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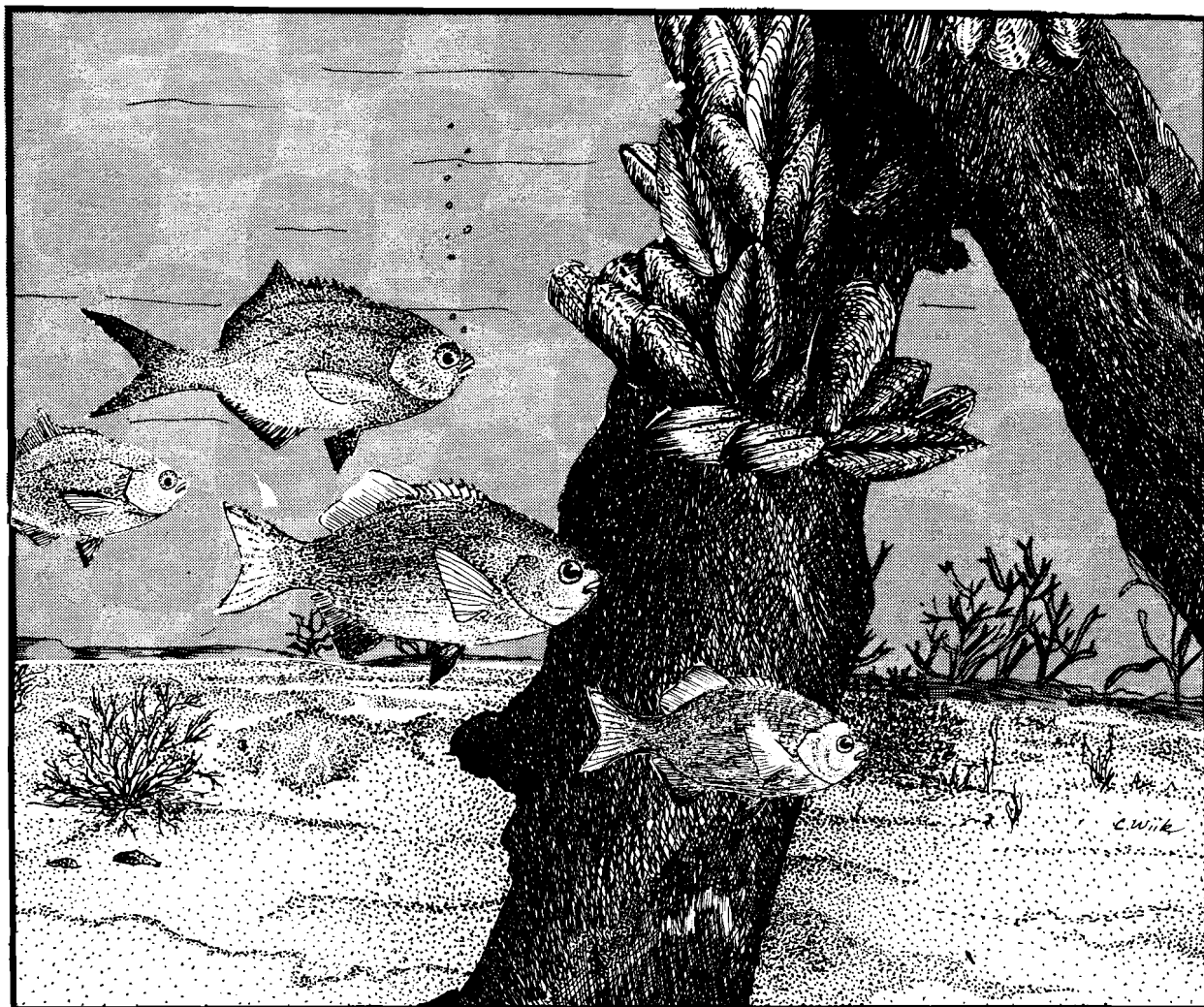
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**Species Profiles: Life Histories and
Environmental Requirements of Coastal Fishes
and Invertebrates (Pacific Southwest)**

PILE PERCH, STRIPED SEAPERCH, AND RUBBERLIP SEAPERCH



Fish and Wildlife Service

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Coastal Ecology Group
Waterways Experiment Station

