

Northwest and Alaska Fisheries Center Processed Report*

RECREATIONALLY IMPORTANT MARINE FISHES OF
PUGET SOUND, WASHINGTON

by

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* This report does not constitute a publication and is for information only. All data herein are to be considered provisional.

ABSTRACT

Thirty-four species of non-salmonid fishes were determined to be of recreational importance in Puget Sound, Washington. A review of the literature provided such information as local names, physical features used in their recognition, world and Washington state distribution, habitat, utilization, and size. Additional information on Puget Sound distribution, eating qualities, and baits and lures were gathered during NMFS-Marine Recreational Fisheries surveys (1973-1976) and was added to provide a handy recreational marine fishery resource guide.

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INTRODUCTION

While numerous marine species have been the object of intensive recreational fisheries elsewhere along the Pacific Coast, few have received much attention from anglers in the Puget Sound region. Here, salmon alone is king—that is, until recently. In addition, of the 45 or so species in the Sound that may be of potential interest to anglers, few other than salmon are the target of commercial fisheries. Possibly for these reasons relatively little has been known of the rockfishes and numerous other "bottom" fish species. That, however, is also changing. For example, a National Marine Fisheries Service (NMFS) program, begun in 1973, has now gained considerable information on the abundance, distribution, and life history of the marine fish species of recreational importance.

This report constitutes a compilation of data on Puget Sound marine fishes of potential interest to anglers. Included is information on abundance, distribution, and life history of bottomfish species--as well as charts which inform the reader where to find them--compiled from NMFS survey records and from a review of fishery publications. In this report, Puget Sound is defined as the marine waters inside or east of a line drawn from Partridge Point on Whidbey Island to Point Wilson on Quimper Peninsula, and south of a line drawn from Strawberry Point on Whidbey Island to Utsalady Point on Camano Island.

Common and scientific names are those provided by the American Fisheries Society (Bailey et al 1970). A phylogenetic listing of the families and an alphabetical listing of names of species is given in Table 1; the table also indicates the number of the page on which the description of the species begins. For each species, a list of references has been included by author and date of publication, with a comprehensive bibliography beginning on Page 51. These were added in hopes of making this a more complete reference work for Puget Sound anglers as well as others interested in fish and fishing.

Table 1.--A listing of the common and scientific names of the recreationally important marine fish other than salmon and smelt in Puget Sound, Washington (Delacy et al 1972; Buckley 1967, 1968, and 1969).

Codfishes and hakes - Gadidae

Pacific cod, Gadus macrocephalus

Pacific hake, Merluccius productus

Tom cod, Microgadus proximus

Walleye pollock, Theragra chalcogramma

Surfperches - Embiotocidae

Shiner perch, Cymatogaster aggregata

Striped seaperch, Embiotoca lateralis

Pile perch, Rhacochilus vacca

Rockfishes - Scorpaenidae

Brown rockfish, Sebastes auriculatus

Copper rockfish, Sebastes caurinus

Greenstriped rockfish, Sebastes elongatus

Yellowtail rockfish, Sebastes flavidus

Quillback rockfish, Sebastes maliger

Black rockfish, Sebastes melanops

Bocaccio, Sebastes paucispinis

Canary rockfish, Sebastes pinniger

Redstripe rockfish, Sebastes proriger

Yelloweye rockfish, Sebastes ruberrimus

Sablefishes - Anoplopomatidae

Sablefish, Anoplopoma fimbria

Greenlings - Hexagrammidae

Kelp greenling, Hexagrammos decagrammus

Whitespotted greenling, Hexagrammos stelleri

Lingcod, Ophiodon elongatus

Sculpins - Cottidae

Red Irish Lord, Hemilepidotus hemilepidotus

Pacific staghorn sculpin, Leptocottus armatus

Cabezon, Scorpaenichthys marmoratus

Lefteye flounders - Bothidae

Pacific sanddab, Citharichthys sordidus

Righteye flounders - Pleuronectidae

Arrowtooth flounder, Atheresthes stomias

Petrable sole, Eopsetta jordani

Flathead sole, Hippoglossoides elassodon

Pacific halibut, Hippoglossus stenolepis

rock sole, Lepidopsetta bilineata

English sole, Parophrys vetulus

Starry flounder, Platichthys stellatus

C-O sole, Pleuronichthys coenosus

Sand sole, Psettichthys melanostictus

GODS AND HAKE

The fishes in this family, Gadidae, are real cod and quite common in the waters of Puget Sound. Included in this group are walleye pollock, Pacific hake, tomcod, and Pacific cod. Tomcod and Pacific cod are regarded highly by experienced anglers who know quality foodfish. Pollock is of lesser value, and hake is regarded as a nuisance to anglers.

Pacific cod, Gadus macrocephalus
Pacific hake, Merluccius productus
Pacific tomcod, Microgadus proximus
Walleye pollock, Theragra chalcogramma

NOTE: All photos have been deleted from this report
but will be available in the publication.

Pacific cod, Gadus macrocephalus

Local Names: True cod, gray cod, cod, Alaska cod.

Recognition: Three separate dorsal fins; the anus is located ventrally below the second dorsal; "whisker" below lower jaw is as long as or longer than eye. Brown to gray on back. Numerous brown spots and vermiculated coloration on back and sides.

Distribution: Common from southern California to Alaska.^{14,21}

Washington Distribution: Very common in almost all marine waters of this state. Polnell Point, Holmes Harbor, Possession Point, Port Madison, Port Orchard, Rich Passage, Dalco Passage, and Hale Passage are very good areas.

Habitat: Occurs over a wide variety of bottom types (generally mud silt) from shallow to deep water. During winter months, forms large spawning schools; at times found off bottom.

Utilization: Important in commercial catch; 1-2 million pounds are landed annually from Puget Sound. Eagerly sought by a growing number of sport anglers in Washington.

Size: To 39 inches.¹⁴ Usually smaller (to 28 inches--71.3 cm) in Puget Sound, but individuals over 10 pounds are not uncommon.

Eating Qualities: Excellent--firm white flesh; 3-7 pound individuals highest quality and less parasitized. Highly recommended in recipes for (1) fish and chips, (2) poached fish, (3) steamed fish, and (4) smoked fish.

Baits and Lures: Herring, jigs, rubber worms.

Additional References:

1. Alderdice and Forrester 1971.
2. Alverson 1960.
3. Alverson, Pruter, and Ronholt 1964.
4. Andriashev 1937.
5. Barraclough, Robinson, and Fulton 1968.
6. Cobb 1927.
7. DeLacy, Miller, and Borton 1972.
8. Fish. Res. Board Canada 1966.
- 9, 10. Forrester 1964a, b.
11. Forrester and Ketchen 1955.
12. Grinols 1965.
- 13, 14. Hart 1949, 1973.
15. Haw and Buckley 1971.
16. Kennedy 1970.
- 17, 18. Ketchen 1961, 1964.
19. Larkin and Richer 1964.
20. Matsubara 1955.
21. Miller and Lea 1972.
22. Moiseev 1953.
23. Nikol'skii 1961.
24. Okada 1955.
- 25, 26, 27. Phillips 1951, 1953, 1958.
28. Pinkas 1967.
29. Popov 1933.
30. Rass 1953.
31. Schultz and Welander 1935.
32. Schmidt 1950.
- 33, 34. Thompson 1962, 1963.
35. Wilimovsky, Peden and Peppar 1967.

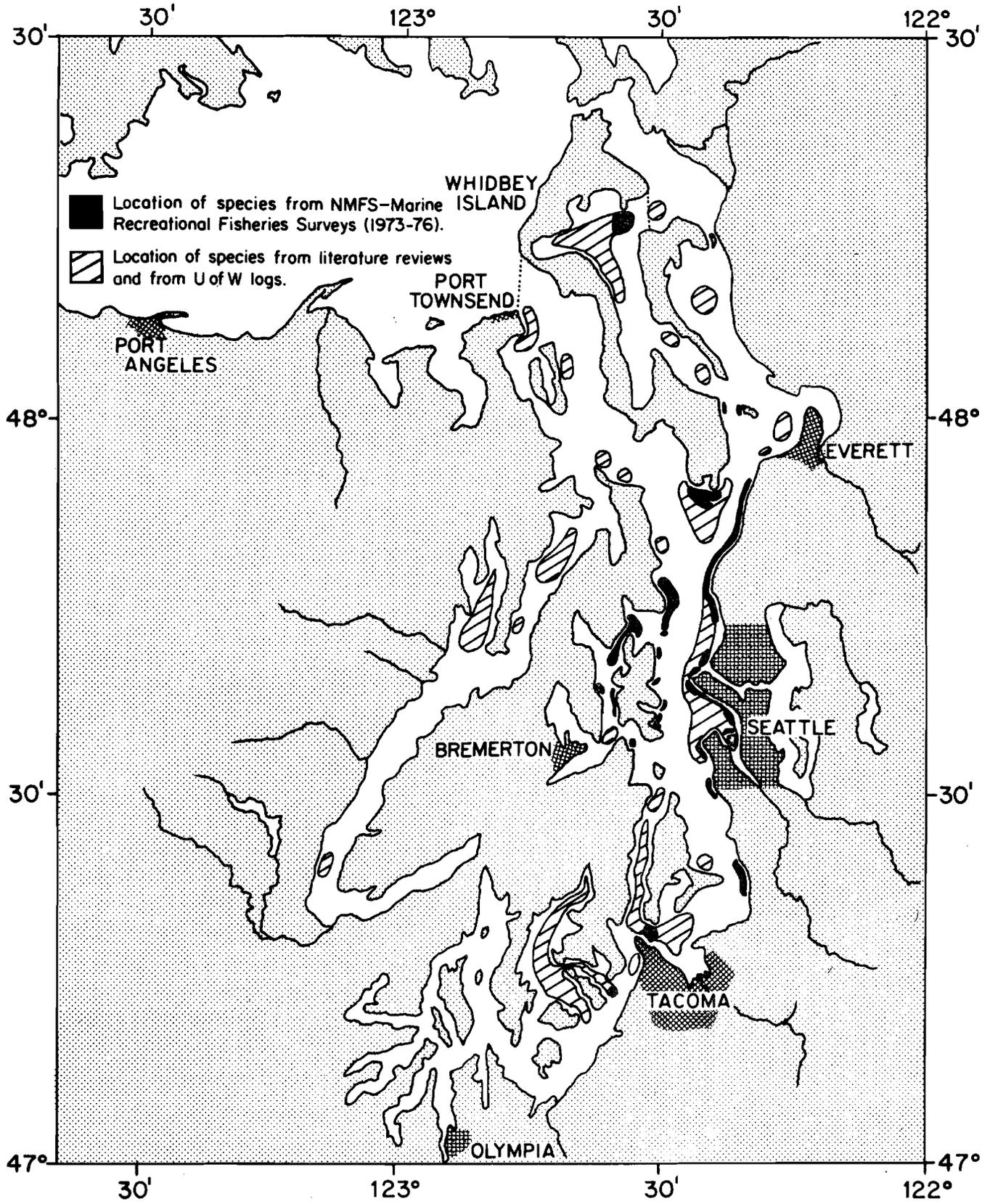


Figure 2 Known distribution of Pacific cod, Gadus macrocephalus, in Puget Sound.

Pacific hake, Merluccius productus

Local Names: Silver cod, white fish, haddock, butterfish, mellusa.

Recognition: Two dorsal fins with the second dorsal and the anal fin both long and notched. There is no "whisker" under the jaw. The mouth is large with sharp teeth. Dark or silvery gray on back. Black inside mouth.

Distribution: From Baja California to Alaska.^{13,17}

Washington Distribution: Common in south Puget Sound, the Seattle and Everett area, and Hood Canal.⁸ Very abundant in Port Susan during the winter. Found in much smaller numbers along the Strait of Juan de Fuca and San Juans. Puget Sound stocks are known to be discrete from coastal stocks.

Habitat: Usually found over a nonrocky bottom in moderate water depths. Often found well off bottom.

Utilization: A large commercial fishery exists during the winter around the Everett area. Almost all fish caught are used for animal food. Large foreign fleets take great numbers of hake annually off the coast of North America. Sold in Russia as fresh-frozen product.

Size: To 3 feet along coast, somewhat smaller in Puget Sound.¹³ Specimens to 27 inches (68.6 cm) have been collected in Puget Sound.

Baits and Lures: Herring, jigs.

Eating Qualities: Flesh is very soft if not cared for properly (bleed, eviscerate, and ice immediately). Smaller individuals with fewer parasites.

Additional References:

1. Ahlstrom and Counts 1955.
2. Alton and Nelson 1970.
3. Alverson, Pruter, and Ronholt 1964.
4. Barraclough 1967a.
5. Barraclough, Robinson, and Fulton 1968.
6. Best 1963a.
7. Conway 1967.
8. DeLacy, Miller, and Borton 1972.
9. Ginsburg 1954.
10. Gotshall 1969.
11. Grinols 1965.
12. Grinols and Tillman 1970.
13. Hart 1973.
14. Haw and Buckley 1971.
- 15, 16. MacGregor 1966, 1971.
17. Miller and Lea 1972.
18. Millikan and Pattie 1970.
19. Nelson and Larkins 1970.
- 20, 21. Robinson, Barraclough, and Fulton 1968a, b,
22. Shippen and Alton 1967.

Pacific tomcod, Microgadus proximus

Local Names: Tomcod, and piciata.

Recognition: Three dorsal fins, with the anus under the first dorsal; the "whisker" on the lower jaw is about as long as the diameter of the eye. Olive green on back with creamy white sides.

Distribution: From central California to Alaska.⁴

Washington Distribution: Found in all marine waters of Washington. Common in San Juan-Bellingham area as well as around Seattle, Port Orchard, and south Puget Sound. Less common in Hood Canal and the Strait of Juan de Fuca.²

Habitat: Found over mud silt bottoms. Often found in shallow water in summer.

Utilization: Not the specific target of a commercial fishery.

Size: To 12 inches (30 cm).

Baits and Lures: Herring, rubber worms, jigs.

Eating Qualities: Excellent--firm white flesh. Smaller sizes require a little extra work in cleaning and filleting.

Additional References:

1. Cobb 1927.
2. DeLacy, Miller, and Borton 1972.
- 3, 4. Hart 1949, 1973.
5. Haw and Buckley 1971.
6. Isaacson 1965.
7. Lamb 1969.
8. Miller and Lea 1972.
9. Wilimovsky 1964.

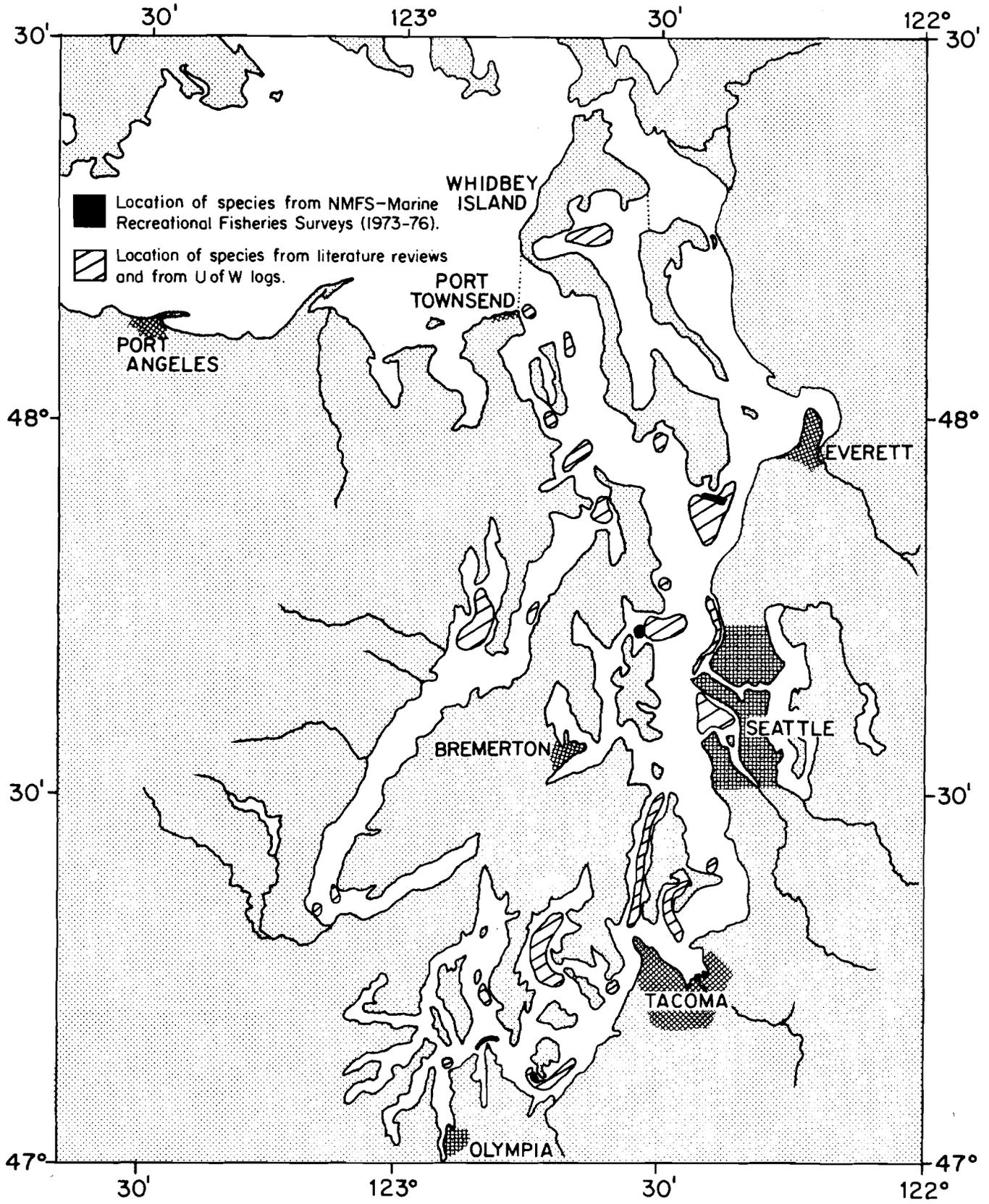


Figure 4 Known distribution of Pacific tomcod, *Microgadus proximus*, in Puget Sound.

Walleye Pollock, Theragra chalcogramma

Local Names: Pollock, whiting.

Recognition: Three well separated dorsal fins. The anus is below the space between first and second dorsals. "Whisker" on lower jaw small or absent. The eyes are relatively large. Dark green to brown on back (often blotched), silvery on sides.

Distribution: Central California to Alaska.¹⁰

Washington Distribution: Found in all marine waters of Washington. Very common in Strait of Juan de Fuca, central and south Puget Sound. Less common elsewhere.

Habitat: Prefers soft bottoms in moderate depths.

Utilization: An important commercial species in the North Pacific and Bering Sea. Small amounts are landed locally for animal food.

Size: Length to 3 ft. Usually smaller in Puget Sound (22 inches--56 cm).

Baits and Lures: Herring, jigs.

Additional References:

1. Alverson, Pruter, and Ronholt 1964.
2. Armstrong and Winslow 1968.
3. Barraclough 1967a.
4. Barraclough, Robinson, and Fulton 1968.
5. Clemens and Wilby 1961.
6. Cobb 1927.
7. DeLacy, Miller, and Borton 1972.
8. Grinols 1965.
- 9, 10. Hart 1949, 1973.
11. Haw and Buckley 1971.
12. Larkin and Richer 1964.
13. Matsubara 1955.
14. Miller and Lea 1972.
15. Nikol'skii 1961.
16. Okada 1955.
- 17, 18. Phillips 1942, 1943.
- 19, 20. Robinson, Barraclough, and Fulton 1968a, b.
21. Wilimovsky, Peden, and Peppar 1967.

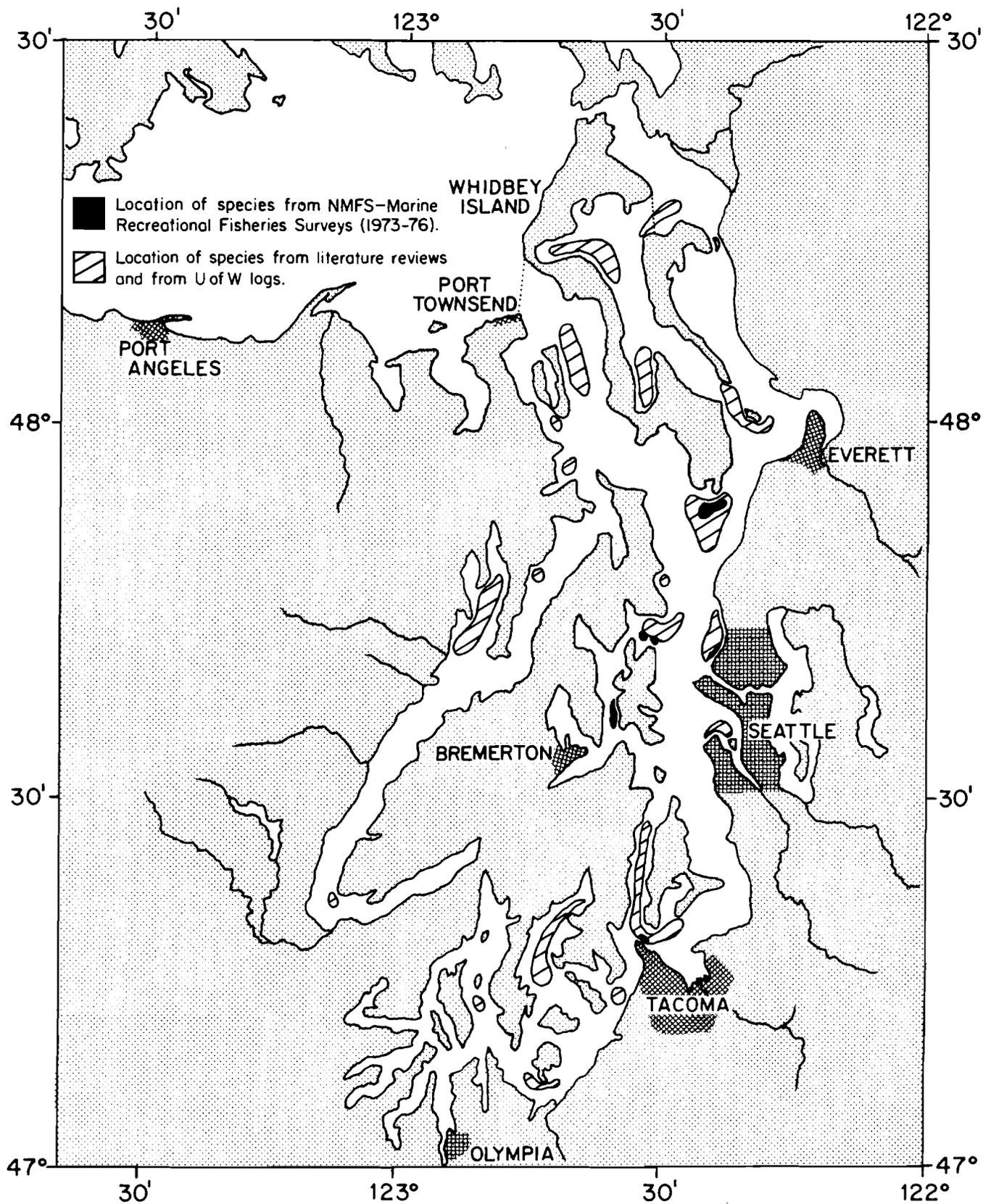


Figure 5 Known distribution of walleye pollock, *Theragra chalcogramma*, in Puget Sound.

