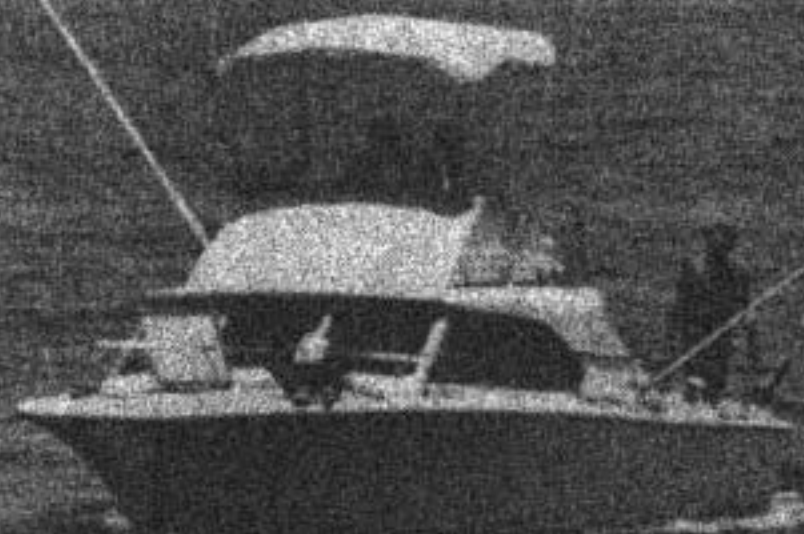


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**A Sportsman's Field Guide  
to the Billfishes, Mackerels,  
Little Tunas and Tunas of  
South Carolina**

by  
**Donald L. Hammond  
David M. Cupka**



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**Educational Report No. 3  
S. C. Wildlife and Marine Resources Department  
Marine Resources Division  
Office of Conservation and Management  
Recreational Fisheries Section  
P. O. Box 12559  
Charleston, South Carolina 29412**

# INTRODUCTION

This guide has been prepared partly to answer the many requests of South Carolina anglers for such a publication. Its purpose is to increase the awareness of the fisherman to the varieties of billfish, mackerel, little tuna, and tuna which may be caught off the coast of South Carolina and to aid in the identification of these fish.

All species of billfish, mackerel, little tuna, and tuna likely to occur off the coast of South Carolina are discussed. Ten of the species have never been authenticated as having been taken on rod and reel off the South Carolina coast, although they are known to occur both north and south of here and some have even been taken by commercial gear. These ten species are: swordfish, longbill spearfish, Atlantic mackerel, chub mackerel, cero (mackerel), bullet mackerel, frigate mackerel, albacore, bigeye tuna and bluefin tuna. The capture of any of these species should be reported immediately to the Recreational Fisheries Section, South Carolina Wildlife and Marine Resources Department.

The grouping of the species discussed does not always adhere to the scientific classification, but rather to the general resemblance of a species to a group. The 21 species identified here are separated into four divisions. The first division—the Billfishes—includes two families (*Istiophoridae* and *Xiphiidae*). The other three—Mackerels, Little Tunas and Tunas—are in a single diverse family (*Scombridae*). Common and scientific names used in this guide are those which are accepted by the American Fisheries Society as standard for the species.

## FISH IDENTIFICATION

The terms used here to identify the various species of fish may not be familiar to all fishermen so they are defined in the terminology section and most are illustrated diagrammatically in Figure 1. Care should be taken to follow the correct procedure for obtaining all measurements. It is important, especially in billfishes and tunas, to note live color patterns (specifically in the fins and body markings). In identifying a fish one should look at the whole fish first and then at individual morphological characters. This guide presents the major distinguishing characters for each species in bold-face type.

## RARE OR UNCERTAIN CATCHES

When attempting to identify a fish, there is always the possibility of variation in one or more characteristics, and the fish might even be an undescribed species so that no given description fits. The fisherman should contact a qualified person in the fisheries field when a fish can not be identified. A new species of billfish, the longbill spearfish, was described from specimens collected almost entirely by sportsfishermen. Information from anglers on the landing of odd fish is of great importance to science and the need for this feed-back is stressed here again.

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# TERMINOLOGY

**ADIPOSE EYELID.** A translucent fleshy membrane covering the front and rear portions of the eye, found only in the Atlantic and chub mackerel. (Figure 1; 1).

**CAUDAL KEELS.** Flattened lateral ridges projecting from the front of the caudal fin (tail) where it joins the body. The Atlantic mackerel has two small keels on either side extending onto the caudal fin. All of the other tunas and mackerels also have a third keel which is larger and in advance of the other two. In billfish, the keels are paired on each side, except in the swordfish which has only a single keel per side. (Figure 1; 9 and 19).

**COMPRESSED.** Flattened laterally (side to side). May refer either to the teeth or the body.

**CONICAL TEETH.** Teeth that are round in cross section and taper to a point. Found only in the Atlantic bonito.

**CORSELET.** An area on the front part of the body where scales are usually larger and heavier, almost forming a hard shield, contrasting with the posterior part of the body, where scales are smaller or absent. Found in tunas and mackerels. (Figure 1; 12).

**DEPTH OR BODY DEPTH.** Refers to the greatest straight line distance between the top and bottom surfaces of the body perpendicular to the body axis.

**DORSAL SPINES.** Supporting elements of the first dorsal fin that in most cases can be folded back to fit into a body groove.

**FIN HEIGHT.** Refers to the dorsal and anal fins. The distance from the point where the longest spine or ray meets the body to the tip of that element along its curvature.

**FIN LENGTH.** Refers to the dorsal and anal fins. The distance from the point where the front of the first ray or spine meets the body, to the point where the rear of the last ray or spine meets the body. (Figure 1; 5).

**FINLETS.** The small, free, flag-like elements found behind the second dorsal and anal fins. (Figure 1; 8 and 18).

**FIRST GILL ARCH.** The outermost gill arch. First one seen when the gill plate is raised. Care should be taken when removing it so as not to cut off any gill rakers. (Figure 4).

**GILL FILAMENTS.** The fleshy projections on the trailing edge of the gill arch. (Figure 4).

**GILL RAKERS.** The bony forward projecting part of the gill arch. All elements that protrude above the arch are counted. May be totally absent, as in the wahoo and billfishes. (Figure 4).

**HEAD LENGTH.** The straight-line distance from the tip of the upper snout to the hindmost tip of the gill plate. (Figure 1; 10).

**INTERPELVIC PROCESS.** Scale-like process located between the pelvic fins. (Figure 2).

**LATERAL LINE.** Usually one row of pore-bearing scales along each side of the body. Not to be confused with other lines caused by pigments. May not be readily visible. (Figure 1; 15).

**LIVER.** A soft, solid internal organ that, at its front end, abuts against the front end of the body cavity. It may be restricted to the front portion of the body cavity, or it may have lobes extending far backwards. The liver shape and color are useful characters in identifying some species. (Figure 3).

**LIVER STREAKS.** More-or-less parallel dark lines on the bottom surface of the liver, caused by the arrangement of the blood vessels. Found only in the bigeye tuna, bluefin tuna, (Figure 3) and albacore.

**ORIGIN.** Where the first ray or spine meets the body as in the dorsal and anal fins. (Figure 1; 4, and 7).

**PECTORAL FINS.** Paired fins, one on each side of the body, located just behind the head. (Figure 1; 13).

**PECTORAL FIN LENGTH.** The straight-line distance from the foremost point where the fin meets the body to the tip of the fin.

**PELVIC FINS.** Paired fins located on the belly, usually just behind the head region. May be long and slender, as in most billfish, or absent as in the swordfish. (Figure 1; 11).

**SNOUT LENGTH.** The straight line distance from the tip of the upper snout to the foremost edge of the eye socket. (Figure 1; 2).

**SPEAR.** The bony elongated portion of the upper snout which projects well beyond the lower jaw. Found only in the billfishes.

**VENT.** The outside body opening where waste is discharged from the digestive tract. Always located just in front of the anal fin, with the exception of the longbill spearfish where it occurs well in advance of the anal fin. (Figure 1; 16).

Figure 1. External features of a generalized scombrid.