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Species Profiles: Life Histories and Environmental Requirements
of Coastal Fishes and Invertebrates (Pacific Southwest)

PILE PERCH, STRIPED SEAPERCH, AND RUBBERLIP SEAPERCH

by

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Vicksburg, MS 39180

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PREFACE

This species profile is one of a series on coastal aquatic organisms, principally fish, of sport, commercial, or ecological importance. The profiles are designed to provide coastal managers, engineers, and biologists with a brief comprehensive sketch of the biological characteristics and environmental requirements of the species and to describe how populations of the species may be expected to react to environmental changes caused by coastal development. Each profile has sections on taxonomy, life history, ecological role, environmental requirements, and economic importance, if applicable. A three-ring binder is used for this series so that new profiles can be added as they are prepared. This project is jointly planned and financed by the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service.

Suggestions or questions regarding this report should be directed to one of the following addresses.

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CONVERSION TABLE

Metric to U.S. Customary

<u>Multiply</u>	<u>By</u>	<u>To Obtain</u>
millimeters (mm)	0.03937	inches
centimeters (cm)	0.3937	inches
meters (m)	3.281	feet
meters (m)	0.5468	fathoms
kilometers (km)	0.6214	statute miles
kilometers (km)	0.5396	nautical miles
square meters (m ²)	10.76	square feet
square kilometers (km ²)	0.3861	square miles
hectares (ha)	2.471	acres
liters (l)	0.2642	gallons
cubic meters (m ³)	35.31	cubic feet
cubic meters (m ³)	0.0008110	acre-feet
milligrams (mg)	0.00003527	ounces
grams (g)	0.03527	ounces
kilograms (kg)	2.205	pounds
metric tons (t)	2205.0	pounds
metric tons (t)	1.102	short tons
kilocalories (kcal)	3.968	British thermal units
Celsius degrees (°C)	1.8(°C) + 32	Fahrenheit degrees

U.S. Customary to Metric

inches	25.40	millimeters
inches	2.54	centimeters
feet (ft)	0.3048	meters
fathoms	1.829	meters
statute miles (mi)	1.609	kilometers
nautical miles (nmi)	1.852	kilometers
square feet (ft ²)	0.0929	square meters
square miles (mi ²)	2.590	square kilometers
acres	0.4047	hectares
gallons (gal)	3.785	liters
cubic feet (ft ³)	0.02831	cubic meters
acre-feet	1233.0	cubic meters
ounces (oz)	28350.0	milligrams
ounces (oz)	28.35	grams
pounds (lb)	0.4536	kilograms
pounds (lb)	0.00045	metric tons
short tons (ton)	0.9072	metric tons
British thermal units (Btu)	0.2520	kilocalories
Fahrenheit degrees (°F)	0.5556 (°F - 32)	Celsius degrees

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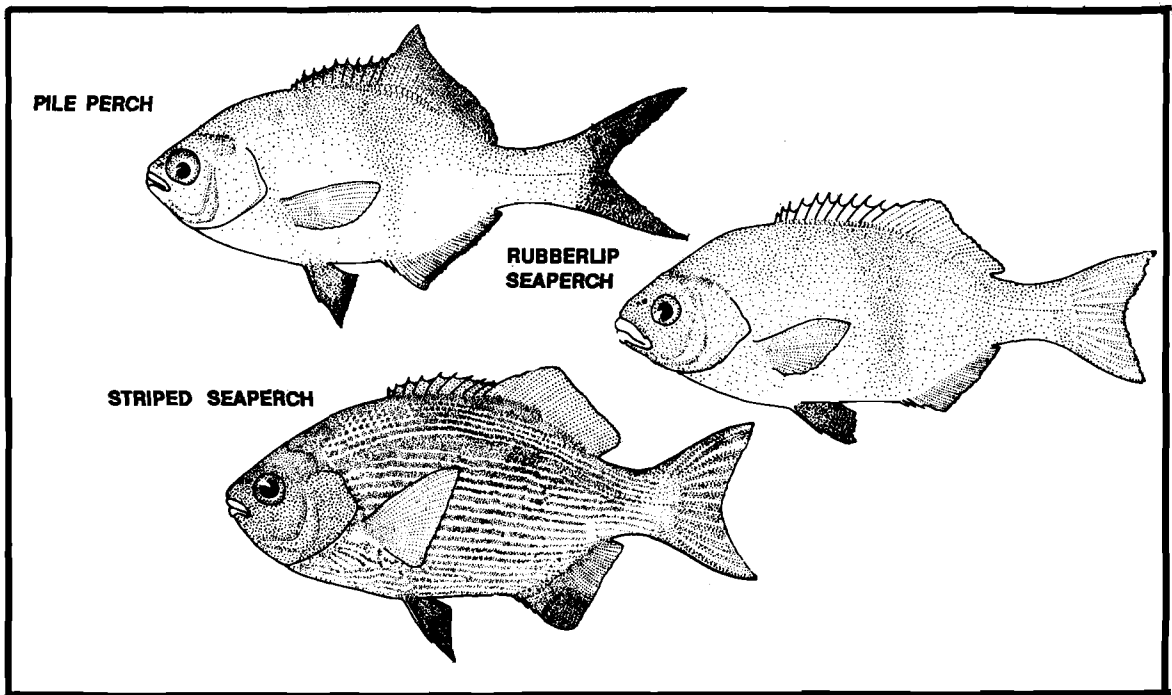


