T. atlanticus*).

Thunnus obesus: liver striated ventrally; finlets bright yellow with black margins.

Thunnus alalunga: liver striated ventrally; pectoral fins longer, reaching well beyond posterior end of anal fin base; caudal fin with a narrow white distal margin.

Thunnus thynnus: second dorsal fin reddish brown; pectoral fins very short, not reaching past base of first dorsal fin; liver striated ventrally.

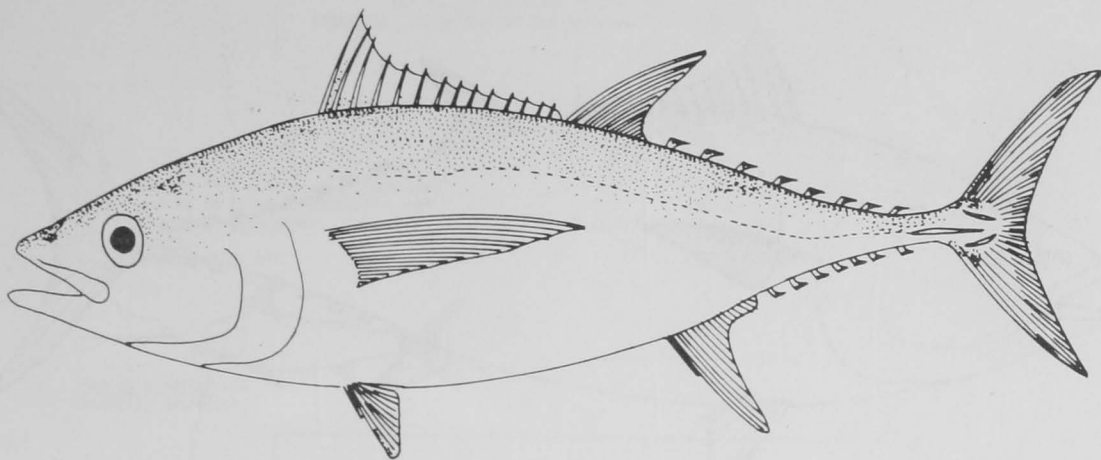
SIZE: To 89 cm FL; common to 72 cm.

GEOGRAPHIC DISTRIBUTION: An offshore species known only from the western Atlantic, from off Massachusetts southward to the Atlantic coast of Brazil including the Gulf of Mexico and the Caribbean Sea.

Thunnus obesus (Lowe)

COMMON NAME: Bigeye tuna.

DESCRIPTIVE CHARACTERS: A large species with a robust fusiform body, slightly laterally compressed. Teeth small and conical. Two dorsal fins separated by a narrow interspace, the second followed by 8–10 finlets. Pec-



toral fins moderately long extending to under second dorsal in adult specimens but very long (as long as in *T. alalunga*) in smaller specimens. Maxilla relatively short, not extending to a vertical below posterior margin of pupil. Interpelvic process small and bilobed. Body covered with small scales; corselet well developed, not conspicuous but extends beyond pectoral fin. A well developed median caudal keel present. Ventral surface of the liver striated. Swim bladder present.

COLOR: Back metallic dark blue, lower sides and belly whitish; a lateral iridescent blue band runs along the sides in live specimens; first dorsal fin deep yellow, second dorsal and anal fins light yellow, and finlets bright yellow, edged with black.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Scomberomorus spp.: corselet not developed, enlarged scales not extending past base of pectoral fin (corselet present but not very distinct in *Thunnus* spp.); maxilla long, at least extending to a vertical under posterior margin of pupil (maxilla short, not extending to a vertical under posterior margin of pupil in *Thunnus* spp.); teeth compressed (conical in *Thunnus* spp.).

Auxis spp.: dorsal fin interspace at least as long as base of first dorsal fin (interspace short in *Thunnus* spp.); interpelvic process composed of a single large lobe (small and bilobed in *Thunnus* spp.).

Sarda sarda: stripes on back extending forward under origin of first dorsal fin (back is a more or less uniform metallic dark blue, turning whitish on the lower sides and belly in *T. obesus*); outline of first dorsal fin almost straight (outline of first dorsal fin strikingly concave in *Thunnus* spp.).

Katsuwonus pelamis: four to six conspicuous longitudinal dark bands which in live specimens may appear as discontinuous lines of dark blotches on belly (belly white, immaculate in *T. obesus*); 53-63 gill rakers on first gill arch (23-31 gill rakers in *T. obesus*).

