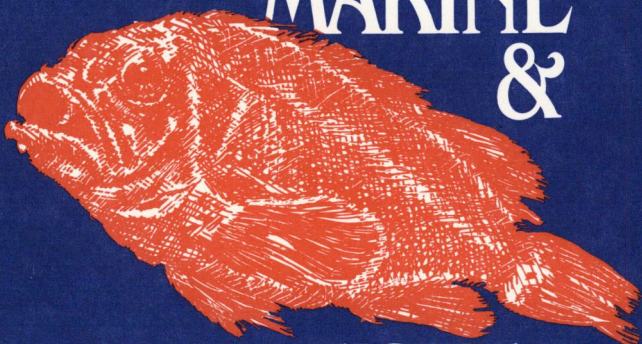


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FIELD GUIDE TO COMMON MARINE &



BAY FISHES OF OREGON

Oregon State University
Extension Service and
Agricultural Experiment Station

Extension Manual 4
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The Oregon State University Extension Service provides education and information based on timely research to help Oregonians solve problems and develop skills related to youth, family, community, farm, forest, energy, and marine resources.

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This publication was prepared by Carl E. Bond, professor of fisheries, Oregon State University, and Alan J. Beardsley, former director, Fisheries Investigations Laboratory, National Marine Fisheries Service, Kodiak, Alaska. It is a revision of the Oregon State University Agricultural Experiment Station Bulletin 607, with the same title, by Alan J. Beardsley and Carl E. Bond.

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**FIELD GUIDE
TO COMMON
MARINE**



**BAY FISHES
OF OREGON**

Glossary

Adipose fin—A small, flexible, rayless fin on the dorsal edge of the caudal peduncle.

Anadromous—Running from saltwater to freshwater for the purpose of spawning.

Anal fin—Unpaired fin located behind the anus on the ventral surface.

Barbel—A slender tactile process ("feeler") usually located near the mouth or nostrils.

Caudal fin—Tail fin.

Caudal peduncle—The tapered portion of the body between the anal fin and the caudal fin (the "handle" of the fish).

Cirrus—A thin projection of skin; may be slender or branched, or may appear as a fringed flap.

Demersal—Living on the sea bottom.

Dorsal fin—Unpaired fins on the back.

Isthmus—Narrow, median portion forming lower boundary of gill cavities.

Keel—Raised, narrow ridge, usually on sides of the caudal peduncle.

Lateral line—The row of sensory pores along the side of a fish.

Maxillary (maxilla)—The upper jaw bones that extend farthest back toward the corners of the mouth.

Occiput—The back of head, dorsally.

Pectoral fins—The paired fins on the sides just behind the gill openings.

Preopercle—Curved, flat bone forming the front part of the gill cover—often bearing a series of spines (preopercular spines).

Pyloric caeca—A mass of tubelike, fleshy projections from the anterior portion of the intestine.

Ray (= fin ray)—Stiffening elements of fins—so-called soft rays may be very flexible or fairly stiff. Spinous rays are usually harder, not branched and sometimes sharp.

Scute—A bony plate.

Tubercle—Small knoblike processes, or rough, raised projections.

Ventral fins (pelvic fins)—Paired fins on the belly or thoracic region.

Vermiculations—Marks like "worm tracks."

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Introduction

A varied and complex assemblage of fishes inhabit the coastal waters of Oregon. The variety of habitats, the ocean current patterns, and the geographical placement (42° to 46° N) of this coast allow for visitation and colonization by northern and southern inshore fishes as well as those from the open ocean. This manual describes some of the commonest kinds of fish found in this faunally rich area. Those fishes were selected because of their present or potential use for food and sport as well as their general interest to vacationers.

For purposes of description, the fishes can be separated into three general groupings: the jawless fishes, the cartilaginous fishes, and the bony fishes. Jawless fishes (figure 1) are represented by the hagfishes and

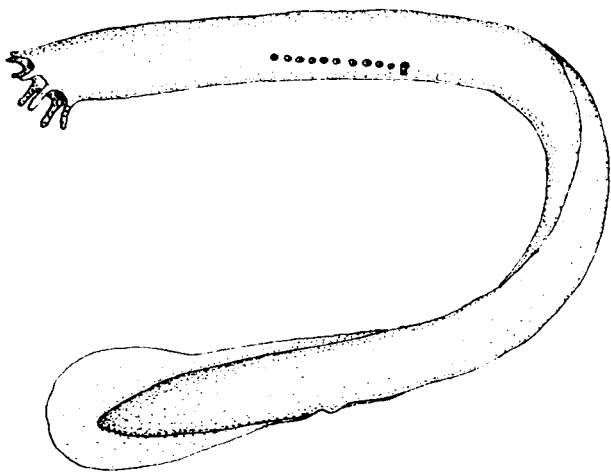


Figure 1
Hagfish

lampreys, neither of which is often seen by the coastal visitor, although the anadromous lamprey can be seen at dams on its spawning migration into fresh water. The hagfish is a burrowing scavenger of the ocean floor. Cartilaginous fishes include the sharks, skates, rays, and the ratfish (figure 2). There are several species representing this general group. The bony, or "true," fishes are by far the most numerous in number of species (figure 3). Many species of bony fishes are actively

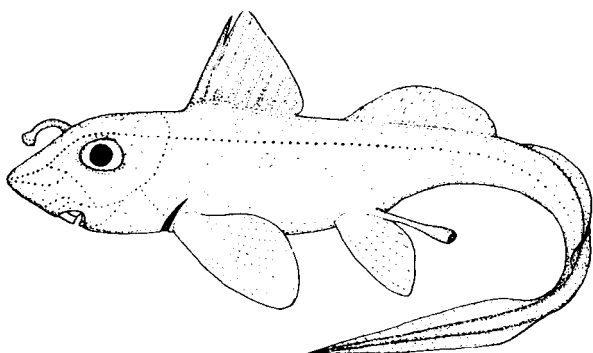


Figure 2
Ratfish

sought by anglers and commercial fishermen. Species of the other two groups are taken only incidentally.

This manual combines short descriptions of selected species with simple drawings that show the general outline and main distinguishing features or markings. This method is useful only for identification of typical adult specimens.

The ranges given represent the eastern Pacific distribution unless otherwise noted.

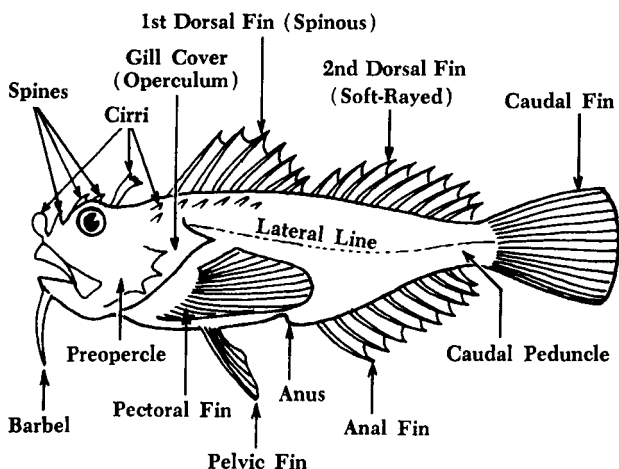


Figure 3
Hypothetical spiny-rayed fish,
showing some external features

Selected Species

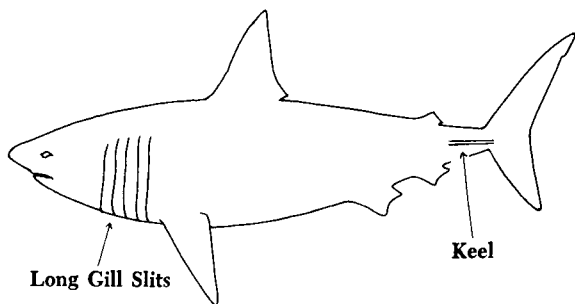
Sharks and Rays

Although they do not often enter bays, there are several species of sharks along, or close to, the coast of Oregon. Other than the four covered below, species occasionally seen include the following: sixgill shark (*Hexanchus griseus*), recognized by its single dorsal fin, set far back, and its six gill slits; sevengill shark (*Noto-rhynchus maculatus*), also with one dorsal fin set behind the origin of the pelvic fins, but with seven gill slits; soupfin shark (*Galeorhinus zyopterus*), with five gill slits, the fifth over the pectoral fin; and the Pacific sleeper shark (*Somniosus pacificus*), a large, dark shark without an anal fin. The thresher shark (*Alopias vulpinus*) is taken off Oregon, as is the white shark, *Carcharodon carcharias*. The latter has attacked and wounded persons riding surfboards on the Oregon Coast. White sharks resemble basking sharks, but they have shorter gill slits and large teeth.

The big skate is the commonest ray in our area, but the longnose skate (*Raja rhina*) is sometimes seen by bay and inshore anglers. The California skate (*R. inornata*) is not commonly found in Oregon. Other rays seen mainly in catches of trawlers are the electric ray (*Torpedo californica*), the black skate (*Raja kinkaidi*), and the starry skate (*Raja stellulata*). The bat ray (*Myliobatis californica*) and the diamond sting ray (*Dasyatis dipterura*) are possible visitors to our shores.

Basking shark

(*Cetorhinus maximus*)



Distinguishing characteristics: Keel on each side of the caudal peduncle; long gill slits.

Coloration: Bluish or brownish gray on dorsal surface; lighter on sides and ventral surface.

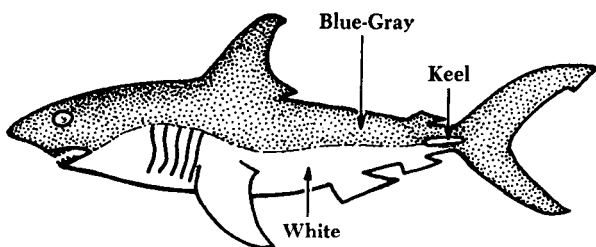
Size: Length up to 45 feet (13.7 m).

Range in eastern Pacific: Southern California to Gulf of Alaska; fairly common in offshore waters.

The basking shark is named for its habit of lying motionless on the top of the water with only its dorsal fin exposed. It feeds on minute crustaceans and other small animals, which it strains from the water by means of long, horny gill rakers. Although large and powerful, it is not considered harmful to people.

Salmon shark

(*Lamna ditropis*)



Distinguishing characteristics: Coloration; small dorsal and anal fins; keel on caudal peduncle; teeth narrow, smooth, with short points on each side of main point.

Coloration: Dark blue or gray on back and upper sides, changing sharply to white on lower sides and belly.

Size: Length to 10 feet (3 m).

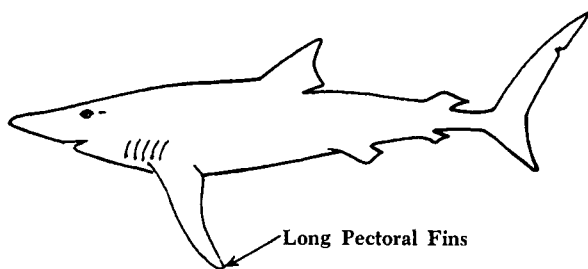
Range in eastern Pacific: San Diego to Bering Sea.

The salmon shark is found in both temperate and cold waters and is likely to remain off the Oregon coast into the winter. It is a fast, voracious predator that feeds on a variety of fish, including salmon.

Blue shark

(*Prionace glauca*)

Distinguishing characteristics: Long pectoral fins equaling twice the height of the first dorsal fin; fourth and fifth gill slits above base of pectoral fin.



Coloration: Grayish blue on back, lighter on sides; almost white on ventral surface.

Size: Length to 13 feet (4 m).

Range in eastern Pacific: Southern California to Alaska; common in the open ocean.

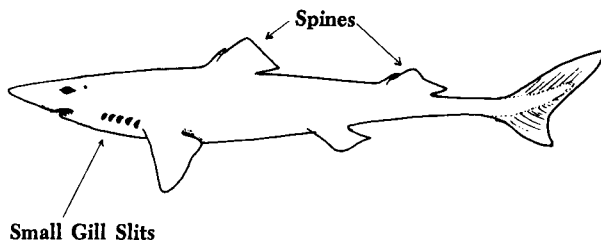
The blue shark appears off the Oregon coast in large numbers during the summer months when ocean waters approach 60° F (16° C) at the surface. It is frequently seen swimming near the surface several miles from shore. The blue shark will occasionally strike a trolled herring or spoon, greatly surprising the angler. They have also been known to attack a hooked salmon. Commercial fishermen often carry a shotgun or rifle to subdue a struggling shark.

It is a very active fish and a voracious feeder. From time to time this shark has been placed in aquariums and undersea observation chambers for viewing by the public. Specimens are short-lived in such environments.

The blue shark is not sought by sport fishermen in Oregon and is not generally eaten. It is thought to have attacked human beings in one instance on the Oregon coast.

Spiny dogfish

(*Squalus acanthias*)



Distinguishing characteristics: Spine anterior to each dorsal fin; two dorsal fins; no anal fin; small gill slits.

Coloration: Slate gray to light brown on dorsal surface; dirty white on ventral surface; young have white spots on back.