Figure 1. Three species of seaperches.

PILE PERCH, STRIPED SEAPERCH, AND RUBBERLIP SEAPERCH

NOMENCLATURE/TAXONOMY/RANGE

Scientific name Rhacochilus vacca (Girard)

Preferred common name. . . pile perch (Figure 1)

Local common names . . pile surfperch, fork-tail perch, porgy

Class Osteichthyes

Order Perciformes

Family Embiotocidae

Geographic range: Port Wrangell, Alaska, to Guadalupe Island off Baja California (Figure 2). Rocky shores and near kelp, pilings, and underwater structures; inshore and to 46 m (Eschmeyer et al. 1983).

Scientific name Embiotoca lateralis Agassiz

Preferred common name striped seaperch (Figure 1)

Local common names striped surfperch, blue perch

Class Osteichthyes

Order Perciformes

Family Embiotocidae

Geographic range: Port Wrangell, Alaska, to northern Baja California (Figure 2). Rocky coasts and kelp beds; inshore and to 21 m (Eschmeyer et al. 1983).

Scientific name. . Rhacochilus toxotes Agassiz

Preferred common name . . . rubberlip seaperch (Figure 1)

Local common names rubberlip surfperch, porgy

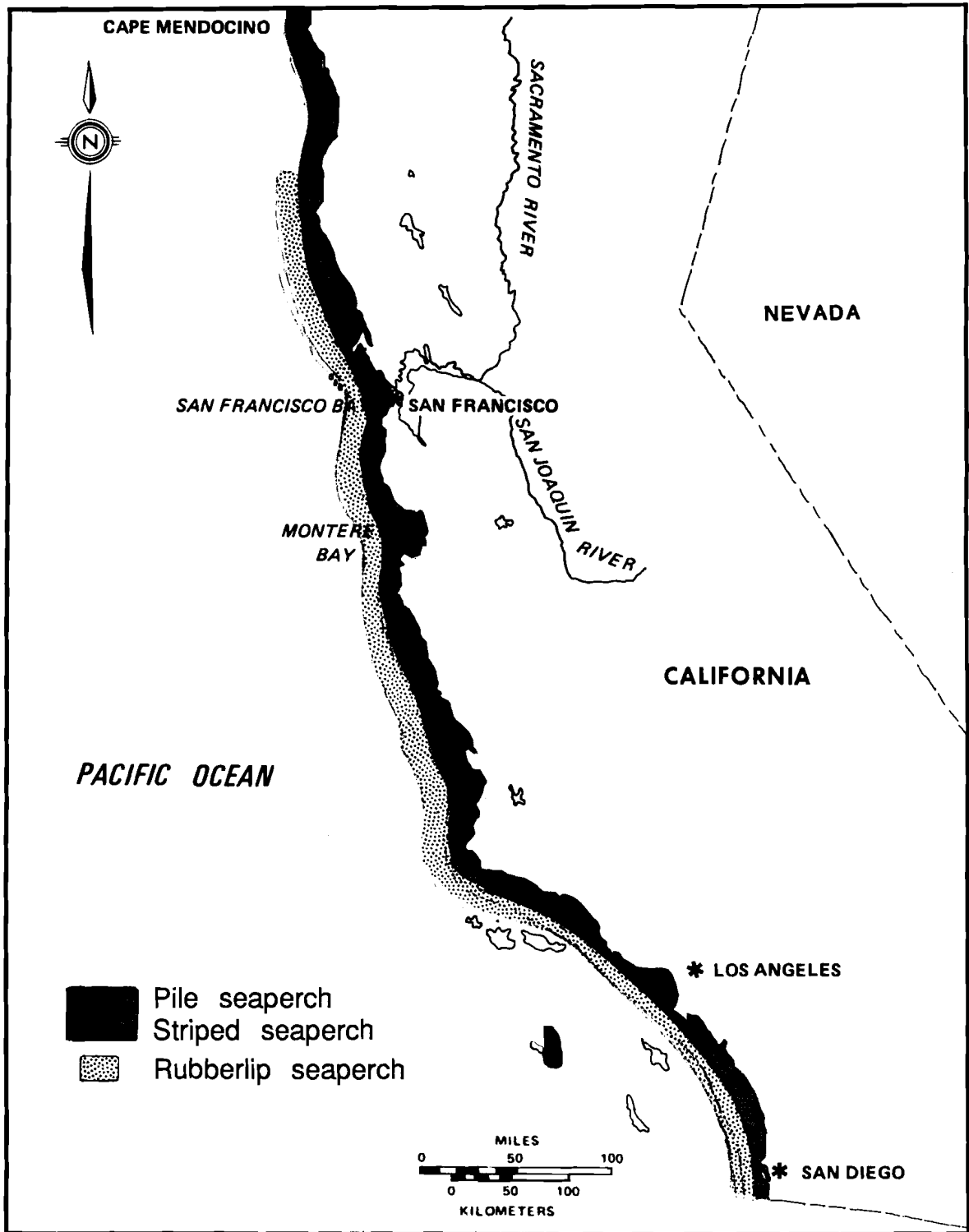


Figure 2. California distribution of pile perch, striped seaperch, and rubberlip seaperch.

Class Osteichthyes
Order Perciformes
Family Embiotocidae

Geographic range: Mendocino County, California, to central Baja California including Guadalupe Island (Figure 2). Usually rocky areas and near jetties, kelp or pilings; inshore and to 46 m (Eschmeyer et al. 1983).

MORPHOLOGY/IDENTIFICATION AIDS