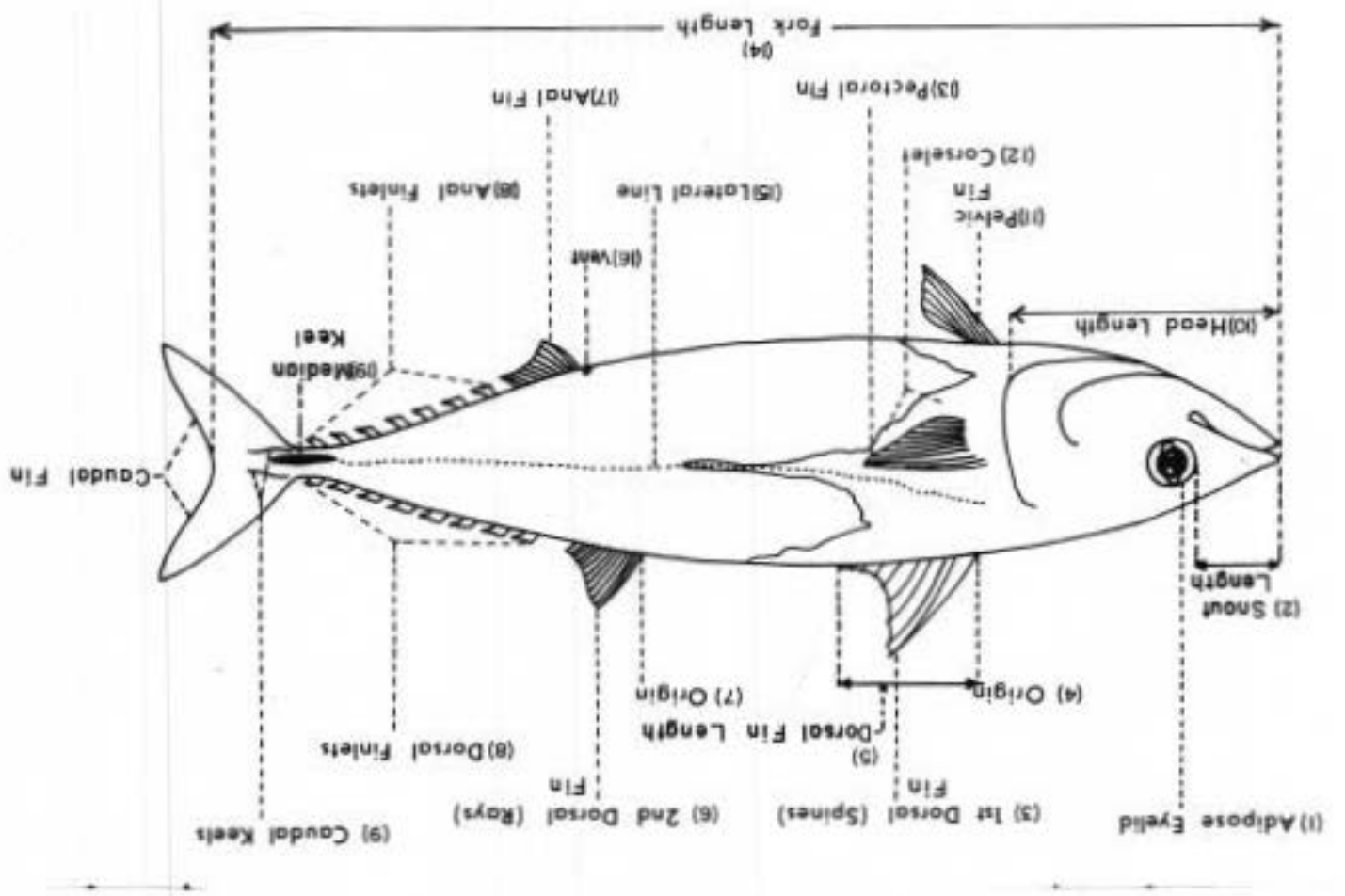
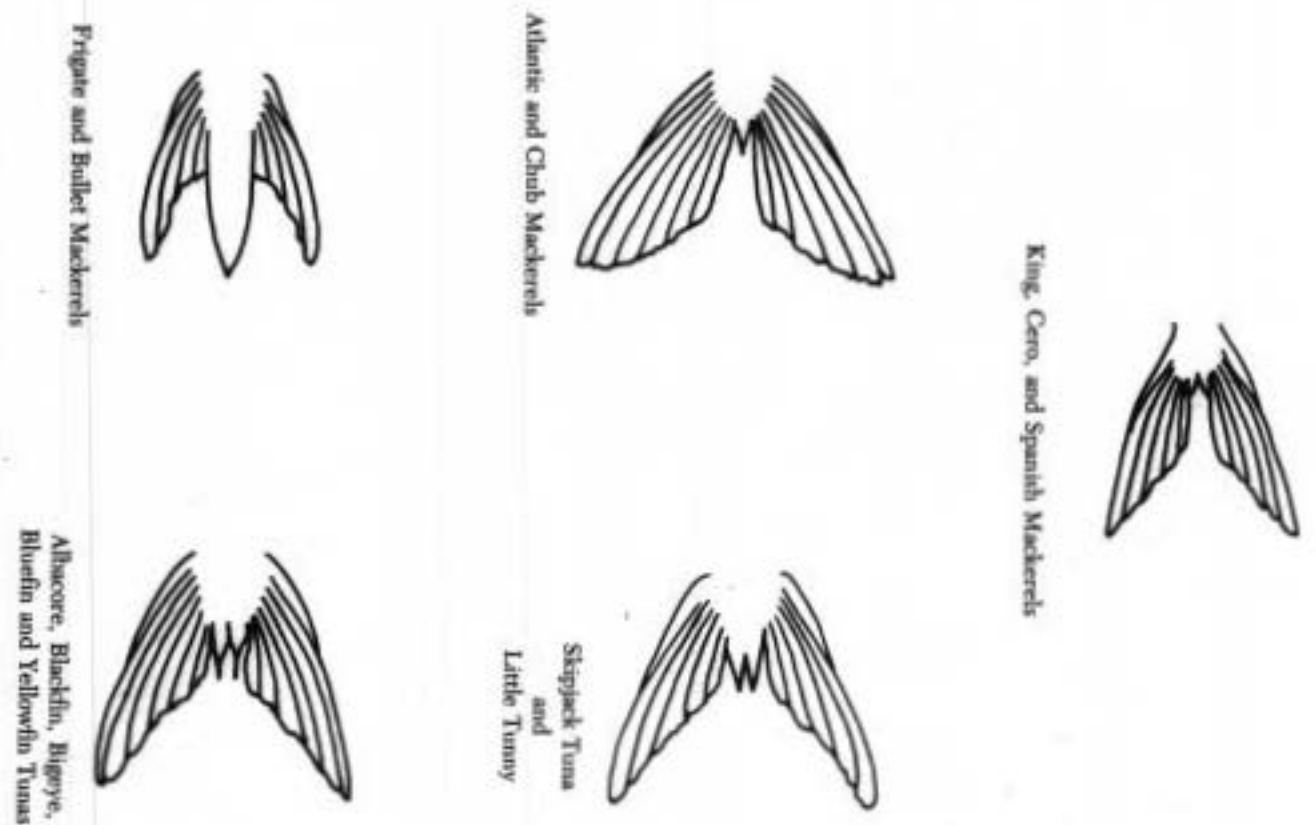
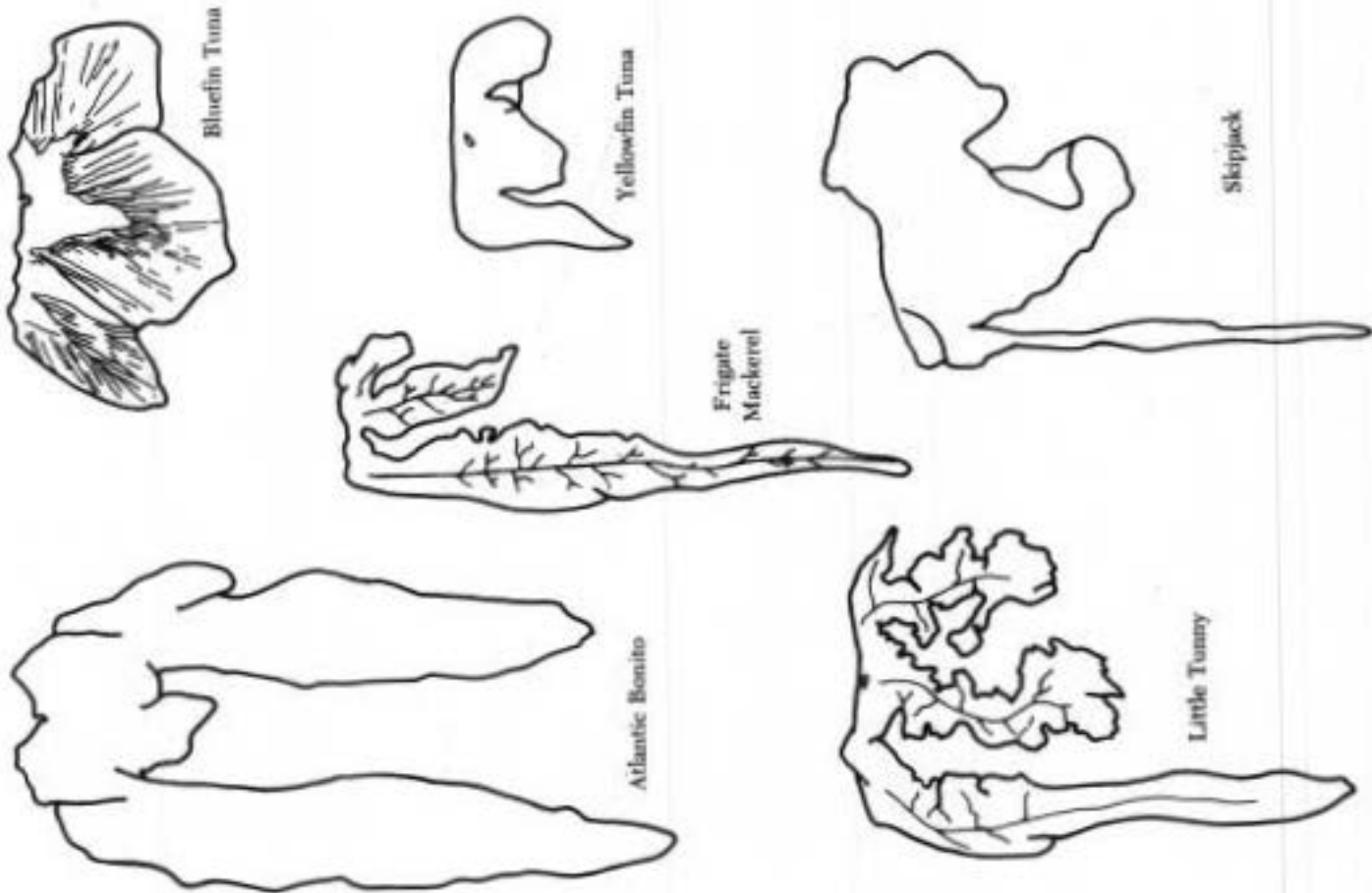
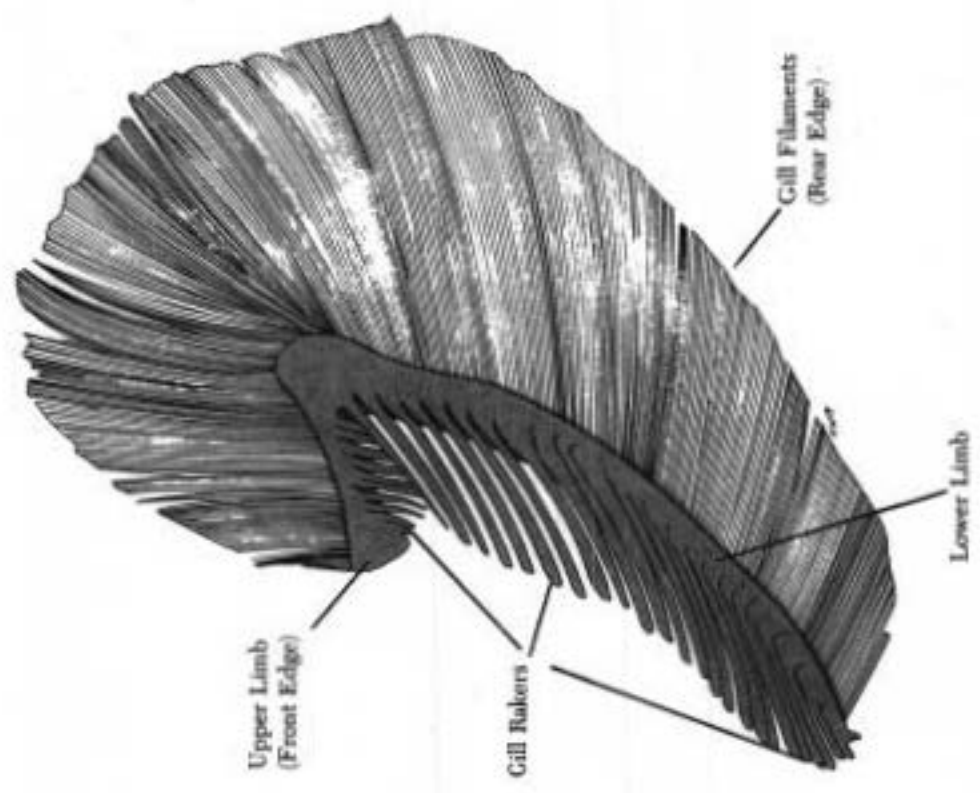