SURFPERCHES

In Puget Sound, the surfperches, family Embiotocidae, have three representatives that are important in the sport catch. These include the shiner perch, striped seaperch, and pile perch. This family is an important group to the shore-bound angler, being closely associated with barnacle- and mussel-encrusted pilings. In addition, they are important forage species for numerous predator fish species.

A rather unique group, the eggs are fertilized and develop internally, being released as miniature replicas of the parent. A pregnant female taken in early summer will very likely abort several dozen offspring.

Shiner perch, Cymatogaster aggregata
Striped seaperch, Embiotoca lateralis
Pile perch, Rhacochilus vacca

NOTE: All photos have been deleted from this report
but will be available in the publication.

Shiner perch, Cymatogaster aggregata

Local Names: Shiner seaperch, yellow shiner, shiner, bayperch, poggie.

Recognition: Large scales. There is no fold of skin attaching lower jaw to lip. Silvery. May have three yellow vertical bands on sides.

Distribution: From northern Baja California to southern Alaska.¹¹

Washington Distribution: Found in all marine waters of this state. Very common throughout Puget Sound, Hood₄ Canal, and the San Juans. Less abundant in the Strait of Juan de Fuca.

Habitat: During summer and fall, found in schools in shallow water. During the winter they apparently move into deeper water.

Utilization: Sometimes used for bait. There is a limited market for human consumption.

Size: Length to 6 inches.¹¹

Baits and Lures: Clams, mussels, shrimp, worms.

Eating Qualities: Occasionally eaten dried or pickled. Considered a delicacy by Chinese.

Additional References:

1. Anderson and Bryan 1970. 2. Arai 1967. 3. Clothier 1950. 4. DeLacy, Miller, and Borton 1972. 5. Earnest and Benville 1972. 6. Eigermann 1894. 7. Gordon 1965. 8. Hart 1973. 9. Haw and Buckley 1971. 10. Hubbs 1917, 1921. 11. Miller and Lea 1972. 12. Roedel 1953. 13. Shaw, Allen, and Stone 1974. 14. Smith 1969. 15. Suomela 1931. 16. Tarp 1952. 17. Turner 1952. 18, 19. Wiebe 1968a, b.

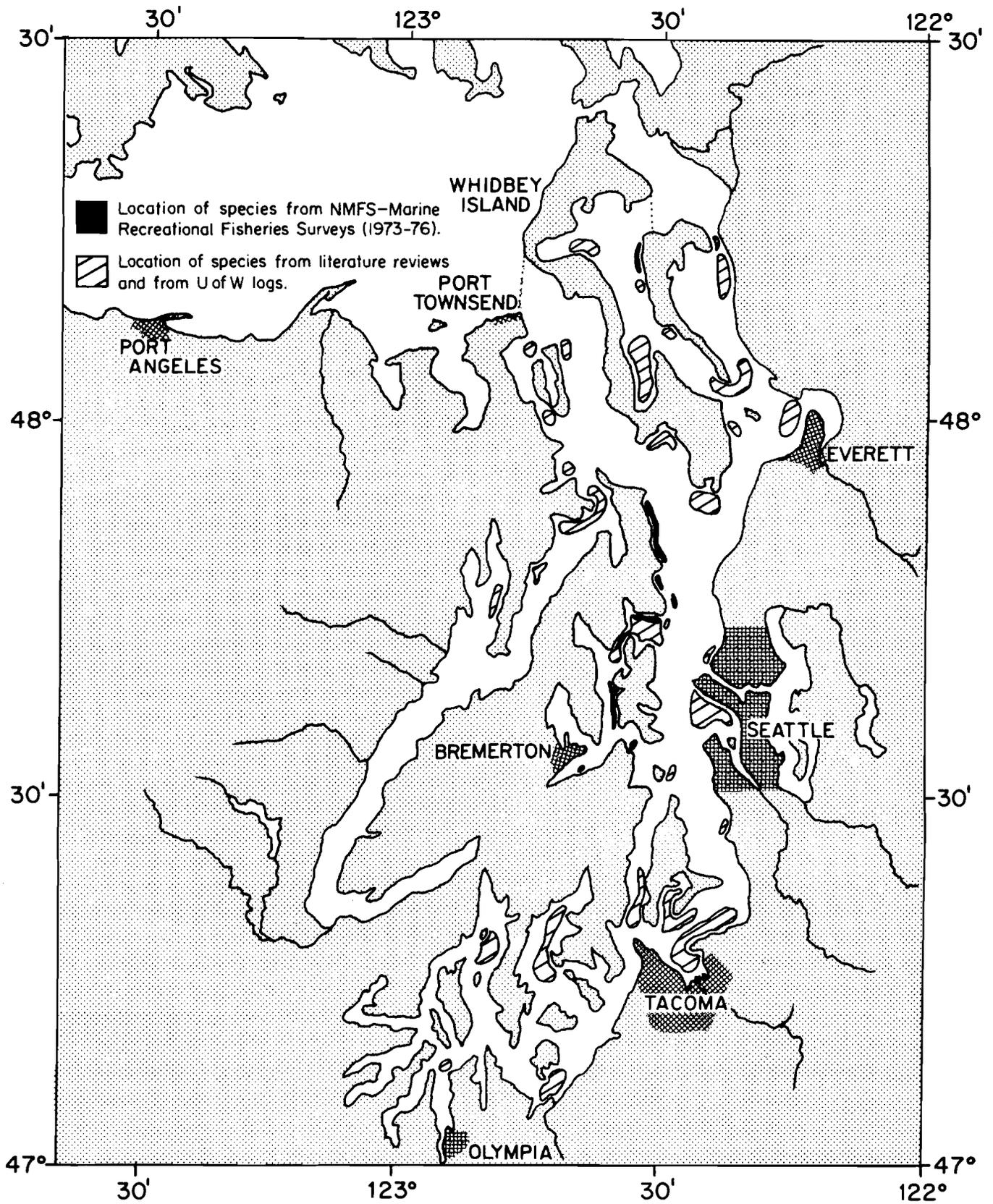


Figure 7 Known distribution of shiner perch, *Cymatogaster aggregata*, in Puget Sound.

Striped seaperch, Embiotoca lateralis

Local Names: Blue perch, crugnoli.

Recognition: Several bright blue stripes running along body. Relatively short dorsal fin. Copper color on back with about 15 blue stripes running along body.

Distribution: Pt. Cobras, Baja California to southeast Alaska (Port Wrangel).^{5,8}

Washington Distribution: Very common in southern and central Puget Sound. Less common in San Juans and Strait of Juan de Fuca.²

Habitat: During summer and fall, found in shallow water in schools. Found over rocks or often in kelp and eel grass beds.

Utilization: Small amounts caught commercially in this area. Small fishery exists in northern California. Important to shore-bound angler.

Size: Length to 15 inches.⁵

Baits and Lures: Clams, mussels, shrimp, worms, small spinners, and flies.

Eating Qualities: Good.

Additional References:

1. Arai 1967. 2. DeLacy, Miller, and Borton 1972. 3. Edwards 1970. 4. Fraser 1923. 5. Hart 1972. 6. Haw and Buckley 1971. 7. Grose 1968. 8. Miller and Lea 1972. 9. Roedel 1953. 10. Smith 1969. 11. Swedberg 1965. 12. Tarp 1952.

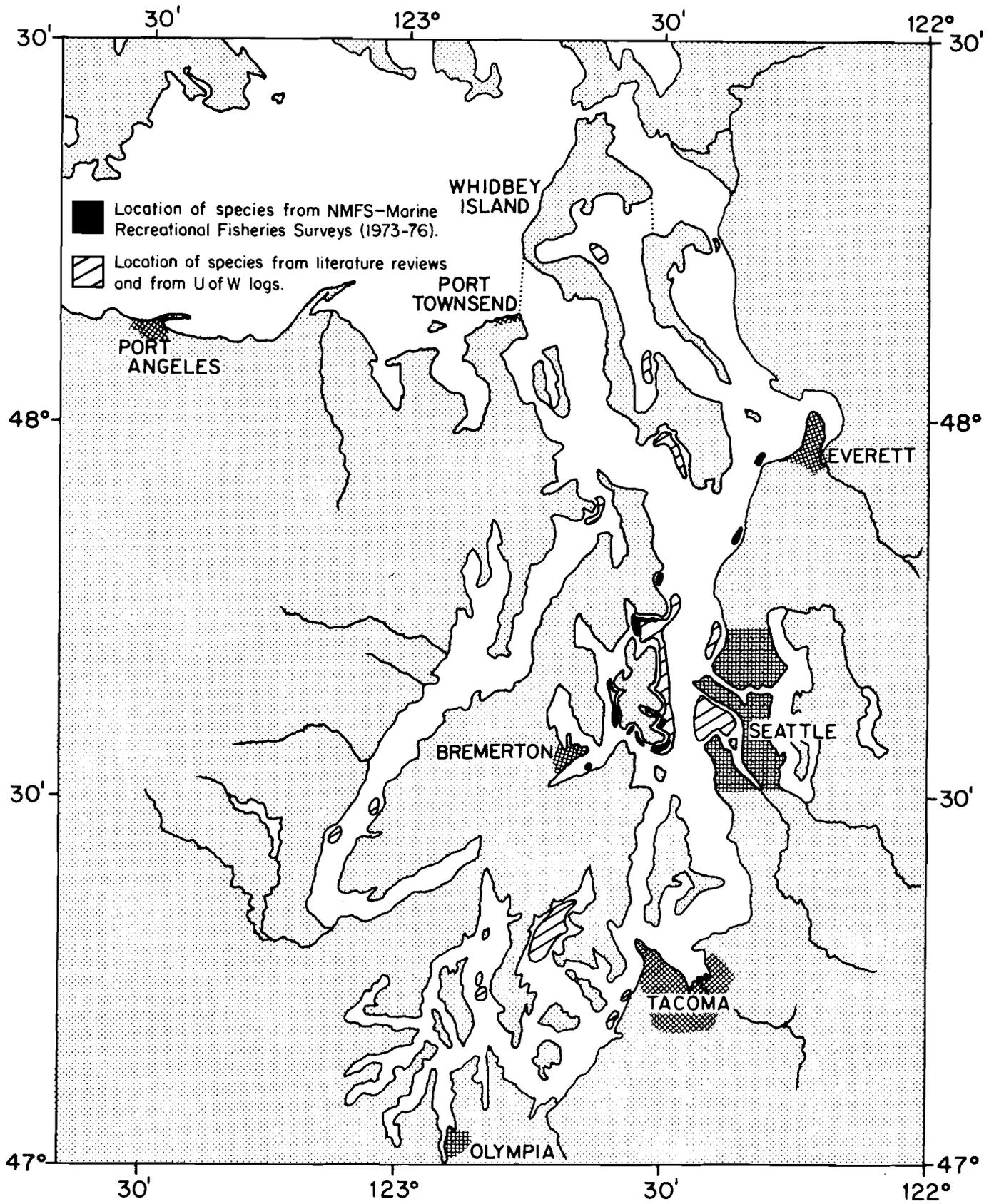


Figure 8 Known distribution of striped perch, *Embiotoca lateralis*, in Puget Sound.

Pile perch, Rhacochilus vacca

Local Names: Pile seaperch, dusky seaperch, porgie, white seaperch, silver perch.

Recognition: The dorsal fin has a low spiny section followed by a much higher soft rayed section. The tail is deeply forked. Dark gray or brown on back. Silvery on sides.

Distribution: Northern Baja California to southern Alaska.⁶

Washington Distribution: Common throughout all of Puget Sound. Less common elsewhere.²

Habitat: Prefers rocky bottoms in shallow water.

Utilization: Small amounts caught commercially in the Pacific Northwest. There is a commercial fishery in northern California. Important to shorebound angler.

Size: Length to 17 inches.⁴ Individuals have been reported over 19 inches (about 5 lb) from Puget Sound.

Baits and Lures: Clams, mussels, shrimp, worms, smelt, crabs, small spinners, and flies.

Eating Qualities: Good

Additional References:

1. Arai 1967. 2. DeLacy, Miller, and Borton 1972. 3. Eigenmann and Ulrey 1894. 4. Hart 1973. 5. Haw and Buckley 1971. 6. Miller and Lea 1972. 7. Morgan 1961. 8. Randolph 1898. 9. Roedel 1953. 10. Smith 1969. 11. Tarp 1952. 12. Wales 1929. 13. Wares 1968. 14. Wilimovsky 1954.

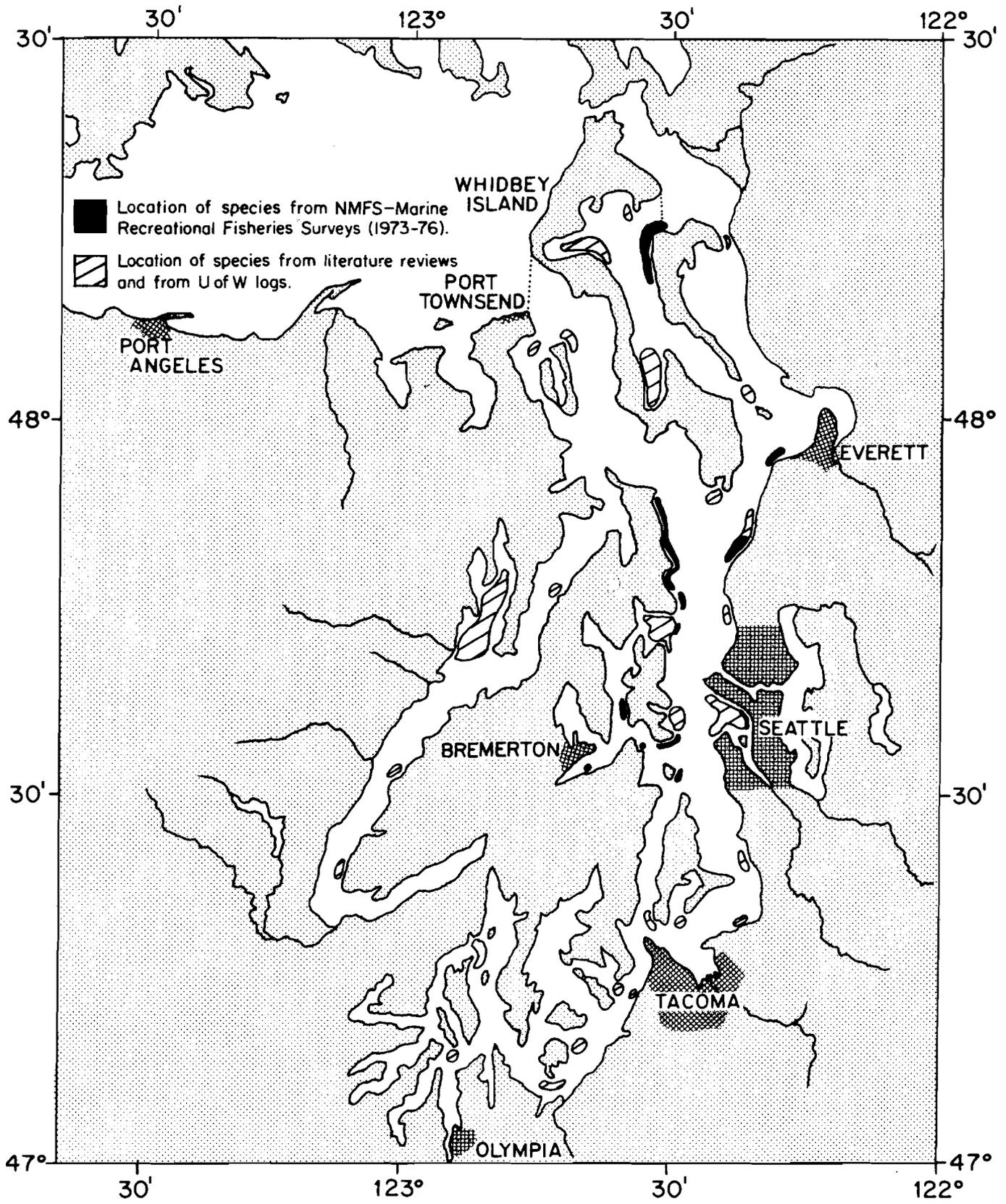


Figure 9 Known distribution of pile perch, *Rhacochilus vacca*, in Puget Sound.

ROCKFISHES

The rockfishes are by far the most important marine fish group in Puget Sound. There are known to be 21 members of the family Scorpaenidae in the "Sound"¹; however, five of them (brown, copper, quillback, black, and yellowtail) make up 85-90% of the total bottomfish catch--both incidental (to salmon) and specific catches, while some others are seldom caught.² Local names for this species wrongly associate them with the cods, sea bass, and snapper (a tropical deep-water species). In no case is there any relation. The various species resemble each other in body shape but may differ radically in color.

Rockfish, like the surfperches, have an unusual life history in that they give birth to live young. Unlike the surfperches, the young are born as larvae which are initially pelagic. A female rockfish may carry 1,000,000 or more eggs, or larvae, the number varying widely between species. The time of spawning varies by species but is usually between winter and summer. Some species (rasphead and copper rockfish) have been found to contain fertilized eggs in summer, which probably means a minor spawning period occurs in fall also.

Brown rockfish, S. auriculatus
 Copper rockfish, S. caurinus
 Greenstripe rockfish, S. elongatus
 Yellowtail rockfish, S. flavidus
 Quillback rockfish, S. maliger
 Black rockfish, S. melanops
 Bocaccio, S. paucispinis
 Canary rockfish, S. pinniger
 Redstripe rockfish, S. proriger
 Rasphead rockfish, S. ruberrimus

¹ DeLacy, Miller, and Borton 1972.

² Buckley 1970.

NOTE: All photos have been deleted from this report
but will be available in the publication.

Brown rockfish, Sebastes auriculatus

Local Names: Bolina, sand bass, rock cod.

Recognition: Similar to copper rockfish. Brown body with dark spot on gill cover. Dark to light brown, head and body with dark vague bars across back.

Distribution: Hipolito Bay, Baja California to southeast Alaska. Not common north of Washington.

Washington Distribution: Fairly common in Puget Sound. Rarely found in San Juans, or Strait of Juan de Fuca.

Habitat: Widely spread in shallow water (to 180 ft).

Utilization: Caught commercially but not sought specifically.

Size: To 20 inches.⁴ Uncommon over 15 inches, but a specimen 17 inches (43.2 cm) and 4 pounds was taken in Puget Sound.

Baits and Lures: Herring, squid, crab, clams, artificial worms, jigs.

Eating Qualities: Excellent--steamed, baked, or fried.

Additional References:

1. DeLacy and Dryfoos 1962.
2. DeLacy, Hitz, and Dryfoos 1964.
3. DeLacy Miller, and Borton 1972.
4. Hart 1973.
5. Hitz 1965.
6. Hitz and DeLacy 1961.
7. Miller and Lea 1972.
8. Phillips 1957.
9. Roche and Halstead 1972.
10. Wilimovsky 1954.

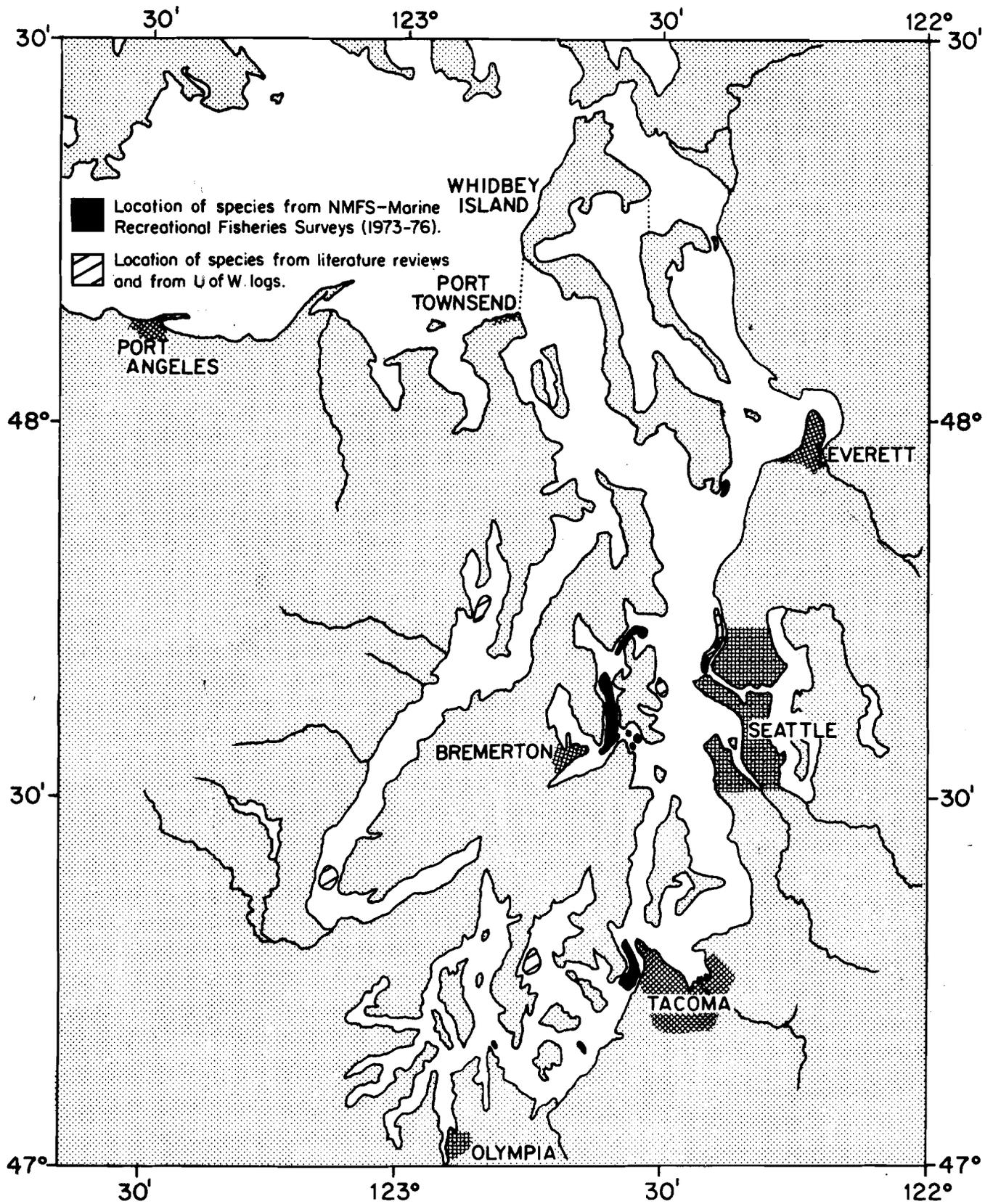


Figure 11. Known distribution of brown rockfish, *Sebastes auriculatus*, in Puget Sound.