Surfperches are characterized by having cycloid scales covering the body and forming a sheath at the base of the dorsal fin. The dorsal fin is single; the spinous portion gradually increases in height to the point where it joins the soft rayed portion. There are three anal-fin spines. No teeth on vomer or palatines. Branchiostegals 5-6; gill membranes free from the isthmus. All surfperches are viviparous; the male has a distinctive anal gland on the anal fin (Tarp 1952).

Rhacochilus vacca: Rays at front of soft dorsal fin long--about twice as long as dorsal fin spines. Caudal fin deeply forked (Eschmeyer et al. 1983). Dorsal fin spines 9-11; soft rays 21-25. Anal fin rays 25-31; pectoral fin rays 19-22; vertebrae 34-39. Scales along the lateral line 56-69 + 5-8 on tail. Gill rakers 18-22 on the first arch (Miller and Lea 1972). Ground color silvery overlain with brown or sooty tones; most heavily pigmented on dorsal surface. Fins dusky (Tarp 1952). Maximum length 44 cm total length (TL) (Eschmeyer et al. 1983).

Embiotoca lateralis: Body compressed; caudal peduncle short and deep. Spinous portion of dorsal fin low. Dorsal fin spines 10-12; soft rays 23-26. Anal fin rays 29-33; pectoral fin rays 21-24; vertebrae 33-35. Scales along the lateral line 59-65 + 6-8 on the tail. Gill rakers 22-27 on the first arch (Miller and Lea 1972).

Ground color coppery, darker brown dorsally; about 15 horizontal blue stripes on the body below the lateral line; several series of blue spots and stripes on head; fins coppery. Maximum length 38 cm TL (Eschmeyer et al. 1983).