Figure 2. Interpectvic processes of various species of mackerel, little tuna and tuna





10. Figure 3. Representative livers of various scombrids.

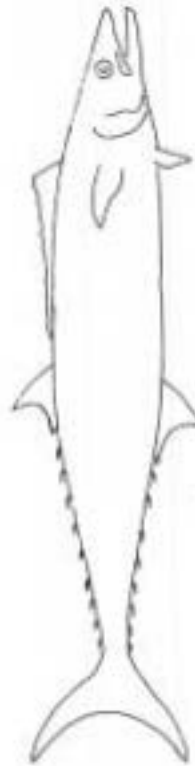


11. Figure 4. Representative first gill arch of a scombrid.

# THE MAJOR GROUPS OF FISHES



Billfishes



Mackerels



Little Tunas



Tunas

## USING THE GUIDE.

To identify a fish using this guide, the fish must be placed in one of the four major groups by comparing it to the drawings and descriptions presented in the following section. After determining the major group to which the fish belongs, the species may be identified by turning to the appropriate section of the guide and comparing the fish to the drawings and descriptions of the various species in the group. The major distinguishing characters for each species are in bold-face type.

## MAJOR CHARACTERISTICS OF THE BILLFISHES, MACKERELS, LITTLE TUNAS, AND TUNAS

### THE BILLFISHES CHARACTERISTICS

**Body Form:** Extremely long and not compressed at all to strongly compressed; snout extremely long forming a spear.

**Body Markings:** Pale vertical stripes or no body markings at all.

**Scale Covering:** Scales present over entire body except in adult swordfish which totally lack scales.

**Teeth:** Absent

**Gill Rakers:** Absent

**First Dorsal Fin:** Extremely tall (at least 70 percent of body depth) and sickle shaped or tall and long, covering major portion of body.

**MAXIMUM SIZES:** 70 to 1,000 pounds.

**NUMBER OF SPECIES:** Five

See pages 14 to 17.

### THE MACKERELS CHARACTERISTICS

**Body Form:** Long and slightly compressed to strongly compressed.

**Body Markings:** Faint to dark spots, vertical bars, stripes or vertical wavy lines.

**Scale Covering:** Very small scales covering entire body.

**Teeth:** Triangular and laterally compressed, small in the Atlantic and chub mackerels, but prominent in other species.

**Gill Rakers:** Present on all but the Wahoo.

**First Dorsal Fin:** Never tall (less than 70 percent of body depth) but may be long.

**MAXIMUM SIZES:** 2 to more than 150 pounds.

**NUMBER OF SPECIES:** Six

See pages 18 to 21.

### THE LITTLE TUNAS CHARACTERISTICS

**Body Form:** Moderately long and robust.

**Body Markings:** Either definite stripes or spots on the belly and/or wavy lines on the back.

**Scale Covering:** Scales absent behind caudal peduncle except in Atlantic bonito where scales cover entire body.

**Teeth:** Prominent and conical in Atlantic bonito but small and inconspicuous in other species.

**Gill Rakers:** Present

**First Dorsal Fin:** Never tall (less than 70 percent of body depth) or long.

**MAXIMUM SIZES:** 10 to 40 pounds.

**NUMBER OF SPECIES:** Five

See pages 22 to 25.

### THE TUNAS CHARACTERISTICS

**Body Form:** Short and very robust.

**Body Markings:** Body plain except for two species that may have a yellow to gold body band on the upper sides.

**Scale Covering:** Scales cover entire body.

**Teeth:** Small, triangular, inconspicuous.

**Gill Rakers:** Present

**First Dorsal Fin:** Never tall (less than 60 percent of body depth.)

**MAXIMUM SIZES:** 40 to over 1,000 pounds.

**NUMBER OF SPECIES:** Five

See pages 26 to 29.

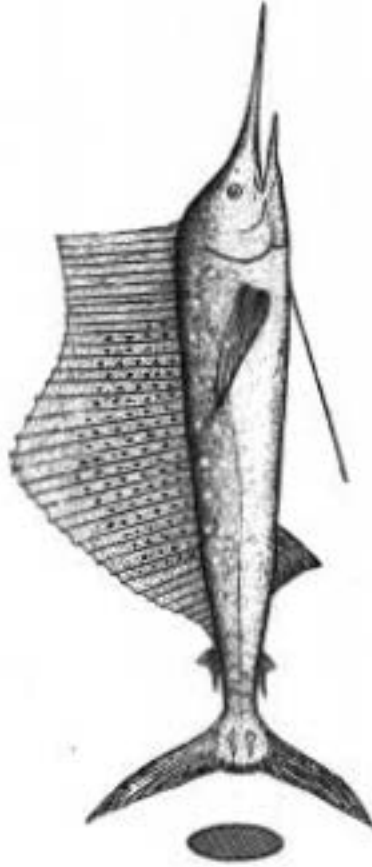


# THE BILLFISHES

**SOUTH CAROLINA NOTES:** Sailfish are the most abundant billfish off South Carolina, generally reaching their peak abundance in late summer.

**FOOD QUALITY:** Excellent when smoked.

SAILFISH



*Istiophorus platypterus*

## DISTINGUISHING CHARACTERISTICS

**DORSAL FIN:** First fin enormous. Greatest height occurs near middle of fin and equal to at least one and one-half times the body depth.