Copper rockfish, Sebastes caurinus

Local Names: Whitebelly rockfish, white gopher, barriga blanca, palermotana, copper cod, northern rockfish, bracea, rock cod.

Recognition: Coppery brown coloration, dark fins, lightly colored along posterior two-thirds of lateral line. Black and dark brown to olive brown, with some copper color; occasionally yellow patches.

Distribution: From Monterey, California, to Kenai Peninsula, Alaska.³

Washington Distribution: Very common throughout Puget Sound, San Juans, and Strait of Juan de Fuca. One of the most common rockfish in Puget Sound.²

Habitat: Prefers rocky bottoms or kelp beds. Most often found in shallow water (less than 100 ft).

Utilization: The copper rockfish makes up a significant portion of the commercial catch in Puget Sound. Salmon anglers often catch this fish while fishing in water less than 100 feet deep.

Size: To 20 inches.³ A number of individuals have been collected from Puget Sound that exceed 20-3/4 inches (52.7 cm).

Baits and Lures: Herring, squid, crab, clams, worms, artificial lures.

Eating Qualities: Excellent--steamed, baked, or fried.

Additional References:

1. DeLacy, Hitz, and Dryfoos 1964. 2. DeLacy, Miller, and Borton 1972. 3. Hart 1973. 4. Haw and Buckley 1971. 5, 6. Hitz 1961, 1965. 7, 8. Hitz and DeLacy 1960, 1965. 9. Miller and Lea 1972. 10. Patten 1973. 11. Schultz and DeLacy 1936. 12. Westrheim 1966a.

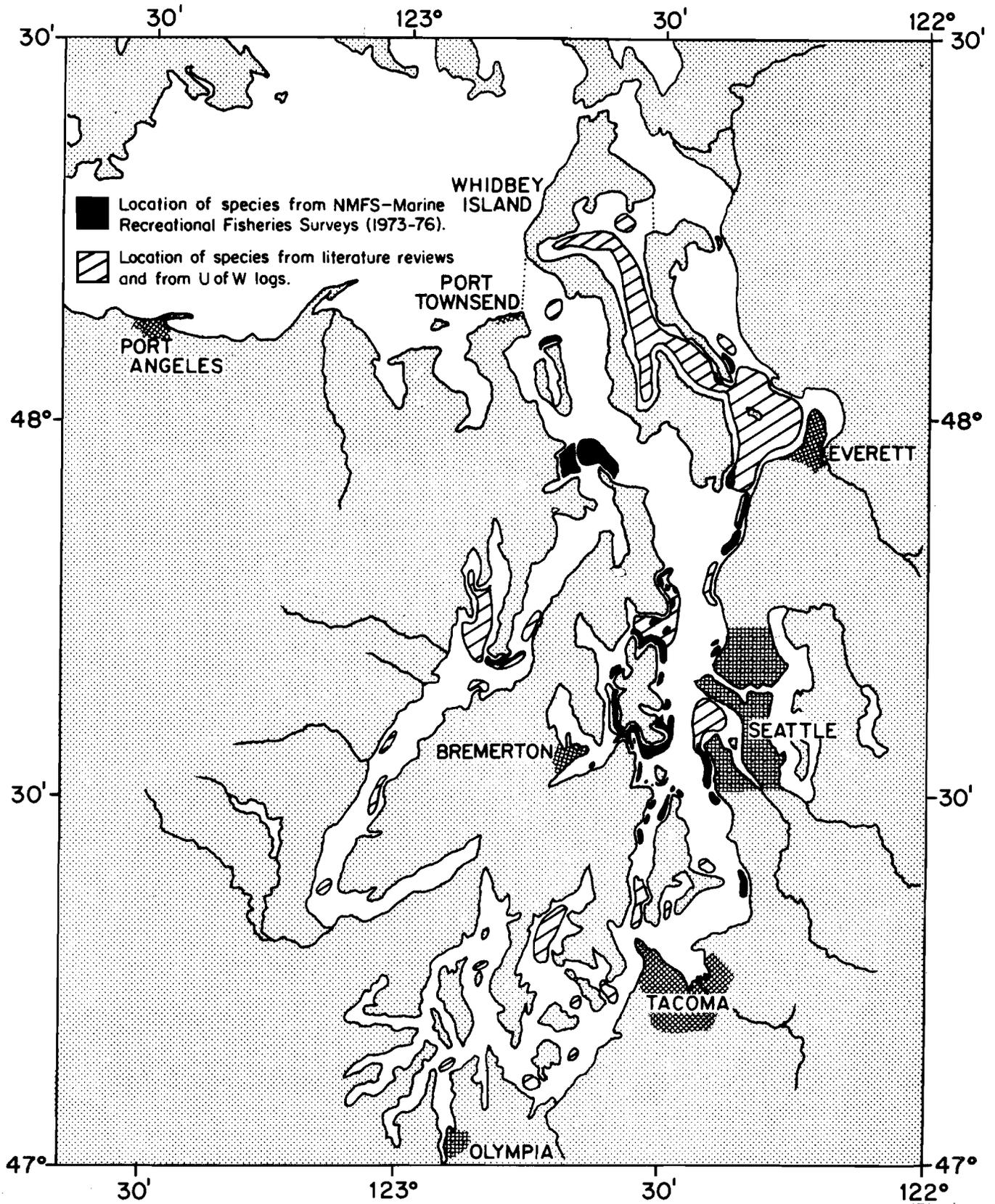


Figure 12 Known distribution of copper rockfish, *Sebastes caurinus*, in Puget Sound.

Greenstripe rockfish, Sebastes elongatus

Local Names: Strawberry rockfish, serena, rima, poinsetta, striped rockfish.

Recognition: Distinguished by its slender body and green horizontal stripes on body. Body is pinkish red with four horizontal stripes.

Distribution: Cedros Island, Baja California to the Montague Island, Alaska.^{4,6}

Washington Distribution: Most abundant in Hood Canal.³

Habitat: Not known. Prefers deep water (greater than 100 ft).

Utilization: Small portion of incidental commercial catch.

Size: To 15 inches.⁴ Largest specimen from Puget Sound 13-3/4 inches (34.9 cm).

Baits and Lures: Herring, artificial lures.

Eating Qualities: Good.

Additional References:

1. Alverson, Pruter, and Ronholt 1964.
2. DeLacy, Hitz, and Dryfoos 1964.
3. DeLacy, Miller, and Borton 1972.
4. Hart 1973.
5. Hitz 1962.
6. Miller and Lea 1972.
7. Phillips 1957.
8. Roche and Hatstead 1972.
9. Smith 1936.
10. Westrheim 1966.
11. Westrheim, Harling, Davenport and Smith 1968.

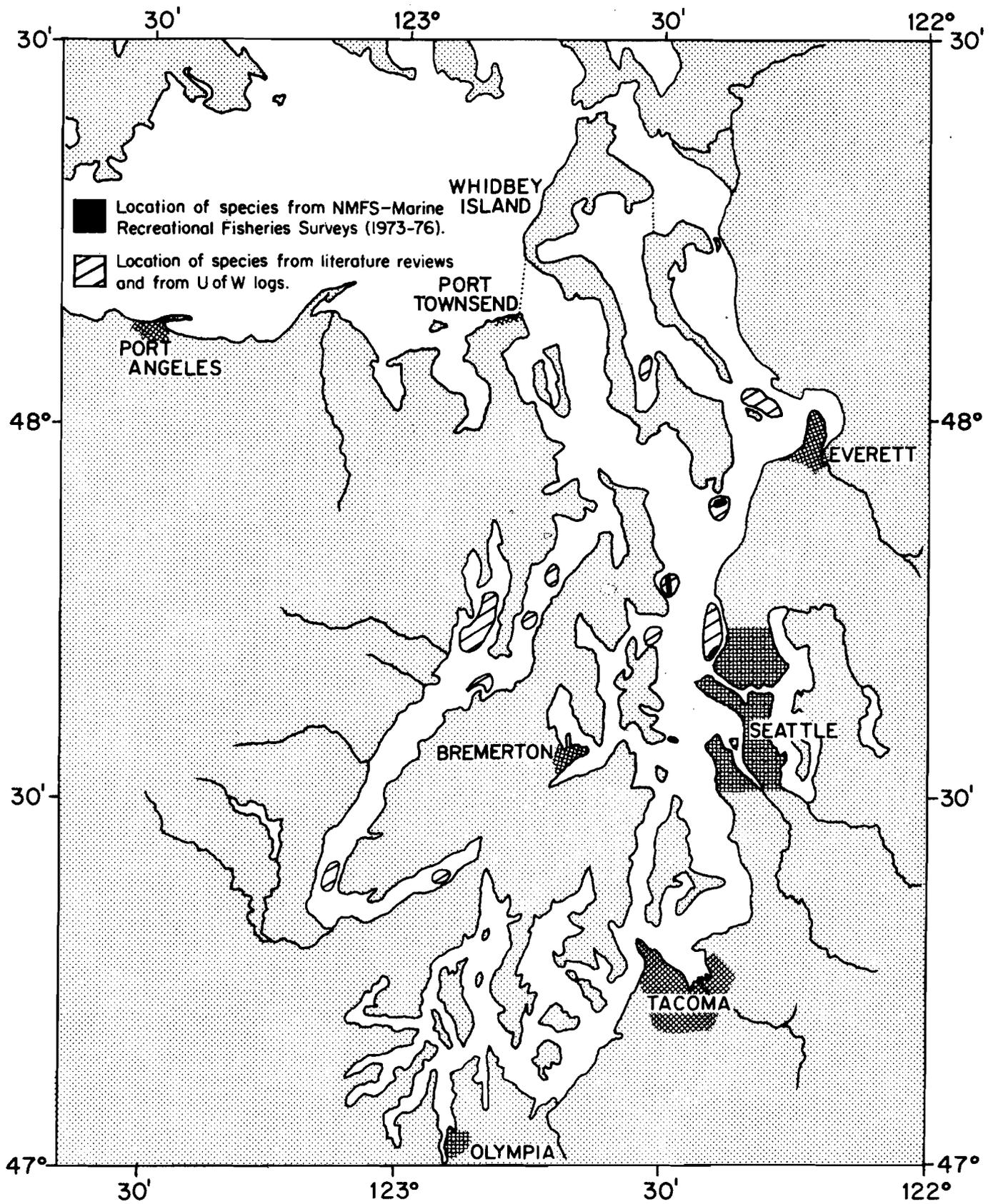


Figure 13 Known distribution of greenstripe rockfish, *Sebastes elongatus*, in Puget Sound.

Yellowtail rockfish, Sebastes flavidus

Local Names: Green snapper, giola, gialota, chune, yellow rockfish.

Recognition: Body color greenish to olive green. Tail is a definite yellow, vaguely streaked with brown.

Distribution: San Diego, California, to Kodiak Island, Alaska.^{6,9}

Washington Distribution: Found throughout Puget Sound, Hood Canal, and San Juans. Very common along the coast.

Habitat: Younger fish form schools off bottom in shallow water, while older fish can be found in both deep (to 900 ft during day) and shallow water.

Utilization: Of considerable importance (up to 3 million lb annually) to commercial fishery, along the Washington coast. A very fine sportfish.

Size: To 26 inches;⁶ in Puget Sound uncommon over 15 inches or 2 pounds.

Baits and Lures: Herring, squid, plugs, spoons, flies, rubber worms.

Eating Qualities: Excellent.

Additional References:

1. Alverson, Pruter, and Ronholt 1964.
2. Carlson and Haight 1972.
3. DeLacy, Hitz, and Dryfoos 1964.
4. DeLacy, Miller, and Borton 1972.
5. Grinols 1965.
6. Hart 1973.
7. Haw and Buckley 1971.
8. Hitz 1962.
9. Miller and Lea 1972.
10. Pereyra, Percy, and Karvey 1969.
- 11, 12. Phillips 1957, 1964.
13. Westheim 1966.

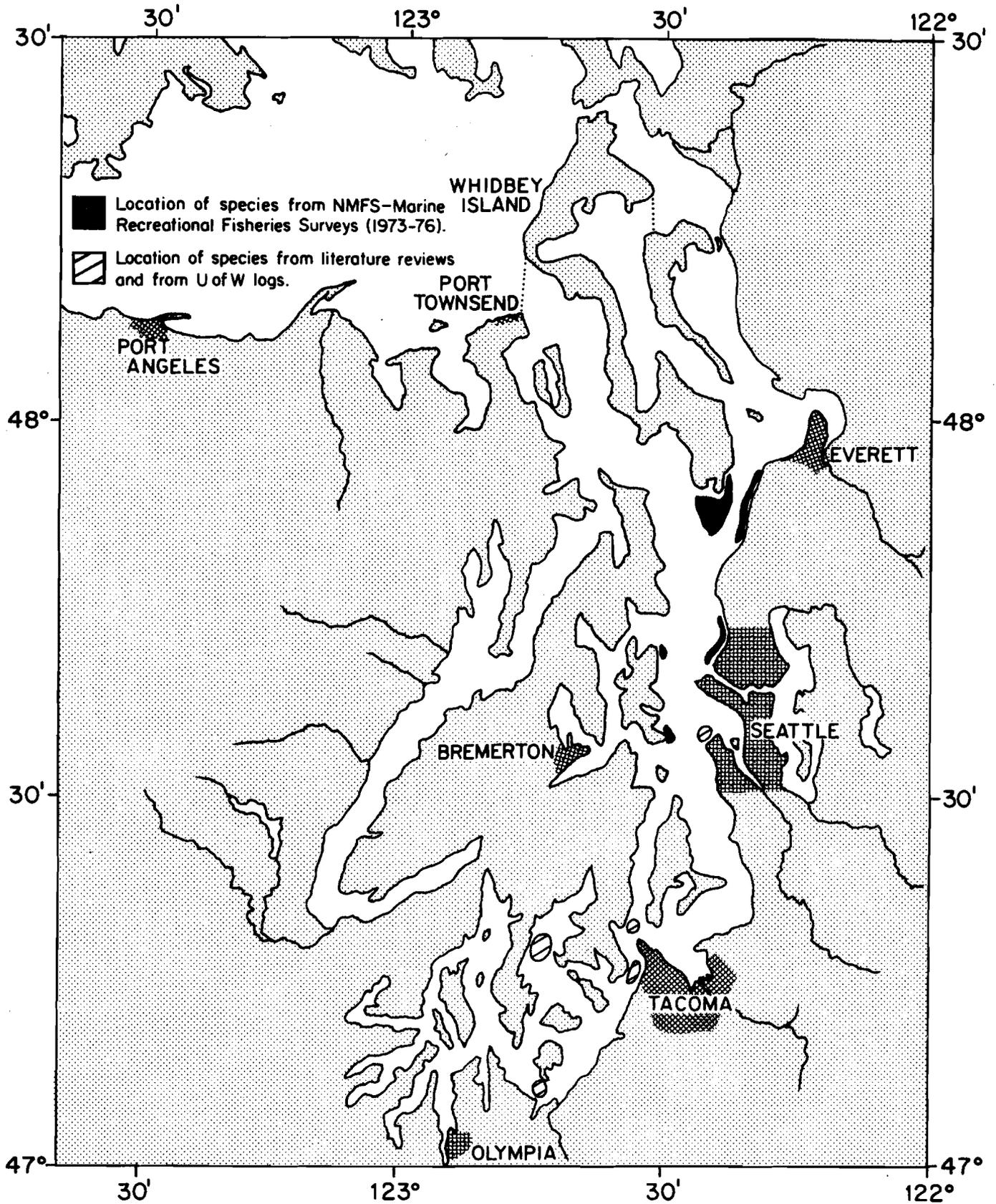


Figure 14 Known distribution of yellowtail rockfish, *Sebastes flavidus*, in Puget Sound.

Quillback rockfish, Sebastes maliger

Local Names: Orange spotted rockfish, yellow backed rockfish, brown rockfish, speckled rockfish, rock cod.

Recognition: Very similar to the copper rockfish. Can be distinguished by high fin on back, yellowish blotch on back, dark fins, and freckles. Brown with yellow or tan areas behind head and brownish freckles on jaw. Fins are dark.

Distribution: From central California (Point Sur) to Gulf of Alaska.^{4,6}

Washington Distribution: Common throughout Puget Sound, San Juans, and the Strait of Juan de Fuca. Most common rockfish in Puget Sound.²

Habitat: Prefers rocky bottoms and obstructions on bottom--such as sunken logs, ships or rock piles. Found in 10 to over 500 feet of water.

Utilization: Quillbacks make up a significant portion of the commercial catch of rockfish in Puget Sound. Many are taken by sports fishermen, a large portion incidental to salmon.

Size: To 24 inches⁴; uncommon over 15 inches in Puget Sound (to 15-5/8 inches--39.8 cm or 2-3/4 lb).

Baits and Lures: Herring, candlefish, squid, worms, crabs, plugs, spoons, flies, jigs, rubber worms.

Eating Qualities: Excellent.

Additional References:

1. Alverson, Pruter, and Ronholt 1964.
2. DeLacy, Miller, and Borton 1972.
3. Grinols 1965.
4. Hart 1973.
5. Haw and Buckley 1971.
6. Miller and Lea 1972.
7. Phillips 1957.
8. Roche and Holstead 1972.
9. Wilimovsky 1954.

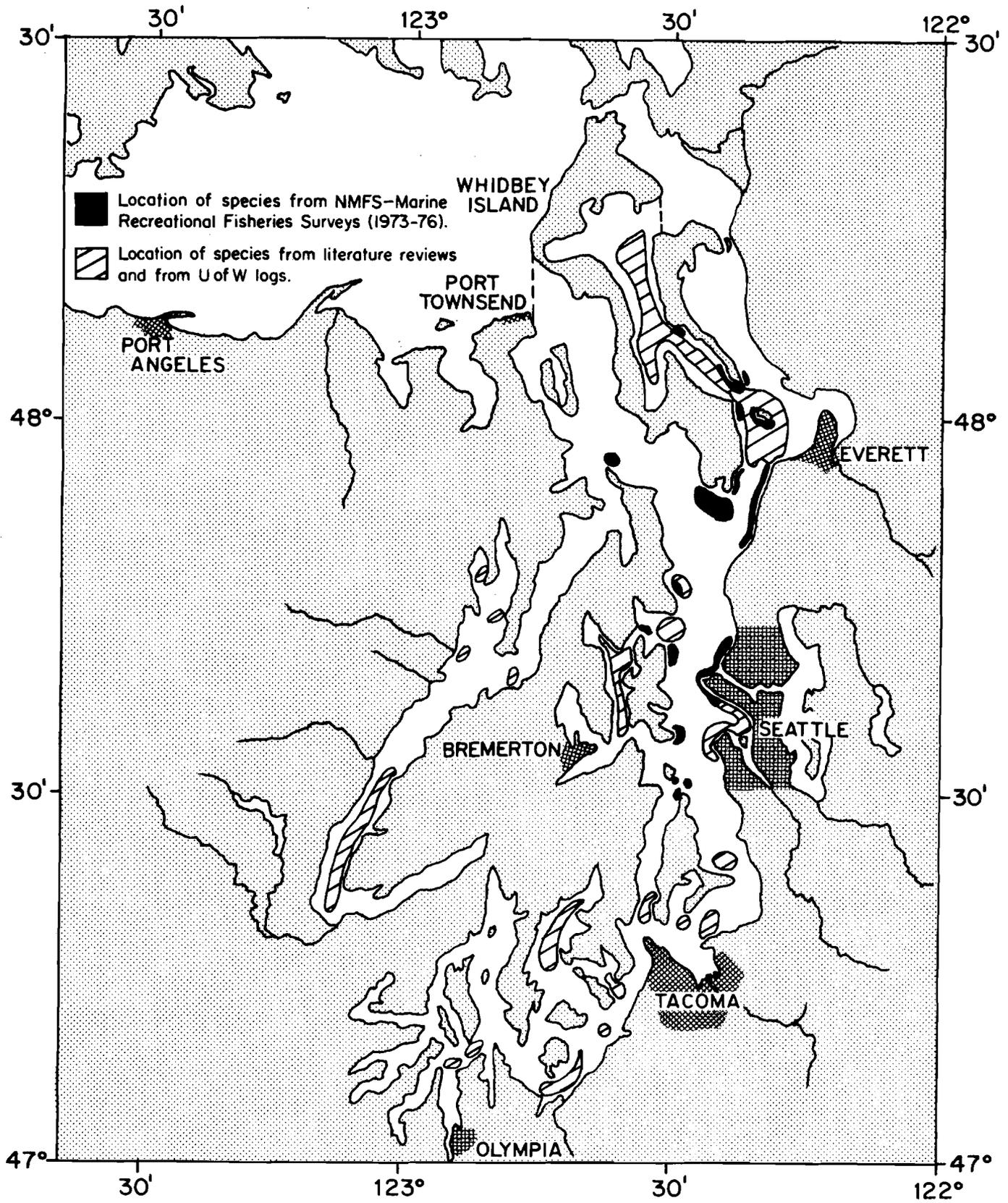


Figure 15 Known distribution of quillback rockfish, *Sebastes maliger*, in Puget Sound.