Rhacochilus toxotes: A large surfperch with thick lips. Spines slightly shorter than rays in dorsal fin (Eschmeyer et al. 1983). Dorsal fin spines 9-11, soft rays 20-25; anal fin rays 27-30; pectoral fin rays 21-24; vertebrae 35-38. Scales in lateral line 69-76 + 6-9 on the tail. Gill rakers 26-28 on the first arch (Miller and Lea 1972). Ground color silvery with blue to purple coloration on dorsal surface; pectoral fins yellowish and pelvics black; other fins dusky or fringed with black. Lips white or pink (Tarp 1952). The largest of the surfperches, reaching a maximum length of 47 cm TL (Eschmeyer et al. 1983).

REASON FOR INCLUSION IN SERIES

The pile perch, striped seaperch, and rubberlip seaperch all belong to the family Embiotocidae, the surfperches. Of the 23 species in this family, nineteen are widespread along the California coast. Most are inshore species, found in kelp beds, in estuaries, around jetties, and outside the surf zone of beaches. Many are popular sport species, and a few, including the three contained herein, support a small commercial fishery (Fritzsche 1982).

LIFE HISTORY

Spawning

Embryos are nurtured in the female before birth and may be fairly large as newborn young (Eschmeyer et al. 1983).

The testis index for male pile perch from Yaquina Bay, Oregon, peaked

in September and October; the highest index in late September was ten times that in midsummer (Wares 1971).

Fecundity (brood size) is positively correlated with size and age in female pile perch (Baltz 1984; Wares 1971), and weight in pile perch and striped seaperch (Webb and Brett 1972a). Female striped seaperch also display an age-specific increase in fecundity, while no data are available for rubberlip seaperch (Baltz 1984). Fecundity of pile perch at the age of first reproduction (IV) averages 11.7 and sometimes exceeds 60 in older fish (ages VII-X). Average fecundity of striped seaperch is 18 at the age of first reproduction (III) and increases to 32 at age VII (Baltz 1984).

Breeding behavior has been observed only in pile perch and striped seaperch. A pair of pile perch swimming in the same direction suddenly turn on their sides or upside down and bring their urogenital openings into contact for an instant (Randolph 1928; Wales 1929). The behavior is somewhat different in striped seaperch. One member of a pair maintains a normal (vertical) swimming position while the other orients in a horizontal plane. The anal fins are situated opposite one another. They maintain this position for 2 or 3 seconds while the horizontally oriented individual (male?) vibrates or shudders and fertilization occurs (Edwards 1970).

Development

Since surfperches are viviparous, the eggs and embryos develop within the maternal ovaries. The embryos obtain nourishment for growth by absorbing the rich ovarian fluid. The dorsal and anal fins of the embryo are large and vascular and have spatulate extensions (Moyle 1976; Webb and Brett 1972a) that lie in close contact with the well-vascularized ovarian wall. Respiration also takes place between these spatulate fins and

the ovarian wall (Webb and Brett 1972a). The oxygen capacity of the ovarian fluid of striped seaperch and pile perch is about the same as that of 10 ppt seawater. This fluid apparently lacks respiratory pigments (Webb and Brett 1972b). In striped seaperch, the oxygen affinity of fetal hemoglobin is higher than that of the adult hemoglobin at all physiological pH's. This difference is apparently due to two mechanisms: (1) structurally different hemoglobin, and (2) differences in intra-erythrocytic organic phosphate concentrations (Ingermann and Terwilliger 1981). The embryo may show adaptations to hypoxia, such as having lower mean corpuscular hemoglobin concentrations, since the oxygen tensions it is exposed to may be lower than those available to the adult. This difference may facilitate oxygen transfer between the embryo and the adult (Ingermann and Terwilliger 1982; Ingermann et al. 1984).

During gestation the fins change little in surface area, while the body area does change. The spatulate fin extensions are absorbed before birth (Webb and Brett 1972a).

In British Columbia young pile perch are born in mid to late August (Webb and Brett 1972a). Rubberlip seaperch containing nearly mature embryos have been taken from April to June (Fitch and Lavenberg 1971). In British Columbia waters striped seaperch liberate their young in June and July (Fraser 1923).

Movement, Seasonality, and Longevity

Studies in and near the kelp forests off Santa Barbara, California, have indicated that the three species of surfperches considered here generally remain in the mid-water and suprabenthic zones both day and night, and pile perch are often seen scattered in the water column at night (Table 1). Ebeling and Bray (1976) reported that the relative abundance