**LATERAL LINE:** Single and prominent.

**PELVIC FINS:** Extremely long and thin. Almost reaching first anal fin. May be hidden in a body groove.

**VENT LOCATION:** Just in front of the first anal fin.

**BODY FORM:** Long and strongly compressed. (See above).

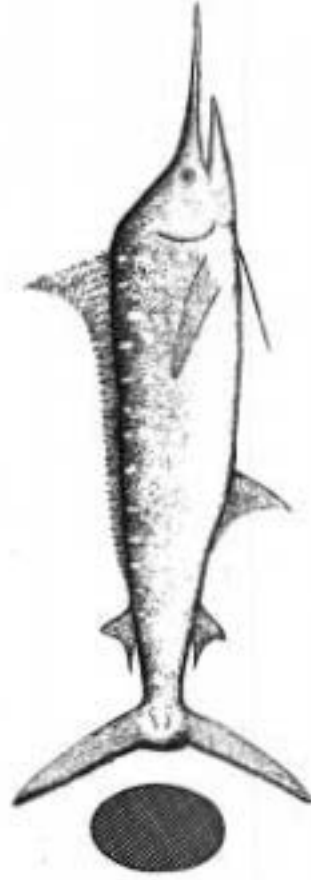
**FIN MARKINGS:** First dorsal fin with numerous black spots,

**OTHER CHARACTERS:** Pale vertical stripes present on the sides. May fade at death. Spear long and slender.

**COLOR:** In life, back and upper sides dark blue fading to a silvery white on the lower sides and belly with pale vertical stripes on the sides. First dorsal fin, and most of the other fins, a brilliant cobalt blue with black spots present. At death color fades, fins become dark blue with spots, back and upper sides a dark blue, and lower sides and belly white to gray.

**SIZE:** Current I. G. F. A. all tackle Atlantic record 123 pounds. Averages 30 to 40 pounds.

BLUE MARLIN



*Makaira nigricans*

## DISTINGUISHING CHARACTERISTICS

**DORSAL FIN:** Front lobe the highest coming to a point, then sharply dropping downward and tapering back. Greatest height of first fin less than the depth of the body.

**LATERAL LINE:** Complex, forming irregular hexagons, only visible in very small individuals. Adults without any visible lateral lines.

**PELVIC FINS:** Short, seldom extending backward past the tip of the pectoral fins.

**VENT LOCATION:** Just in front of the first anal fin.

**BODY FORM:** Front portion, ahead of the first anal fin, almost oval in cross section. (See above).

**FIN MARKINGS:** No spots. Varying shades of blue.

**OTHER CHARACTERS:** Pale vertical stripes present on the sides. May fade at death. First anal fin lobe sharply pointed. Spear long and stout, almost oval in cross section.

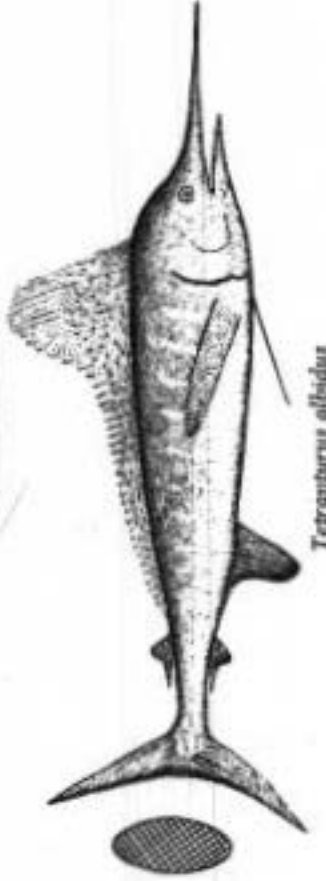
**COLOR:** In life, the back and upper sides a dark steel blue. Lower sides and belly a silvery white with pale brown vertical stripes. Fins generally a cobalt blue. At death the back becomes almost black, lower sides a steel gray, and fins dark blue.

**SIZE:** Current I. G. F. A. all tackle Atlantic record 1142 pounds. Averages 175 to 400 pounds.

**SOUTH CAROLINA NOTES:** Blue marlin are the largest billfish commonly caught off South Carolina. They are generally most abundant in early spring and late fall.

**FOOD QUALITY:** Good when smoked.

## WHITE MARLIN



*Tetrapturus albidus*

### DISTINGUISHING CHARACTERISTICS

**DORSAL FINS:** Front lobe of first fin broadly rounded with a sharp downward drop toward the tail then tapering back. Greatest height of first fin at least equal to greatest body depth.

**LATERAL LINE:** Single and prominent at all sizes.

**PELVIC FINS:** Short, seldom extending backward past the top of the pectoral fins.

**VENT LOCATION:** Just in front of first anal fin.

**BODY FORM:** Slender and strongly compressed, though not as much as in the sailfish. (See above).

**FIN MARKINGS:** Dark spots of black or purple present on the first dorsal fin, sometimes the first anal fin as well.

**OTHER CHARACTERS:** Front lobe of first anal fin strongly rounded. Pale vertical stripes present on the sides in life, possibly fading at death. Spear long but not as stout as in the blue marlin.

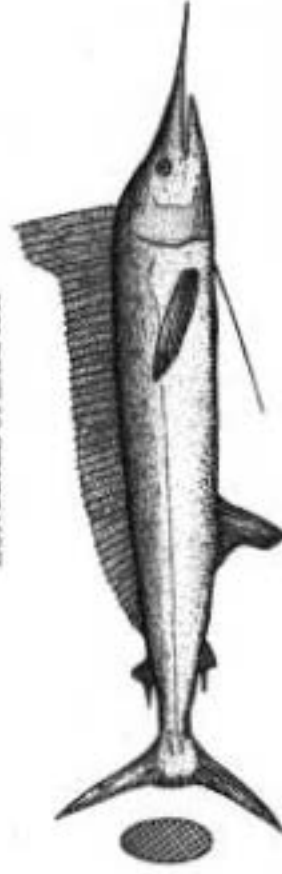
**COLOR:** In life, upper sides and back greenish blue to dark blue, lower sides and belly a silvery white with pale vertical stripes. The dorsal fins and frequently the anal fin a brilliant cobalt blue with dark spots of black or purple. Colors fade at death with the back becoming dark blue to black, sides and belly light gray to white usually without the stripes, and the fins a dark blue.

**SIZE:** Current I. C. F. A. all tackle record 159½ pounds. Averages 40 to 60 pounds.

**SOUTH CAROLINA NOTES:** White marlin are usually more abundant off the northern half of the South Carolina coast.

**FOOD QUALITY:** Good when smoked.

## LONGBILL SPEARFISH



*Tetrapturus pfluegeri*

### DISTINGUISHING CHARACTERISTICS

**DORSAL FINS:** Front lobe of first dorsal fin highest, with remainder of the fin only slightly

less in height, not reduced as much as in the white and blue marlins. Front lobe slightly pointed.

**LATERAL LINE:** Single and usually prominent.

**PELVIC FINS:** Moderate in length, extending back past tip of pectoral fins almost reaching the vent opening.

**VENT LOCATION:** Lies well in front of first anal fin, usually separated by a distance equal to the height of the first anal fin.

**BODY FORM:** Less compressed than the sailfish but more so than the white marlin. (See above).

**FIN MARKINGS:** No spots on any fins.

**OTHER CHARACTERS:** Spear very short in relation to the other billfishes. First anal fin broadly rounded.

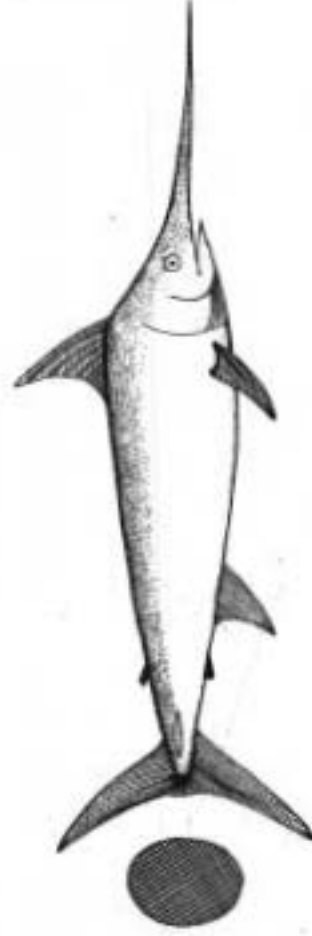
**COLOR:** The back generally dark blue with the sides and belly light gray to silvery white. The fins generally dark blue without spots.

**SIZE:** May exceed 70 pounds. Averages 20 to 50 pounds.

**SOUTH CAROLINA NOTES:** This species has never been reported off South Carolina, though it is known to occur both to the north and to the south of the state.

**FOOD QUALITY:** Good when smoked.

## SWORDFISH



*Xiphias gladius*

### DISTINGUISHING CHARACTERISTICS

**DORSAL FINS:** First dorsal tall and sickle-shaped. Lacks a long backward tapering portion. Second dorsal fin very small.

**PELVIC FINS:** Totally absent.

**VENT LOCATION:** Just in front of first anal fin.

**BODY FORM:** Long and strongly rounded (almost round behind the head). (See above).

**FIN MARKINGS:** None.

**OTHER CHARACTERS:** Only a single large median keel present on each side of the tail (all other billfish have two on each side). Spear extremely long (30 percent of fork length), broad and flattened. Scales totally absent in adults.

**COLOR:** Generally drab, browns to black on the upper sides and back with the lower sides and belly gray to off white. Some individuals may be almost totally brown to black.

**SIZE:** Current I. C. F. A. all tackle record 1,182 pounds. Averages 250 to 400 pounds.

**SOUTH CAROLINA NOTES:** There are a few records of the swordfish occurring off South Carolina but no catches with roe and reel have been verified.