Black rockfish, Sebastes melanops

Local Names: Black snapper, black bass, nero, cherna, coastal black rockfish, Columbia River rockfish, blackcod, sea bass.

Recognition: Has large eyes. When the mouth is closed, the upper jaw extends at least to the rear of the eye (distinguishes from blue rockfish), black over entire head and body except for whitish belly.

Distribution: From southern California to the Gulf of Alaska.^{3,4,6}

Washington Distribution: Common in all marine waters of Washington except for south Puget Sound where it is absent.²

Habitat: Kelp beds, rocky shorelines. In summer it is found in shallow water. These fish are often found off the bottom.

Utilization: A small number are taken as an incidental catch in the commercial fishery. Very fine light-gear sportfish.

Size: To 23 inches.⁴ Specimens to 22 inches (56 cm) and 6 pounds in Puget Sound with unconfirmed reports of fish up to 10 pounds.

Baits and Lures: Herring, squid, plugs, spoons, spinners, flies, rubber worms, jigs.

Eating Qualities: Excellent.

Additional References:

1. Alverson, Pruter, and Ronholt 1964.
2. DeLacy, Miller, and Borton 1972.
3. Dunn and Hitz 1969.
4. Hart 1973.
5. Haw and Buckley 1971.
6. Miller and Lea 1972.
7. Phillips 1957.
8. Wilimovsky 1954.

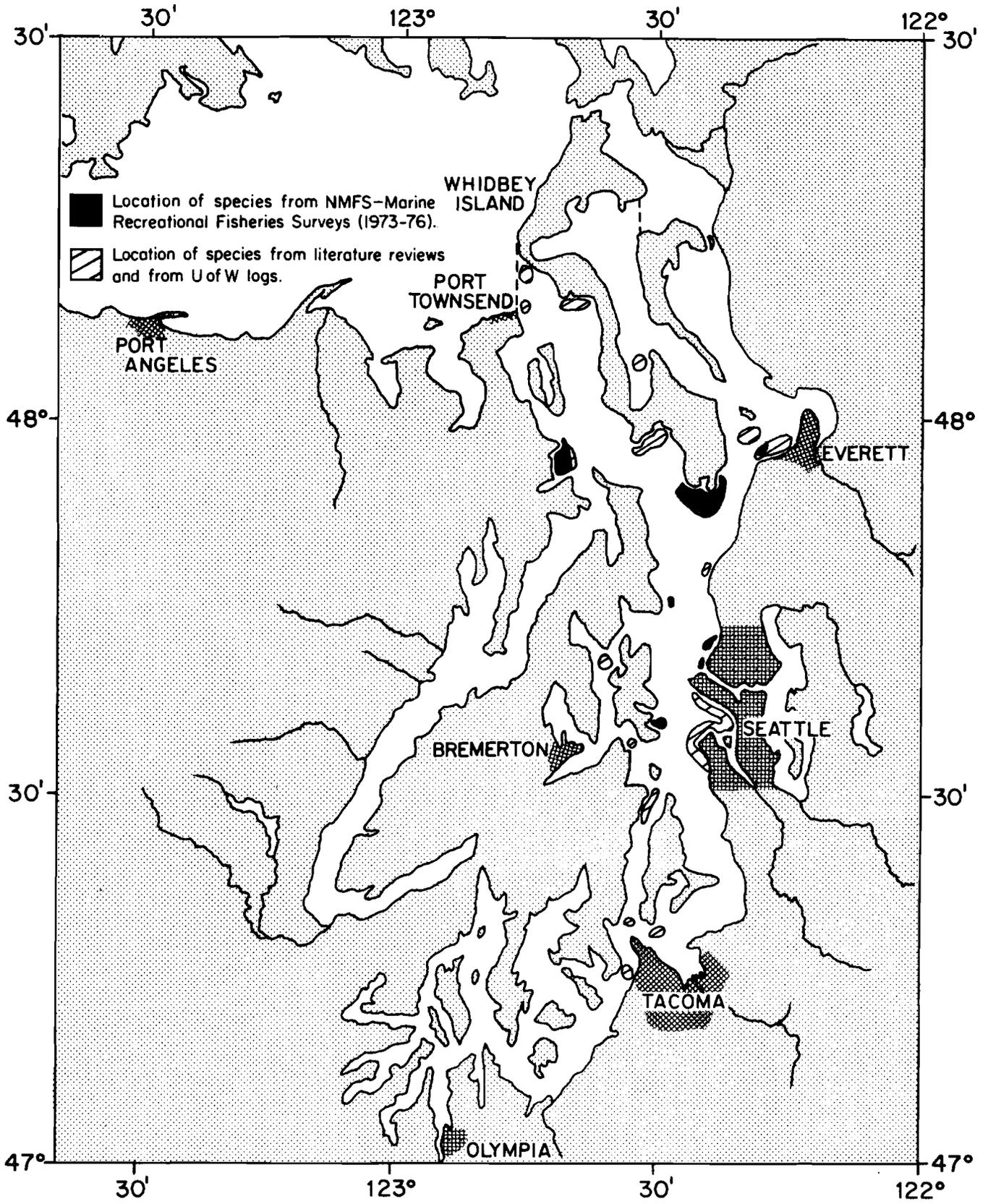


Figure 16 Known distribution of black rockfish, *Sebastes melanops*, in Puget Sound.

Bocaccio, Sebastes paucispinis

Local Names: Salmon grouper, tomcod, rock cod, spotted rockfish.

Recognition: Large mouth. Lower jaw extends beyond upper jaw. Dull red on head and back. May be pink on sides with dark blotches on sides.

Distribution: Baja California to British Columbia.^{3,4}

Washington Distribution: Relatively common in northern Puget Sound and Hood Canal. Less common in south Puget Sound.²

Habitat: Prefers deep water (more than 100 ft) deep. May be found over a variety of hard bottom types.

Utilization: Caught commercially in Washington and British Columbia. An important commercial species in California. Recently, an important sport species in south Puget Sound.

Size: To 36 inches.³ Specimens to 28-3/4 inches (73 cm) and 13 pounds collected from Puget Sound with reports of larger specimens 15 pounds unverified.

Baits and Lures: Herring, squid, jigs.

Eating Qualities: Fair. A little grainier flesh than other rockfish. Flesh exceptionally fatty for a rockfish. Smaller fish in 3-5 pound range best.

Additional References:

1. Davenport 1966. 2. DeLacy, Miller, and Borton 1972. 3. Hart 1973. 4. Miller and Lea 1972. 5. Moser 1967. 6, 7. Phillips 1964. 8. Roche and Halstead 1972. 9. Westrheim 1966b.

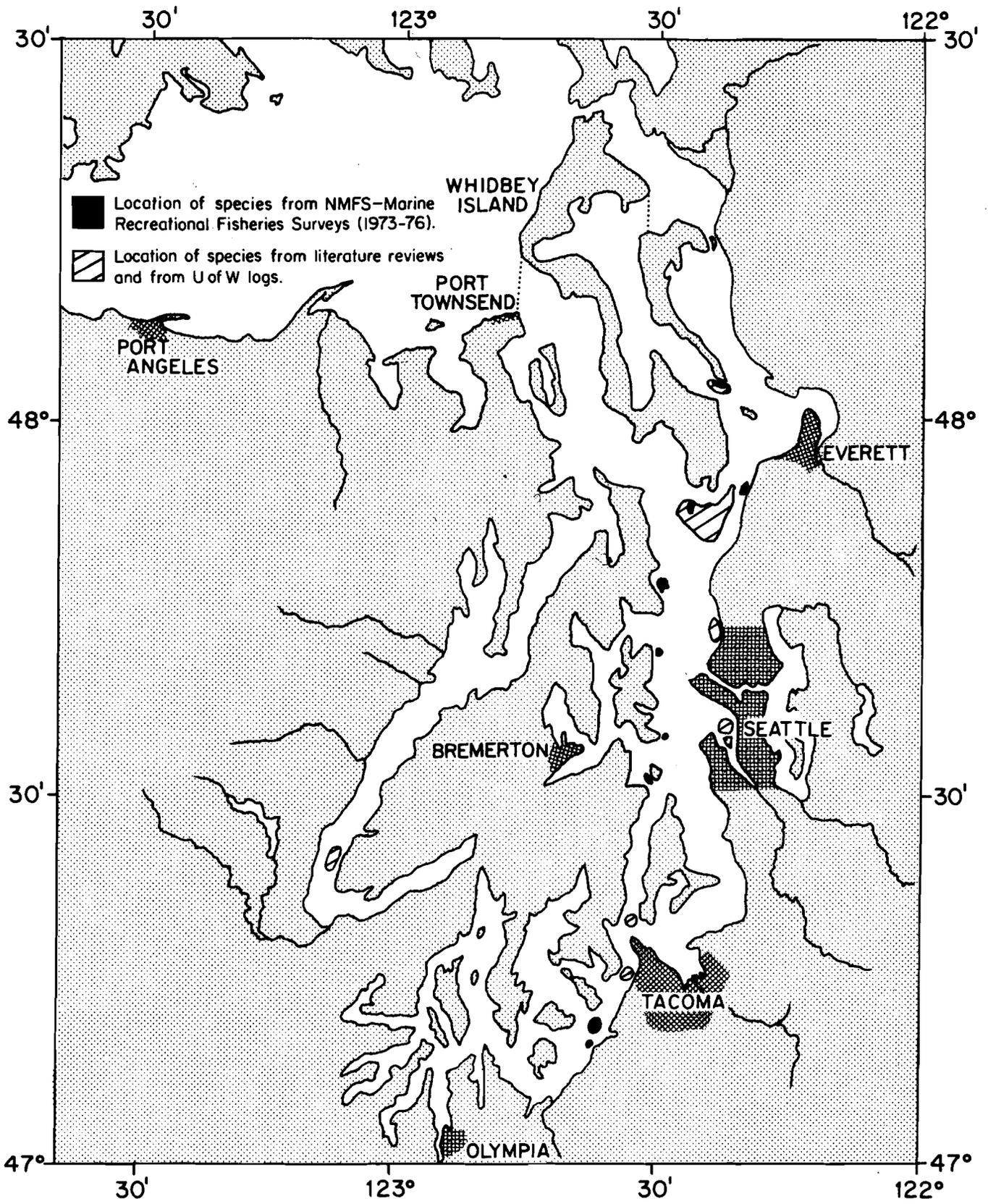


Figure 17 Known distribution of bocaccio, *Sebastes paucispinis*, in Puget Sound.

Canary rockfish, Sebastes pinniger

Local Names: Orange rockfish, yellow snapper, codalargo, filione, fantail, red rock cod, red snapper, bosco.

Recognition: Head and body orange with some dark speckles on back. Fins are bright orange.

Distribution: Baja California to southeast Alaska.^{3,5}

Washington Distribution: Found in northern Puget Sound, San Juans, and Strait of Juan de Fuca.²

Habitat: Prefers deep water (deeper than 150 ft). Found over hard bottom.

Utilization: An important part of the coastal commercial catch. Marketed "red snapper."

Size: To 30 inches.³ Specimens to 22 inches (56.4 cm) and 6 pounds collected from Puget Sound.

Baits and Lures: Herring, candlefish, squid, jigs, rubber worms.

Eating Qualities: Excellent.

Additional References:

1. Alverson, Pruter, and Ronholt 1964.
2. DeLacy, Miller, and Borton 1972.
3. Hart 1973.
4. Haw and Buckley 1971.
5. Miller and Lea 1972.
- 6,7. Phillips 1957, 1964.
8. Waldron 1968.
9. Westrheim 1966b.

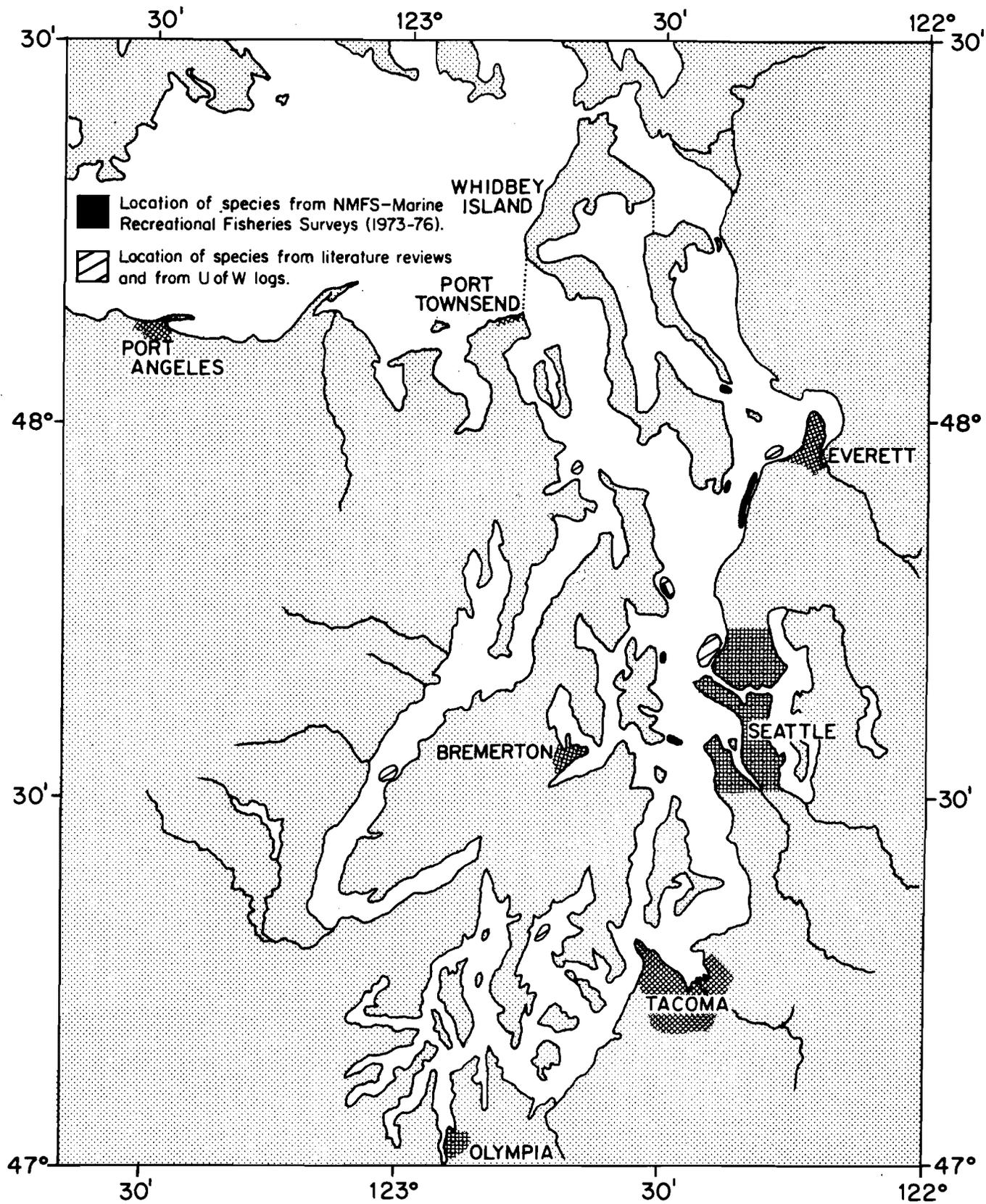


Figure 18 Known distribution of canary rockfish, Sebastes pinniger, in Puget Sound.

Redstripe rockfish, Sebastes proriger

Local Names: Little red rock cod, restripe cod.

Recognition: Clear red stripe running the full length of the lateral line canal. Green stripes radiating from eyes. Pale red, mottled with green and yellow.

Distribution: San Diego, California, to the Bering Sea.^{4,5}

Washington Distribution: Moderately common in San Juans and northern Puget Sound. Also found in Hood Canal and south Puget Sound.²

Habitat: Prefers moderately deep water over rocky bottoms.

Utilization: An incidental commercial species.

Size: Length to 20 inches⁴, uncommon over 12 inches (30 cm) in Puget Sound.²

Baits and Lures: Herring, jigs, rubber worms.

Eating Qualities: Excellent.

Additional References:

1. Alverson, Pruter, and Ronholt 1964.
2. DeLacy, Miller and Borton 1972.
3. Grinols 1965.
4. Hart 1973.
4. Miller and Lea 1972.
6. Phillips 1957.
7. Wilimovsky 1954.

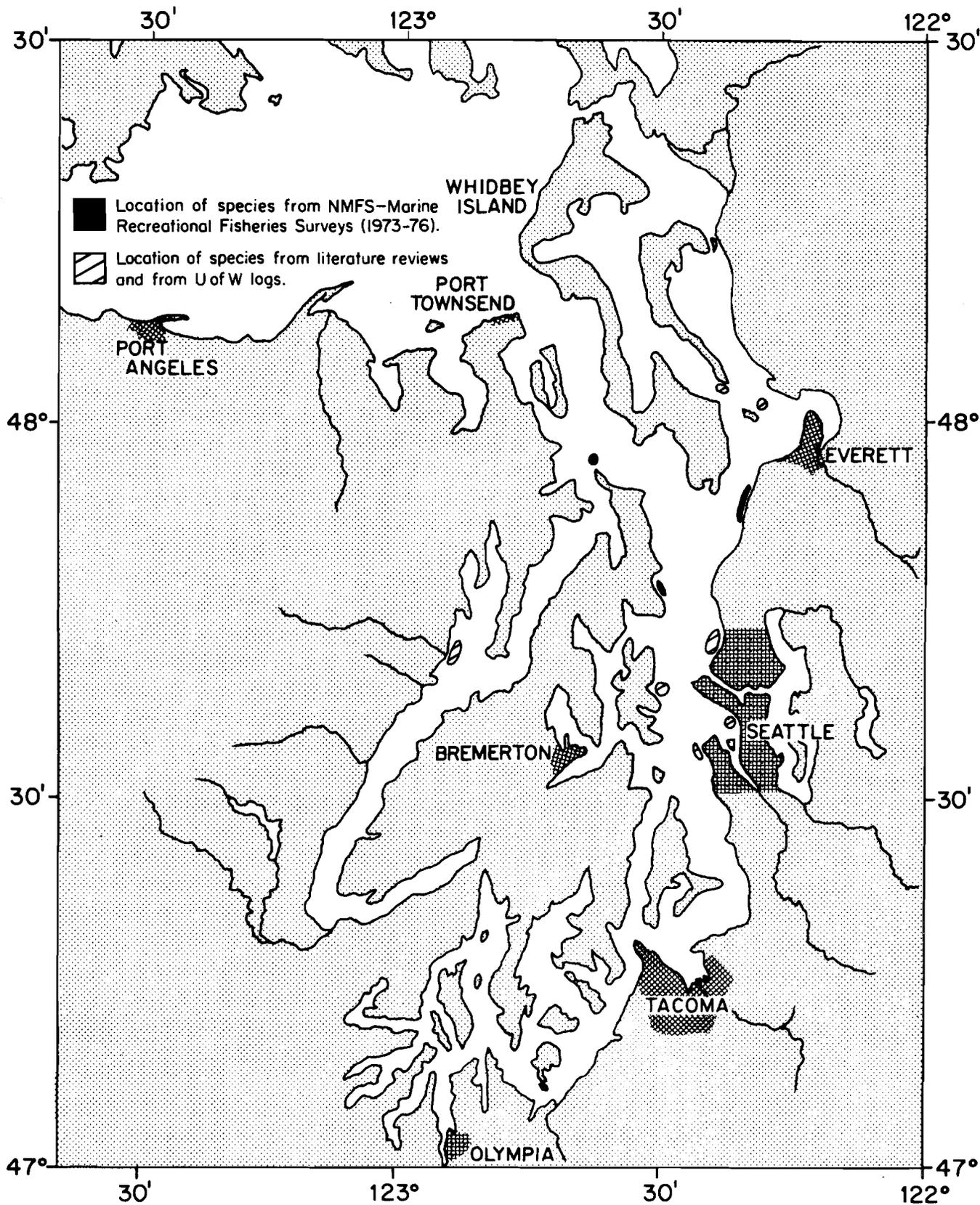


Figure 19 Known distribution of redstripe rockfish, *Sebastes proriger*, in Puget Sound.

Yelloweye rockfish, Sebastes ruberrimus

Local Names: Red snapper, pot belly, drum, tambor, vecchia, red rock cod, cowfish, turkey rockfish, rasphead rockfish.

Recognition: Orange red coloration. The fins are tipped with black and the eye is a bright yellow. Orange yellow over head and body. May be some black mottling around head.

Distribution: Baja California to Gulf of Alaska.^{8,10}

Washington Distribution: Common in coastal waters. San Juan Islands, Strait of Juan de Fuca, Puget Sound, and Hood Canal.⁵

Habitat: Found over reefs in deep water (deeper than 200 ft).

Utilization: Important commercial species. Usually caught by setlines. Sold as "red snapper." Highly prized by most anglers because of its large average size.

Size: To 36 inches.⁸ Specimens to 27-3/4 inches (70.1 cm) and 16 pounds have been collected in Puget Sound with unconfirmed reports of larger specimens.

Baits and Lures: Herring, squid, jigs, spoons, spinners.

Eating Qualities: Excellent.

Additional References:

1. Alverson, Pruter, and Ronholt 1964. 2. Barsukov 1964. 3. DeLacy, and Dryfoos 1962. 4. DeLacy, Hitz, and Dryfoos 1964. 5. DeLacy, Miller, and Borton 1972. 6. Grinols 1965. 7, 8. Hart 1942, 1973. 9. Haw and Buckley 1971. 10. Miller and Lea 1972. 11. Phillips 1957. 12. Welander and Alverson 1954. 13. Wilimovsky 1954.