Size: Length to about 5 feet (about 1.5 m)

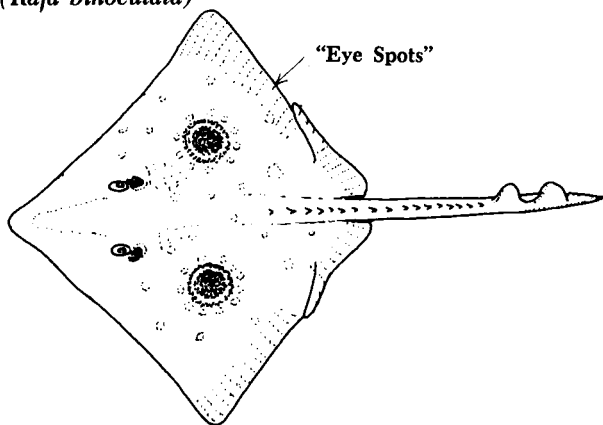
Range in eastern Pacific: Northern Baja California to Alaska; numerous.

The spiny dogfish is the commonest of all sharks found off the coast of Oregon. Because of its small size and relative inactivity, this fish is the most suited of all local sharks for aquarium display. The long spines form more of a threat to persons who handle them than do their very small teeth.

The dogfish shark feeds on nearly all the locally abundant smaller fishes. Herring, anchovies, smelt, sandlances, small crustaceans, and squid seem to be preferred. It is often caught by sport and commercial fishermen using trolled herring. Before the manufacture of synthetic vitamin A in 1948, dogfish sharks were captured for the high vitamin A content of their livers. Today these fish have little commercial value, except for the small numbers taken by biological supply houses for classroom dissection.

Big skate

(Raja binoculata)



Distinguishing characteristics: Depressed (flat); concave outer margin of pelvic fins; spines along tail; large spine short distance behind eye.

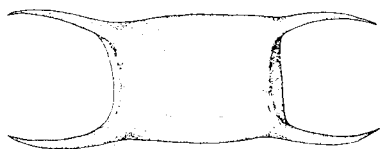
Coloration: Dorsal surface, dull olive brown to black with dark "eyespot" near center of base of pectorals; ventral surface, light and creamy white.

Size: Maximum length 6 to 8 feet (1.8 to 2.4 m)

Range in eastern Pacific: Southern California to Gulf of Alaska; common.

The empty leathery "mermaid's purses" that wash up on Oregon's beaches are usually egg cases of skates

and less frequently those of sharks. Embryonic skates remain in the protective custody of the egg case until mature enough to survive the rigors of oceanic existence.



Skate Egg Case

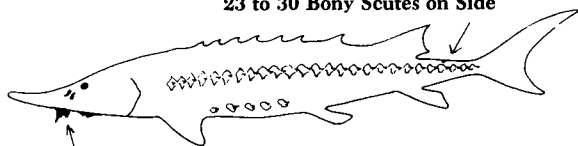
The skate is a relative of the shark, adapted for living on the ocean floor. The young of the big skate are frequently found in Oregon bays. Large specimens, 4 feet (1.2 m) from wingtip to wingtip, have been taken from Yaquina Bay. Larger individuals generally inhabit deeper waters of the continental shelf. They have been known to strike shrimp, clams, or trolled herring, but are seldom caught by sport fishermen because of their scattered distribution.

During World War II, enterprising restaurateurs were known to punch out pieces of skate wings with circular "cookie cutters" and serve the product as "scallops" to their patrons. Skate caught by commercial trawlers today are used industrially.

The longnose skate is similar to the big skate but does not have "eyespot" on the pectoral fins; it has a blue-gray underside.

Green sturgeon (*Acipenser medirostris*)

23 to 30 Bony Scutes on Side



Barbels Close to Mouth

Distinguishing characteristics: Long snout with four underlying barbels placed nearer the mouth than the tip of the snout; 23 to 30 bony scutes in main row on each side of the body.

Coloration: Blotched olive green on dorsal surface; sides silvery, with green or white on ventral surface.

Size: Length to 7 feet (2.1 m); weight to 350 pounds (159 kg).

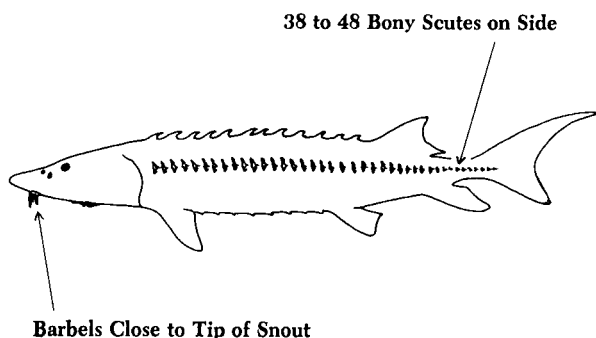
Range in eastern Pacific: Southern California to Alaska; common.

The green sturgeon, a large, primitive bottom fish, inhabits marine and brackish waters but is seldom found in fresh water. Occasionally it will enter the Columbia River and has been found at the head of coastal bays. Commercial trawlers obtain moderate numbers of these fish on the continental shelf. The dark flesh and strong taste of this fish make it unpopular on the market.

Green sturgeon inhabit several Oregon estuaries and may be taken on herring, clam necks, or lamprey fished near the bottom.

White sturgeon

(*Acipenser transmontanus*)



Distinguishing characteristics: Short wide snout, four barbels hanging from the snout in a position closer to the tip of the snout than the mouth; 38 to 48 bony scutes in one row on each side of the body.

Coloration: Uniform dark gray with no stripes on the sides; lighter on ventral surface.

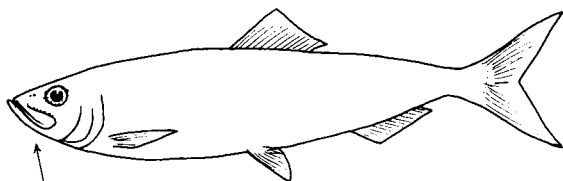
Size: Length to 20 feet (6 m); weight to 1,500 pounds (680 kg).

Range in eastern Pacific: Northern California to Gulf of Alaska; common.

The white sturgeon is known better as a resident of salt and brackish water, although it is also found in deep holes in large rivers of Western North America. It is one of the few fish capable of moving freely from the river to the ocean and back again on spawning or feeding migrations. The white sturgeon is a slow-growing fish and seldom spawns before reaching the age of 15 years. A 50-year-old fish may deposit as many as four million eggs.

This is a valuable food fish. The flesh is sold at a high price on the fresh or smoked fish market, and caviar is made from the roe. Fishermen use strong rods and lines to battle this often large fish. Smelt, lamprey, or clam necks are often used for bait.

Pacific herring
(*Clupea harengus pallasii*)



Projecting Lower Jaw

Distinguishing characteristics: No ridges on the gill covers; deciduous (easily removed) scales; projecting lower jaw; absence of scales on head; no black spots on upper sides.

Coloration: Bluish green on back; silvery on sides and ventral surface.

Size: Length to 18 inches (46 cm).

Range in eastern Pacific: Southern California to Bering Sea; numerous.

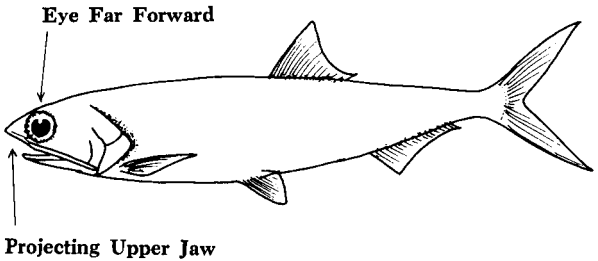
The Pacific herring is the most widely used bait fish in the sports and commercial salmon troll fishery along the coast of Oregon. Herring will readily strike a small silver hook jerked repeatedly in the water. A series of these hooks tied on a piece of leader is called a *herring jig*. Fishermen frequently jig their own fresh herring in one of Oregon's bays before going salmon fishing. Herring are available in markets for use as bait or as food. Pickling is a favorite means of preparation.

Herring can be unpredictable in their movements. They may be abundant in a bay one day and absent the next. Sea birds that gather to feed on schooled herring often guide commercial and sport fishermen to catches of large salmon.

Herring migrate into bays to spawn in winter. Females lay enormous numbers of adhesive eggs on rocks, eelgrass, sea weeds, and pilings.

In addition to the very abundant Pacific herring, there are two others present along the Oregon coast: the Pacific sardine or California pilchard and the American shad. The latter was introduced from the east coast in 1871. During the 1930's, the sardine was the object of a great commercial fishery, pursued mainly in California. Disappearance of the large stocks during the later 1930's and early 1940's brought the fishery to an end. The shad is anadromous and is sought in freshwater by sport and commercial fishermen. Both the shad and the sardine have a row of round black spots on the upper side just behind the head. The shad has a saw-edged belly, with sharp, modified scales called *scutes*, pointing backward.

Northern anchovy
(*Engraulis mordax*)



Distinguishing characteristics: Large mouth; projecting snout; eye near end of snout; gill covers not united under head; very long maxillary reaching nearly to the edge of the gill cover.

Coloration: Metallic bluish or greenish on dorsal surface; silvery on sides.

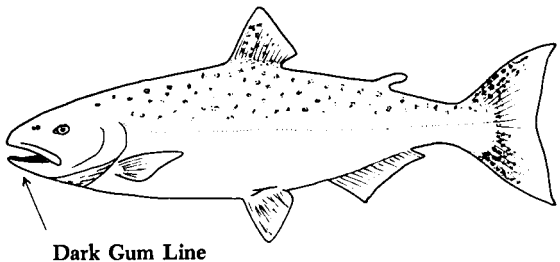
Size: Length to 9 inches (23 cm).

Range in eastern Pacific: Cape San Lucas, Baja California to British Columbia; common.

This fish is valuable as bait in the salmon and tuna fisheries. Some sport fishermen prefer anchovies to the more commonly used herring for salmon trolling along the Oregon coast. The anchovy may be caught on herring jigs. Some are used for human consumption.

The anchovy is a schooling fish and often may be seen feeding near the surface. When frightened by feeding predatory fish, they may form a ball at the surface.

Chinook salmon
(*Oncorhynchus tshawytscha*)



Distinguishing characteristics: 13 to 19 rays in the anal fin; black pigment along gum line; spots in both upper and lower lobes of caudal fin; pyloric caeca number 140 to 185.

Coloration: *In ocean*—greenish blue on dorsal surface; numerous irregular black spots on back, dorsal fin, and both lobes of caudal fin; flesh red. *In bays late in the fall*—dark, almost black in color; red blotches on sides; numerous spots present; hooked snout may develop in males; flesh becomes pink or white.

Size: Commonly seen in length to 3 feet (91 cm) and weight to 30 pounds (14 kg), but weights to 60 pounds (27 kg) may be encountered; maximum weight 120 pounds (54 kg).

Range in eastern Pacific: Southern California to Bering Sea; common.

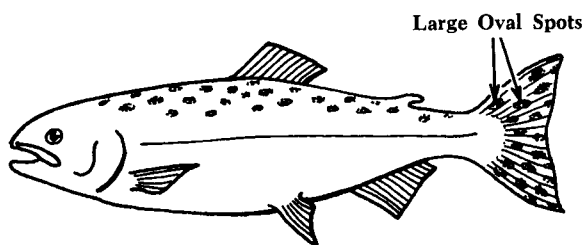
Oregon's anglers would probably vote the chinook salmon the most esteemed marine sport fish. Commercial salmon trollers are paid more per pound for large chinook than for any other fish in their catch. Although not as numerous as the coho salmon, the chinook grows to a greater size. Several 50-pounders are taken each year in Oregon. Because of the tremendous fishing pressure and deterioration of their natural spawning beds, great numbers of chinook salmon are artificially propagated each year, particularly in hatcheries located along the Columbia River.

The flesh of the chinook salmon is usually deep red in color. Most often it is cut into steaks or roasts for cooking, but some is canned or smoked. Salmon to be frozen should be sealed in water or glazed with ice before storing.

The smaller pink salmon is similar in appearance to the chinook, but it has larger spots and finer scales.

Pink salmon

(*Oncorhynchus gorbuscha*)



Distinguishing characteristics: Coloration; small scales (more than 150 in lateral line); gill rakers 24 to 35 on first arch; spawning males with grotesquely humped back.

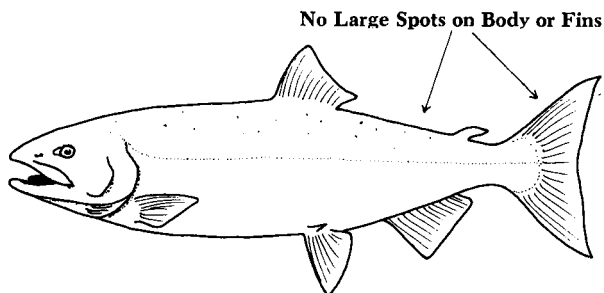
Coloration: Blue on back, silver on sides; large, well-defined, oval spots on caudal fin. Other large spots on back are often nearly obscured by the metallic blue ground color. The spots on caudal fin are about as long as the eye. Spawning fish are dark olive green on back, somewhat lighter on sides; males have irregular splashes of yellow (sometimes red) on the sides.

Size: Length to 30 inches (76 cm).

Range in eastern Pacific: In ocean, southern California to Bering Strait; in fresh water, strays into California and Oregon streams, but is most abundant from Puget Sound north.