Euthynnus alletteratus: a complicated mottled pattern of lines or bars on back, extending forward beyond the middle of the first dorsal fin (back is a more or less uniform metallic dark blue to black in *Thunnus* spp.).

Thunnus albacares: no striations on ventral surface of the liver; second dorsal and anal fins elongate in adults; belly frequently crossed by about 20 broken, nearly vertical lines. In specimens of similar length, *T. albacares* is generally lighter weight, slimmer, and has a smaller eye than *T. obesus*.

Thunnus atlanticus: no striations on ventral surface of liver; dorsal and anal finlets dusky, not bright yellow with black margins as in *T. obesus*.

Thunnus alalunga: a narrow white border on caudal fin (no border in *T. obesus*); the greatest body depth nearest the second dorsal and anal fin origins (greatest body depth more anterior in *T. obesus*); pectoral fins long, in adults reaching to about second dorsal finlet.

Thunnus thynnus: thirty-four to forty-three gill rakers on first arch (23-31 gill rakers in *T. obesus*); pectoral fin short, not reaching beyond base of first dorsal fin (moderately long, extending to under second dorsal fin in *T. obesus*).

SIZE: To 236 cm FL; common to 180 cm.

GEOGRAPHIC DISTRIBUTION: A large pantropical species occurring offshore from south of Cape Cod throughout the western Atlantic to Argentina. Also found throughout the Gulf of Mexico and the Caribbean Sea.

Thunnus thynnus thynnus (Linnaeus)

COMMON NAME: Northern bluefin tuna.



DESCRIPTIVE CHARACTERS: A large species with a fusiform and rounded body (nearly circular in cross section). Teeth small and conical. Two dorsal fins separated by a narrow interspace, the second higher than the first and followed by 8–10 finlets. Pectoral fins short, not extending past first dorsal fin. Maxilla relatively short, not extending to a vertical below posterior margin of pupil. Interpelvic process small and bilobed. Body covered with small scales; corselet well developed, not conspicuous but extends beyond pectoral fin. A well developed median caudal keel present. Ventral surface of liver striated. Swim bladder present.

COLOR: Back dark blue or black, lower sides and belly silvery white with colorless transverse lines alternating with rows of colorless dots (the latter dominate in older fish) visible only in fresh specimens; first dorsal fin yellow or bluish, second reddish brown; anal fin and finlets dusky yellow edged with black; lateral keel black in adults.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Scomberomorus spp.: corselet not developed, enlarged scales not extending past base of pectoral fin (corselet present but not very distinct in *Thunnus* spp.); maxilla long, at least extending to a vertical under posterior margin of pupil (maxilla short, not extending to a vertical under posterior margin of pupil in *Thunnus* spp.); teeth compressed (small and conical in *T. t. thynnus*).

Auxis spp.: dorsal fin interspace at least as long as base of first dorsal fin (interspace short in *Thunnus* spp.); interpelvic process composed of a single large lobe (small and bilobed in *Thunnus* spp.).

Sarda sarda: stripes on back extending forward under origin of first dorsal fin (back is a more or less blue or black gradually turning silvery white on sides in *T. t. thynnus*); outline of first dorsal fin almost straight (outline of first dorsal fin strikingly concave in *Thunnus* spp.).

Katsuwonus pelamis: four to six conspicuous longitudinal dark bands which in live specimens may appear as discontinuous lines of dark blotches on belly (belly with alternating columns of transverse lines and dots in *T. t. thynnus*); 53–63 gill rakers on first arch (34–43 gill rakers in *T. t. thynnus*).

Euthynnus alletteratus: a complicated mottled pattern of lines or bars on back, extending forward beyond middle of first dorsal fin (back is a more or less uniform metallic dark blue to black in *Thunnus* spp.).

Thunnus spp.: other species of *Thunnus* have fewer gill rakers, at most 33 on the first arch (34–43 in *T. t. thynnus*); pectoral fins much longer reaching at least to space between dorsal fins (do not reach beyond base of first dorsal fin in *T. t. thynnus*).

Further distinguishing characters of the species of *Thunnus* are the following:

Thunnus alalunga: caudal fin with a distinct white margin; body depth greatest more posteriorly, near origin of second dorsal and anal fins.

Thunnus albacares: ventral surface of liver without striations; dorsal and anal fins bright yellow and becoming very elongated in large specimens.

Thunnus atlanticus: ventral surface of liver without striations.

SIZE: Occasionally over 300 cm FL; common to 200 cm.