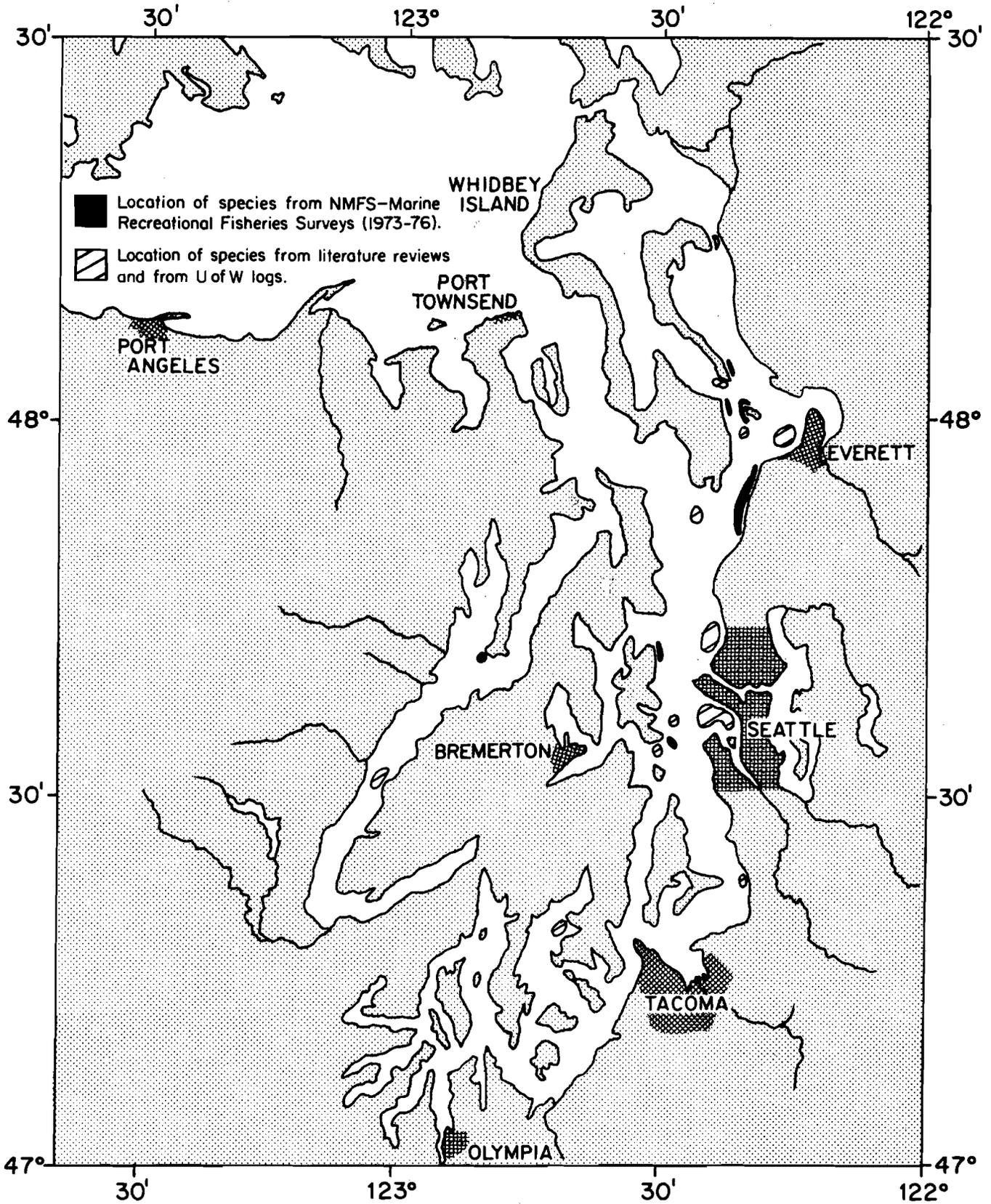


Figure 20 Known distribution of yelloweye rockfish, *Sebastes ruberrimus*, in Puget Sound.

SABLEFISH

Sablefish belong to the skilfish family, Anoplopomatidae, and are also known as blackcod (no relation to Pacific cod), the adults of this species are seldom, if ever, found in Puget Sound. Sablefish are available to Puget Sound anglers as 1-, 2-, and 3-year-old juveniles--probably having entered the Sound as pelagic eggs or larvae in water masses from the ocean or the Strait of Juan de Fuca. The adult female will produce several hundred thousand free-floating eggs.

Even though much smaller than adults which can grow to 40 inches in length and over 126 pounds, the youngsters found in the "Sound" are "alley fighters," putting up a more than respectable battle from their bottom home at 100 or so feet to the surface. This species is gaining popularity amongst bottom anglers because of the firm white flesh and the high oil content, which makes it a prime smoking fish.

Sablefish, Anoplopoma fimbria

NOTE: All photos have been deleted from this report
but will be available in the publication.

Sablefish, Anoplopoma fimbria

Local Names: Blackcod, coalfish, blue cod, butterfish.

Recognition: No spines on head or body. Two well-separated dorsal fins, that are almost equal in size. Black or greenish gray on back with a light gray on underside.

Distribution: Baja California to Alaska.¹⁷

Washington Distribution: Found in almost all marine waters of this state.¹¹ Common in Strait of Juan de Fuca, northern Puget Sound. Puget Sound has only juveniles. Species leaves by the end of its third year.

Habitat: Found over flat mud silt bottoms over a wide variety of depths.

Utilization: An important coastal commercial species, 40 thousand tons are landed annually, mainly by foreign fishing vessels off the coast. Prized in Midwest as Alaska blackcod--a smoked product. (Be careful, the oil will burn up your electric smoker.)

Size: To 40 inches¹⁷ along coast; much smaller (23-1/2 inches--59.4 cm and 4-1/4 lb) within Puget Sound (juveniles only).

Bait: Herring (plugged or spinner cut best).

Eating Qualities: The flesh is very oily, which results in an excellent smoked product. Good with beer or poached for breakfast.

Additional References:

1. Alverson 1960.
2. Alverson, Pruter, and Ronholt 1964.
3. Andriashev 1937.
4. Bailey, Carter, and Swain 1952.
5. Bell and Gharett 1945.
6. Bell and Pruter 1958.
7. Bourne and Pope 1969.
8. Brock 1940.
9. Conway 1967.
10. Cox 1948.
11. DeLacy, Miller and Borton 1972.
12. Edson 1954.
- 13, 14. Fisheries Research Board Canada 1966, 1967.
15. Grinols 1965.
16. Grinols and Gill 1968.
17. Hart 1973.
18. Haw and Buckley 1971.
19. Heyamoto 1963.
20. Heyamoto and Alton 1964.
21. Holmberg and Jones 1954.
- 22, 23. Kennedy 1968, 1970.
24. Kennedy and Pletcher 1968.
25. Ketchen and Forrester 1954.
26. Larkin and Ricker 1964.
27. Matsubara 1955.
28. Miller and Lea 1972.
29. Nikol'skii 1961.
30. Pasquale 1964.
- 31, 32. Phillips 1952, 1958a,
33. Phillips, Clothier, and Fry 1954.
- 34, 35. Pruter 1954, 1959.
36. Roedel 1953.
37. Thompson 1941.

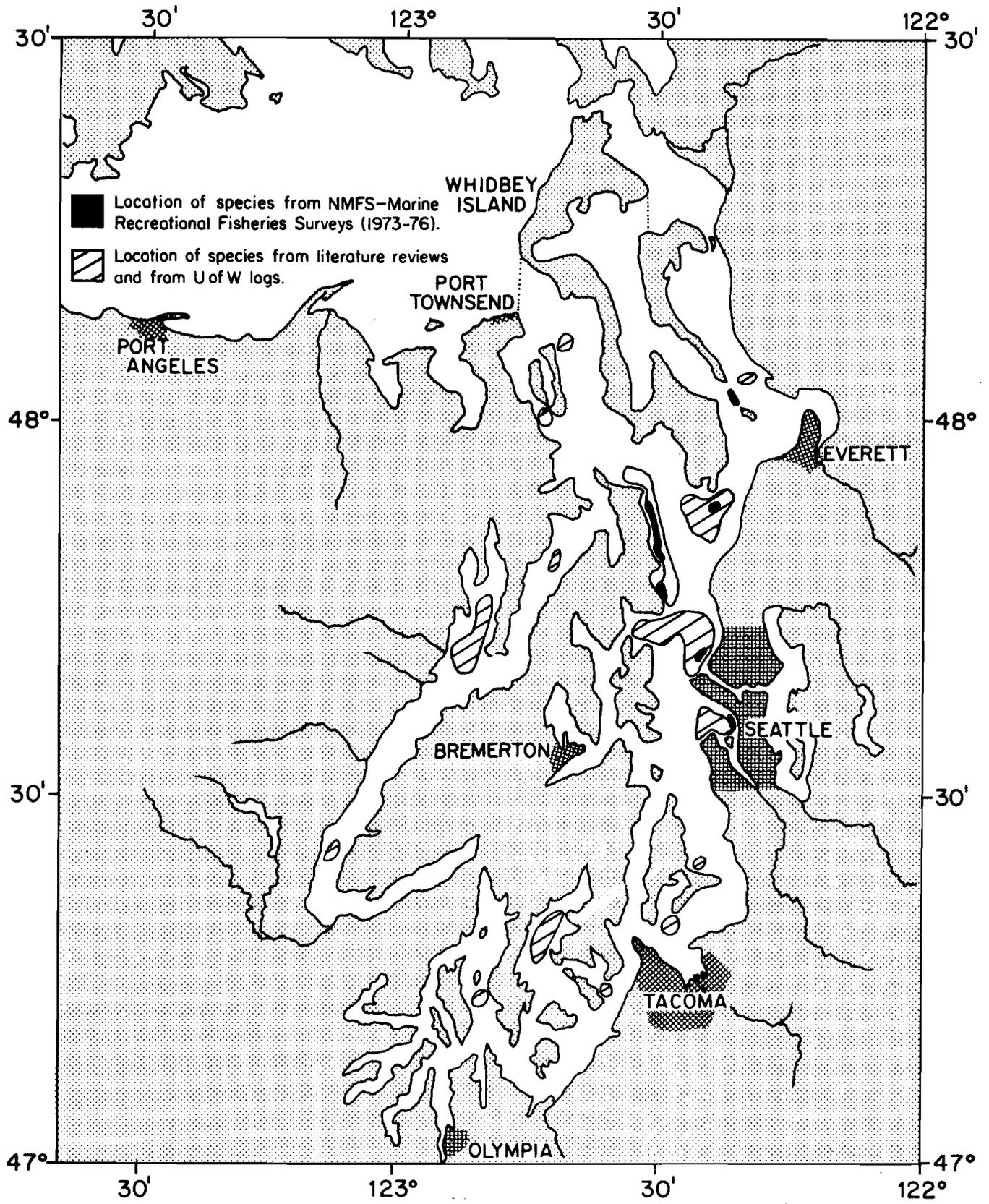


Figure 22 Known distribution of sablefish, *Anoplopoma fimbria*, in Puget Sound.

GREENLINGS

Members of this family, Hexagrammidae, vary widely in coloration and size from the smaller whitespotted greenling to the massive lingcod (no relation to Pacific cod, rockfish, or sablefish), which have been caught weighing up to 105 pounds in British Columbia. Only the lingcod is of commercial importance to the United States.

Kelp greenling, Hexagrammus decagrammos
Whitespotted greenling, Hexagrammos stellari
Lingcod, Ophiodon elongatus

NOTE: All photos have been deleted from this report
but will be available in the publication.

Kelp greenling, Hexagrammus decagrammos

Recognition: Two pairs of "fleshy flaps" above eyes, long dorsal fin with about 21 spines and five lateral lines on body. Color depends on sex. Females have a slate brown or gray body covered with round reddish spots. The males have slate brown or gray bodies with large turquoise spots on the head and anterior part of body.

Distribution: From Los Angeles Harbor to Alaska.^{5,7}

Washington Distribution: Found in moderate numbers, in Strait of Juan de Fuca, San Juans, Bellingham area, central Puget Sound. Not common in south Puget Sound or Hood Canal.⁴

Habitat: Found in shallow water over rocky and sandy bottoms. Most common in kelp beds and over reefs.

Utilization: Not caught commercially.

Size: Length to 22 inches.⁵ Specimens to 17-1/2 inches (44.5 cm) have been collected from Puget Sound.

Baits and Lures: Herring, candlefish, rubber worms.

Eating Qualities: Excellent.

Additional References:

1, 2, 3. Barraclough 1967a, b, c. 4. DeLacy, Miller, and Borton 1972. 5. Hart 1973. 6. Haw and Buckley 1971. 7. Miller and Lea 1972. 8, 9. Robinson, Barraclough, and Fulton 1968a, b. 10. Roedel, Roedel 1953. 11. Wilimovsky 1964.

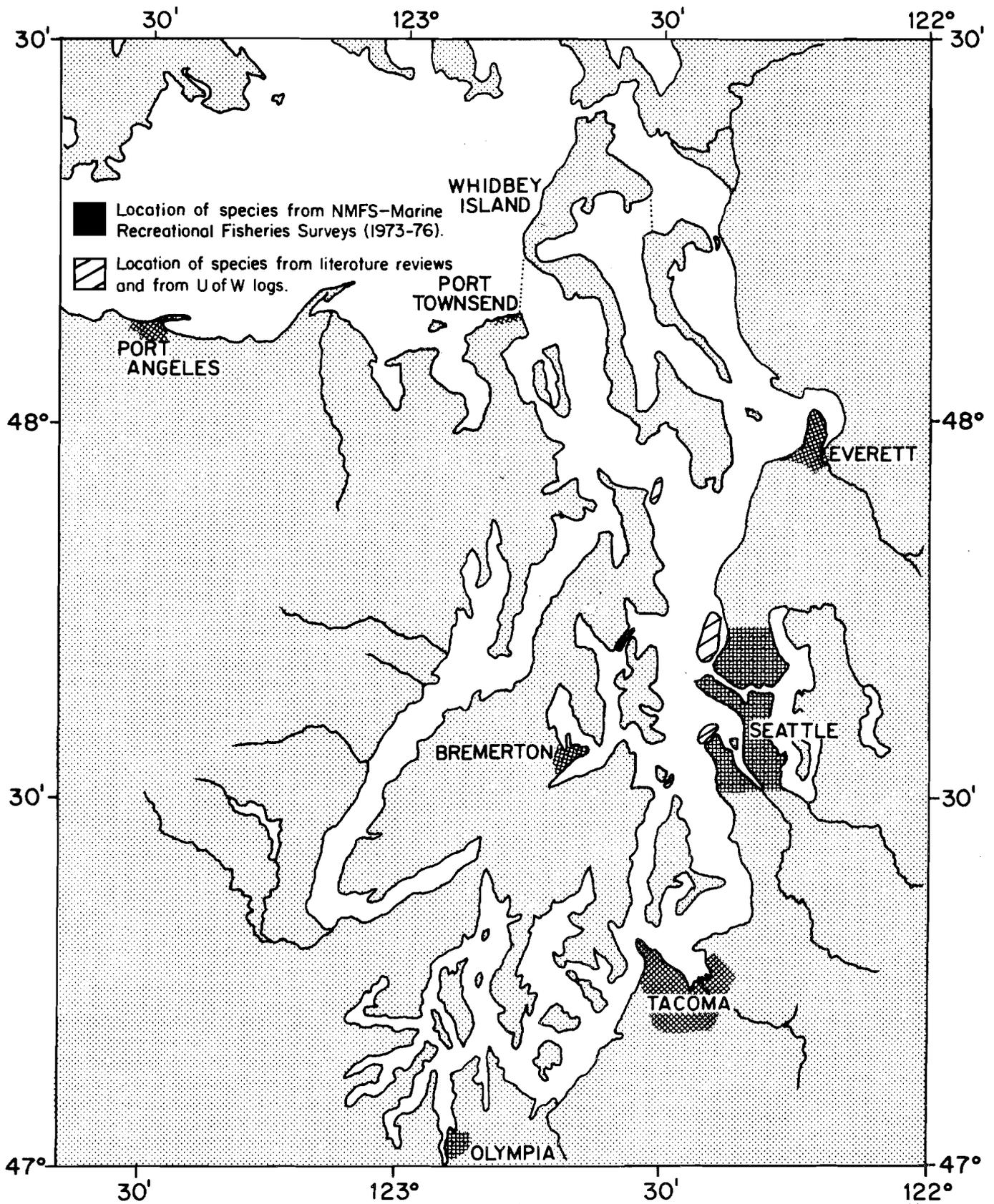


Figure 24 Known distribution of kelp greenling, *Hexagrammos decagrammus*, in Puget Sound.

Whitespotted greenling, Hexagrammos stellari

Recognition: One small fleshy flap above each eye, small white spots all over body, five lateral lines. Usually mostly green but may vary from pale red to tan with dark bars or spots. White spots over body.

Distribution: Northern California to Alaska.^{5,8}

Washington Distribution: Found in moderate numbers in Strait of Juan de Fuca, San Juans, and Puget Sound.

Habitat: Prefers rocky areas in shallow water.

Utilization: Not caught commercially.

Size: Length to 24 inches.⁵ Specimens to 14-1/2 inches (37 cm) collected from Puget Sound.

Baits and Lures: Herring, candlefish, jigs, rubber worms.

Eating Qualities: Excellent.

Additional References:

1. Barraclough and Fulton 1968.
2. Barraclough, Robinson, and Fulton 1968.
3. DeLacy, Dryfoos, and Miller 1963.
4. DeLacy, Miller, and Borton 1972.
5. Hart 1973.
6. Haw and Buckley 1971.
7. Matsubata 1955.
8. Miller and Lea 1972.
9. Popov 1933.
10. Roedel 1953.
11. Schmidt 1950.
- 11, 12. Wilimovsky 1954, 1964.

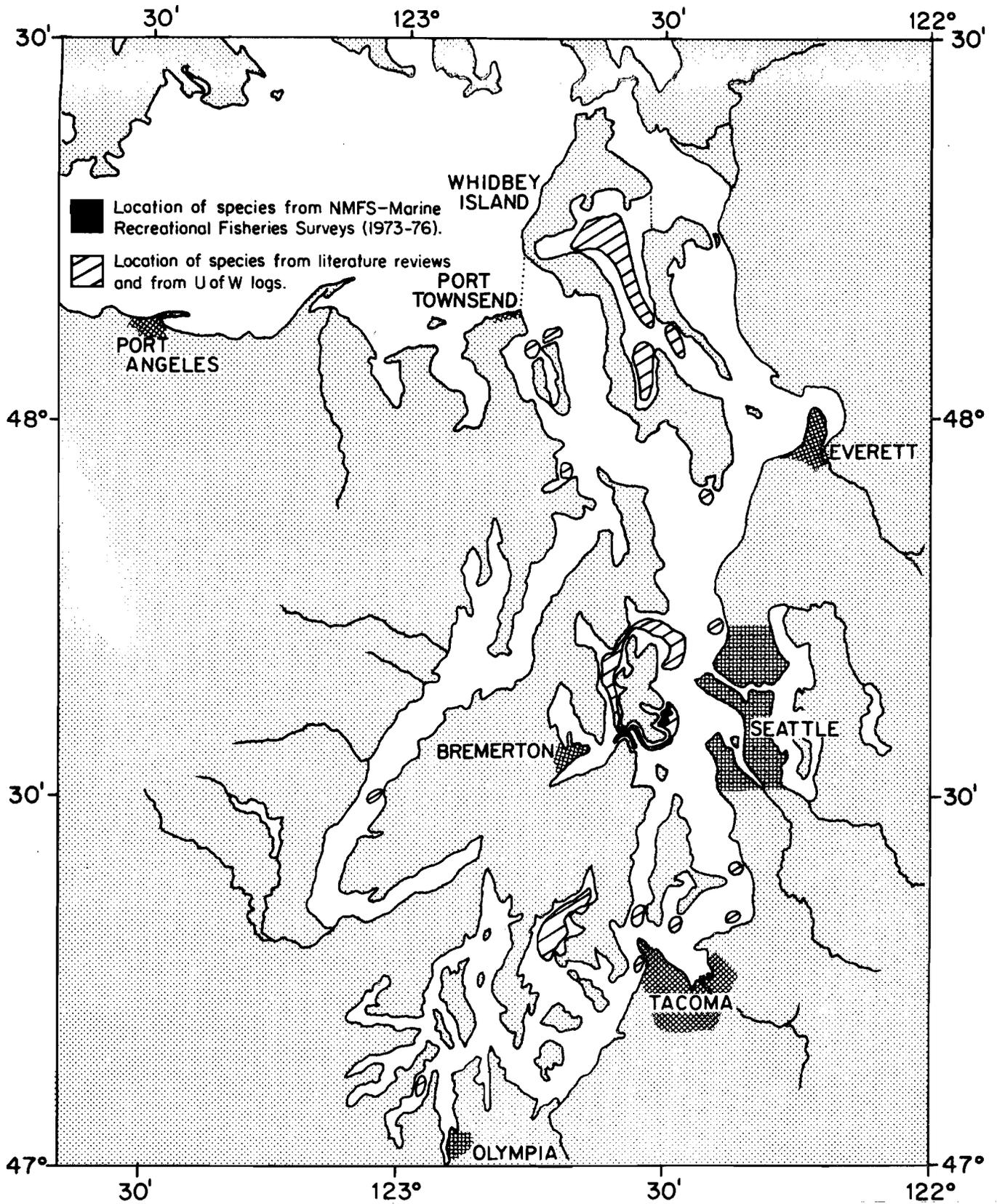


Figure 25 Known distribution of whitespotted greenling, *Hexagrammos stellari*, in Puget Sound.

Lingcod, Ophiodon elongatus

Recognition: Elongated body with large mouth, large teeth, and long dorsal fin. Very variable. May be green to dark brown. Color depends on environment.

Distribution: Baja California to Alaska. Greatest abundance is in vicinity of British Columbia.^{24,28,29}

Washington Distribution: Found in all marine waters of the State. Most common along the coast, the western Strait of Juan de Fuca and the San Juan Islands. Less common in central Puget Sound.¹⁵

Habitat: Prefer rocky bottoms where there is a strong tidal current. Usually found in deep water in summer and shallow water in winter.

Utilization: An important commercial fish. Over 2 million pounds of lingcod are landed annually--mostly from coastal waters.

Size: Length to 5 feet.²⁴ Specimens to 41 inches (104 cm) and 26 pounds collected from Puget Sound with many unverified reports of much larger specimens.

Baits and Lures: Herring, plugs, jigs, spoons, rubber worms.

Eating Qualities: Excellent. The pale blue/green color flesh turns white during cooking.