Although the pink salmon seldom enters streams south of the Columbia River, the species feeds in the ocean along the Oregon shore and is occasionally caught by salmon anglers. The small average size of the pink salmon is due to its short life cycle. They mature, spawn, and die in the second year of life. There is almost no overlap of generations, and some streams (or geographic areas) have only odd-year or even-year runs. The flesh of the pink salmon, though highly palatable, is not as rich as that of the coho or chinook.

Chum salmon
(*Oncorhynchus keta*)



Distinguishing characteristics: 13 to 17 rays in anal fin; no large spots on body or fins; slender caudal peduncle; all fins (except the dorsal) tinged with black; 140 to 186 pyloric caeca.

Coloration: Metallic blue on dorsal surface; silvery on sides and belly; no black spots; black tips on all fins except dorsal; maturing adults in brackish and fresh water have irregular brown or purple blotches on sides of body.

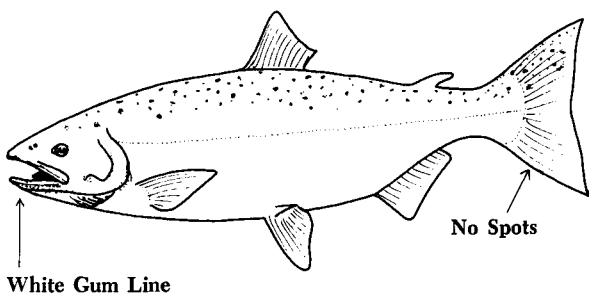
Size: Length to 40 inches (about 1 m).

Range in eastern Pacific: Northern California to Bering Sea.

Although the species may be found in a number of streams on the Oregon coast, the largest runs are in Tillamook Bay. Spawning adults are seldom found more than a few miles from saltwater.

The flesh of the chum salmon is not as highly prized as that of others, but commercial fisheries on the species exist from the Columbia River northward. Sport anglers do not usually seek the chum salmon because it rarely strikes a lure.

Coho (Silver) salmon
(*Oncorhynchus kisutch*)



Distinguishing characteristics: 13 to 16 rays in anal fin; gums nearly white in color; spots on tail (if present) only in dorsal half; 45 to 83 pyloric caeca.

Coloration: *In ocean*—metallic green or blue on back; silver on sides and belly; small dark spots on back, dorsal fin, and upper portions of tail. *In bays late in fall*—spawning coloration may occur before the fish leave the estuary; mature males become deep red with a noticeable hooked snout; a white spot may occur behind the eye at the top of the gill opening in both sexes; females turn a dull bronze changing to black, lighter on the belly.

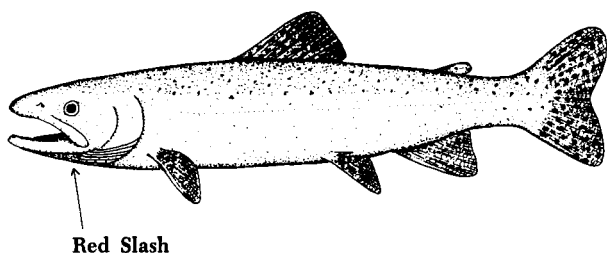
Size: Length to 3 feet (91 cm), weight to 35 pounds (15.9 kg).

Range in eastern Pacific: Northern California to Bering Sea.

The silver salmon supports an active sport and commercial fishery along the Oregon coast. Along with other salmon and trout, it is considered a game fish and therefore must be taken on hook and line. Trolled herring or anchovies are the commonest baits.

Coastal cutthroat trout
(*Salmo clarki clarki*)

Distinguishing characteristics: 8 to 12 rays in anal fin; bright red slash under and on side of lower jaw; small teeth on the back portion of tongue, between gill arches.



Coloration: Greenish blue on back; silvery on sides and belly; in freshwater, numerous black spots on sides of body, head, and tail; bright red dash on lower portion of each jaw. Interior of mouth white.

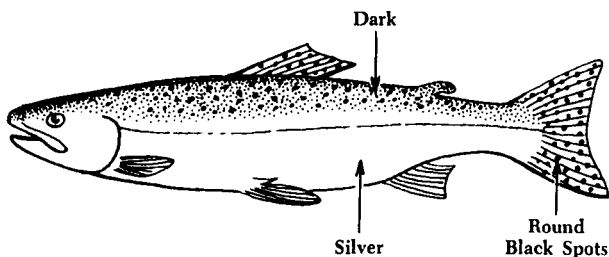
Size: Usual length to 25 inches (63.5 cm); weight to 5 pounds (2.3 kg). Maximum known length 30 inches (76.2 cm).

Range in eastern Pacific: Northern California to South-eastern Alaska.

The sea-run coastal cutthroat trout is highly prized by Oregon sport fishermen. These savage fighters inhabit all coastal streams, spending part of their lives in the ocean or bays and lagoons. At maturity these trout ascend freshwater streams to spawn. Several well-developed tidewater fisheries for cutthroat exist in Oregon. These fisheries, located predominantly in the central coast region of the state, begin in late July and reach a peak in August and early September. Trolling lures, small herring, or spinner and worm from a boat is the commonest method of angling.

The flesh of sea-run cutthroat trout is pink to red and is extremely tasty.

Steelhead (Rainbow trout) (*Salmo gairdneri*)



Distinguishing characteristics: Coloration; lacks teeth behind patch of large teeth on tongue.

Coloration: *In ocean*—metallic blue on back, changing abruptly to silver above the lateral line; round black spots are visible through the blue sheen of the back, and are prominent in dorsal and caudal fins; no red dash under edges of lower jawbone. *In freshwater*—the metallic sheen is gradually lost, and a red band appears along the sides, especially broad and bright in males.

Size: Length to 45 inches (1.1 m).

Range in eastern Pacific: Southern California into Bering Sea.

The steelhead is not often caught by saltwater anglers, but is generally sought in upper tidewater and in rivers. It is one of the most prized game fishes in the area and attracts thousands of anglers to the coastal rivers during the winter months. A summer migration is known in a few streams of the Oregon coast. The steelhead is an excellent table fish.

Smelts

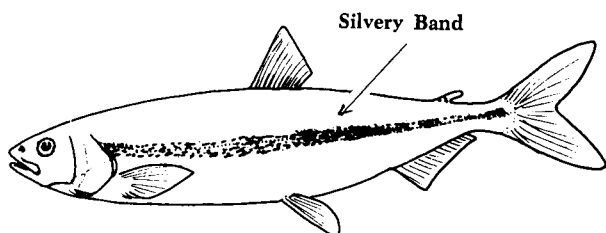
The smelt family (Osmeridae) has five representatives on the Oregon coast. These are all small, translucent or silver-sided fishes of similar appearance. They are usually difficult to identify without the aid of a microscope to examine teeth, scales, and fin rays. The surf smelt, illustrated on page 20, is the species most often seen along the coast. It has a small mouth. The others have the upper jaw extending past the middle of the eye. The eulachon (*Thaleichthys pacificus*) runs into freshwater to spawn during late winter or spring; it sometimes enters the Columbia River in great numbers. The night smelt (*Spirinchus starksi*) spawns on beaches at night during late spring and summer, but its close relative the longfin smelt (*S. thaleichthys*) spawns in coastal rivers in late fall. The whitebait smelt (*Allosmerus elongatus*), which is sometimes seen in great numbers in bays, spawns in the ocean. Although similar in appearance and spawning habits to some of the smelts, the grunion of California is not a close relative. It is a silverside (Atherinidae).

Surf smelt

(*Hypomesus pretiosus*)

Distinguishing characteristics: Upper jaw reaches to below front edge of eye; adipose fin present; dorsal fin originates farther forward than origin of pelvic fins.

Coloration: Light brown to green on back; silvery band along sides; silver to white on belly; spawning males may have golden tones.



Size: Length to 10 inches (25.4 cm).

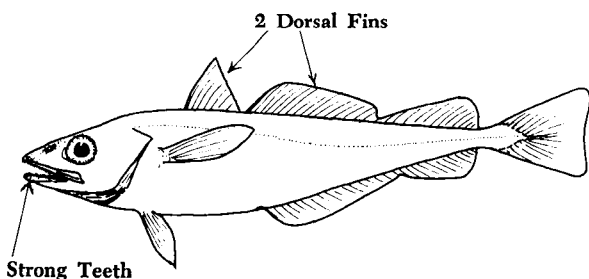
Range in eastern Pacific: Northern California to Alaska.

The surf smelt is captured as it spawns on gravelly ocean beaches during the summer. Dip nets and a special "A-frame" net are used in the fishery. The best spawning beaches have pea-sized gravel, freshwater seepage, and some afternoon shade.

Other smelts on the Oregon coast include the night surf smelt and the eulachon, which runs into the Columbia River and occasionally into coastal streams to spawn.

Pacific hake

(*Merluccius productus*)



Distinguishing characteristics: Teeth; slender and strong; first dorsal fin short; second dorsal fin long and deeply notched; head and mouth large; lower jaw protruding; black lining in mouth; large eyes.

Coloration: Metallic black or gray on top; silvery on sides and belly; lining of mouth and gill covers is black.

Size: Length to 3 feet (91 cm).

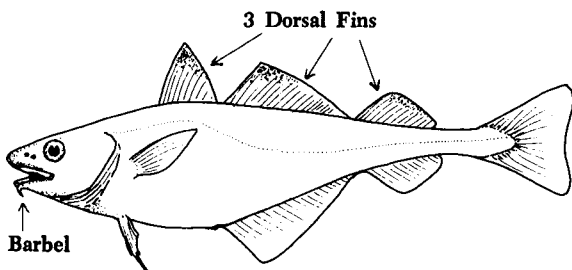
Range in eastern Pacific: Gulf of California to Alaska; common.

Hake are considered a pest by ocean anglers and many commercial salmon fishermen. They eagerly take trolled herring, particularly when it is fished at a depth of 5 fathoms (about 9 m) or more. Americans consider the flesh of the hake soft and not very palatable, but

Russian trawlers during 1966 took 140,000 to 145,000 tons (roughly, 127,000 to 131,500 metric tons) of hake off the Oregon and Washington coasts. This species has continued to be a prime attraction for foreign fishing fleets—and, more recently, an attraction for U.S. fishermen as well. The economic importance of this resource is growing.

Pacific tomcod

(Microgadus proximus)



Distinguishing characteristics: Small barbel on the lower jaw; three separate dorsal fins; two separate anal fins; anus positioned below first dorsal fin.

Coloration: Olive green to brownish on dorsal surface; white or silvery on sides and belly; dusky fins.

Size: Length to 12 inches (30.5 cm).

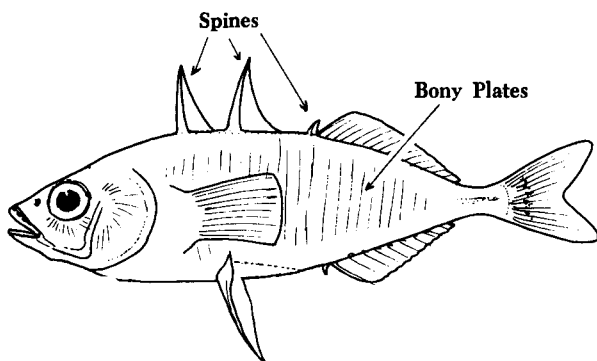
Range in eastern Pacific: Central California to Gulf of Alaska; common.

The Pacific tomcod is not of commercial importance, but is the subject of a sport fishery at several locations on the Oregon coast. If a school is located, they may be taken on almost any bait kept in motion.

The flesh is white, delicate, and tasty. Despite the small size, they probably should receive more attention from anglers.

Threespine stickleback

(Gasterosteus aculeatus)



Distinguishing characteristics: Large spines in dorsal and pelvic fins; vertical bony plates on sides of body; slender caudal peduncle (part before tail fin).

Coloration: Variable, silvery green, blue, or mottled brown, depending on habitat; spawning males blue with orange on lower part of head and breast.

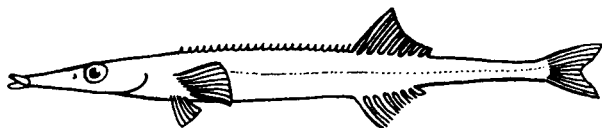
Size: Length to 4 inches (10.2 cm).

Range in eastern Pacific: Southern California to Bering Sea; common.

These fish are too small to be of commercial or sport fishing importance. They are frequently abundant in brackish sloughs of estuaries. The threespine stickleback is an active fish, making an interesting display in many public aquaria. Aquarists enjoy the nest building and courtship behavior of this species.

Tube-snout

(*Aulorhynchus flavidus*)



Distinguishing characteristics: Body elongate, slender, rather rigid because of bony plates under the skin; mouth at end of an elongate tube formed by the jaws; about 16 small spines along back in front of soft dorsal fin.

Coloration: Olive green to brown on back and sides, greenish white to cream-colored on ventral surface; dark band along snout and from eye to pectoral fin, a silvery area below the band.

Size: Length to 7 inches (17.8 cm).

Range in eastern Pacific: Baja California to Alaska.

The tube-snout is most often seen in and around eelgrass or other vegetation. The species spawns during the spring, usually attaching the eggs to kelp or other marine algae. Males guard the eggs. The tube-snout feeds on zooplankton, catching the organisms individually in the small mouth.

Bay pipefish

(*Syngnathus leptorhynchus*)

Distinguishing characteristics: Snout long and tubular; body elongate, subcylindrical, and angular, encased in bony plates; no pelvic fins.

Coloration: Olive green with narrow horizontal gray lines.