GEOGRAPHIC DISTRIBUTION: A North Atlantic subspecies which is known from Labrador and Newfoundland southward throughout the Atlantic Ocean, the Gulf of Mexico, and the Caribbean Sea to northeastern Brazil.

KEY TO THE ADULTS OF SPECIES OF BILLFISHES
(FAMILIES: ISTIOPHORIDAE AND XIPHIIDAE) OCCURRING IN THE AREA



Pelvic fins absent; gill membranes united to isthmus anteriorly, but free from each other.

FAMILY XIPHIIDAE



Xiphias gladius
Broadbill swordfish



Pelvic fins present; gill membranes united to each other along entire ventral surface.

FAMILY ISTIOPHORIDAE

First dorsal fin not sail-like, lower to slightly higher than body depth at mid-body; pelvic fins about as long as pectoral fins.

First dorsal fin sail-like, much higher than body depth at mid-body; pelvic fins much longer than pectoral fins, extending almost to anus.

Anterior part of first dorsal fin slightly higher than or nearly equal to body depth at mid-body; tips of first dorsal, first anal and pectoral fins more or less rounded.

Anterior part of first dorsal fin lower than body depth at mid-body; tips of first dorsal, first anal and pectoral fins pointed.



Istiophorus platypterus
Sailfin

Pectoral fins movable, can be folded back along sides of body; about 15 vertical bars of blue spots on sides of body.

Pectoral fins not movable, can not be folded back along sides of body; no vertical bars on sides of body.



Makaira nigricans
Blue marlin



Makaira indicus
Black marlin



Anus well in front of first anal fin; scales ending in several points.

Anus close to origin of first anal fin; scales ending in a single point.



Tetrapturus pfluegeri
Longbill spearfish



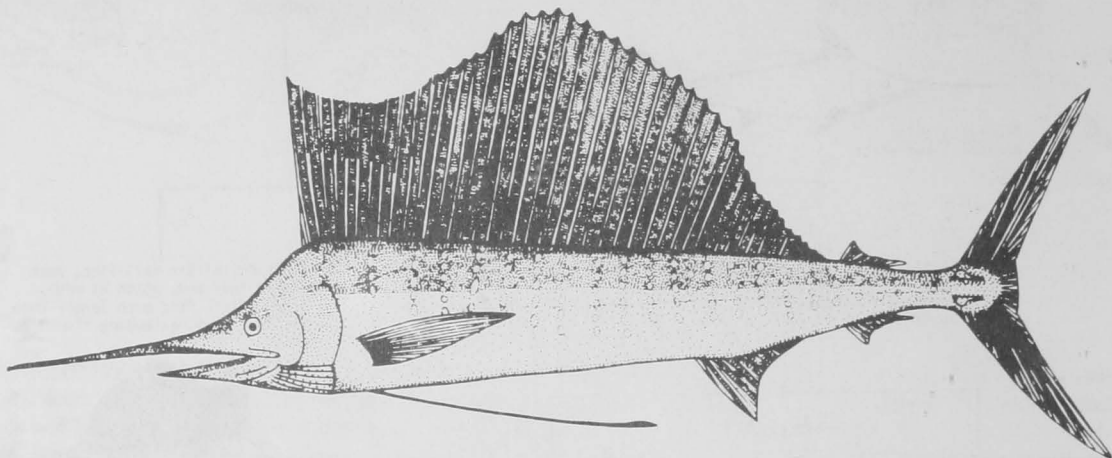
Tetrapturus albidus
White marlin

BILLFISHES

This group is comprised of two families of fishes. The broadbill swordfish is the exclusive representative of the family Xiphiidae. The sailfin, spearfish, and marlins represent the family Istiophoridae. These families are easily distinguished from other fishes because of their relatively short lower jaw and elongate upper jaw which is drawn

out into a long projection, bears very fine teeth, and is tapered at the end. The upper jaw is greatly depressed, ovoid, and almost flat in the Xiphiidae, and in the Istiophoridae it is more or less round in cross section. Six species in four genera are taken in the western Atlantic. Additional information regarding the species of billfishes in the western Atlantic is contained in Miyake and Hayasi (1972), Shomura and Williams (1974), and Fischer (1978).

Istiophorus platypterus (Shaw and Nodder)



COMMON NAME: Sailfish.