Additional References:

1. Alverson 1960. 2. Alverson, Pruter, and Ronholt 1964. 3. Bailey, Carter, and Swain 1952. 4, 5, 6. Barraclough 1967a, b, c. 7, 8. Barraclough and Fulton 1967, 1968. 9. Biological Board of Canada 1935. 10, 11, 12, 13. Chatwin 1954, 1965a, b, 1968. 14. Clothier 1950. 15. DeLacy, Miller, and Borton 1972. 16, 17. Fisheries Research Board Canada 1954, 1967. 18. Fitch 1949. 19. Forrester 1969. 20. Grinols 1965. 21, 22, 23, 24. Hart 1943a, b, 1967, 1973. 25. Haw and Buckley 1971. 26. Ketchen 1950a. 27. Larkin and Ricker 1964. 28. Miller and Lea 1972. 29. Phillips 1959. 30, 31. Robinson, Barraclough, and Fulton 1968a, b. 32. Roedel 1948. 33. Wendler 1953. 34. Wilby 1937.

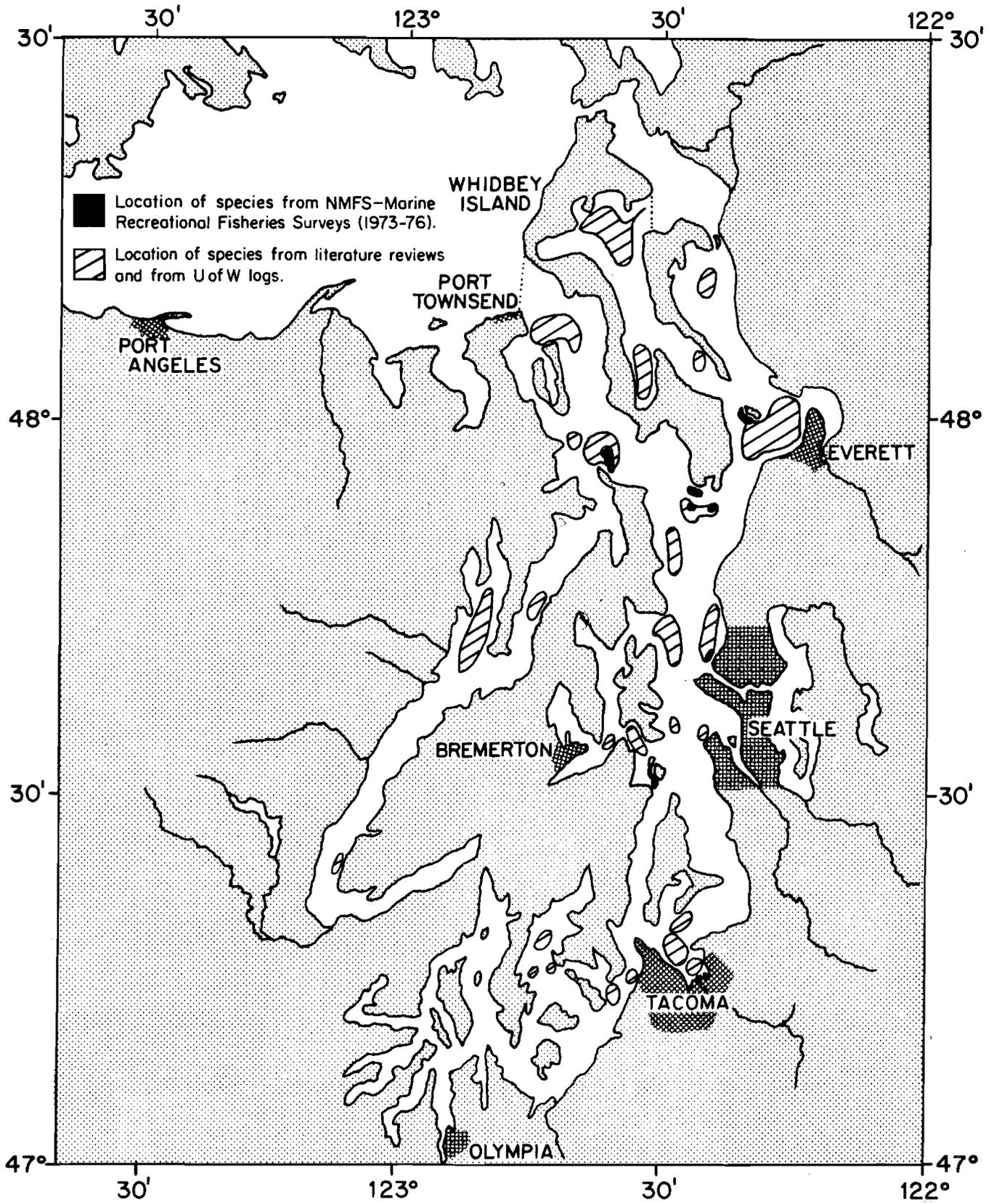


Figure 26 Known distribution of lingcod, *Ophiodon elongatus*, in Puget Sound.

SCULPINS

The family Cottidae is an extremely large and diverse group. While most are important as forage for other fishes, only a few species are large enough to be of true recreational importance. While the flesh of some species is of high quality, the eggs of the Cabezon are extremely poisonous.

Red Irish lord, Hemilepidotus hemilepidotus
Pacific staghorn sculpin, Leptocottus armatus
Cabezon, Scorpaenichthys marmoratus

NOTE: All photos have been deleted from this report
but will be available in the publication.

Red Irish lord, Hemilepidotus hemilepidotus

Local Names: Spotted Irish lord, bullhead.

Recognition: Has a single dorsal fin that has three different levels; there is a band of scales, 4-5 scales wide, surrounding dorsal fin. Variable, mainly red with mottling all over body. Not always red--some may be brownish.

Distribution: From central California to Bering Sea.^{5,7}

Washington Distribution: Common in Puget Sound; not recorded from Hood Canal.⁴

Habitat: Occurs in shallow water over rocky bottoms.

Utilization: Not caught commercially.

Size: Length to 20 inches (50.8 cm).⁵

Baits and Lures: Herring, jigs, rubber worms.

Eating Qualities: Good.

Additional References:

1. Arai 1969. 2, 3. Barraclough 1967a, b. 4. DeLacy, Miller, and Borton 1972. 5. Hart 1973. 6. Haw and Buckley 1971. 7. Miller and Lea 1972. 8. Peden 1964. 9. Popov 1933. 10, 11. Wilimovsky 1954, 1964.

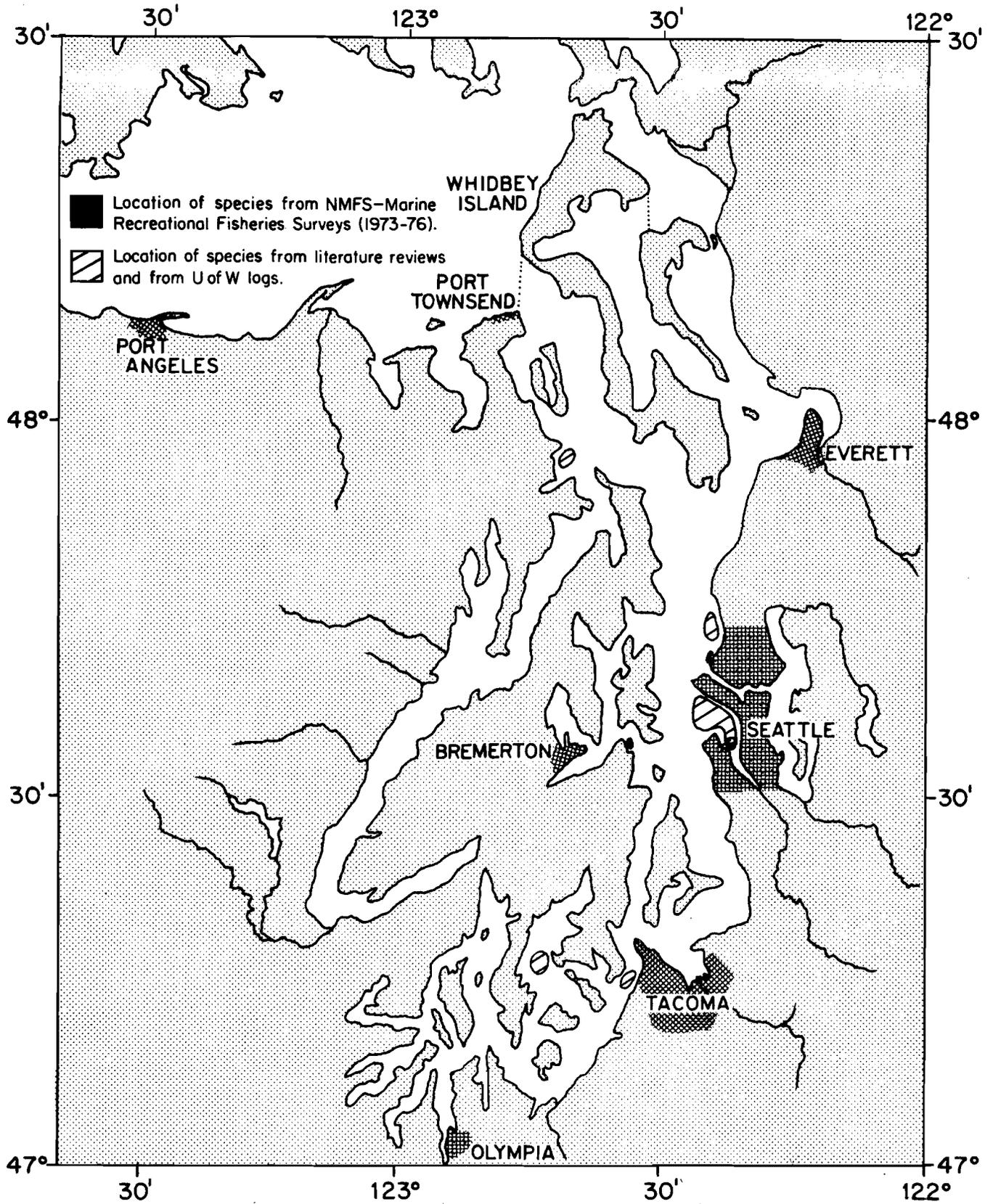


Figure 28 Known distribution of red Irish lord, Hemilepidotus hemilepidotus, in Puget Sound.

Pacific staghorn sculpin, Leptocottus armatus

Local Names: Staghorn sculpin, buffalo sculpin, buffalo fish, bullhead.

Recognition: No scales on body. There is a large spine on each gill cover and a dark spot on the rear portion of the spinous dorsal fin. Olive gray to green with some yellow on back. Orange-yellow to white on stomach.

Distribution: Baja California to the Gulf of Alaska.^{2,4}

Washington Distribution: Found in all marine waters of Washington. Very abundant throughout Puget Sound and the San Juans.¹

Habitat: Usually found in very shallow water over nonrocky bottoms but may occur in water over 100 feet deep. Often enters lower portions of rivers and streams.

Utilization: Not caught commercially. This species is one of the more common catches for the shore or pier angler. Mainly thought of as a pest, but fillets a good bait. Try live for ling cod.

Size: Length to 18 inches (45.7 cm).²

Eating Qualities: Good.

Baits and Lures: Herring, jigs, rubber worms.

Additional References:

1. DeLacy, Miller, and Borton 1972.
2. Hart 1973.
3. Haw and Buckley 1971.
4. Miller and Lea 1972.
5. Roedel 1948.
6. Wilimovsky 1954.

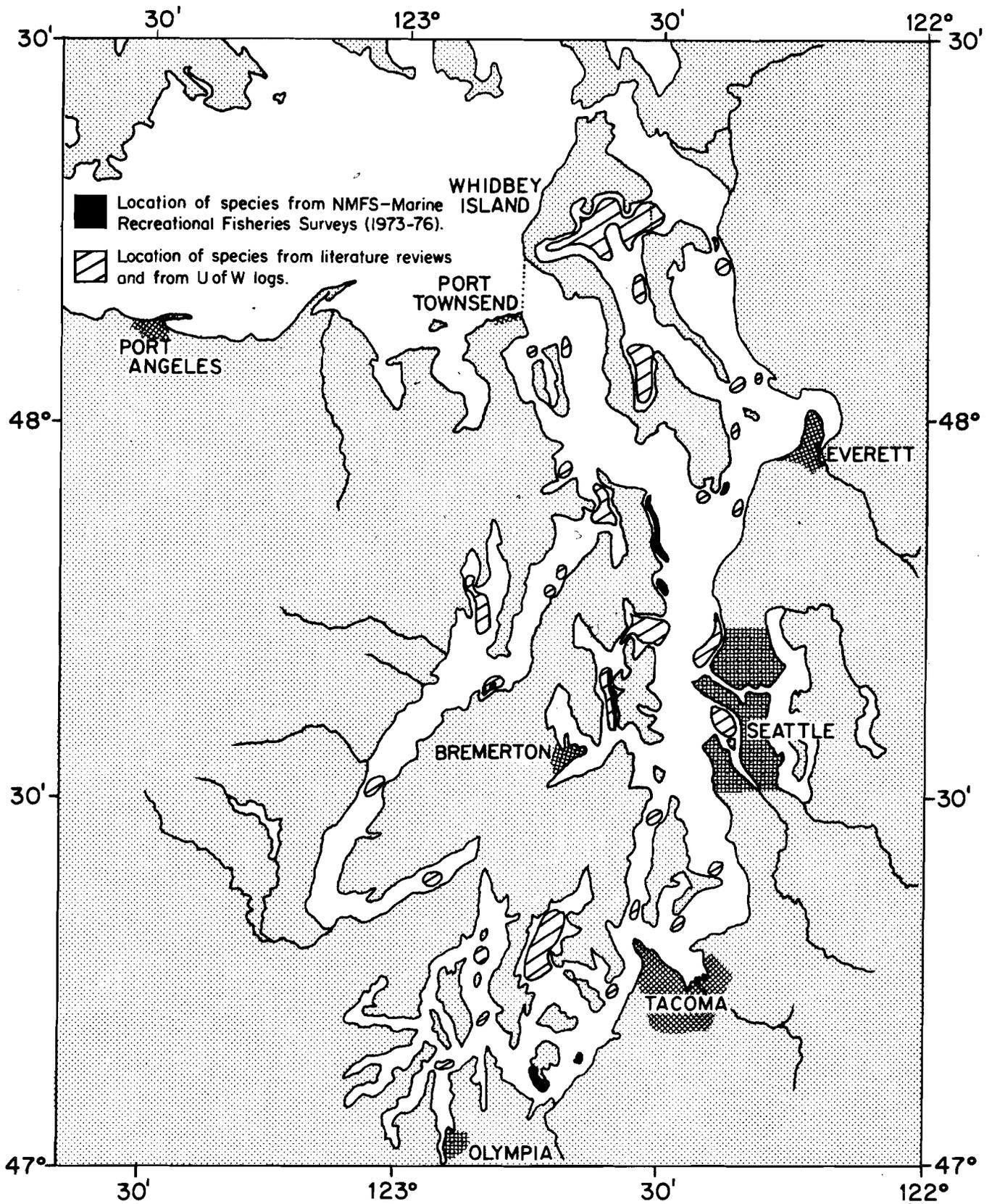


Figure 29 Known distribution of Pacific staghorn sculpin, *Leptocottus armatus*, in Puget Sound.

Cabezon, Scorpaenichthys marmoratus

Local Names: Giant marbled sculpin, bullhead, blue cod.

Recognition: Flaplike fleshy stalk on snout with a mottled appearance over head and body. Green to brown or gray over entire body, mottled with large pale areas. Color is very variable.

Distribution: Baja California to south Alaska.^{4,7}

Washington Distribution: Abundant in area of Port Orchard. Found throughout Washington shallow marine waters.³

Habitat: Prefers shallow water (3-80 ft) over rocky and sandy bottoms.

Utilization: Caught commercially occasionally, but eaten by only the knowledgeable few.

Size: Length to 30 inches.⁴ Specimens to 24-1/2 inches (68.1 cm) and 9-1/4 pounds from Puget Sound with unconfirmed reports of individuals much larger.

Baits and Lures: Squid, ghost shrimp, crabs, jigs, rubber worms.

Eating Qualities: Excellent. (Caution: the eggs are poisonous.) One of the better eating fish in Puget Sound. Don't let the greenish flesh scare you off (it turns white when cooked).

Additional References:

1. Barraclough 1967a.
2. Clothier 1950.
3. DeLacy, Miller, and Borton 1972.
4. Hart 1973.
5. Haw and Buckley 1971.
6. Hubbs and Wick 1951.
7. Miller and Lea 1972.
8. O'Connell 1953.
9. Pillsbury 1957.
10. Quast 1968.
11. Roedel 1948.

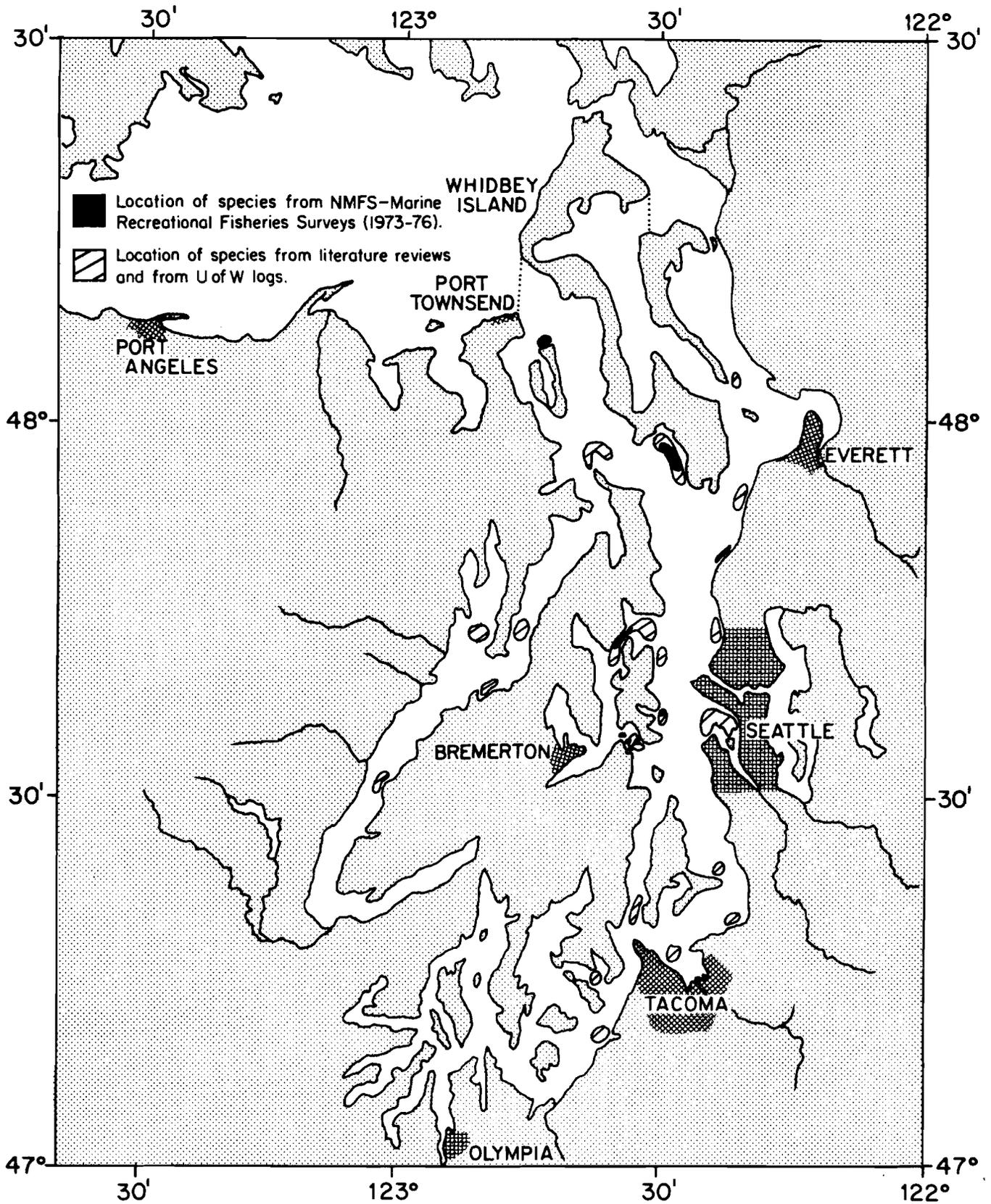


Figure 30 Known distribution of cabezon, *Scorpaenichthys marmoratus*, in Puget Sound.

SANDDABS - LEFT EYE FLATFISHES

The sanddabs (family Bothidae) are very abundant in Puget Sound found over sandy bottoms in moderate to shallow waters, 30-80 feet. Dabs are so voracious at times that they can be pests. Included in this group are the speckled and the Pacific sanddab. The Pacific is the larger and the more commonly caught in Puget Sound. The speckled is too small to be considered of recreational importance.

Pacific sanddab, Githarichthys sordidus

NOTE: All photos have been deleted from this report
but will be available in the publication.

Pacific sanddab, Citharichthys sordidus

Local Names: Mottled sanddab, megrim, soft flounder, sanddab.

Recognition: Mouth on left side of head. There is a bony bridge between the eyes. The diameter of the lower eye is greater than the length of the snout. On eyed side, dull brown. May be mottled with black. Blind side is white to light brown.

Distribution: Baja California to Alaska.^{8,10}

Washington Distribution: Found in all marine waters of Washington. Especially common around Seattle, Everett, and central Puget Sound.⁵

Habitat: Found in shallow water (to 80 ft) over a variety of bottom types. Most common over gravel, sand, or mud bottoms.

Utilization: A small commercial fishery exists in British Columbia and California. A very good live bait for lingcod.

Size: To 16 inches.⁸ Uncommon over 10 inches in Puget Sound (to 10-1/2 inches--26.5 cm).

Baits and Lures: Herring (best spinner or plug cut), polychaetes, clams, jigs, spinners, flies.

Eating Qualities: Good--highly regarded in California and by many people in the Puget Sound area. Try skinning instead of filleting.

Additional References:

1. Alverson, Pruter, and Ronholt 1964.
2. Arora 1951.
3. Batts 1964.
4. Clothier 1950.
5. DeLacy, Miller, and Borton 1972.
6. Demory 1971.
7. Grinols 1965.
8. Hart 1973.
9. Haw and Buckley 1971.
10. Miller and Lea 1972.
11. Roedel 1948.
12. Smith 1936.
13. Wilimovsky 1954.