Size: Length to 13 inches (33 cm).

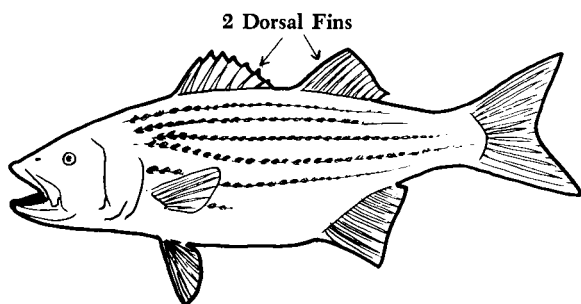
Range in eastern Pacific: Southern California to Southeastern Alaska.

The bay pipefish, relative of the seahorse, feeds on small crustaceans and is usually found in or near eelgrass beds. Although never taken on sport gear, it may be seen by clam diggers when it becomes stranded on mud flats in small tide pools. The pipefish is on display in a number of aquarium concessions along the Oregon coast.

The male incubates the eggs in a peculiar abdominal brood pouch.

Striped bass

(*Morone saxatilis*)



Distinguishing characteristics: Two dorsal fins completely separated; seven or eight horizontal blackish stripes along the sides of the body; torpedo-shaped body.

Coloration: Steel blue to olive green or black becoming silvery on the sides and belly; copper reflection to sides; seven or eight horizontal stripes on sides.

Size: Maximum length to 4 feet (1.2 m); weight to 78 pounds (35.4 kg).

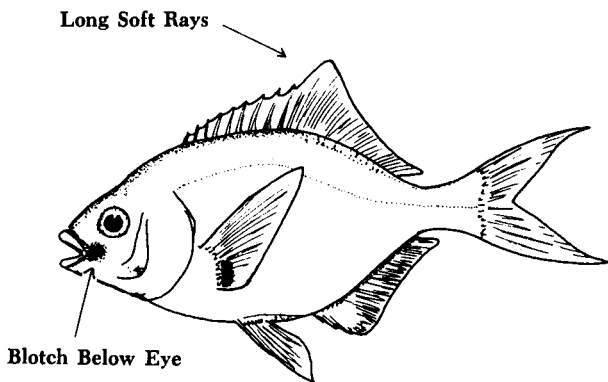
Range in eastern Pacific: San Diego to Straits of Juan de Fuca; uncommon north of Winchester Bay, Umpqua, and Smith Rivers.

The striped bass was introduced to the Pacific Coast in 1879 when 132 small fish were planted in San Francisco Bay. A supplemental plant of 300 fish was made in 1882. Having since spread northward, the Oregon striped bass population is chiefly located in Coos Bay, with lesser numbers in the Coquille and Umpqua Rivers. It is an anadromous fish, moving into freshwater to spawn. Spawning takes place primarily in May and June. A 9-pound female deposits about 900,000 eggs.

An extremely important sport fish, the striped bass is an unmatched test of skill to the most experienced fishermen. Summer and fall provide the best fishing opportunities, although it may be taken all year. The quality of this fish makes it excellent for eating.

Pile perch

(Rhacochilus vacca)



Distinguishing characteristics: Anal fin with three spines and 25 to 30 soft rays; body oval in shape; dusky coloration with dark spot on each gill cover; vertical dark stripe on about the middle of each side; deeply forked tail.

Coloration: Dusky to dark gray on back; lighter on sides; vertical dark stripe on each side; dark spot on gill cover.

Size: Length to 18 inches (45.7 cm); weight to 5 pounds (2.3 kg).

Range in eastern Pacific: Northern Baja California to Alaska.

This is the largest surfperch of the six or seven species found here and gives sport fishermen an exciting fight on light tackle. When hooked near docks or pilings, this fish frequently will cut the line on the abrasive barnacles encrusting such structures.

Large pregnant females caught in June and July often give birth to several dozen lively young, when the adult is removed from the water. Young placed quickly back in the water have a good chance of survival.

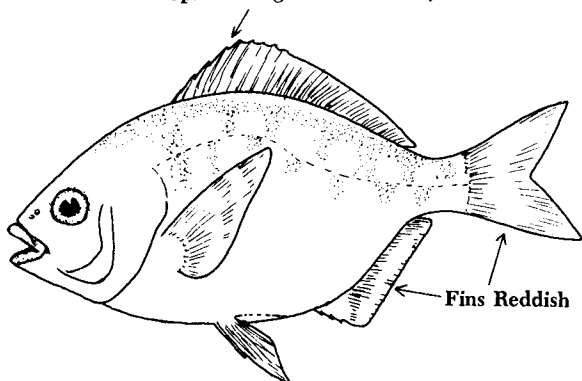
The pile perch is large enough to make sizable, meaty fillets. The carcasses are useful for crab bait.

Redtail surfperch

(Amphistichus rhodoterus)

Distinguishing characteristics: Anal fin with three spines and 28 to 31 soft rays; body oval in shape; high

Spines Longer than Soft Rays



angular spinous portion of dorsal fin; most spines longer than soft rays; 9 to 11 vertical reddish brown or bronze bars on the sides of the body; reddish color to tail and pelvic fins.

Coloration: Silvery background coloration with the above-mentioned markings.

Size: Length to 16 inches (40.6 cm); weight to about 3 pounds (1.4 kg).

Range in eastern Pacific: Southern California to Vancouver Island.

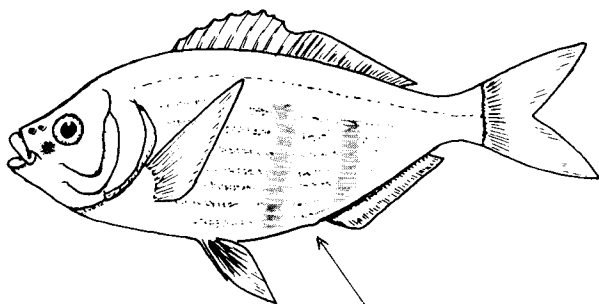
This colorful fish is most easily recognized by the reddish pelvic fins and tail, which contribute to its name.

Redtail surfperch are most frequently found in the surf zone of the ocean but on occasion are found in bays. The commonest habitat is around pilings and jetties, especially over sandy bottoms.

Redtail surfperch are generally filleted and are of similar eating quality to the other members of the surfperch family.

Shiner perch

(*Cymatogaster aggregata*)



Vertical Yellow Bars

Distinguishing characteristics: Anal fin with three spines and 22 to 25 soft rays; body oval in shape; vertical light yellow bars on the sides of the body, crossing faint horizontal stripes; large scales in proportion to body length; small size.

Coloration: Silvery or dusky on dorsal surface; dark linear markings on lower body; vertical light yellow bars on the sides of the body; males (recognized by swelling in anal fin) are nearly black in winter and spring.

Size: Length to 8 inches (20.3 cm).

Range in eastern Pacific: Northern Baja California to Port Wrangel, Alaska.

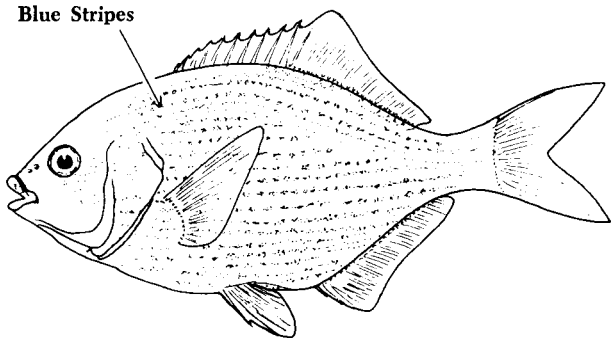
The shiner perch gives birth to live young in the spring of the year. Fertilization takes place shortly after the young are born. Food consists of barnacles, small clams, shrimp, algae, and miscellaneous crustaceans.

Adult fish will readily take a small hook baited with shrimp, clam necks, or barnacles. Many are caught on herring jigs, employing bare hooks or hooks with a small piece of red yarn attached. This schooling species provides excellent recreational fishing to youngsters on docks and piers. Although this is a marine fish, specimens are frequently found in brackish water, and sometimes in freshwater.

Although many people consider this fish too small for eating, its flesh is nevertheless very firm and tasty. The easiest method of preparation for cooking is to remove the head, fins, and viscera prior to skinning. The body portion may then be breaded and fried.

Striped seaperch (*Embiotoca lateralis*)

Orange and
Blue Stripes



Distinguishing characteristics: Anal fin with three spines and 29 to 33 soft rays; body oval in shape; low spinous portion of the dorsal fin with length of the last spine about three-quarters of the length of the first ray.

Coloration: Bright orange and blue horizontal strips on head and body.

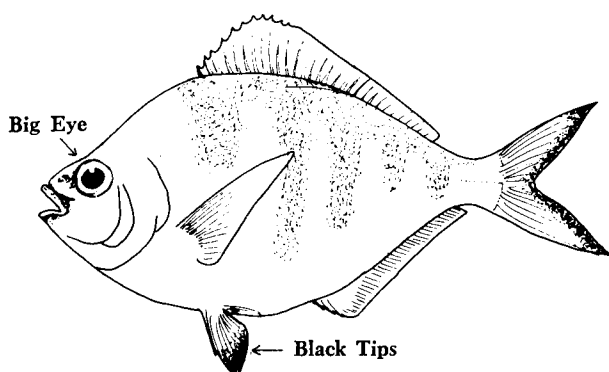
Size: Length to 15 inches (38 cm).

Range in eastern Pacific: Northern Baja California to Alaska.

The striped seaperch is one of the most important bay sport fish in Oregon. Its vivid coloration makes it an attractive addition to an angler's catch. Scuba divers say the natural curiosity of the striped seaperch makes it an easy spear gun target. Fishermen catch numerous striped seaperch in spring and summer, using ghost or mud shrimp and clam necks for bait. Seaperch can be enticed by slowly retrieving these baits along the bottom.

Walleye surfperch

(*Hyperprosopon argenteum*)



Distinguishing characteristics: Anal fin with three spines and 28 to 31 soft rays; body oval in shape; eyes very large (about one-third length of head); longest dorsal spine longer than soft rays; black-tipped pelvic fins.

Coloration: Steely blue on dorsal surface; silvery on sides and ventral surface; sides have five faint bars that fade soon after death; pelvic fins tipped with black.

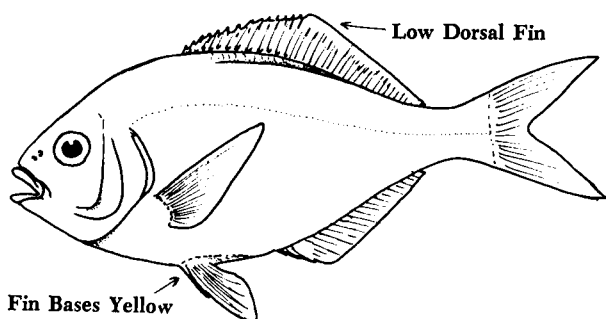
Size: Length to about 1 foot (about 30 cm).

Range in eastern Pacific: Central Baja California to Vancouver Island.

The walleye surfperch is at times very common in bays and water adjacent to the surf zone along the Oregon coast. At times only scattered representatives are found in the sport catch, but on occasion walleye surfperch specimens are in the majority.

The flesh is comparable to other members of the family. Larger specimens can be filleted, although generally they are most easily prepared by skinning.

White seaperch
(*Phanerodon furcatus*)



Distinguishing characteristics: Anal fin with three spines and 29 to 34 soft rays; body oval in shape; continuous low margin of dorsal fin; deeply forked tail; often pelvic and pectoral fins yellow in color.

Coloration: Silvery white along dorsal surface and sides; pectoral and pelvic fins may be tinged with yellow; both sexes may appear deep gray in color during the winter months.

Size: Length to 1 foot (30.5 cm).

Range in eastern Pacific: Northern Baja California to Vancouver Island.

Common in all Oregon bays, the white seaperch is also caught in the ocean surf. Mature females give birth to live young in the spring of each year.

The white perch is most frequently caught during the spring and summer months in estuaries. Most specimens are small in size and are most easily prepared by skinning. Larger individuals are filleted.

Albacore
(*Thunnus alalunga*)

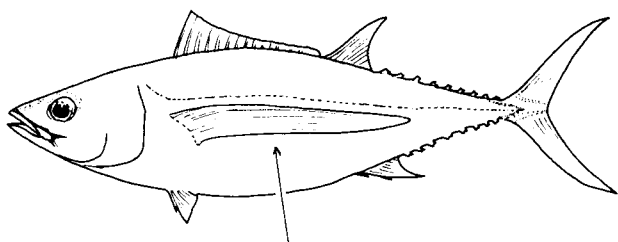
Distinguishing characteristics: Slender caudal peduncle with seven or eight finlets above and below; long, sabre-shaped pectoral fins extending beyond front of anal fin.

Coloration: Dark steel blue above; silvery on the sides and underparts.

Size: Length to 5 feet (1.5 m).

Range in eastern Pacific: Baja California to Alaska; common, depending largely on water temperature.