DESCRIPTIVE CHARACTERS: Body elongate and more or less compressed. Upper jaw drawn out into a long projection which is round in cross section. Two dorsal fins separated by a small interspace; the first high, saillike, higher than body depth throughout most of its length, consisting of 47-47 rays. Two anal fins, the second smaller than the first and similar in size and shape to the second dorsal fin. Pelvic fins consisting of 1 spine and 2 rays forming a long filament, reaching almost to the anus. Lateral line visible, arched above pectoral fin. Body covered with narrow scales which bear blunt points.

COLOR: Body dark blue dorsally changing to a brownish blue on sides and then to silvery white on belly. First dorsal fin blue black, covered with many small black spots; other fins brown black; about 20 vertical bars consisting of several small pale blue spots present on sides of body.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

All other species of Istiophoridae: dorsal fin not saillike in that its anterior part is at most slightly higher than body depth and the fin gradually slopes downward posteriorly (there is a slight increase in height posteriorly to a point over the anus, then the outline of the fin rapidly curves downward in *Istiophorus*). The pelvic fins of other species are much shorter, terminating a good distance from the anus.

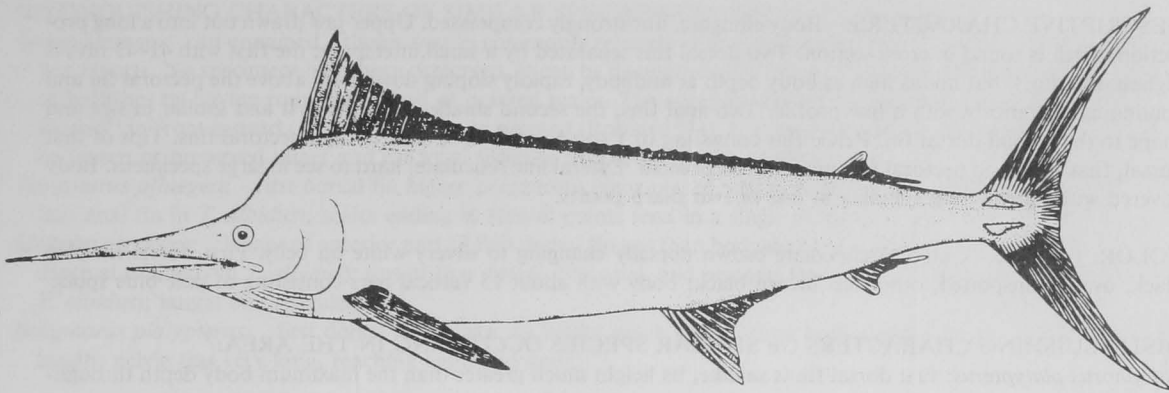
SIZE: To 3 m TL; common to 2.5 m.

GEOGRAPHIC DISTRIBUTION: A worldwide tropical and temperate species found throughout the western Atlantic, as far north as the Gulf of Maine, throughout the Caribbean Sea and the Gulf of Mexico, south to southern Brazil.

Makaira indica (Cuvier)

COMMON NAME: Black marlin.

DESCRIPTIVE CHARACTERS: Body elongate, not strongly compressed. Upper jaw drawn out into a long projection which is round in cross section. Two dorsal fins separated by a small interspace; the first with 38-42 rays is highest anteriorly, but not as high as body depth at midbody, rapidly sloping downward above the pectoral fin and continuing posteriorly with a low profile. Two anal fins, the second smaller than the first and similar in size and shape to the second dorsal fin. Pelvic fins consisting of 1 spine and 2 rays, shorter than pectoral fins. Pectoral fins extend away from body, rigid, cannot be folded back against sides of body. Tips of first dorsal, first anal, and pec-



toral fins more or less pointed. Lateral line indistinct but single. Body covered with narrow scales ending in one or two sharp points.

COLOR: Body blackish dark blue changing to silvery white on belly. First dorsal fin dark blue, usually unspotted; other fins brown black; no marks or blotches on body.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Istiophorus platypterus: dorsal fin is saillike, its height much greater than maximum body depth throughout most of its length; pelvic fins long, reaching past the pectoral fins almost to the anus (pelvic fins shorter than pectoral fins in *M. indica*).

Makaira nigricans: pectoral fins movable, can be folded back along sides of body (pectoral fins rigid, extend away from body, and cannot be folded back in *M. indica*). Lateral line system reticulate (single in *M. indica*). Body pigmentation consisting of about 15 vertical bars of pale blue spots (no marks or blotches on body in *M. indica*).