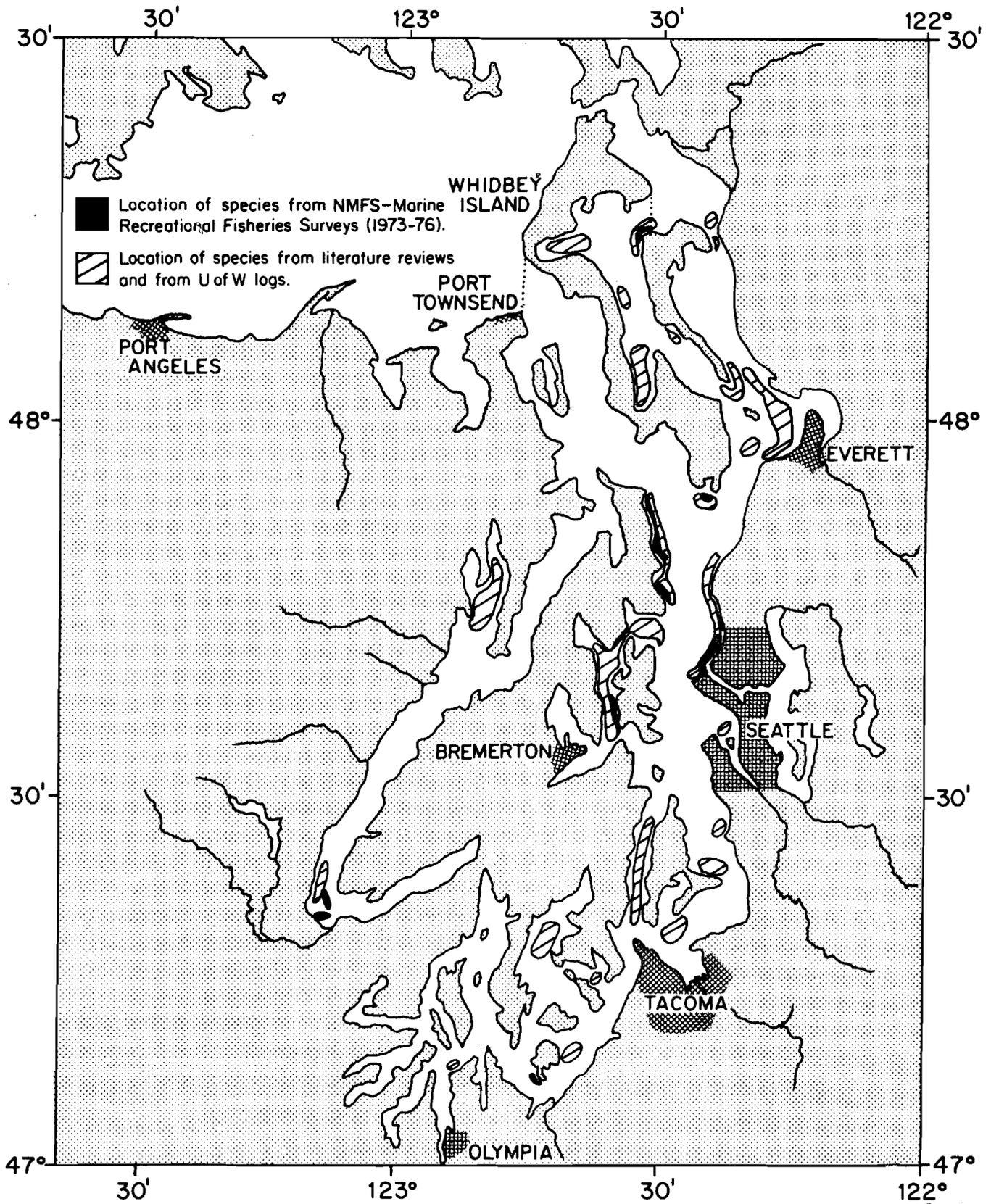


Figure 32 Known distribution of Pacific sanddab, *Citharichthys sordidus*, in Puget Sound.

FLOUNDERS

This is one of the larger families (Pleuronectidae), in terms of numbers of species and individuals present in Puget Sound. This is probably due to the fact that the major portion of Puget Sound habitat is well suited to flatfishes--sand, mud, or silt bottoms.

Arrowtooth flounder, Atheresthes stomias
Petrale sole, Eopsetta jordani
Flathead sole, Hippoglossoides elassodon
Pacific halibut, Hippoglossus stenolepis
Rock sole, Lepidopsetta bilineata
English sole, Parophrys vetulus
Starry flounder, Platichthys stellatus
C-O sole, Pleuronichthys coenosus
Sand sole, Psettichthys melanostictus

NOTE: All photos have been deleted from this report
but will be available in the publication.

Arrowtooth flounder, Atheresthes stomias

Local Names: Long jaw flounder, turbot, French sole, English flounder, bastard halibut, arrowtooth halibut.

Recognition: Very large mouth (extends behind eyes), and long, sharp teeth. It has a slender body compared to most flatfish. Brown on eyed side. Blind side is white and finely dotted with black.

Distribution: Central California to Bering Sea. It is most common in British Columbia and Alaska.¹⁰

Washington Distribution: Found in all marine waters. Found throughout Puget Sound, especially near Everett, Port Orchard, and throughout central and southern Puget Sound.⁵

Habitat: Prefers moderately deep water (more than 75 ft) and soft bottoms.

Utilization: Large amounts are sold annually for mink food. There is minimal market for human consumption.

Size: Length to 33 inches (83.8 cm).¹⁰

Baits or Lures: Herring.

Eating Qualities: Fair.

Additional References:

1. Alverson, Pruter, and Ronholt 1964.
2. Andriashev 1937.
3. Barraclough and Fulton 1968.
4. Batts 1964.
5. DeLacy, Miller, and Borton 1972.
- 6, 7. Forrester 1958, 1968.
8. Gotshall 1969.
9. Grinols 1965.
10. Hart 1973.
11. Haw and Buckley 1971.
12. Miller and Lea 1972.
13. Nikol'skii 1961.
14. Roedel 1948.
15. Taylor 1967.

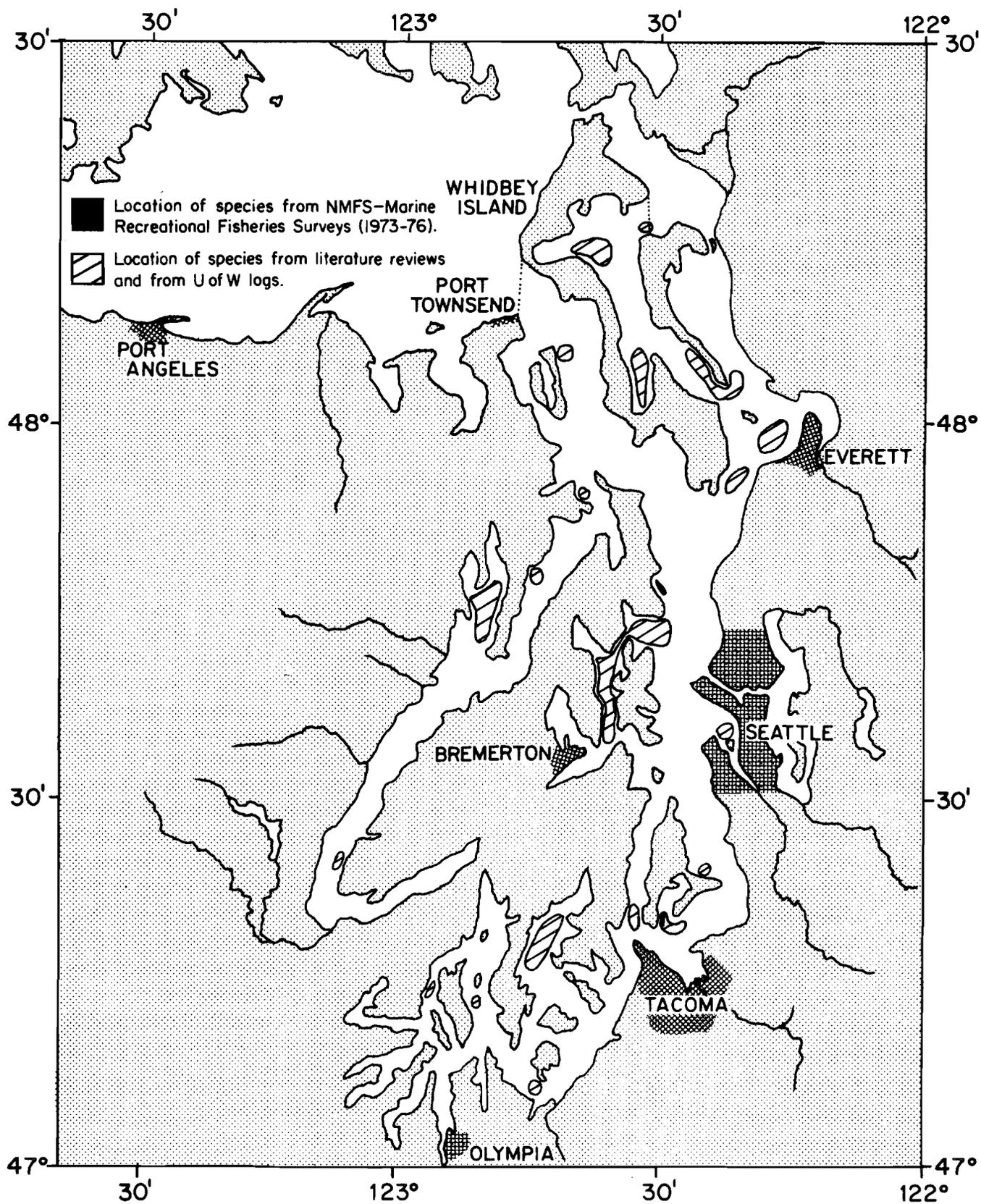


Figure 34 Known distribution of arrowtooth flounder, *Atheresthes stomias*, in Puget Sound.

Petrable sole, Eopsetta jordani

Local Names: Brill, California sole, English sole, Jordan's flounder.

Recognition: Large mouth (maxillary extends under eye). Two rows of teeth in upper jaw. The scales are small. Eyed side is an even olive brown. Blind side is white.

Distribution: Northern Baja California to the Bering Sea.^{17,20}

Washington Distribution: Abundant along the coast of Washington, but in limited numbers in Puget Sound.¹⁰

Habitat: Prefers deep water. In winter, moves into very deep water (400 ft or more) to spawn. During the rest of the year, from 150 to 200-ft depths.

Utilization: A very valuable commercial species. Two million pounds are taken annually by Washington coastal trawlers.¹³

Size: Length to 27 inches (68.6 cm),¹⁷ generally smaller in Puget Sound.

Baits and Lures: Herring, candlefish, rubber worms.

Eating Qualities: Excellent. Probably the finest eating "small" flatfish of the northeastern Pacific Ocean.

Additional References:

1. Alderdice and Forrester 1968.
2. Alverson 1960.
3. Alverson and Chatwin 1957.
4. Alverson, Pruter, and Ronholt 1964.
5. Barraclough 1954a.
6. Batts 1964.
7. Best 1963a.
8. Cleaver 1949.
9. Clemens and Wilby 1961.
10. DeLacy, Miller, and Borton 1972.
11. DiDonato and Pasquale 1970.
12. Evermann and Goldsborough 1907.
13. Forrester 1969a.
14. Forrester and Alderdice 1967.
15. Forrester and Smith 1971.
16. Grinols 1965.
17. Hart 1973.
18. Harry 1959.
19. Haw and Buckley 1971.
20. Miller and Lea 1972.

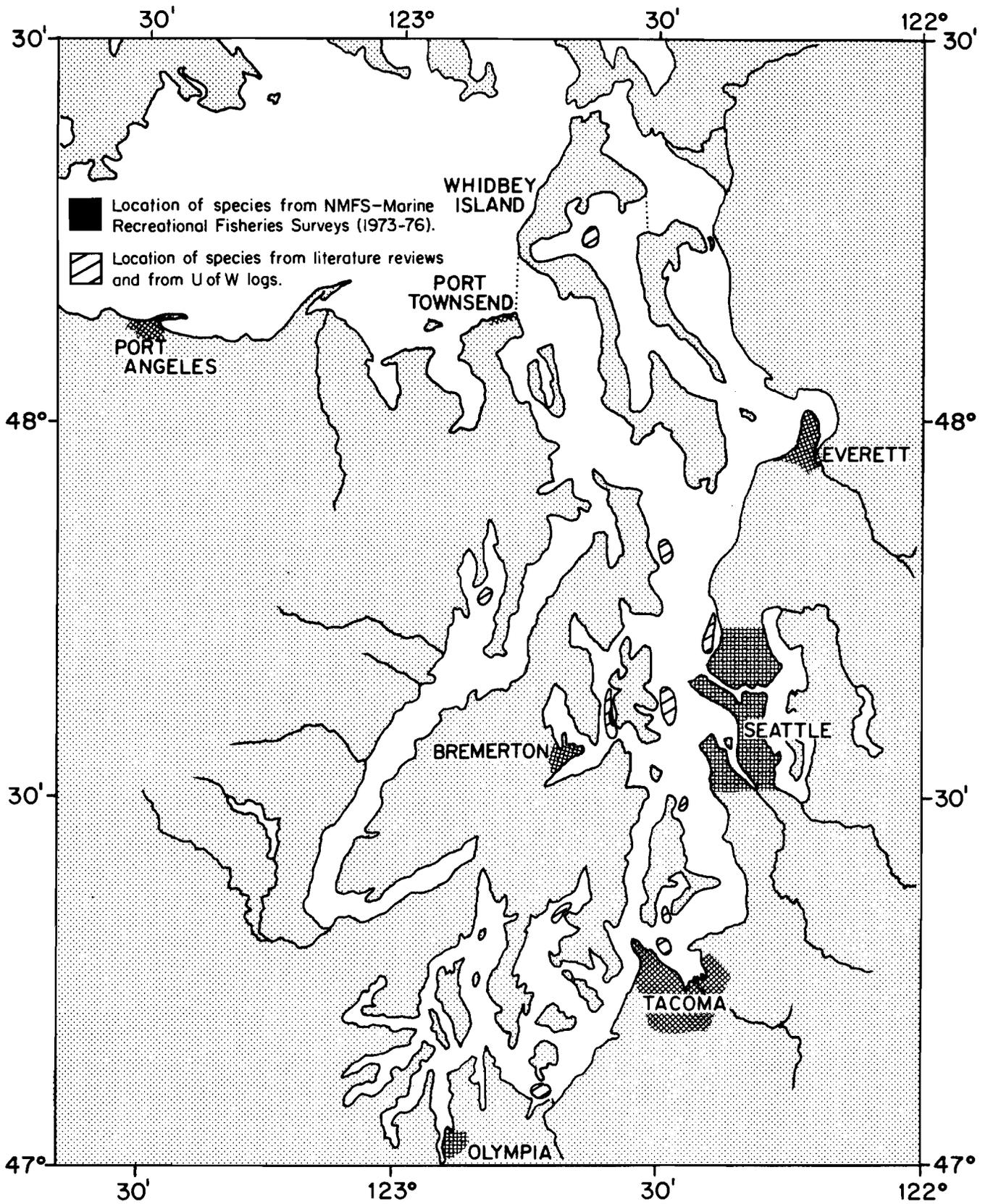


Figure 35 Known distribution of petrale sole, *Eopsetta jordani*, in Puget Sound.

Flathead sole, Hippoglossoides elassodon

Local Names: Paper sole, cigarette paper, false halibut.

Recognition: Mouth extends to pupil of eye but not beyond, end of tail is nearly straight and teeth on the upper jaw are in one row. Gray to brown on eyed side. Dusky blotches on fins.

Distribution: Northern California to Alaska.^{9,13}

Washington Distribution: Found in all marine waters of Washington State.⁴

Habitat: Prefers deep water--usually well over 150 feet.

Size: Length to 18 inches.⁹ Generally smaller in Puget Sound.

Utilization: Generally used in reduction and animal food.

Baits and Lures: Herring, candlefish, rubber worms.

Eating Qualities: Fair to poor--too much work for a small flesh yield.

Additional References:

1. Alverson, Pruter, and Ronholt 1964. 2. Andriashev 1937. 3. Batts 1964. 4. DeLacy, Miller, and Borton 1972.^{1/} 5. English 1966. 6. Forrester and Alderdice 1968. 7. Gilbert and Burke 1912. 8. Grinols 1965. 9. Hart 1973. 10. Haw and Buckley 1971. 11. Matsubara 1955. 12. Miller 1969. 13. Miller and Lea 1972. 14. Mineva 1964. 15. Schmidt 1950. 16. Smith 1936. 17. Townsend 1936. 18. Wilimovsky, Peden, and Peppar 1967.

^{1/} English, T. S. 1966. English sole egg studies. Contract Rep. Northwest Pulp Pap. Assoc. 93 p.

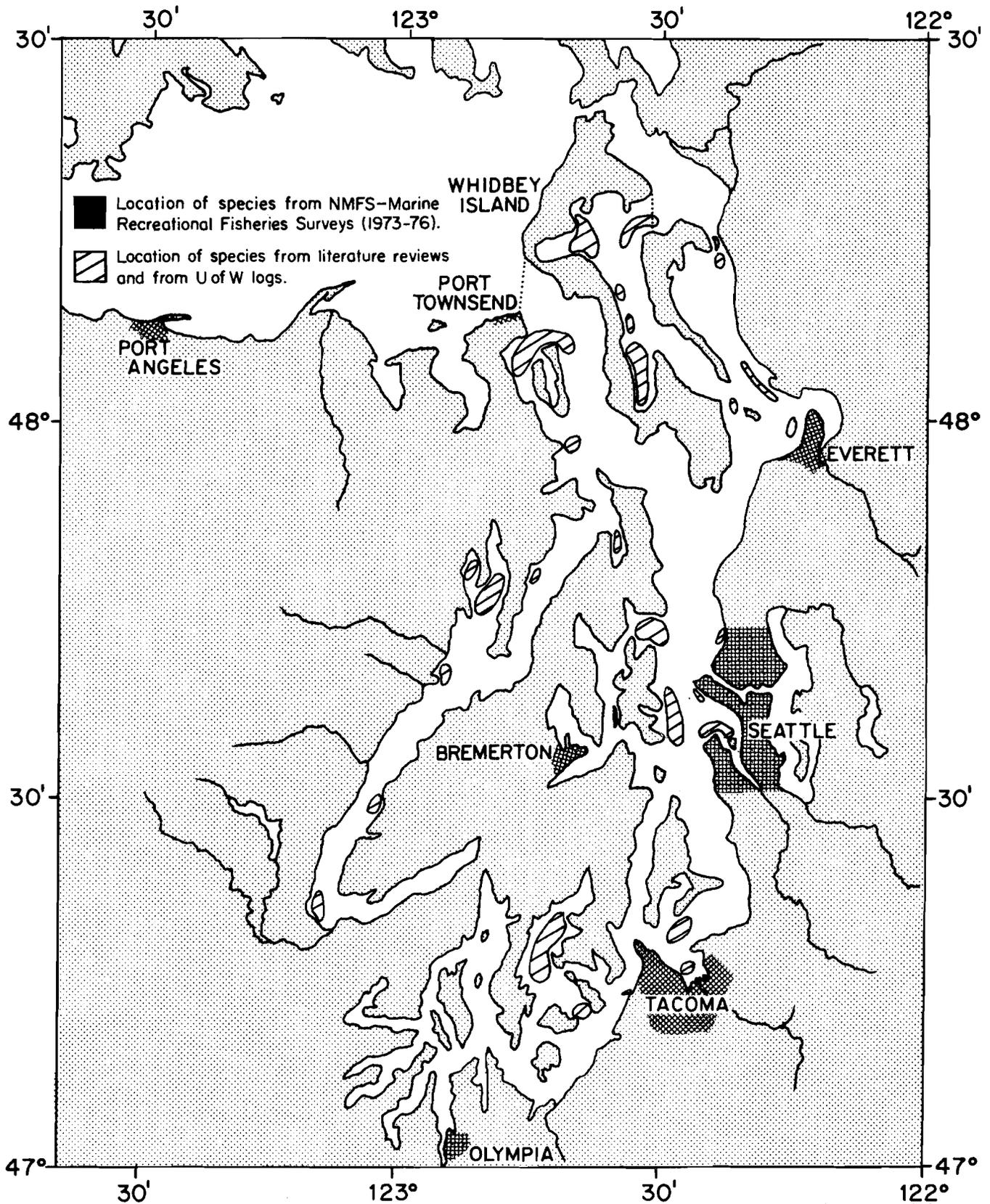


Figure 36 Known distribution of flathead sole, *Hippoglossoides elassodon*, in Puget Sound.

Pacific halibut, Hippoglossus stenolepis

Local Names: Northern halibut, right halibut, alabato.

Recognition: Moderately large mouth with conical teeth, arched lateral line, and smooth scales. Any flatfish larger than 15 pounds in this region is likely to be a halibut. Dark brown or gray on eyed side. Usually white on blind side.

Distribution: Southern California to Bering Sea. Uncommon south of Columbia River.^{8,15}

Washington Distribution: Most common along the Strait of Juan de Fuca. Also found in San Juan Islands, Hood Canal, and Admiralty Inlet.³ Not common in central Puget Sound.

Habitat: Prefers water deeper than 100 feet.

Utilization: An important commercial and sports species. Over 50 million pounds were caught commercially in 1970. In Washington the average sport catch is about 1,200 fish annually, mostly by salmon fishermen who generally can only land fish less than 20 pounds.

Size: To 8 feet, 9 inches and over 500 pounds,⁸ to 200 pounds in Strait of Juan de Fuca and Puget Sound. Several unconfirmed reports of individuals to 50 pounds in Puget Sound.

Baits and Lures: Herring, jigs, spoons, plugs, spinners.

Eating Qualities: Excellent. Smaller fish ("chickens") best eating.