The albacore tuna migrates to Oregon waters during the summer months when offshore ocean temperatures approach 60° F (16° C). Large tuna vessels (36 to 120 feet; 10 to 36 m) seek the albacore off the Oregon coast, generally 30 to 100 miles from land. Most of the fish are canned. Albacore occasionally enter the



Sabre-Shaped Pectorals

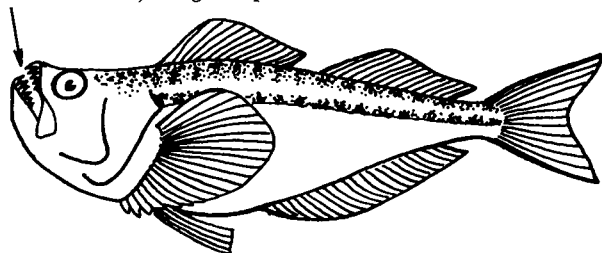
sport fishery when they wander within several miles of the coastline. Extremely swift, this species is an exciting sport fish when hooked. Feathered jigs, trolled at a speed of about 5 knots, are the commonest lures of sport and commercial fishermen.

Although sometimes baked, the dry meat of albacore is probably best prepared by canning.

Pacific sandfish

(*Trichodon trichodon*)

Vertical Mouth, Fringed Lips



Distinguishing characteristics: Mouth nearly vertical, opening on dorsal profile of head; lips fringed with fine papillalike structures; two dorsal fins; caudal fin forked; no scales on body.

Coloration: Dorsal surface brown with darker blotches and vermiculations crossing midline, a clear area below these and a nearly continuous line of blotches forming a stripe just above the lateral line. Sides light, blending into the silver of the belly.

Size: Length to 1 foot (30.5 cm).

Range in eastern Pacific: San Francisco to Bering Sea.

The sandfish occurs along sandy beaches and spends much of its time buried in the sand. The placement of the eyes and mouth allow it to be buried except for the upper part of the head and still see and breathe. The

fringes on the lips act as a filter to keep sand out of the mouth while the fish is pumping water over its gills. Razor clam diggers are often startled by turning up a fish instead of a clam after detecting movement of the sand.

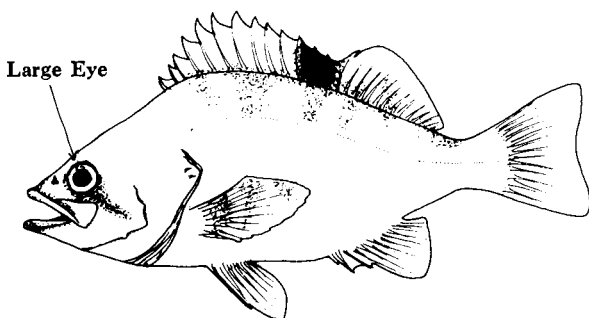
Scorpionfishes (Rockfishes)

The members of the scorpionfish family have been called by any number of common names. Among these are "snapper," "cod," "rockcod," and "sea bass" because of their resemblance to these other fishes. There are about 30 species along the Oregon coast, and many of these can be captured by anglers. Several species are of interest from the standpoint of commercial fishing, as the flesh is excellent.

Because of the great number of species and the difficulty encountered in identifying them, only seven representatives are covered here.

Black rockfish

(*Sebastes melanops*)



Distinguishing characteristics: Space between eyes is convex without spines; moderately large eyes; lining of abdominal cavity is white.

Coloration: Black dorsal surface; gray, mottled with black, on sides.

Size: Length to 2 feet (61 cm).

Range in eastern Pacific: San Miguel Island, California, to Sitka, Alaska; numerous.

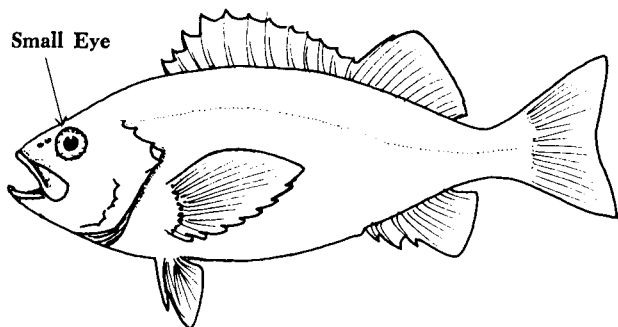
The black rockfish is commonly caught near rock jetties and kelp beds in the ocean along the length of the Oregon coastline. Salmon fishermen frequently catch the fish on trolled herring. Specimens brought to the surface from some depth often will exhibit protruding viscera and eyes, caused by the release of water pressure on the air bladder. Young fish (1 to 2 inches, or 2.5 to 5 cm, in length) are frequently seen near the

surface in estuaries and in tide pools during the summer months.

Black rockfish fillets are of good quality. This fish is well worth keeping if caught. The species represents a latent sport fishery of considerable importance.

Blue rockfish

(Sebastes mystinus)



Distinguishing characteristics: Space between eyes is convex without spines; small eyes; lining of the abdominal cavity is black.

Coloration: Bluish to grayish black; mottled with paler color on sides; fins dark.

Size: Length to 21 inches (53 cm).

Range in eastern Pacific: Baja California to the Bering Sea.

The blue rockfish normally occurs in water between 40 and 50 fathoms (73 to 92 m) deep; therefore, it is not as available to scuba divers and anglers as is the black rockfish, to which it is quite similar in appearance. The coloration of the peritoneum (lining of abdominal cavity) is probably the most foolproof method of distinguishing between the two (see above). A slowly trolled herring is the best fishing technique.

The flesh of the blue rockfish is flavorsome, comparable to that of the black rockfish. Filleting is the easiest method of preparation.

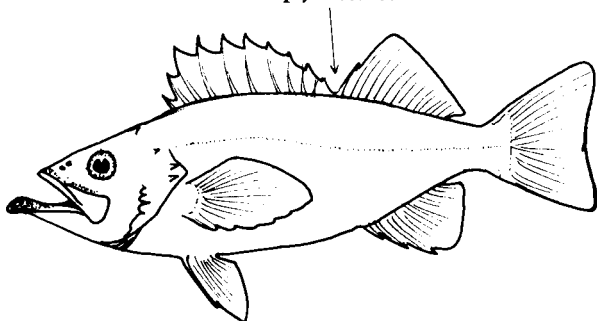
Bocaccio

(Sebastes paucispinis)

Distinguishing characteristics: Highly convex between the eyes; large mouth with greatly projecting lower jaw; spines on top of head; deeply notched dorsal fin; normally nine anal soft rays; lining of abdominal cavity is white or silver.

Coloration: Dorsal surface light to green to dark brown; dull orange or reddish on sides, shading into pale pink to white below; intense black blotches with pale red.

Fin Deeply Notched



Size: Length to 3 feet (91 cm); weight to 21 pounds (9.5 kg).

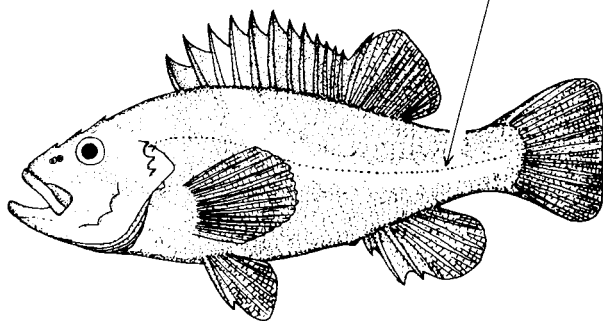
Range in eastern Pacific: Northern Baja California to British Columbia.

The bocaccio inhabits offshore waters along the Oregon coast. Occasionally they are caught in estuaries. It enters the commercial trawl catch and is most frequently found in water 40 fathoms (73.1 m) or deeper.

China rockfish

(*Sebastes nebulosus*)

Yellow
Stripe



Distinguishing characteristics: Broad yellow stripe on each side of the bluish-black body; strong spines on top of head; space between eyes concave.

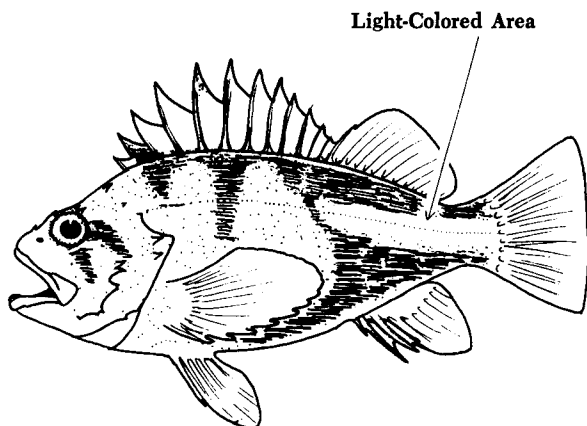
Coloration: Blackish to blue black; everywhere speckled with yellowish or whitish spots that are sometimes tinged with blue; broad yellow stripe down each side terminating in tail fin.

Size: To 17 inches (43 cm).

Range in eastern Pacific: Central California to Alaska.

This species is found in waters of moderate depth. It makes an attractive aquarium display animal because of its brilliant coloration.

Copper rockfish
(*Sebastes caurinus*)



Distinguishing characteristics: Coppery brown coloration; long blackish pectoral fins with thickened rays; lightly colored area along posterior two-thirds of lateral line.

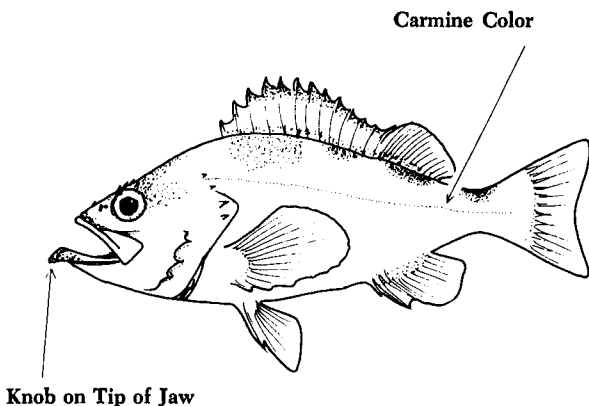
Coloration: Dark brown or olive brown; splashed with copper and occasionally splashed with dull yellow; posterior two-thirds of lateral line usually white.

Size: To 22 inches (56 cm).

Range in eastern Pacific: Central California to Southeastern Alaska.

The copper rockfish enters the commercial trawl catch but is not of particular importance. Anglers occasionally take this fish along the open coast and off the jetties. It is often seen in aquarium displays.

Pacific ocean perch
(*Sebastes alutus*)



Distinguishing characteristics: Space between eyes slightly convex to flat; long lower jaw, extending to a point meeting an extension of the upper profile of the head; large knob on tip of lower jaw.

Coloration: Carmine red with black markings on back and on dorsal surface of caudal peduncle.

Size: Length to 20 inches (51 cm).

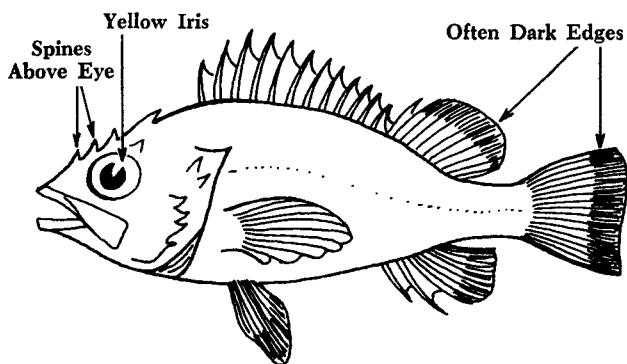
Range in eastern Pacific: Southern California to Bering Sea.

This is an excellent commercial fish and is sought by fishermen of many nations. The catch is marketed as fillets, both fresh and frozen.

Foreign fishing fleets began to exploit the Pacific ocean perch resources off the coast of Oregon in the 1960's and took catches reportedly up to 25,000 tons (22,700 metric tons) in some years. The heavy use of the resource depressed the Oregon fishery, which showed signs of recovery by 1976. The law establishing control over fisheries to a 200-mile limit will aid in the proper management of our stocks of commercial fish.

This species is generally found in waters deeper than those fished by anglers.

Yelloweye rockfish (*Sebastes ruberrimus*)



Distinguishing characteristics: Coloration; 26 to 30 gill rakers on first arch; 3 spines above each eye, orbital rim very rough in large specimens.

Coloration: Eyes with bright yellow iris and black pupil; sides and back orange-yellow, often with pink overtone; belly yellow; fins pink, soft-rayed fins with black margins in many specimens; lining of body cavity white with fine black speckles.

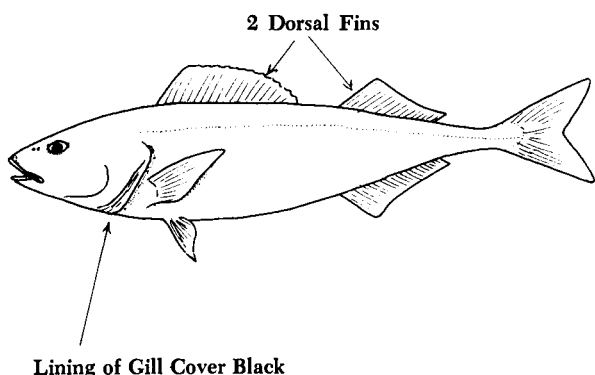
Size: Length to 36 inches (91 cm).

Range in eastern Pacific: Baja California (Ensenada) to Gulf of Alaska.

The yelloweye rockfish has been called the turkey-red rockfish and raspehead, and is known to fishermen as "red snapper," although it bears only a slight resemblance to the true snappers of subtropical and tropical waters. It is one of the many red to yellow species found in the eastern Pacific Ocean and resembles several of the others. Identification and recognition are often difficult. The yelloweye rockfish is a favorite of recreational fishermen because of its large size and excellent flesh.