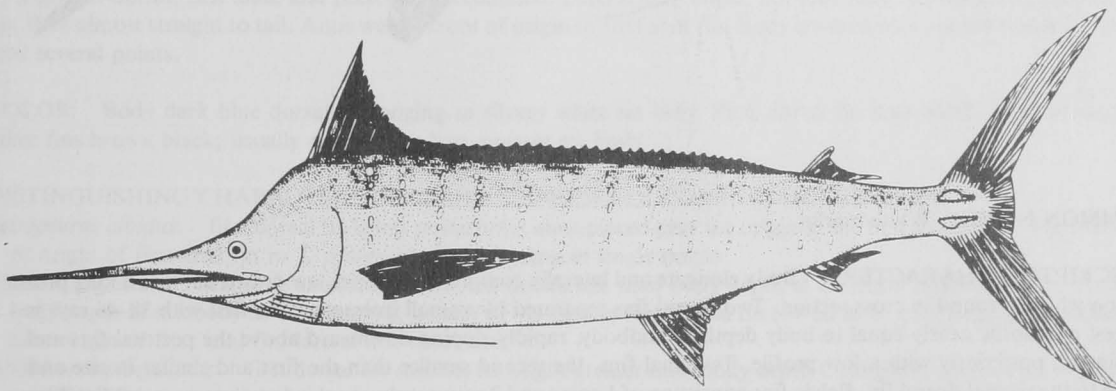
Tetrapturus albidus: height of anterior part of first dorsal fin nearly equal to body depth at midbody (height of first dorsal fin much less than body depth at midbody in *M. indica*); tips of first dorsal, first anal, and pectoral fins rounded (more or less pointed in *M. indica*).

Tetrapturus pfluegeri: height of anterior part of first dorsal fin slightly greater than body depth at midbody (height of dorsal fin shorter than body depth at midbody in *M. indica*); usually 44–50 rays in first dorsal fin (38–42 in *M. indica*); scales ending in several points (ending in one or two points in *M. indica*).

SIZE: To 4.6 m TL; common to 3 m.

GEOGRAPHIC DISTRIBUTION: A tropical and temperate Indian and Pacific Ocean species which may occasionally stray into the Atlantic Ocean (W. J. Richards²).

Makaira nigricans Lacepede



COMMON NAME: Blue marlin.

²W. J. Richards, Southeast Fisheries Center Miami Laboratory, National Marine Fisheries Service, NOAA, 75 Virginia Beach Drive, Miami, FL 33149, pers. commun. February 1978.

DESCRIPTIVE CHARACTERS: Body elongate, not strongly compressed. Upper jaw drawn out into a long projection which is round in cross section. Two dorsal fins separated by a small interspace; the first with 41-43 rays is highest anteriorly, but not as high as body depth at midbody, rapidly sloping downward above the pectoral fin and continuing posteriorly with a low profile. Two anal fins, the second smaller than the first and similar in size and shape to the second dorsal fin. Pelvic fins consisting of 1 spine and 2 rays, shorter than pectoral fins. Tips of first dorsal, first anal, and pectoral fins more or less pointed. Lateral line reticulate, hard to see in large specimens. Body covered with narrow scales ending in one or two sharp points.

COLOR: Body dark blue to chocolate brown dorsally changing to silvery white on belly. First dorsal fin blue black, usually unspotted; other fins brown black; body with about 15 vertical bars consisting of pale blue spots.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Istiophorus platypterus: first dorsal fin is saillike, its height much greater than the maximum body depth throughout most of its length; pelvic fins long, reaching past pectoral fins almost to anus (pelvic fins shorter than pectoral fins in *M. nigricans*); lateral line simple, not reticulate.

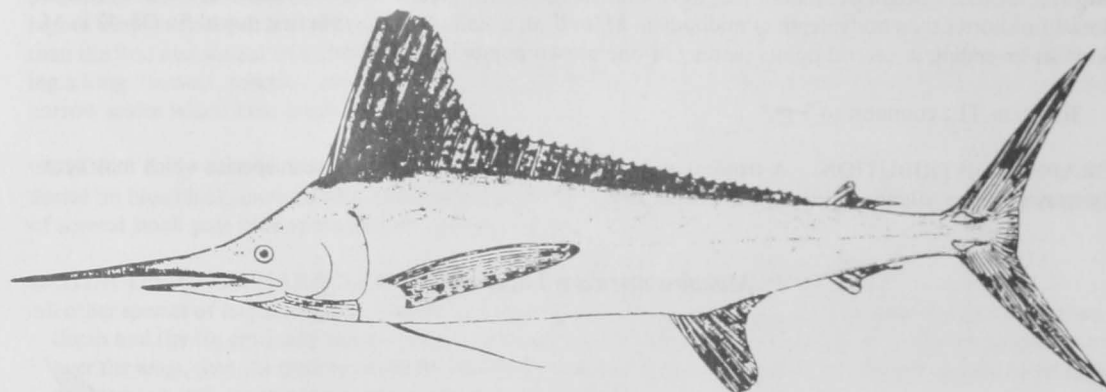
Tetrapturus albidus: height of anterior part of first dorsal fin nearly equal to body depth at midbody (height of first dorsal fin much less than body depth at midbody in *M. nigricans*); tips of first dorsal, first anal, and pectoral fins rounded (more or less pointed in *M. nigricans*); lateral line simple, not reticulate.