**FOOD QUALITY:** Excellent.

# THE MACKERELS

WAHOO



*Acanthocybium volanderi*

## DISTINGUISHING CHARACTERISTICS

**DORSAL FIN:** First fin long and low with 21 to 27 spines present.

**GILL RAKERS:** Absent.

**LATERAL LINE:** Small drop below middle of first dorsal fin while the remainder continues back almost straight.

**TEETH:** Large and laterally compressed.

**BODY FORM:** Long and slender; body almost round in cross section.

**CAUDAL KEELS:** Two caudal keels plus a larger median keel on each side of the tail.

**OTHER CHARACTERS:** Snout very long and slender, equal to remainder of head length.

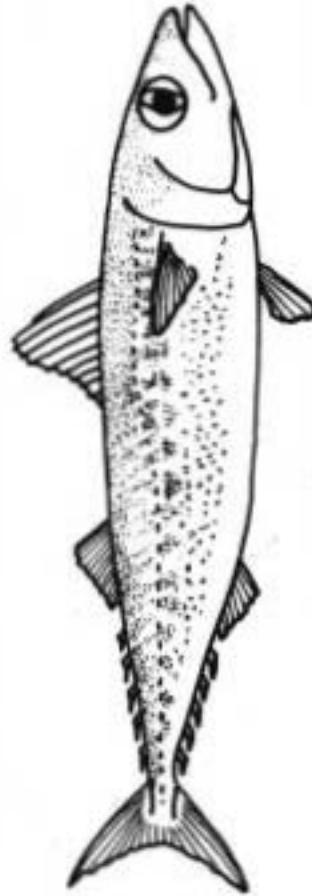
**COLOR:** Distinctively marked in life with alternating dark blue and white vertical bands. At death fades to uniform steel blue on the back with lower sides and belly gray to silver.

**SIZE:** Current I.G.F.A. all tackle record 140 pounds. Averages 20 to 40 pounds.

**SOUTH CAROLINA NOTES:** This species is the most outstanding gamefish of the mackerels and is very common off our coast.

**FOOD QUALITY:** Excellent.

CHUB MACKEREL



*Scomber japonicus*

## DISTINGUISHING CHARACTERISTICS

**DORSAL FIN:** Separated by a distance at least equal to the base of the first dorsal fin; 9 to 19 spines in the first fin.

**LATERAL LINE:** Prominent and almost straight.

**INTERPELVIC PROCESS:** Singular and shorter than the shortest pelvic fin in length. (Figure 2).

**TEETH:** Very small and inconspicuous.

**BODY FORM:** Relatively elongate and only slightly compressed.

**CAUDAL KEELS:** Two small keels on each side of the tail.

**OTHER CHARACTERS:** Adipose eyelid present on the eye. (Figure 1, 1).

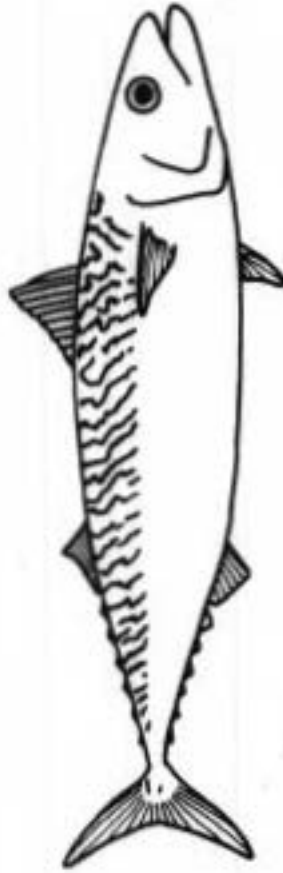
**COLOR:** Small dusky blotches present on the lower sides. The upper sides and back a dark greenish-blue with dark vertical to oblique wavy bars. Lower sides and belly coppery to silver with the dark blotches.

**SIZE:** Seldom exceeds 2 pounds. Averages  $\frac{1}{2}$  to  $\frac{3}{4}$  pound.

**SOUTH CAROLINA NOTES:** Capture of this mackerel with rod and reel has not been verified in South Carolina though it has been caught in large quantity by commercial gear off the state.

**FOOD QUALITY:** Excellent.

ATLANTIC MACKEREL



*Scomber scomberus*

## DISTINGUISHING CHARACTERISTICS

**DORSAL FIN:** Separated by a distance at least equal to the base of the first dorsal fin; 11 to 13 spines in first fin.

**LATERAL LINE:** Almost straight and very prominent.

**INTERPELVIC PROCESS:** Singular and shorter than the shortest pelvic fin length. (Figure 2).

**TEETH:** Very small and inconspicuous.

**BODY FORM:** Relatively elongate and only slightly compressed.

**CAUDAL KEELS:** Two small keels present on each side of tail.

**OTHER CHARACTERS:** Adipose eyelid present on the eye. (Figure 1).

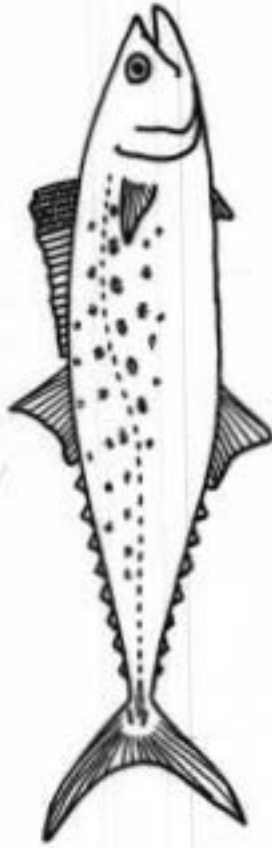
**COLOR:** Upper sides and back blue to green with dark vertical or oblique wavy lines. Lower sides and belly silver to copper, without dark spots.

**SIZE:** Seldom exceeds 2 pounds. Averages  $\frac{1}{2}$  to 1 pound.

**SOUTH CAROLINA NOTES:** Though seldom reported from South Carolina, this mackerel is of commercial importance in the more northern portion of its range.

**FOOD QUALITY:** Excellent.

### SPANISH MACKEREL



*Scomberomorus maculatus*

#### DISTINGUISHING CHARACTERISTICS

**DORSAL FIN:** Almost unitted. A black patch present on front of first fin bordered below by white.

**GILL RAKERS:** 12 to 15 on first gill arch.

**LATERAL LINE:** No sharp drop below second dorsal fin.

**INTERPELVIC PROCESS:** Extremely short and paired. (Figure 2).

**TEETH:** Large, triangular and laterally compressed.

**BODY FORM:** Elongate and moderately compressed.

**CAUDAL KEELS:** Three keels present on each side of the tail with the middle keel being the largest.

**OTHER CHARACTERS:** Pectoral fins scaleless. Spots on side oval, never unitting to form a lateral stripe.

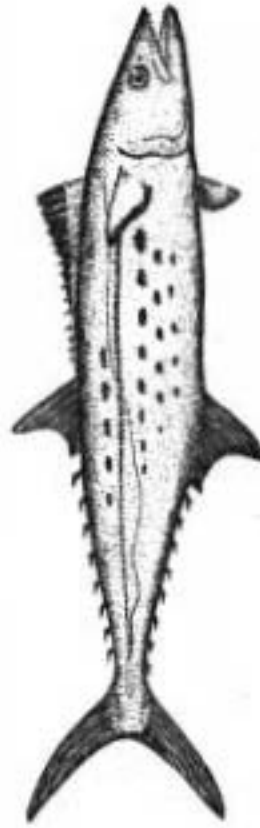
**COLOR:** In life upper sides and back greenish fading to silver on lower sides and belly. Orange to yellow oval spots with well defined edges present on the sides in several irregular rows.

**SIZE:** May reach 18 pounds. Averages 1 to 5 pounds.

**SOUTH CAROLINA NOTES:** The most abundant mackerel off South Carolina. Catches of 50 to 100 fish per boat day are common.

**FOOD QUALITY:** Excellent.

### CERO



*Scomberomorus regalis*

#### DISTINGUISHING CHARACTERISTICS

**DORSAL FIN:** Almost unitted. A black patch present on front of first dorsal fin not bordered below by white.

**GILL RAKERS:** 13 TO 17 on first gill arch.  
**LATERAL LINE:** Prominent, gradually descends toward the tail then undulating on the back portion of the body.

**INTERPELVIC PROCESS:** Very small and paired. (Figure 2).

**TEETH:** Large, triangular and laterally compressed.

**BODY FORM:** Elongate and moderately compressed.

**CAUDAL KEELS:** Three keels present on each side, the median keel being the largest.  
**OTHER CHARACTERS:** Pectoral fins having scales on them. One or more rows of spots unitting to form a lateral stripe which may be broken up towards the tail.

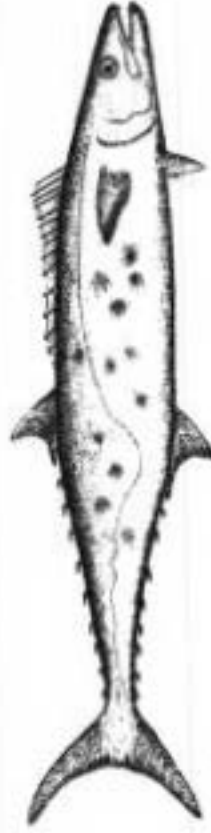
**COLOR:** In life, upper sides and back dark blue to green fading to silver on the lower sides and belly. Numerous rows of orange to brown elliptical spots on the sides. The spots in one or more of these rows unitting forming a brown to black lateral stripe.