Sablefish

(*Anoplopoma fimbria*)



Distinguishing characteristics: First dorsal fin spinous, the second with soft rays; body covered with small scales; pelvic fins each with one spine and five soft rays; gill cover lined with black.

Coloration: Slate gray to greenish black on dorsal surface; lighter gray on ventral surface; pale on outer margins of all fins except spinous dorsal.

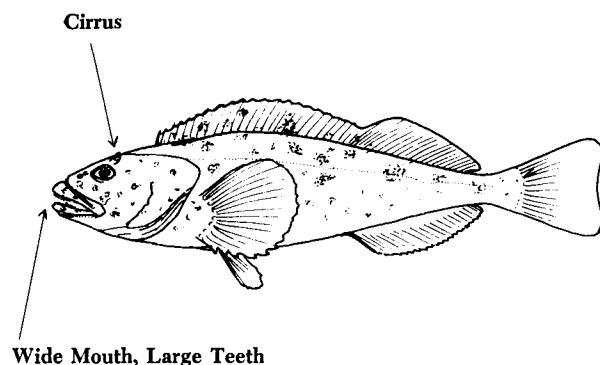
Size: Length to about 3½ feet (about 1 m); weight to 25 pounds (11.3 kg).

Range in eastern Pacific: Northern Baja California to Northwest Alaska.

The sablefish inhabits deeper offshore waters along the Oregon coast. It is captured chiefly by commercial long-lines, but some are taken by trawlers. Like most oily fish, the sablefish finds a ready market as a smoked product.

In some aquariums, the sablefish has been trained to eat herring from a scuba diver's hand. Large schools of juvenile sablefish are frequently observed near the surface during the summer months.

Lingcod
(*Ophiodon elongatus*)



Distinguishing characteristics: Teeth large and canine-like; dorsal fin long and deeply notched; two large cirri above eyes; small smooth scales covering body and head.

Coloration: Highly variable, being closely associated with habitat; may appear light brown or tan with spots and blotches of brown, green, or orange; others appear a vivid green or bluish brown with darker blotches outlined in orange or pale blue.

Size: Length to 5 feet (1.5 m); weight to 105 pounds (47.6 kg).

Range in eastern Pacific: Northern Baja California to Northwestern Alaska.

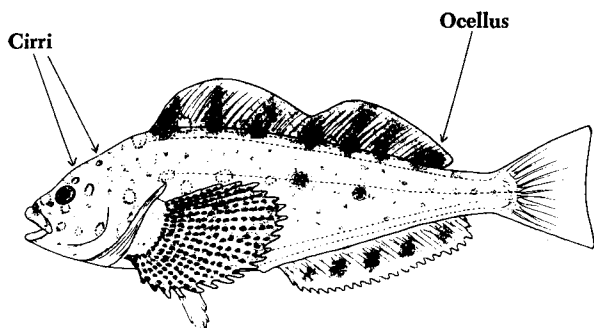
The lingcod is one of the most highly prized ocean sport fish. It can give anglers an exciting battle on light tackle, and its flesh is highly palatable. Some people prefer it over salmon. Because of the sharp teeth, the hook must be removed with care. Although the flesh of some lingcod appears green or bluish, this does not impair the flavor. The meat turns white when cooked.

The lingcod inhabits rocky areas and kelp beds. It is a bottom-dwelling fish, and bait (commonly herring or filleted fish) should be trolled or placed as near the bottom as possible.

The lingcod possesses a large proportion of high-quality flesh. Filleting is the easiest method of removing the meat. The fillets can be fried in a pan or in deep fat for "fish and chips." Lingcod frequently can be purchased in a fish market or coastal restaurant.

Kelp greenling
(*Hexagrammos decagrammus*)

Distinguishing characteristics: Two pairs of cirri on top of head; prominent transparent area on the posterior



portion of the dorsal fin (ocellus); long dorsal fin with about 21 spines; five lateral lines on body.

Coloration: Female and young have brownish or grayish body covered with round, reddish-brown spots; light brown color on ventral surface; male is generally brown or slate gray in color with large, turquoise spots on the head and anterior portion of the body.

Size: Length to 22 inches (56 cm).

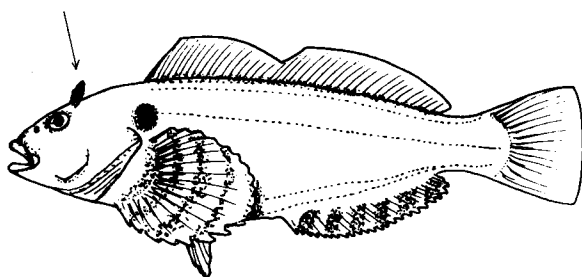
Range in eastern Pacific: Kodiak Island to Southern California; numerous.

The kelp greenling, a close relative of the lingcod, is an important sport fish in most Oregon bays and along rocky shorelines. It will take most bait, including shrimp, clams, and fish fillets. Occasionally, one is caught on a herring jig. Tolerant of brackish water, the kelp greenling can be found several miles landward from the mouth of a bay. This fish seems to be common over many bottom types.

Kelp greenling, also called sea trout, are easily filleted. Their flesh is of high eating quality.

Rock greenling (*Hexagrammos lagocephalus*)

Large Cirrus



Distinguishing characteristics: Large fringed cirrus above each eye; length of cirrus equal to or greater than the diameter of the eye; round dark spot above the base of each pectoral fin; five lateral lines.

Coloration: Extremely variable, from bright red and brown to bright green; sometimes with bright round spots; alternating light green and red spots on pectoral fins; red spots or bars usually on pelvic and anal fins; caudal fin green and tipped with red; black spot above pectoral fin.

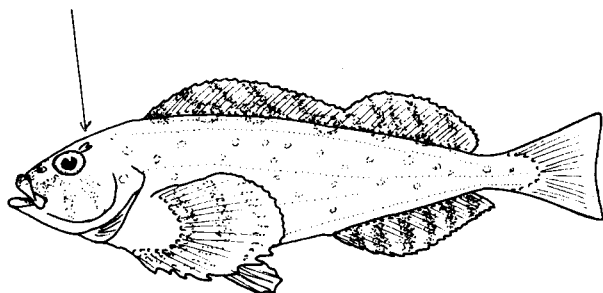
Size: Length to 2 feet (61 cm).

Range in eastern Pacific: Southern California to Bering Sea.

The rock greenling frequently is confused with its relative, the kelp greenling. The length of the cirrus probably is the easiest method of identification. The rock greenling is abundant north of Coos Bay in shallow water along rocky shorelines. Specimens are often found in bays, where they are taken by sport fishermen. Clams or shrimp are the best bait. The flesh is firm and quite tasty.

Whitespotted greenling
(*Hexagrammos stelleri*)

Small Cirrus



Distinguishing characteristics: Small cirrus above each eye; small white spots profusely scattered over body; five lateral lines (the first and fourth extremely short); slender caudal peduncle.

Coloration: Predominantly green, but may vary from pale red to tan with irregularly placed, dark or dusky bars or spots; six dark spots or bars on anal fins with yellowish background; white spots evenly scattered over body.

Size: Length to about 19 inches (about 48 cm).

Range in eastern Pacific: Northern California to Bering Sea.

The whitespotted greenling appears in sport catches less regularly than its relatives, the kelp and rock greenlings. It inhabits rocky areas along the open coast and frequently enters bays. Its flesh is comparable to other greenlings and, therefore, is esteemed by sport fishermen.

Sculpins

More than 20 species of this family can be found in the salt and brackish waters of Oregon. They range in size from 2-inch (5-cm) inhabitants of tide pools to the 3-foot (91-cm) cabezon sought by skindivers. Similar body forms and variable coloration make many of the small species seem very similar and difficult to identify, although identification can be made with the aid of a microscope and a key of important characteristics. Only the large, common species, those that most often are taken on hook and line, will be covered here. These are the brown Irish lord, red Irish lord, cabezon, buffalo sculpin, and staghorn sculpin.

Some of the commonest sculpins in tide pools are the fluffy sculpin (*Oligottus snyderi*), the tidepool sculpin (*O. maculosus*), and the mosshead sculpin (*Clinocottus globiceps*). *O. maculosus* is usually abundant in rocky intertidal areas of bays. It is a rather dark-colored species, ranging from dull green to dull red. The belly is whitish, but the underside of the head tends to be dark. *O. snyderi* is more brightly colored and is white on the underside of the head. *C. globiceps* is recognizable by its stubby, round head.

Brown Irish lord

(*Hemilepidotus spinosus*)

Distinguishing characteristics: Six to seven rows of scales encircling the dorsal fin; emarginate (notched) portion of the dorsal fin; united gill membranes broadly joined at the isthmus.

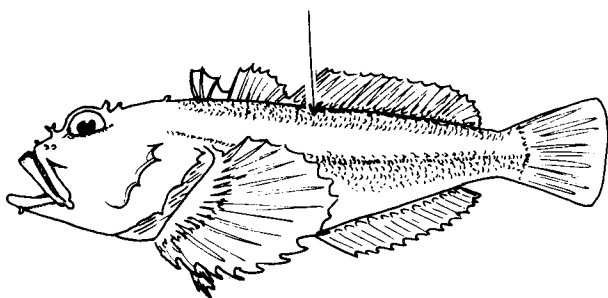
Coloration: Predominantly brown, tinged with red; mottled with dark brown on the dorsal surface; white on the ventral surface.

Size: Length to 10 inches (25.4 cm).

Range in eastern Pacific: Southern California to Vancouver Island.

The brown Irish lord at maturity has a total length of only 10 inches (25.4 cm). Larger specimens probably will be its relative, the red Irish lord. The brown

7 Scale Rows



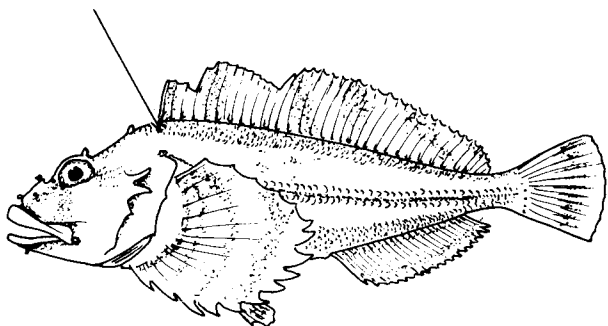
Irish lord usually frequents sheltered, rocky areas and tide pools along the Oregon coast, but may travel small distances up bays.

As is the case with most sculpins, the brown Irish lord is not considered an important food fish.

Red Irish lord

(*Hemilepidotus hemilepidotus*)

4 Scale Rows



Distinguishing characteristics: Four rows of scales encircling the dorsal fin; emarginate (notched) spinous portion of the dorsal fin; united gill membranes narrowly joined at the isthmus.

Coloration: Mottled dull to brilliant red bands, alternating with brownish red bars on dorsal surface; pale red to grayish green on ventral surface; profuse scattering of brown to black spots.

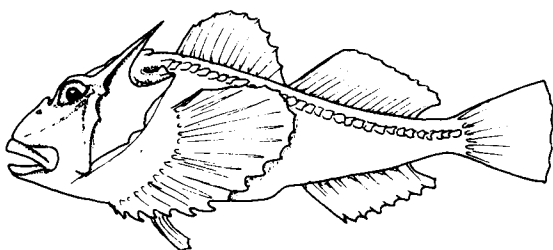
Size: Length to 20 inches (51 cm).

Range in eastern Pacific: Northern California to Bering Sea.

The red Irish lord frequents rocky areas along the entire Oregon coast, and is often taken by fishermen using clams or shrimp for bait.

This sculpin is not sought as a food fish because of the small amount of boneless flesh contained on its body.

Buffalo sculpin
(*Enophrys bison*)



Distinguishing characteristics: Heavy, stout appearance; very long pointed spines on upper part of gill cover; large raised bony tubercles on the high lateral line.

Coloration: Three broad black saddles across dorsal surface; dark green to brownish on dorsal surface and white on ventral surface; some specimens have maroon blotches on head and back; yellowish white bands on back and sides.

Size: Length to 14.6 inches (37 cm).

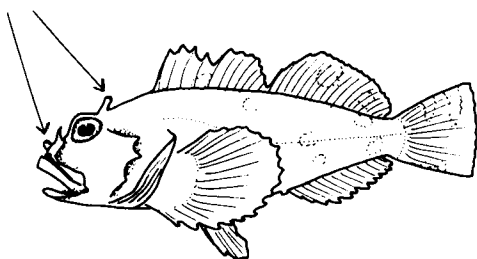
Range in eastern Pacific: Southern California to Gulf of Alaska.

The buffalo sculpin often takes bait from hooks intended for more desirable sport fish. It is caught frequently in all Oregon bays. When landed, the buffalo sculpin projects its preopercular spines, giving it a fearsome appearance. Care must be taken when removing the hook as these spines can inflict a painful puncture.

Although not prized for their palatability, many buffalo sculpins are used as crab bait by sport crabbers in bays.

Cabezon
(*Scorpaenichthys marmoratus*)

Large Cirri



Distinguishing characteristics: Heavy body; chunky appearance; body scaleless; prominent fleshy flap (cirrus) on middle of snout and a larger pair just back of the eyes; anal fin with thick soft rays, but no spines.