Tetrapturus pfluegeri: height of anterior part of first dorsal fin slightly greater than body depth at midbody (height of dorsal fin shorter than body depth at midbody in *M. nigricans*); usually 44-50 rays in first dorsal fin (41-43 in *M. nigricans*); anus placed well in front of origin of first anal fin (near origin of first anal fin in *M. nigricans*); lateral line simple, not reticulate; scales ending in several points (ending in one or two points in *M. nigricans*).

SIZE: To 4 m TL; common to 3.5 m.

GEOGRAPHIC DISTRIBUTION: An Atlantic species, found throughout the western Atlantic occasionally as far north as the Gulf of Maine. Most common in the Gulf of Mexico, the Caribbean Sea, and off southern Brazil.

Tetrapturus albidus Poey



COMMON NAME: White marlin.

DESCRIPTIVE CHARACTERS: Body elongate and laterally compressed. Upper jaw drawn out into a long projection which is round in cross section. Two dorsal fins separated by a small interspace; the first with 38-46 rays is highest anteriorly, nearly equal to body depth at midbody, rapidly sloping downward above the pectoral fins and continuing posteriorly with a low profile. Two anal fins, the second smaller than the first and similar in size and shape to the second dorsal fin. Pelvic fins consisting of 1 spine and 2 rays nearly equal in length to pectoral fin. Tips of the first dorsal, first anal, and pectoral fins are rounded. Lateral line simple, not reticulate, arched above pectoral fin, then almost straight to tail. Anus close to origin of first anal fin. Body covered with narrow scales which bear single sharp points.

COLOR: Body dark blue to chocolate brown on the back changing to a silvery white on the belly. First dorsal fin blue black covered with small black spots; other fins brown black; usually no spots or bars on body.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Tetrapturus sp.: an unnamed Atlantic marlin commonly referred to as the "hatchet marlin" is known only from a few reports. No specimens have been preserved. It can be distinguished from *T. albidus* and other Atlantic species of billfishes by having rounded instead of pointed scales. The anterior part of the dorsal fin is flat or "hatchet-shaped" in front instead of being rounded or pointed (Robins 1974). If a specimen of this fish is taken, it should be frozen or preserved intact and the local fisheries officer should be notified.

Tetrapturus pfluegeri: first dorsal fin higher posteriorly; anus placed well in front of first anal fin (near origin of first anal fin in *T. albidus*); scales ending in several points (end in a single point in *T. albidus*).

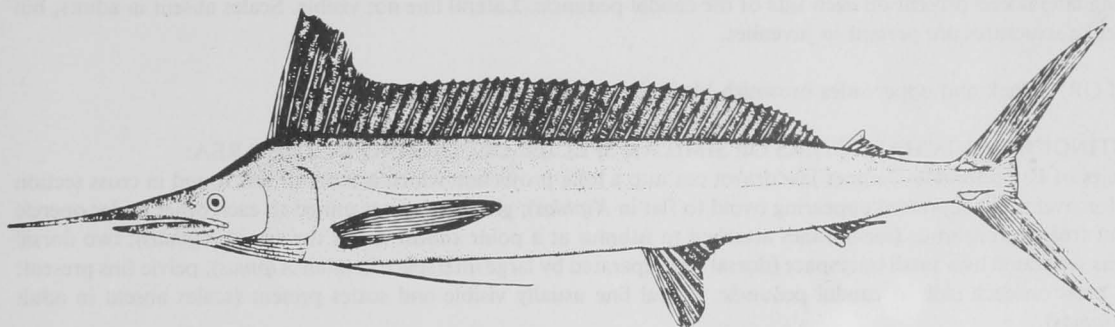
Makaira nigricans: height of anterior part of first dorsal fin less than body depth at midbody (nearly equal to body depth at midbody in *T. albidus*); tips of first dorsal, first anal, and pectoral fins pointed (more or less rounded in *T. albidus*); lateral line reticulate.