**SIZE:** May exceed 30 pounds. Averages 5 to 10 pounds.

**SOUTH CAROLINA NOTES:** No documented records of the cero occurring in South Carolina waters exist.

**FOOD QUALITY:** Excellent.

### KING MACKEREL



*Scomberomorus cavalla*

#### DISTINGUISHING CHARACTERISTICS

**DORSAL FIN:** Almost unitted. First dorsal fin lacking a black patch.

**GILL RAKERS:** 7 to 11 on first gill arch.

**LATERAL LINE:** Drops very sharply below second dorsal fin, then undulating back towards the tail.

**INTERPELVIC PROCESS:** Extremely short and paired. (Figure 2).

**TEETH:** Large, triangular and laterally compressed.

**BODY FORM:** Elongate and only slightly compressed (less than in the cero and Spanish mackerel).

**CAUDAL KEELS:** Two caudal keels plus a large median keel on each side of the tail.

**OTHER CHARACTERS:** Pectoral fins short with scales on them.

**COLOR:** Upper sides and back greenish in life fading to brown or gray at death. Lower sides and belly gray to silver. Pale yellow spots with ill-defined borders generally present on the sides (usually found on fish of less than 15 pounds).

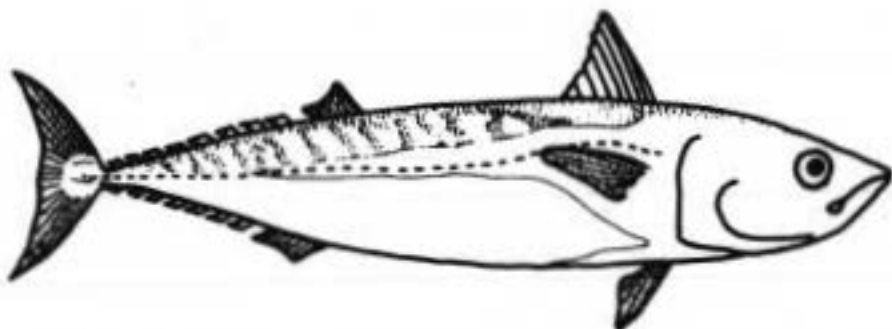
**SIZE:** Current I.G.F.A. all tackle record 76 pounds 12 ounces. Averages 10 to 30 pounds.

**SOUTH CAROLINA NOTES:** King mackerel are the second most abundant mackerel caught off South Carolina being exceeded only by the Spanish mackerel.

**FOOD QUALITY:** Good.

# THE LITTLE TUNAS

BULLET MACKEREL



*Auxis rochei*

## DISTINGUISHING CHARACTERISTICS

**DORSAL FINS:** Widely separated by a distance equal to approximately 80 percent of the head length.

**CORSELET:** Well-developed, tapering back along the lateral line. Usually more than six scale rows wide below the second dorsal fin. Remainder of body scaleless.

**TEETH:** Small, triangular, and laterally compressed.

**INTERPELVIC PROCESS:** Single, almost as long as the pelvic fins. (Figure 2).

**PECTORAL FINS:** Extend back almost to the end of the first dorsal fin.

**BODY SHAPE:** Strongly rounded with abrupt tapering to the caudal fin.

**BODY MARKINGS:** Dark, irregularly broken, vertical (or almost so) wavy lines on the back.

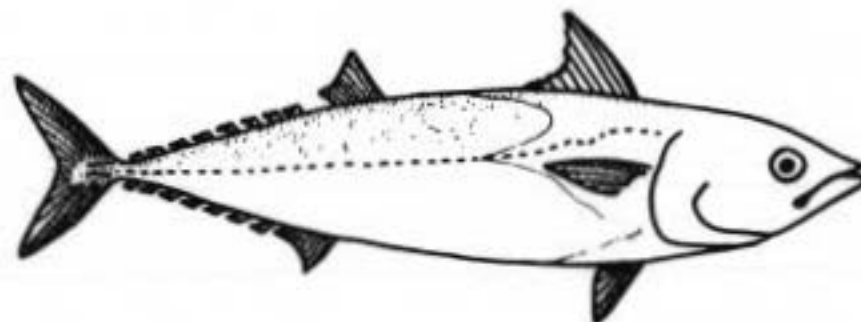
**COLOR:** Upper sides and back blue with vertical dark wavy lines. Lower sides and belly silver to white.

**SIZE:** May exceed 10 pounds. Averages 1 to 3 pounds.

**SOUTH CAROLINA NOTES:** Bullet mackerel are known to be more abundant off South Carolina than the frigate mackerel from samples taken by commercial and scientific gear. Yet, neither species has been recorded from the sportfish landings.

**FOOD QUALITY:** Reported poor.

FRIGATE MACKEREL



*Auxis thazard*

## DISTINGUISHING CHARACTERISTICS

**DORSAL FINS:** Widely separated by a distance equal to approximately 80 percent of the head length.

**CORSELET:** Well-developed, tapering back along the lateral line. One to five scale rows wide below the second dorsal fin. Remainder of body scaleless.

**TEETH:** Small, triangular and laterally compressed.

**INTERPELVIC PROCESS:** Single, almost as long as the pelvic fins. (Figure 2).

**PECTORAL FINS:** Extend back past middle of first dorsal fin.

**BODY SHAPE:** Strongly rounded with abrupt tapering to the caudal fin.

**BODY MARKINGS:** Dark, irregularly broken, oblique to horizontal wavy lines on back. May disappear with age and possibly have faint dark spot appearing below the pectoral fins on old individuals.

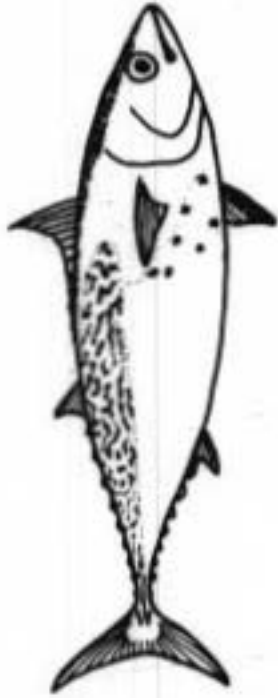
**COLOR:** Upper sides and back blue with oblique to horizontal dark, wavy lines. Lower sides and belly silver to white.

**SIZE:** May exceed 10 pounds. Averages 1 to 3 pounds.

**SOUTH CAROLINA NOTES:** Frigate mackerel are seldom reported in our waters, though they do occur here.

**FOOD QUALITY:** Reported poor.

### LITTLE TUNNY



*Euthynnus alletteratus*

#### DISTINGUISHING CHARACTERISTICS

**DORSAL FINS:** Set very close together, less than the diameter of the eye apart.  
**CORSELET:** Well-developed, extending back to tip of pectoral fin. Remainder of body scaleless.

**TEETH:** Small, triangular and laterally compressed.

**INTERPELVIC PROCESS:** Paired, less than one-half of the pelvic fin length. (Figure 2).

**PECTORAL FINS:** Do not reach much past the middle of the first dorsal fin.

**BODY SHAPE:** Short and robust with gradual tapering to the caudal fin.

**BODY MARKINGS:** Numerous black spots present below pectoral fins. Dark wavy oblique lines on the back.

**COLOR:** Bluish-green back with several dark wavy, oblique lines. Lower sides and belly silver to white with black spots.

**SIZE:** May exceed 30 pounds. Averages 10 to 20 pounds.

**SOUTH CAROLINA NOTES:** Little tunny is the most common of the little tunas found off South Carolina. Locally they are usually referred to as bonito.

**FOOD QUALITY:** Poor.

### SKIPJACK TUNA



*Euthynnus pelamis*

#### DISTINGUISHING CHARACTERISTICS

**DORSAL FINS:** Set very close together.

**CORSELET:** A heavy corselet present, extending slightly back along the lateral line. Remainder of the body scaleless.

**TEETH:** Small, triangular and laterally compressed.

**INTERPELVIC PROCESS:** Paired, length is less than one-half of pelvic fin length. (Figure 2).

**PECTORAL FINS:** Seldom extend back past middle of first dorsal fin.

**BODY SHAPE:** Short and robust with gradual tapering to the caudal fin.

**BODY MARKINGS:** Back plain; 3 to 5 black longitudinal stripes present on the lower sides.

**COLOR:** Upper sides and back dark blue fading to silver on the lower sides and belly with the black longitudinal stripes.