Coloration: Variable from dark brown to red, tan, gray, or greenish; generally mottled or blotched; light areas frequently margined with darker shades of body color.

Size: Length to 39 inches (1 m).

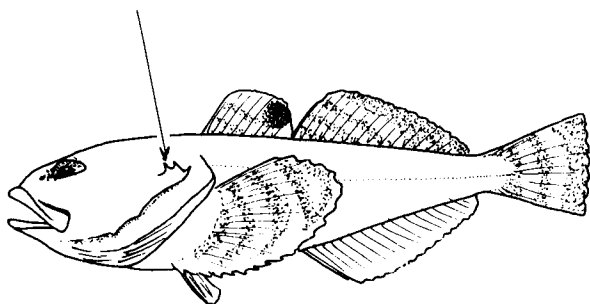
Range in eastern Pacific: Central Baja California to Northern British Columbia.

The cabezon is esteemed for its excellent eating quality. Although the fish is often well camouflaged, the cabezon's sluggish movements make it fairly easy prey for the spear gun of the scuba diver. Sport fishermen frequently catch this fish using shrimp, herring, or cut bait fished near the bottom. Among the largest of the sculpins, cabezon females may live to 13 years, males to 9. A large female may deposit as many as 100,000 eggs. Spawning occurs during the winter months, January through March.

Cabezon can be filleted or baked whole. **Beware! The roe of the cabezon is poisonous and can cause severe illness if eaten.**

Pacific staghorn sculpin
(*Leptocottus armatus*)

Antler-Like Spine



Distinguishing characteristics: Prominent antlerlike spine on each side of the head; slender, scaleless body; conspicuous black spot on the posterior portion of the spinous dorsal fin.

Coloration: Mottled olive gray, green, or brown back; copper-colored sides bordered below by yellow; white belly; black spot on the posterior portion of the spinous dorsal fin.

Size: Length to 1 foot (30.5 cm).

Range in eastern Pacific: Northwest Alaska to northern Baja California.

The staghorn sculpin can tolerate a great range of salinity and, therefore, is found to the head of tidewater in most Oregon bays. A great antagonist of sport fishermen, this is a clever robber of fishermen's bait. It is extremely abundant in all Oregon estuaries and provides a great deal of entertainment for juvenile fishermen. The head spines are sharp and merit caution when the hook is removed.

The staghorn sculpin is not considered a food fish.

Gunnels, Pricklebacks, and relatives (Blennies)

The gunnels and pricklegebacks are often encountered under rocks and among vegetation at low tide. Their elongate, often ribbonlike bodies lead many observers to call them *eels*, but these fishes are not close relatives of the eels, being derived from perchlike ancestors. Only a few selected representatives of the blennies can be covered in this manual. These are the wolf-eel, penpoint gunnel, saddleback gunnel, snake pricklegeback, and high cockscomb.

Wolf-eel (Wolffish) (*Anarrhichthys ocellatus*)



Large Canine and Molar Teeth

Distinguishing characteristics: Large canine and molar teeth; pelvic fins absent; elongate body; large black spots on side of body and dorsal fin.

Coloration: Gray, brown, or dark gray; black circular spots scattered about body; spots of varying size.

Size: Length to nearly 7 feet (about 2 m).

Range in eastern Pacific: Southern California to Gulf of Alaska.

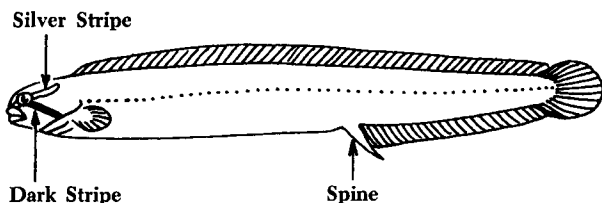
A ferocious looking fish, the wolf-eel generally creates a great deal of interest when put on public display. The name *wolf-eel* is actually a misnomer; there are no true eels north of southern California on the Pacific coast of North America.

The wolf-eel inhabits rocky areas in the ocean and bays. Scuba divers report that this fish is frequently hidden between rocks and debris with only its head revealed. They feed on crabs and other crustaceans. Spec-

imens held in aquariums have been known to attack fish. Commercial crab fishermen dislike this species as it will bite through their crab pot wire in order to eat their crabs.

Penpoint gunnel

(*Apodichthys flavidus*)



Distinguishing characteristics: Silvery line across each side of head; pen-point-shaped spine in the anal fin (may be seen by pressing a sharp instrument behind anal region and moving it toward head); absence of pelvic fins.

Coloration: Brightly colored, varying from green to red, orange-brown, or yellow; distinctive silver bar above eye, black bar below, slanting backward from eye.

Size: Length to 18 inches (45.7 cm).

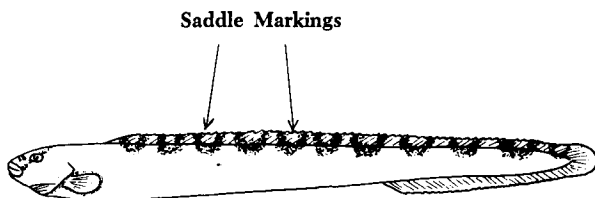
Range in eastern Pacific: Southern California to Southeastern Alaska.

Not of importance as a food fish, the penpoint gunnel may frequently be found under rocks and on mudflats at low tide. It is an attractive aquarium display animal.

A similar species is the rockweed gunnel (*Xererpes fucorum*), recognized by the very small pectoral fins, which are no longer than the diameter of the eye. It has no "penpoint" spine, and it has a *vertical* dark bar below the eye.

Saddleback gunnel

(*Pholis ornata*)



Distinguishing characteristics: Series of saddle-shaped markings along the base of the dorsal fin; minute pelvic fins located just anterior to and below pectoral fins; dark bar across top of head just behind eyes; vertical dark bar below eyes.

Coloration: Variable, green to brown on dorsal surface; ventral surface may be yellow, orange, or red; dark on top of head and underneath eyes.

Size: Length to 1 foot (30.5 cm).

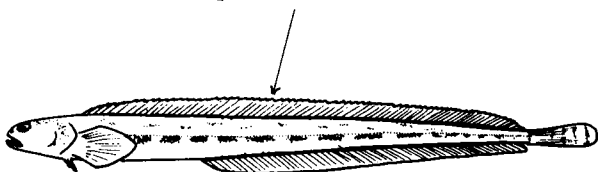
Range in eastern Pacific: Northern California to Bering Sea.

The saddleback gunnel can frequently be found on mudflats at low tide, seeking shelter in water around eel grass or under rocks. It feeds on small crustaceans and mollusks, but it is not caught by sport fishermen. It makes an attractive display in small aquariums.

Two other gunnels in this area resemble the saddleback gunnel. These are the crescent gunnel (*Pholis laeta*) and the red gunnel (*P. schultzi*). The former has pairs of crescent-shaped marks forming brackets [] along the base of the dorsal fin, whereas the latter has a series of indistinct light marks in that area.

Snake prickleback (*Lumpenus sagitta*)

Spines in Dorsal Fin



Distinguishing characteristics: Very elongate body; pointed spines projecting from the length of the dorsal fin; short dark streaks horizontally positioned along the sides of the body.

Coloration: Light green or brown on dorsal surface; dirty white on ventral surface; short dark green to brown streaks on sides; spots and bars on dorsal and caudal fins.

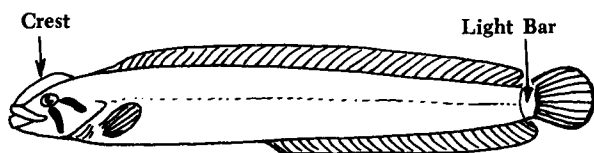
Size: Length to 20 inches (51 cm).

Range in eastern Pacific: Northern California to Bering Sea.

The snake prickleback enters Yaquina Bay in late April and is common until fall. Its bizarre shape and markings make it an interesting fish to observe. It is commonly placed in public aquariums, but it generally does not survive very long.

It is of little or no value to fishermen, although it will take a small baited hook.

High cockscomb
(*Anoplarchus purpurescens*)



Distinguishing characteristics: Body is elongate but flattened from side to side; no pelvic fins; a fleshy crest on midline of head from snout to occiput; coloration.

Coloration: Consistently with a light bar at base of caudal fin; background color of upper body ranges from brown green or light gray to black, with irregular mottling or vermiculations; ventral surface lighter than sides; males tend to have reddish to orange fins during breeding season.

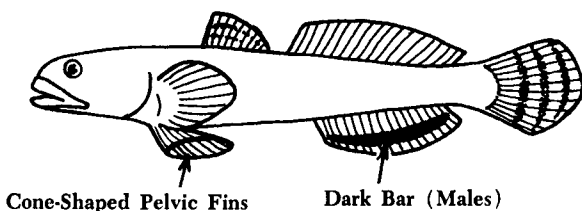
Size: Length to 8 inches (20 cm) but in Oregon bays usually less than 6 inches (15.2 cm).

Range in eastern Pacific: Southern California to Aleutian Islands.

The high cockscomb is very common along the shores of most bays, where it can be found high and almost dry under rocks at low tide. As long as the skin remains moist and the temperature low, it can absorb enough oxygen from the air to last until the next high tide. It feeds on worms and a variety of other small animals. After spawning, usually in winter, the female guards the egg masses.



Arrow goby
(*Clevelandia ios*)



Distinguishing characteristics: Small size, pelvic fins joined to form a cone-shaped adhesive apparatus; mouth extending to behind eye.

Coloration: Light brownish or greenish with darker speckles; faint dark bands in dorsal and caudal fins; males with heavy band in anal fin.

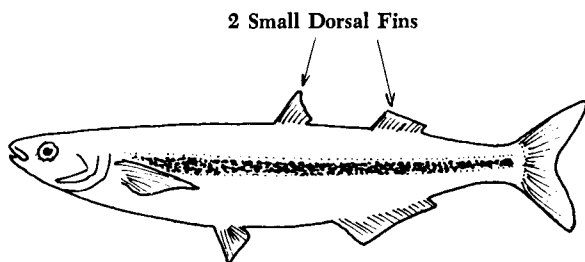
Size: Length to 2 inches (5 cm).

Range in eastern Pacific: Southern California to Strait of Georgia.

The arrow goby is usually found in muddy or sandy areas of bays. It often enters the burrows of mud and ghost shrimp and is, therefore, encountered by fishermen digging bait. Two other gobies are common north and south of Oregon but are not often seen in this state. The blackeye goby has black pelvics and a black-edged spinous dorsal. The bay goby has a moderate-sized mouth, which reaches to below the midpoint of the eye.

Jacksmelt

(*Atherinopsis californiensis*)



Distinguishing characteristics: Slender, smeltlike body; small, spinous dorsal fin a short distance in front of the soft dorsal; mouth and teeth small; operculum (gill-cover) scaly; silvery lateral band.

Coloration: Bluish green on dorsal surface, silvery on sides and belly; bright metallic band extends along side from pectoral fin to tail.

Size: Length reported to 22 inches (55.9 cm), usually to 17 inches (43.2 cm); weight to 2 pounds (0.9 kg).

Range in eastern Pacific: Southern Baja California to northern Oregon.

The jacksmelt, a relative of the grunion, is considered a favorable sport fish by many anglers. Large jacksmelt are sometimes found feeding on the refuse from commercial fish and crab packing plants. Crab gills are often used as bait. Frequently these fish are pickled, although they are extremely tasty when cooked fresh.

A schooling fish, jacksmelt may break the surface of the water as they try to escape a predator or approaching boat. The topsmelt is a similar species sometimes found in this area.

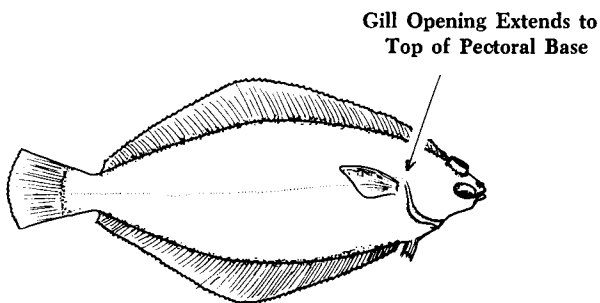
Flatfishes

About 20 species of flatfishes are found in Oregon waters. Most of these are in the righteye flounder family; there are only a few representatives of the lefteye flounders in the area, the two most common being the sand dabs.

Flounders often are called soles, but the true soles do not enter this area. Flatfish in general are excellent food, and a bottom fishery has developed in coastal waters. Some of the species not used for human consumption are utilized as food for mink or other animals. Six species are included here.

Dover sole

(*Microstomus pacificus*)



Distinguishing characteristics: Profuse mucous or slime on body (the species is also called slime sole); small scales; small mouth; gill openings extend only to top of bases of pectoral fins.

Coloration: Uniform brown on eyed side, darker on fins; light brown to cream on blind side.

Size: Length to 30 inches (76 cm).

Range in eastern Pacific: Southern California to Bering Sea.

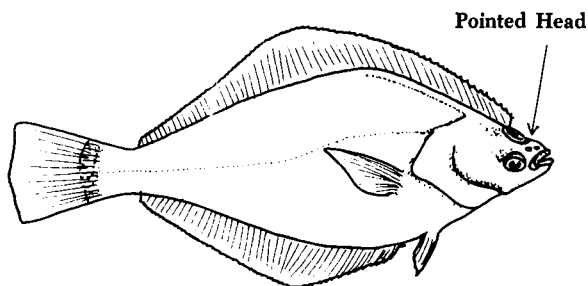
Although the Dover sole is difficult to fillet, it is one of the most important flatfish in the Oregon commercial fishery, accounting for more pounds landed than any of the other flounders. The flesh is palatable and readily accepted on the market.