Istiophorus platypterus: first dorsal fin saillike, its height much greater than body depth throughout most of its length; pelvic fins very long, reaching almost to anus.

SIZE: To 3 m TL; common to 2.5 m.

GEOGRAPHIC DISTRIBUTION: A tropical and temperate species of the Atlantic Ocean, found throughout the western Atlantic, occasionally as far north as Nova Scotia. Most common off Florida, in the Gulf of Mexico, and the Caribbean Sea. Taken off South America as far south as Argentina.

Tetrapturus pfluegeri Robins and de Sylva



COMMON NAME: Longbill spearfish.

DESCRIPTIVE CHARACTERS: Body elongate and laterally compressed. Upper jaw drawn out into a long projection which is round in cross section. Two dorsal fins separated by a small interspace; the first with 44–50 rays is highest anteriorly, slightly greater than body depth at midbody, continues posteriorly, and maintains a relatively high profile until it dips toward base of second dorsal fin. Two anal fins, the second smaller than the first and similar in size and shape to second dorsal fin. Pelvic fins consisting of 1 spine and 2 rays, slightly longer than pectoral fins. Tips of first dorsal, first anal, and pectoral fins rounded. Lateral line simple, not reticulate, arched above pectoral fin, then almost straight to tail. Anus well in front of origin of first anal fin. Body covered with narrow scales which bear several points.

COLOR: Body dark blue dorsally changing to silvery white on belly. First dorsal fin blue black, spots absent; other fins brown black; usually no spots or bars present on body.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Tetrapturus albidus: first dorsal fin lower posteriorly; anus placed near the origin of the first anal fin (well in front of origin of first anal fin in *T. pfluegeri*); scales ending in single points.

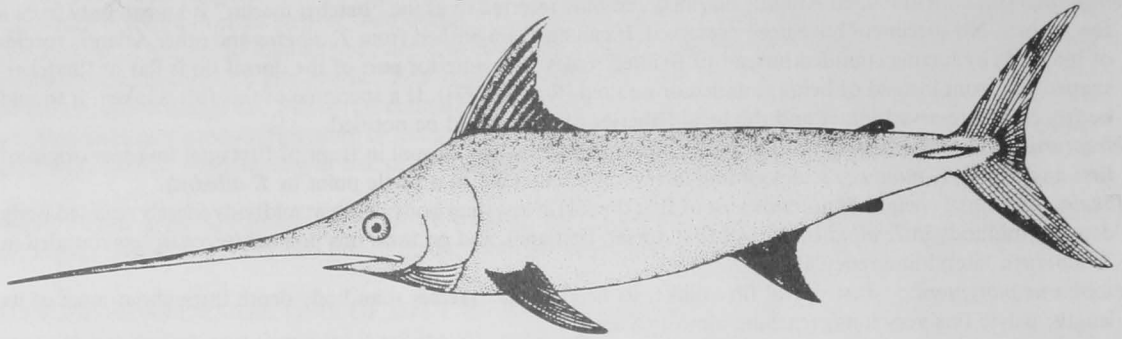
Makaira nigricans: height of anterior part of first dorsal less than body depth at midbody (slightly greater than body depth at midbody in *T. pfluegeri*); usually 41–43 rays in first dorsal fin (44–50 in *T. pfluegeri*); anus placed near origin of first anal fin; lateral line reticulate.

Istiophorus platypterus: first dorsal fin saillike, its height greater than body depth throughout most of its length, covered with numerous black spots; pelvic fins very long, almost reaching to anus; scales ending in single points.

SIZE: To 2 m TL; common to 1.6 m.

GEOGRAPHIC DISTRIBUTION: A tropical and temperate species of the Atlantic Ocean, found throughout the western Atlantic as far north as New Jersey. Common in the Gulf of Mexico, the Caribbean Sea, and off the coast of Venezuela. Also recorded from the central and South Atlantic Ocean.

Xiphias gladius Linnaeus



COMMON NAME: Broadbill swordfish.

DESCRIPTIVE CHARACTERS: Body elongate and more or less rounded, robust in front. Upper jaw drawn out into a long projection which is ovoid, almost flat, in cross section. Mouth not protrusible; teeth absent from jaws in adults. Gill openings large, membrane attached to isthmus at a point almost under the eye; gill rakers absent. Two dorsal fins separated by a large interspace in adults but joined in juvenile specimens. Pelvic fins absent. A single strong lateral keel present on each side of the caudal peduncle. Lateral line not visible. Scales absent in adults, but scalelike structures are present in juveniles.