**SIZE:** Current I.G.F.A. all tackle record 40 pounds. Averages 3 to 5 pounds.

**SOUTH CAROLINA NOTES:** A fairly common little tuna; generally found in waters deeper than 100 feet.

**FOOD QUALITY:** Good.

### ATLANTIC BONITO



*Sarda sarda*

#### DISTINGUISHING CHARACTERISTICS

**DORSAL FINS:** Almost united, less than the diameter of the eye separating them.

**CORSELET:** Small and distinct, not extending past tip of pectoral. Remainder of body uniformly covered with scales.

**TEETH:** Prominent and conical in shape.

**PECTORAL FINS:** Not extending past middle of the first dorsal fin.

**BODY SHAPE:** Moderately elongate with a very gradual tapering to the caudal fin.

**BODY MARKINGS:** 9 to 12 longitudinal or oblique dark stripes above the lateral line.

**COLOR:** Back and upper sides greenish with the dark stripes. Lower sides and belly white to silver.

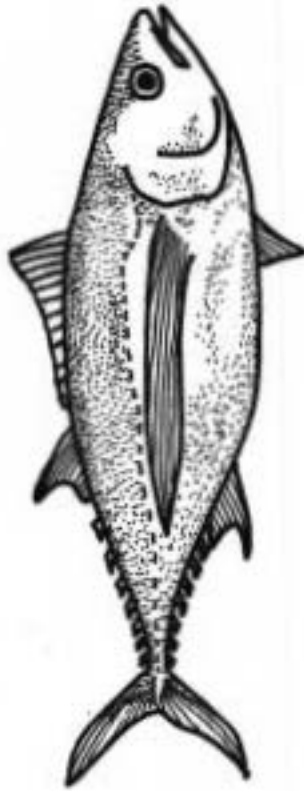
**SIZE:** Seldom exceeds 15 pounds, generally averages 1 to 6 pounds.

**SOUTH CAROLINA NOTES:** Atlantic bonito are generally more abundant in South Carolina waters north of Georgetown.

**FOOD QUALITY:** Reported good.

# THE TUNAS

ALBACORE



*Thunnus albacaranga*

## DISTINGUISHING CHARACTERISTICS

**GILL RAKERS:** 25 to 31 rakers on first gill arch.  
**PECTORAL FINS:** Extremely long, longest of all adult tunas. Extend back past the origin of the first anal fin. Small bigeye tuna possibly with pectoral fins of this length.  
**SECOND DORSAL FIN HEIGHT:** Less than 20 percent of fork length.  
**ANAL FIN HEIGHT:** Less than 20 percent of fork length.  
**FINLETS:** Anal finlets silver or dusky instead of yellow as in the other tunas.  
**BODY DEPTH:** Greatest body depth occurs near origin of second dorsal fin. In all other tunas, it occurs near the middle of the first dorsal fin.  
**LIVER:** Bottom surface streaked.  
**CORSELET:** Small and indistinct.  
**BODY MARKINGS:** May have an iridescent blue band on the sides.  
**COLOR:** Back and upper sides dark blue to black. Lower sides and belly light gray to silvery white. Caudal fin with a narrow white margin.  
**SIZE:** Current I.G.F.A. all tackle record 70 pounds.  
**SOUTH CAROLINA NOTES:** The albacore has been reported north and south of South Carolina but there is no verified record of its occurrence off the state.  
**FOOD QUALITY:** Excellent.

BIGEYE TUNA

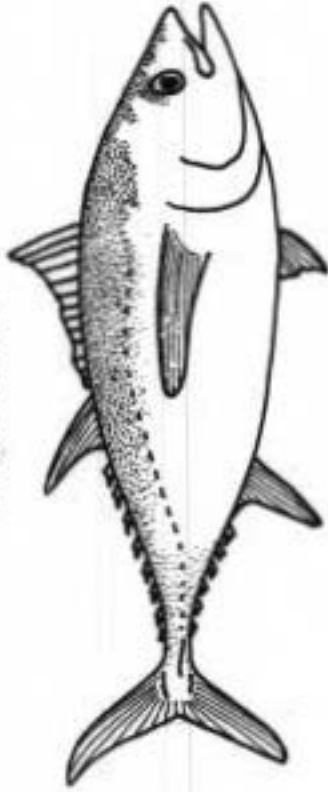


*Thunnus obesus*

## DISTINGUISHING CHARACTERISTICS

**GILL RAKERS:** 25 to 29 rakers on the first gill arch.  
**PECTORAL FINS:** Long, more than 80 percent of head length, extending past the middle of the second dorsal fin. In the young may extend past origin of first anal fin.  
**SECOND DORSAL FIN HEIGHT:** Second dorsal fin never more than 20 percent of fork length.  
**ANAL FIN HEIGHT:** Never more than 20 percent of fork length.  
**FINLETS:** Color of dorsal and anal finlets a bright lemon yellow with a broad black margin.  
**BODY DEPTH:** Usually greater than 25 percent of fork length and occurs near the middle of the first dorsal fin.  
**LIVER:** Bottom surface streaked.  
**CORSELET:** Well-developed and prominent.  
**BODY MARKINGS:** No yellow lateral band present on the sides or only a trace of one.  
**COLOR:** Back and upper sides dark blue to black in color. Sides and belly light gray to white.  
**SIZE:** Current I.G.F.A. all tackle record 321 pounds 13 ounces.  
**SOUTH CAROLINA NOTES:** This tuna has not been documented in the sports fishery of South Carolina, though it has been taken by longline gear off the coast.  
**FOOD QUALITY:** Good.

### BLACKFIN TUNA



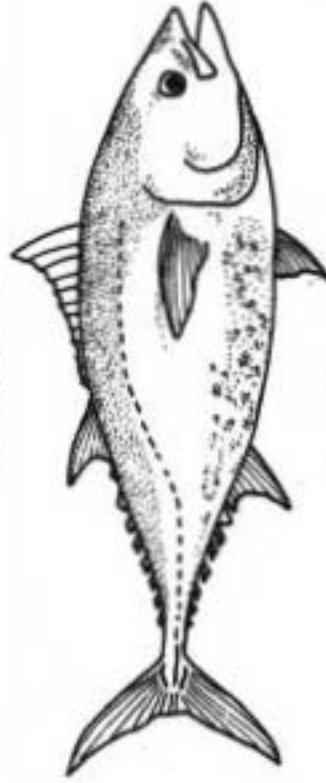
*Thunnus atlanticus*

#### DISTINGUISHING CHARACTERISTICS

**GILL RAKERS:** 19 to 25, usually 20 to 22 rakers on the first gill arch.  
**PECTORAL FINS:** Not reaching to the origin of the first anal fin. Length usually equal to more than 90 percent of head length.  
**SECOND DORSAL FIN HEIGHT:** Less than 20 percent of fork length.  
**ANAL FIN HEIGHT:** Less than 20 percent of fork length.  
**FINLETS:** Both anal and dorsal finlets silver or dusky color in life with white margins. Some yellow may appear at death on the dorsal and some anal finlets.  
**BODY DEPTH:** Greatest body depth occurring near middle of the first dorsal fin.  
**LIVER:** Bottom surface not streaked.  
**CORSELET:** Well-developed and prominent.  
**BODY MARKINGS:** A yellow to gold lateral band present on the sides, usually fading at death.

**COLOR:** Back black, sides and belly gray to silver.  
**SIZE:** Current I.G.F.A. all tackle record 38 pounds. Averages 5 to 15 pounds.  
**SOUTH CAROLINA NOTES:** This species is our most abundant tuna.  
**FOOD QUALITY:** Excellent.

### BLUEFIN TUNA



*Thunnus thynnus*

#### DISTINGUISHING CHARACTERISTICS

**GILL RAKERS:** 34 to 43, usually 37 to 40, rakers on first gill arch.  
**PECTORAL FINS:** Short, length always less than 80 percent of head length.

**SECOND DORSAL FIN HEIGHT:** Less than 20 percent of fork length.  
**ANAL FIN HEIGHT:** Less than 20 percent of fork length.  
**FINLETS:** All finlets yellow.  
**BODY DEPTH:** Greatest depth occurs near middle of first dorsal fin.  
**LIVER:** Bottom surface streaked.

**CORSELET:** Well-developed, extending past tip of pectoral fin.  
**BODY MARKINGS:** None in adults. Small individuals may have pale white spots forming vertical stripes.

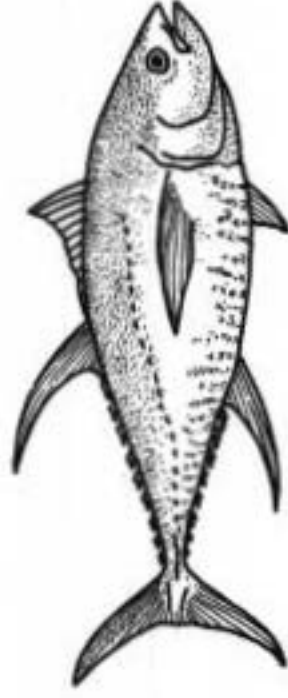
**COLOR:** The back dark blue with the sides and belly a steel gray with faint silver to white blotches.

**SIZE:** Current I.G.F.A. all tackle record 1,065 pounds.

**SOUTH CAROLINA NOTES:** Bluefin tuna are known to migrate past South Carolina, however, no record of it being taken off the state exists.

**FOOD QUALITY:** Excellent.

### YELLOWFIN TUNA



*Thunnus albacares*

#### DISTINGUISHING CHARACTERISTICS

**GILL RAKERS:** 27 to 33 rakers on the first gill arch.

**PECTORAL FINS:** Long, length always more than 80 percent of head length. Extends back almost to the end of the second dorsal fin, never exceeding origin of first anal fin.