It is usually found offshore in depths greater than 100 feet (30 m).

English sole

(*Parophrys vetulus*)

Distinguishing characteristics: Head pointed; mouth small; anterior body smooth; posterior scales rough; dorsal fin extends forward to middle of eye.



Coloration: Yellowish brown on eyed side, white to cream color on blind side.

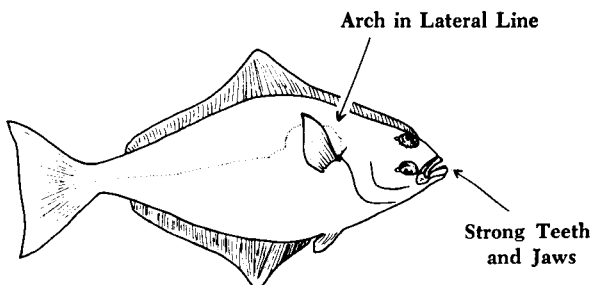
Size: Length to about 2 feet (about 60 cm).

Range in eastern Pacific: Southern California to Alaska.

The English sole brings a high price at fish markets because of its delicate flavor and because it is easily filleted. The young of this species are abundant in estuaries, but adults are rarely found there. Sport fishermen seldom catch this fish because of its demersal habitat in deeper waters.

Pacific halibut

(*Hippoglossus stenolepis*)



Distinguishing characteristics: Lateral line with a high arch over pectoral fin; strongly developed teeth and jaws; mouth large; shallow fork in strong tail; narrow, smooth scales; more than 150 scales in the lateral line.

Coloration: Dark brown on eyed side, irregularly blotched with lighter spots; white on blind side.

Size: Length to 9 feet (2.7 m); weight to nearly 500 pounds (227 kg).

Range in eastern Pacific: Central California to Bering Sea.

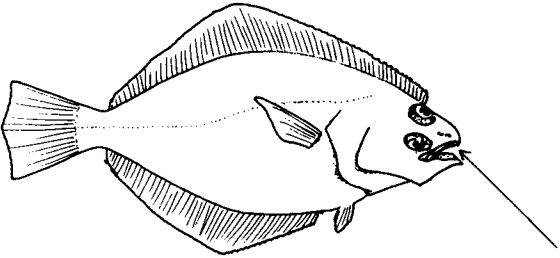
Halibut populations in the Pacific Ocean have increased in recent years because of restrictions on fishing quotas, which followed previous overfishing. This species has been intensely investigated in order to restore sustainable population levels. Halibut are most fre-

quently caught on setlines, with smaller numbers being taken by salmon trollers, trawlers, and sport fishermen.

The halibut warrants a premium price because of its high palatability and keeping qualities.

Petrable sole

(Eopsetta jordani)



**Two Rows of Teeth
in Upper Jaw**

Distinguishing characteristics: Pectoral fin shorter than head; smooth scales on the blind side, slightly rough scales on eyed side; two rows of teeth on each side of upper jaw; mouth large; stout spine just in front of anal fin.

Coloration: Uniform olive brown on eyed side with vague pale blotches on dorsal and fins; white on blind side.

Size: Length to 28 inches (71 cm).

Range in eastern Pacific: Northern Baja California to Alaska.

The petrale sole is widely sought by commercial trawlers because of the premium price its delicate flesh brings at the market. The fish is not caught by anglers, as it is found in deeper waters along the continental shelf.

Rex sole

(Glyptocephalus zachirus)

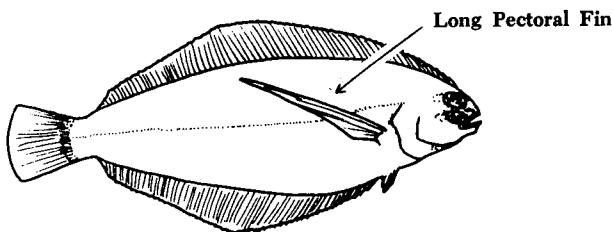
Distinguishing characteristics: Long pectoral fin on eyed side of body; lateral line nearly straight with no dorsal branch; small mouth; teeth and jaws better developed on the blind side.

Coloration: Uniform brown on the eyed side, nearly white on blind side; fins darker brown than body.

Size: Length to 23 inches (58.4 cm).

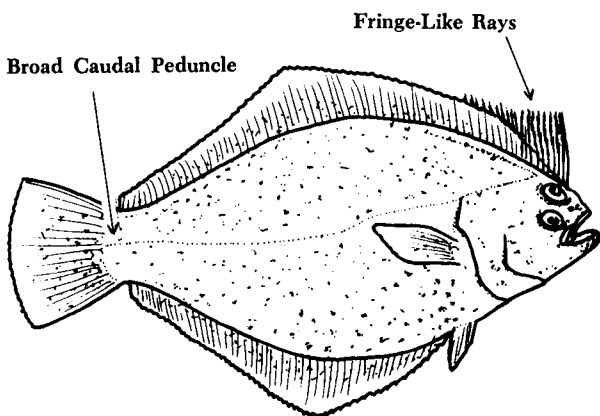
Range in eastern Pacific: Southern California to Bering Sea.

The rex sole rarely is seen in estuaries, as it more commonly inhabits ocean bottoms at a depth of 10 to



140 fathoms (18 to 260 m). Anglers, therefore, seldom hook this fish. Commercial trawlers bring fair numbers to port. This fish is considered very palatable.

Sand sole
(*Psettichthys melanostictus*)



Distinguishing characteristics: Broad caudal area; long free rays in anterior portion of dorsal fin, which extends past eye; sandlike abrasiveness of scales on body.

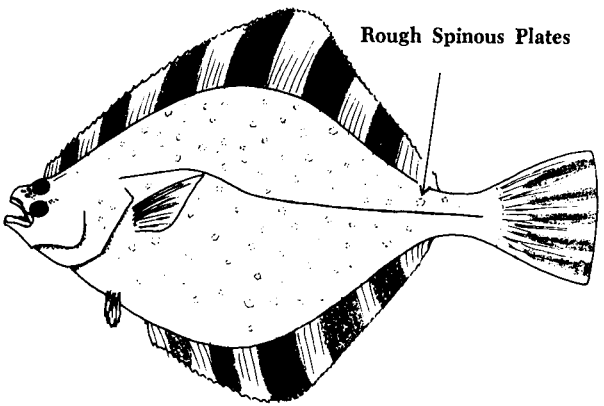
Coloration: Light greenish brown on eyed side, speckled with black; white on blind side.

Size: Length to 21 inches (53 cm).

Range in eastern Pacific: Northern California to Bering Sea.

The sand sole is often taken in estuaries by sport fishermen. It generally is found lying over clean sand near the mouths of bays. Although this species occurs in trawl catches, it is not of great commercial importance.

Starry flounder
(*Platichthys stellatus*)



Distinguishing characteristics: Rough spinous plates scattered over the body.

Coloration: Dark brown to black with frequent blotches on eyed side, white on blind side; fins striped with black; orange to whitish between colored bands in dorsal, anal, and caudal fins.

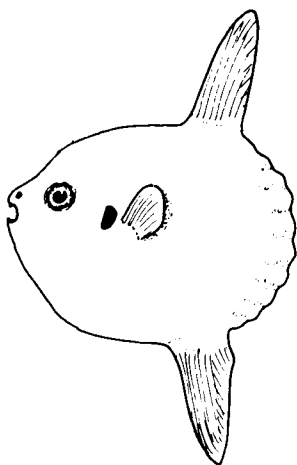
Size: Length to 3 feet (91 cm).

Range in eastern Pacific: Southern California to the Bering Sea; also found in Western Pacific near Japan.

Sport fishermen usually seek the starry flounder from late winter to August in most Oregon estuaries. The species is present in good numbers through the year, but peak concentrations seem to appear in February, March, and April, when spawning takes place. Mud shrimp, ghost shrimp, and clam meats fished near the bottom are the most frequent baits used in angling.

Because of its willingness to bite, its fighting qualities, and its tasty flesh, this is one of the prized sport fishes of the bays.

Ocean sunfish (Mola)
(*Mola mola*)



Distinguishing characteristics: Body short and deep, flattened from side to side; high dorsal and anal fins set back near broad tail; no pelvic fins; mouth small.

Coloration: Dark gray on dorsal surface, brownish gray on sides; light colored bands at base of dorsal, anal, caudal fins.

Size: Length to 9 feet (2.7 m).

Range in eastern Pacific: Southern California to southeastern Alaska.

When warm surface temperatures occur in the ocean off Oregon, ocean sunfish can occasionally be seen lying on their sides near the surface of the water. This sunning posture is responsible for their name. Occasionally ocean sunfish will be placed in a public aquarium, but they generally do not live long.

The ocean sunfish is not the object of a fishery, but it is of interest because of its size and unusual shape. When very young, they are normal fish shape with a caudal peduncle and caudal fin, but the posterior part of the body is resorbed as they grow. Adults may weigh several hundred pounds.

The Tide Pools

Intertidal areas hold a great fascination for many persons, young and old. The greatest attraction is the beauty of the brightly colored and remarkably shaped inhabitants—plants and animals alike—of the tide pools. Creatures of many phyla and many ways of life are concentrated there, to be seen when the tide is low. Most live there permanently, some are there only at certain seasons or stages of life history, and some open-water species are trapped there when the tide recedes. Whether we are drawn to the tide pools out of sheer curiosity, to enjoy the beauty, or to study the ways in which the tenants live in association with the physical environment and each other, we must remember that the attractiveness can be destroyed through misuse.

The habitat should not be disrupted unnecessarily. Seaweed should not be torn loose and stones should not be displaced or removed, for the force of the waves at succeeding tidal cycles will beat on the substrate and organisms left vulnerable by these actions and will continue to alter the habitat. Months or years may elapse before the pool is as attractive as it was before disruption.

Collection of tide pool species should be carried out only for a definite legitimate purpose, and should be done in accordance with the regulations of the Oregon Department of Fish and Wildlife. A permit is necessary for collecting in certain areas; it is required for extensive collecting. Mostly, organisms removed from the habitat quickly lose their charm as well as their lives. Viewing and photographing generally leave the intertidal in reasonably good repair.

About a dozen families of fishes commonly inhabit tide pools on the Oregon coast. Sculpins (Cottidae) are probably the most numerous inhabitants; about 15 species have been identified from the intertidal of the state. Other important families are greenlings (Hexagrammidae), snailfishes (Liparidae), gunnels (Pholidae), pricklebacks (Stichaeidae) and clingfishes (Gobiesocidae). The gunnels and pricklebacks are eellike and are found throughout the intertidal. Clingfishes are equipped with broad sucking discs on the ventral surface and can be found in rocky places in mid- and low-tide levels. Snailfishes have small sucking discs and are usually found in heavy vegetation near the low-tide level and below.

Preservation and Shipment of Fish Specimens

The standard method of preserving fish specimens for further study involves fixation in a solution of formaldehyde, followed by transfer to a solution of alcohol (either ethyl or isopropyl) for long term storage. Formaldehyde is available as Formalin, which is a saturated solution of the gas in water, containing about 40% formaldehyde. Mix full-strength Formalin at the ratio of 1 part Formalin to 10 parts water to make a good fixative. If you are preserving large specimens, or if specimens are crowded, use ratios of 1:8 or 1:6 to produce stronger solutions. If fish are to be held an extended period in Formalin, add borax at the rate of about a teaspoon per quart of solution (about 5 milliliters per liter). This prevents acidification of the preservative. You can reduce the Formalin-water ratio to 1:15 for long term storage.

If you plan to store specimens in alcohol, you can thoroughly wash them or even soak them for a short time, then transfer them directly to 40% isopropyl alcohol. Ethyl alcohol, at 70 to 75%, is another good preservative.

Specimens more than an inch (or about 2.5 cm) in diameter should be slit through the body wall on the right side to allow passage of the fixative into the body cavity. Ichthyologists usually examine specimens from the left side.

If Formalin is not available, you can save usable specimens by fixation in ethyl alcohol or isopropyl alcohol. You can use rubbing alcohol mixtures. You can freeze specimens, thaw them later, and fix them in Formalin, but protect them from drying if you want quality specimens. If there is no other way to save a specimen, you can salt and dry it. Removal of gills and viscera detracts from the value of the specimen for ichthyological purposes.

From the scientific standpoint, an accurate label is one of the most important things about a specimen. The label should be written on water-resistant paper (bond, ledger, etc.) and should include the following: locality where collected—as exact as possible; date of collection; name of collector; other important notes, such as water temperature, means of collection, associated fishes, etc.

Specimens can be shipped or mailed in airtight containers or wrappings. This is a good method of preparation:

1. Remove the specimens from their preservative.
2. Wrap them well in moist cheesecloth, paper

toweling, etc., to prevent drying and physical damage; include label with specimens.

3. Place wrapped specimens in watertight plastic bags (two bags are often better than one).
4. Pack the bags in a stout shipping container (mailing tube, heavy cardboard box, wooden box, metal can, etc.), using shredded paper or other material to prevent movement or rattling around.
5. Wrap and ship.

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