COLOR: Back and upper sides brownish black, lower sides and belly light brown.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Species of Istiophoridae: upper jaw drawn out into a long projection which is more or less round in cross section (dorsoventrally depressed appearing ovoid to flat in *Xiphias*); gill membranes united to each other under opercle but free from isthmus (membranes attached to isthmus at a point almost under the eye in *Xiphias*); two dorsal fins separated by a small interspace (dorsal fins separated by large interspace in adult *Xiphias*); pelvic fins present; 2 keels on each side of caudal peduncle; lateral line usually visible and scales present (scales absent in adult *Xiphias*).

SIZE: To 450 cm; common to 220 cm.

GEOGRAPHIC DISTRIBUTION: Worldwide in tropical and temperate waters; found in the western Atlantic from Nova Scotia to Argentina.

ACKNOWLEDGMENTS

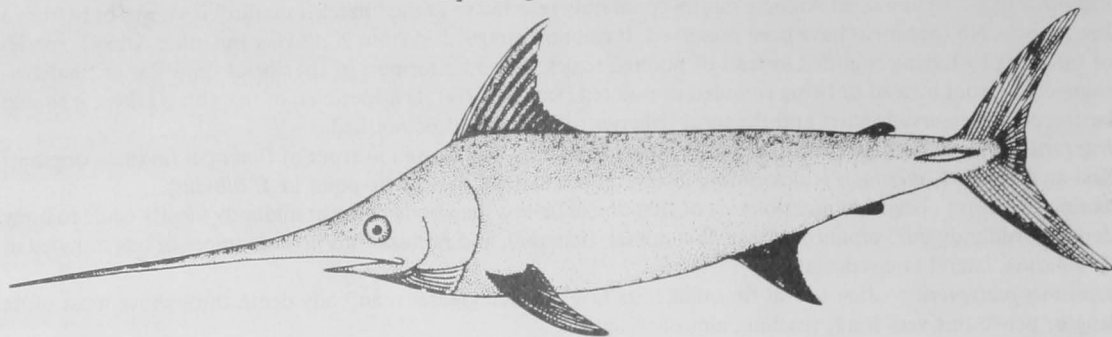
I thank Walter Fischer for making available prepublication sections of the FAO Species Identification Sheets (Fischer 1978) on which many of the accounts are based. Many of the figures were taken from the literature (Bigelow and Schroeder 1948; Fischer 1978). Original drawings and graphics were prepared by Keiko Hiratsuka Moore. Rose Russo provided valuable editorial assistance in the preparation of the manuscript. Drafts of this manuscript were reviewed by F. H. Berry, D. M. Cohen, B. B. Collette, W. J. Richards, and D. P. de Sylva.

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Xiphias gladius Linnaeus



COMMON NAME: Broadbill swordfish.

DESCRIPTIVE CHARACTERS: Body elongate and more or less rounded, robust in front. Upper jaw drawn out into a long projection which is ovoid, almost flat, in cross section. Mouth not protrusible; teeth absent from jaws in adults. Gill openings large, membrane attached to isthmus at a point almost under the eye; gill rakers absent. Two dorsal fins separated by a large interspace in adults but joined in juvenile specimens. Pelvic fins absent. A single strong lateral keel present on each side of the caudal peduncle. Lateral line not visible. Scales absent in adults, but scalelike structures are present in juveniles.

COLOR: Back and upper sides brownish black, lower sides and belly light brown.

DISTINGUISHING CHARACTERS OF SIMILAR SPECIES OCCURRING IN THE AREA:

Species of Istiophoridae: upper jaw drawn out into a long projection which is more or less round in cross section (dorsoventrally depressed appearing ovoid to flat in *Xiphias*); gill membranes united to each other under opercle but free from isthmus (membranes attached to isthmus at a point almost under the eye in *Xiphias*); two dorsal fins separated by a small interspace (dorsal fins separated by large interspace in adult *Xiphias*); pelvic fins present; 2 keels on each side of caudal peduncle; lateral line usually visible and scales present (scales absent in adult *Xiphias*).

SIZE: To 450 cm; common to 220 cm.

GEOGRAPHIC DISTRIBUTION: Worldwide in tropical and temperate waters; found in the western Atlantic from Nova Scotia to Argentina.

ACKNOWLEDGMENTS

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