**SECOND DORSAL FIN HEIGHT:** Height of second dorsal fin usually less than 20 percent of fork length, for specimens smaller than 48 inches fork length. In larger specimens both dorsal and anal fins quite long, always more than 20 percent of fork length.  
**ANAL FIN HEIGHT:** Always more than 20 percent of fork length in fish larger than 48 inches in fork length.

**FINLETS:** Both dorsal and anal finlets bright lemon yellow possibly with a very narrow black border.

**BODY DEPTH:** Greatest depth occurring near middle of first dorsal fin, usually less than 25 percent of fork length.

**LIVER:** Bottom surface not streaked.

**CORSELET:** Well-developed and prominent.

**BODY MARKINGS:** In life, a prominent yellow to gold lateral band present on the sides, fading at death.

**COLOR:** The back dark blue with a yellow lateral band on the upper sides. Lower sides and belly gray to silver, sometimes with spots or streaks of white.

**SIZE:** Current I.G.F.A. all tackle record 308 pounds.

**SOUTH CAROLINA NOTES:** This tuna is landed regularly by South Carolina sportmen fishing in or near the Gulf Stream.

**FOOD QUALITY:** Excellent.



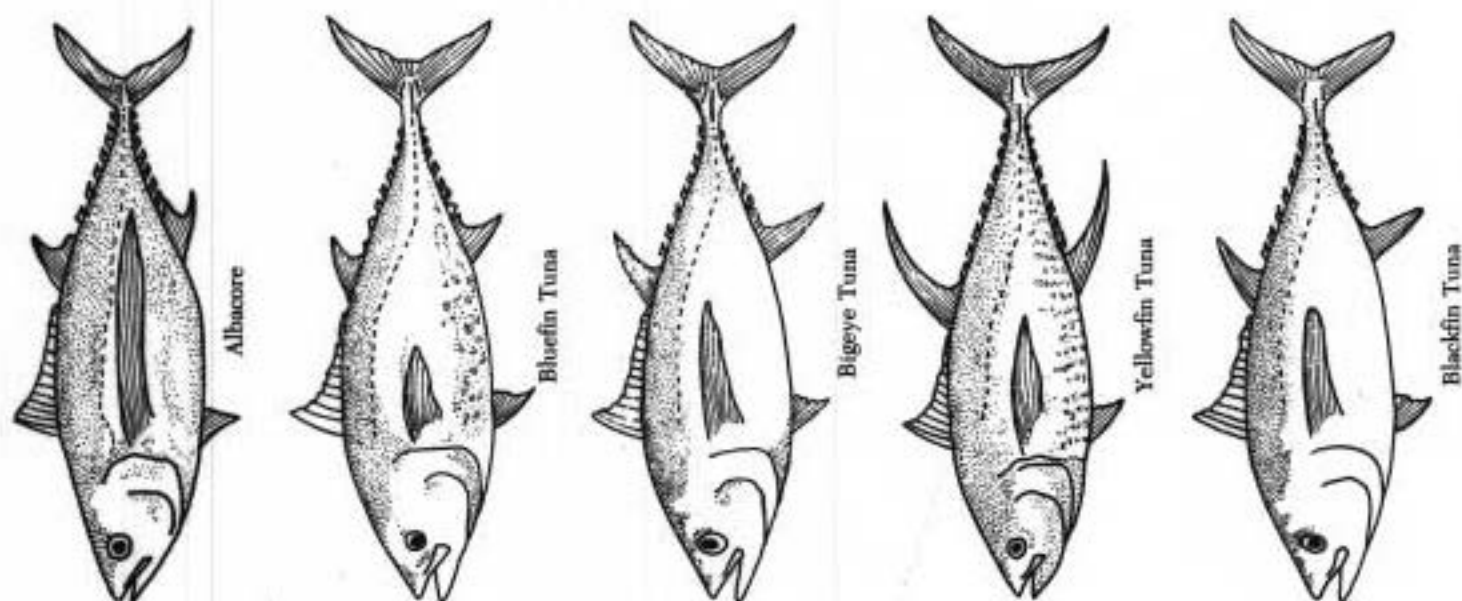


Figure 5. Pictorial comparison of the various tunas

TABLE 1. Summary of major characteristics of the various species of tuna								
CURRENT								
I.C.F.A. RECORDS (POUNDS)								
	PECTORAL FINS	BODY DEPTH	FINLETS	ANAL FIN AND SECOND DORSAL FIN	OTHER DISTINCTIVE MARKS*	NUMBER OF GILL RAKERS ON FIRST GILL ARCH	LIVER	
Albacore	70	Reach well past origin of first anal fin, saber shaped.	Greatest depth occurs near the second dorsal fin.	Anal finlets dusky in color.	Fins of equal height, not elongated.	Narrow white margin on the caudal fin.	25-31, usually 27-29	Bottom surface streaked.
Bluefin Tuna	1065	Length less than 80% of head length, never exceeds the end of second dorsal fin.	Greatest depth occurs near middle of first dorsal fin.	Dorsal and anal finlets yellow.	Heights about equal, never elongated.	Caudal keel semi-transparent in fish less than 40 inches, black in adults.	34-43, usually 37-40	Bottom surface streaked.
Bigeye Tuna	321%	Reach at least to middle of second dorsal fin, and may extend past origin of first anal fin in the young as in the albacore.	Greatest depth occurs near middle of first dorsal fin, usually more than 25% of fork length.	Dorsal and anal finlets lemon yellow with broad black margin on edges.	Heights always less than 20% of fork length.	None	25-30, usually 26-28	Bottom surface streaked.
Yellowfin Tuna	308	Length more than 80% of head length, may reach to the end of second dorsal fin.	Greatest depth occurs near middle of first dorsal fin, usually less than 25% of fork length.	Bright lemon yellow, sometimes having a very narrow black band on the edges.	Heights generally less than 20% of fork length in fish less than 60" in larger fish they are equal to at least 20% of fork length.	An ill-defined yellow longitudinal band is present on the upper sides, disappearing at death.	27-33, usually 29-31	Bottom surface not streaked.
Blackfin Tuna	26	Never reach the origin of the anal fin, equal to at least 60% of head length.	Greatest depth occurs near middle of first dorsal fin.	Dorsal and anal gray or a dusky pale yellow, with a white margin.	Height about equal, dorsal only slightly longer than anal, never elongated.	A wide gold lateral band in life may fade at death.	19-25, usually 20-22.	Bottom surface not streaked.

\*The young of all species may have pale white spots on the lower sides. These may be randomly spaced or form vertical stripes.

# REFERENCES

- Biegelow, H. B. and W. C. Schroeder, 1953. Fishes of the Gulf of Maine. Fish. Bull. 53, 577 pp.
- Bohlke, J. E. and C. C. G. Chaplin, 1968. Fishes of the Bahamas and adjacent tropical waters. Acad. Nat. Sci., Philadelphia, 771 pp.
- Collete, B. B. and R. H. Briggs, Jr., 1963. Preliminary field guides to the mackerel-and tuna-like fishes of the Indian Ocean (*Scombridae*). Smithsonian Institution, Washington, D. C.
- Gehringer, J. W., 1957. Observations of the development of the Atlantic sailfish, *Istiophorus americanus* (Cuvier) with notes on the unidentified species of istiophorid. Fish. Bull. 57:139-171.
- Gibbs, R. H., Jr. and B. B. Collete, 1966. Comparative anatomy and systematics of the tunas, genus *Thunnus*. Fish. Bull; 66(1):65-130.
- International Game Fish Association World Record Marine Fishes, 1975. International Game Fish Association, Fort Lauderdale, Florida, 79 pp.
- Nakamura, I., T. Iwai and K. Matsubara, 1968. A review of the sailfish, spearfish, marlin and swordfish of the world. Kyoto University Special Report No. 4, 95 pp.
- Richards, W. J., Unpublished. Preliminary field guide to the mackerel- and tuna-like fishes of the Atlantic Ocean (*Scombridae*). Mimeographed Internal Document, National Marine Fisheries Service, Miami, Florida, 22 pp.
- Rivas, L. R., 1951. A preliminary review of the western North Atlantic fishes of the family *Scombridae*. Bull; Mar. Sci. Gulf & Caribb., 1(3):209-230.
- \_\_\_\_\_, 1956. Definitions and methods of measuring and counting in the billfishes. (*Istiophoridae*, *Xiphiidae*). Bull; Mar. Sci. Gulf & Caribb., 6(1):18-27.
- Robins, C. R. and D. P. de Sylva, 1960. Description and relationship of the longbill spearfish, *Tetrapterus belone*, based on western North Atlantic specimens. Bull; Mar. Sci. Gulf & Caribb., 10(4):383-413.
- \_\_\_\_\_ and \_\_\_\_\_, 1963. A new western Atlantic spearfish, (*Tetrapturus pfluegeri*), with a redescription of the Mediterranean spearfish *Tetrapturus belone*. Bull; Mar. Sci. Gulf & Caribb., 13(1):84-122.
- Wise, J. P. and C. W. Davis, 1973. Seasonal distribution of tunas and billfishes in the Atlantic. Nat. Mar. Fish Serv., Spec. Sci. Rep. Fish 662, 24 pp.