Additional References:

1. Alverson, Pruter, and Ronholt 1964.
2. Bell and Pruter 1958.
3. DeLacy, Miller, and Borton 1972.
4. *English 1966.
5. Gray 1964.
6. Grinols 1965.
7. Hardman and Southward 1965.
8. Hart 1973.
9. Haw and Buckley 1971.
10. International Pacific Halibut Commission 1965.
11. Kask 1936.
12. Ketchen 1956a.
13. Larkin and Ricker 1964.
14. Matsubara 1955.
15. Miller and Lea 1972.
- 16, 17, 18. Myre 1966, 1967, 1969.
19. Novikov 1969.
20. Peltinen 1969.
21. Phillips 1958b.
22. Popov 1933.
23. Ricker 1963.
24. Schmidt 1934.
25. Schmidt 1950.
- 26, 27, 28, 29. Southward 1961, 1962, 1967, 1968.
30. Southward and Chapman 1965.
31. Thompson and Freeman 1932.
33. Thompson and Herrington 1930.
34. Thompson and VanCleve 1936.
35. Townsend 1936.
36. VanCleve 1936.

*See footnote 1 page 40.

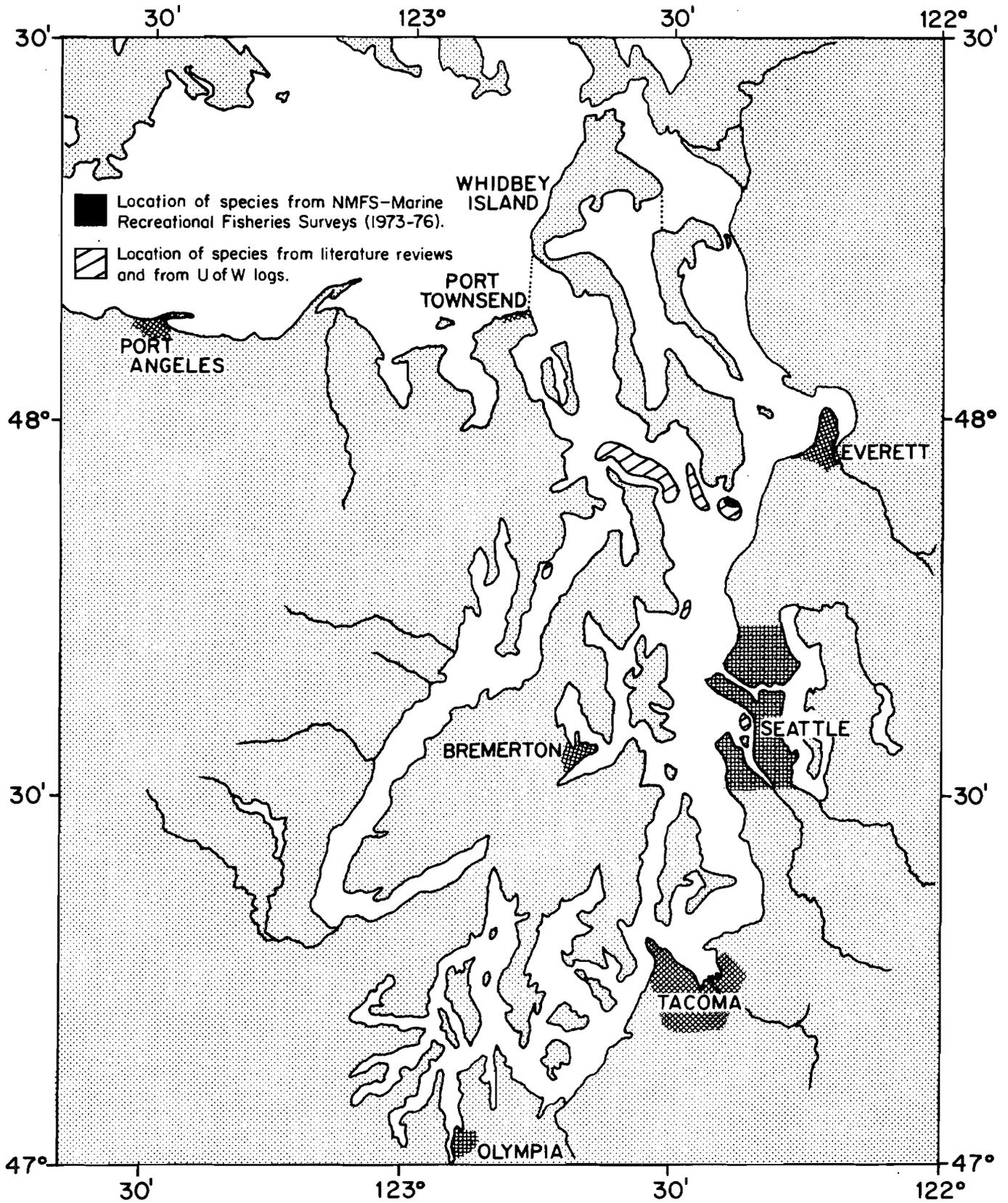


Figure 37 Known distribution of Pacific halibut, *Hippoglossus stenolepis*, in Puget Sound.

Rock sole, Lepidopsetta bilineata

Local Names: Rough back sole, gravel sole, double-line sole.

Recognition: The lateral line has a large arch directly behind gill cover. The scales are very rough. On eyed side, gray or brown, irregularly blotched.

Distribution: Southern California to Bering Sea.^{9,14}

Washington Distribution: Very common in all marine waters inside of Cape Flattery.

Habitat: Found over a wide range of depths.

Utilization: Highly prized as a foodfish. A target species of a large commercial fishery along the Washington coast and in Puget Sound. Landings by Washington trawlers total about 650,000 pounds a year, and most are taken off the coast.

Size: To a length of 23 inches⁹; specimens to 14-3/4 inches (37.5 cm) from Puget Sound.

Baits and Lures: Herring.

Eating Qualities: Excellent.

Additional References:

1. Alverson 1960.
2. Alverson, Pruter, and Ronholt 1964.
3. Batts 1964.
4. DeLacy, Miller, and Borton 1972.
- 5, 6, 7. Forrester 1964b, c, 1969b.
8. Forrester and Thompson 1969.
9. Hart 1973.
10. Haw and Buckley 1971.
11. Ketchen, Peterson, and Forrester 1951.
12. Larkin and Ricker 1964.
13. Levings 1965.
14. Miller and Lea 1972.
15. Mineva 1964.
16. Nishishiamamoto 1958.
17. Roedel 1948.
18. Shubnikov and Lisovenko 1964.
19. Smith 1936.
20. Wilimovsky, Peden, and Peppar 1967.

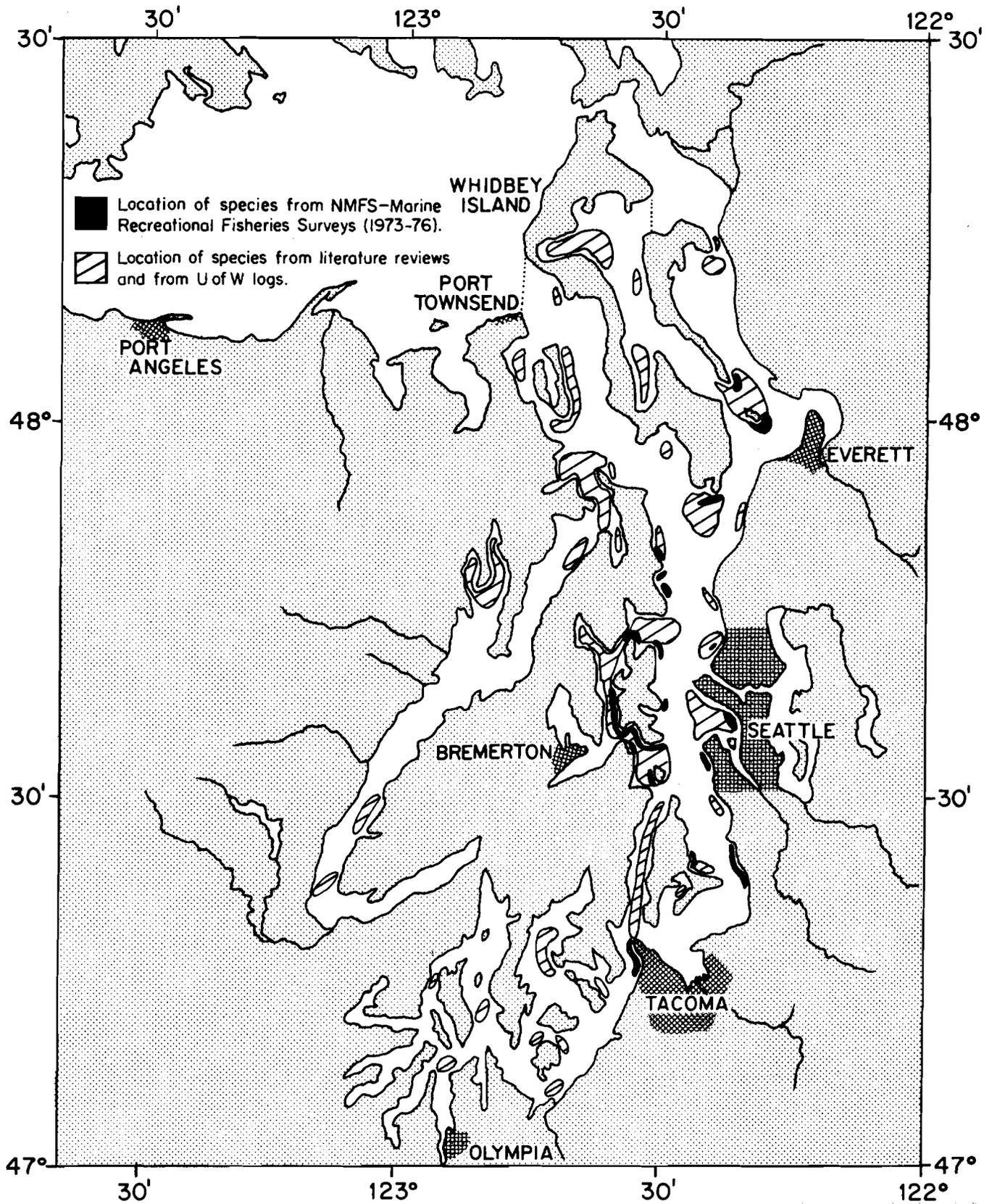


Figure 38 Known distribution of rock sole, *Lepidopsetta bilineata*, in Puget Sound.

English sole, Parophrys vetulus

Local Names: Lemon sole, common sole, California sole, pointed nose sole, sharp nose sole.

Recognition: Pointed head with a small mouth. The lateral line does not have an arch. A rather slender fish. Uniformly brown on eyed side. Blind side is pale yellow to white.

Distribution: Baja California to Alaska.¹⁷

Washington Distribution: Extremely abundant in all marine waters of the state.

Habitat: Prefers soft or sandy bottoms. Most of these fish are found in deep water but during the summer, many move into shallow water.

Utilization: A target species of a substantial commercial fishery along the Washington coast (500,000 lb per year) and in Puget Sound (1.5 million lb per year).

Size: Length to 22 inches.¹⁷ Specimens to 17-1/2 inches (44.2 cm) from Puget Sound.

Baits and Lures: Herring, pileworms, clam necks, rubber worms.

Additional References:

1. Alderdice and Forrester 1968.
2. Alverson 1960.
3. Angell 1972.
4. Batts 1964.
5. Budd 1940.
6. Clothier 1950.
7. DeLacy, Miller, and Borton 1972.
8. Demory 1971.
- 9, 10. English 1966*, 1967.
11. El-Sayed 1959.
12. Fisheries Research Board Canada 1967.
- 13, 14, 15, 16. Forrester 1956, 1967, 1969b, c.
17. Hart 1973.
18. Harry 1959.
19. Haw and Buckley 1971.
20. Holland 1969.
21. Jow 1969.
- 22, 23, 24, 25, 26. Ketchen 1945, 1947a, b, 1950b.
27. Ketchen and Forrester 1951.
28. Ketchen, Peterson, and Forrester 1955.
29. Larkin and Ricker 1964.
- 30, 31. Manzer 1946b, 1951.
32. Manzer and Taylor 1946.
33. Menasveta 1958.
34. Miller and Lea 1972.
35. Orsi 1968.
36. Pacific Marine Fisheries Commission 1961.
37. Palmer 1954.
38. Pattie 1969.
39. Pruter and VanCleve 1954.
- 40, 41. Taylor 1946, 1947.
42. Westrheim 1955b.

*See footnote 1 page 40.

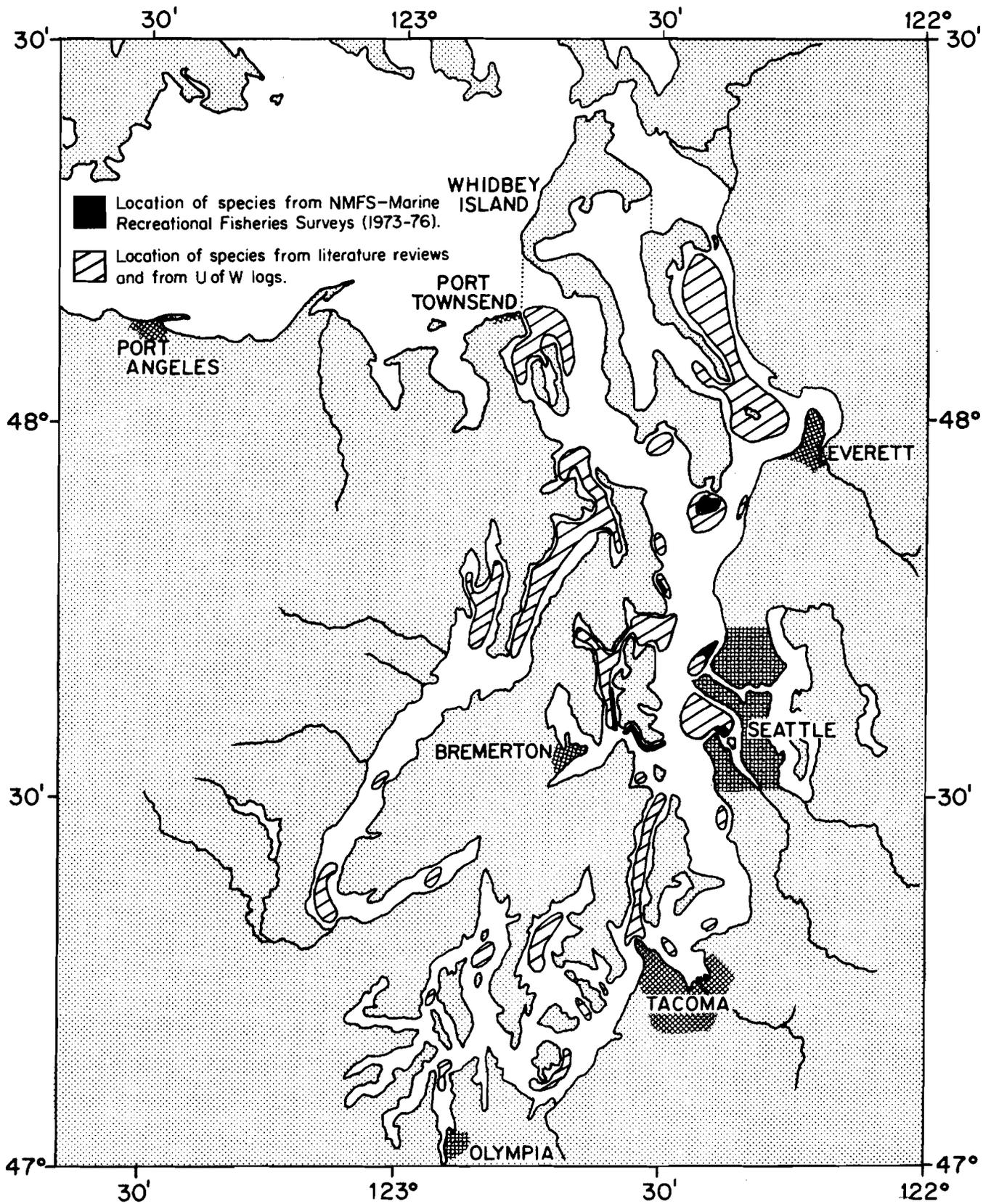


Figure 39 Known distribution of English sole, *Parophrys vetulus*, in Puget Sound.

Starry flounder, Platichthys stellatus

Local Names: Grindstone flounder, great flounder, rough jacket.

Recognition: Fins along side of body have alternating bands of orange and black. Scales are very rough. Individuals with eyes on right side common. Eyed side is dark brown to nearly black with dark blotches. Blind side is white and may have black blotches.

Distribution: Southern California to Alaska.^{9,17}

Washington Distribution: Very common in all marine waters of Washington.

Habitat: Prefers shallow water over muddy or sandy bottoms. Often found in the lower reaches of streams.

Utilization: There is a commercial fishery for this species in the Gulf of Georgia and Saratoga Passage.

Size: Length to 36 inches.⁹ Generally smaller in Puget Sound.

Baits and Lures: Herring, jigs, spinners.

Eating Qualities: Fair.

Additional References:

1. Alverson 1960.
2. Alverson, Pruter, and Ronholt 1964.
3. Andriashev 1937.
4. Barraclough 1967c.
5. Batts 1964.
6. Clothier 1950.
7. DeLacy, Miller, and Borton 1972.
8. Forrester 1969a.
9. Hart 1973.
10. Haw and Buckley 1971.
11. C. Hubbs 1947.
12. Hubbs and Hubbs 1945.
13. Manzer 1952.
14. Matsubara 1955.
- 15, 16. Miller 1965, 1967.
17. Miller and Lea 1972.
18. Nikol'skii, 1961.
19. Okada 1955.
20. Orcutt 1950.
21. Popov 1933.
- 22, 23. Robinson, Barraclough, and Fulton 1968a, b.
24. Roedel 1948.
25. Smith 1936.
26. Townsend 1936.
27. Westrheim 1955.
28. Yusa 1957.

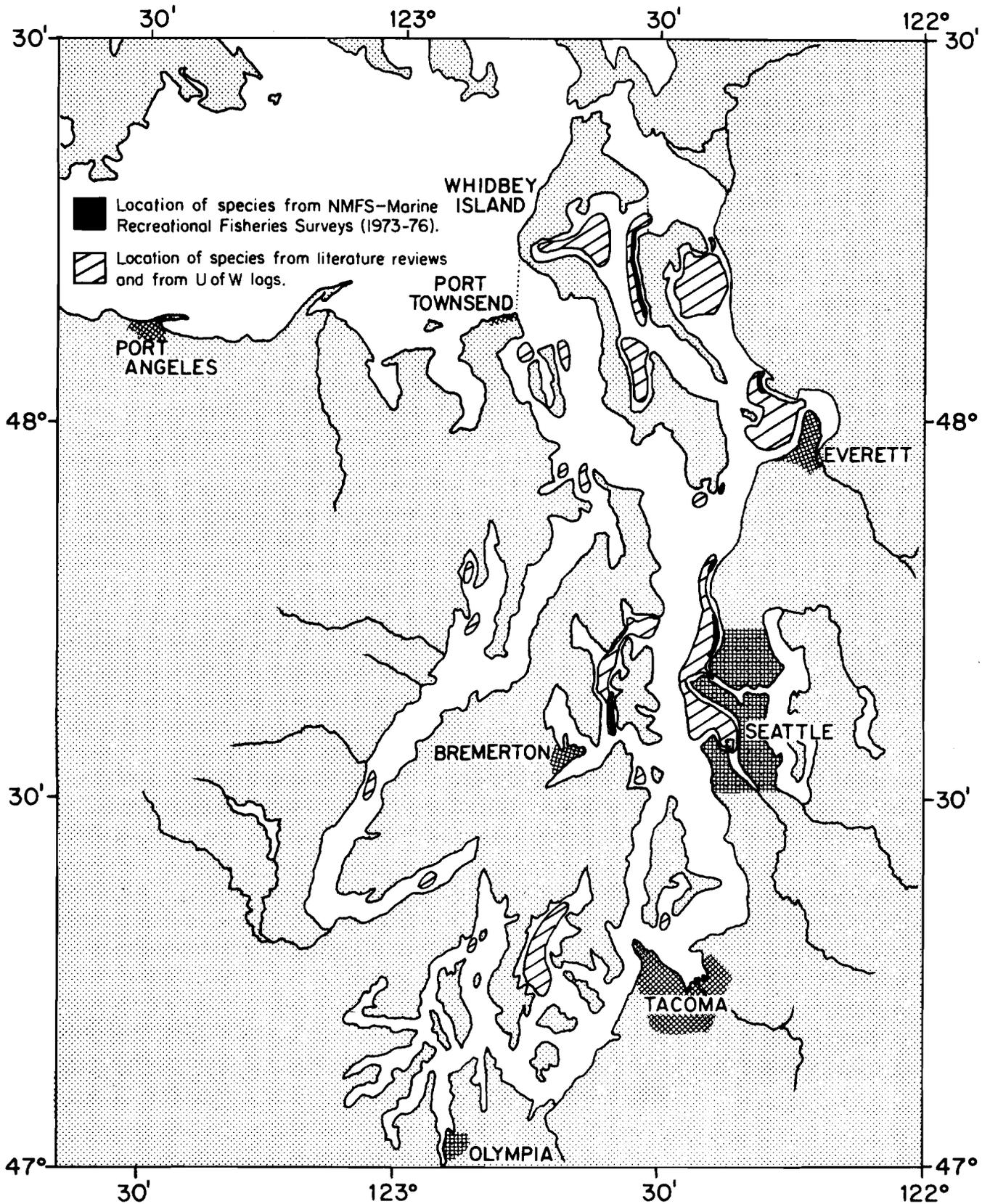


Figure 40 Known distribution of starry flounder, Platichthys stellatus, in Puget Sound.

C-O sole, Pleuronichthys coenosus.

Local Names: Popeye sole, C-O turbot, mottled turbot.

Recognition: Very round fish with a dark spot in the middle of the body.
Dark brown to black on eyed side. Fins are very dark.

Distribution: Baja California to southeast Alaska.^{6,8}

Washington Distribution: Uncommon in Strait of Juan de Fuca and San Juans.
More abundant in Puget Sound south of Admiralty Inlet.⁵

Habitat: Prefers deep water (over 100 ft) but found in eel grass beds commonly
in Puget Sound.

Utilization: The commercial market for these fish is limited because their
small size and tough skin makes filleting difficult.

Size: Length to 14 inches (35.6 cm).⁶

Baits and Lures: Small bait and lures--worms, shrimp, herring.

Eating Qualities: Good.

Additional References:

1. Batts 1964.
2. Budd 1940.
3. Clemens and Wilby 1961.
4. Clothier 1950.
5. DeLacy, Miller, and Borton 1972.
6. Hart 1973.
7. Haw and Buckley 1971.
8. Miller and Lea 1972.

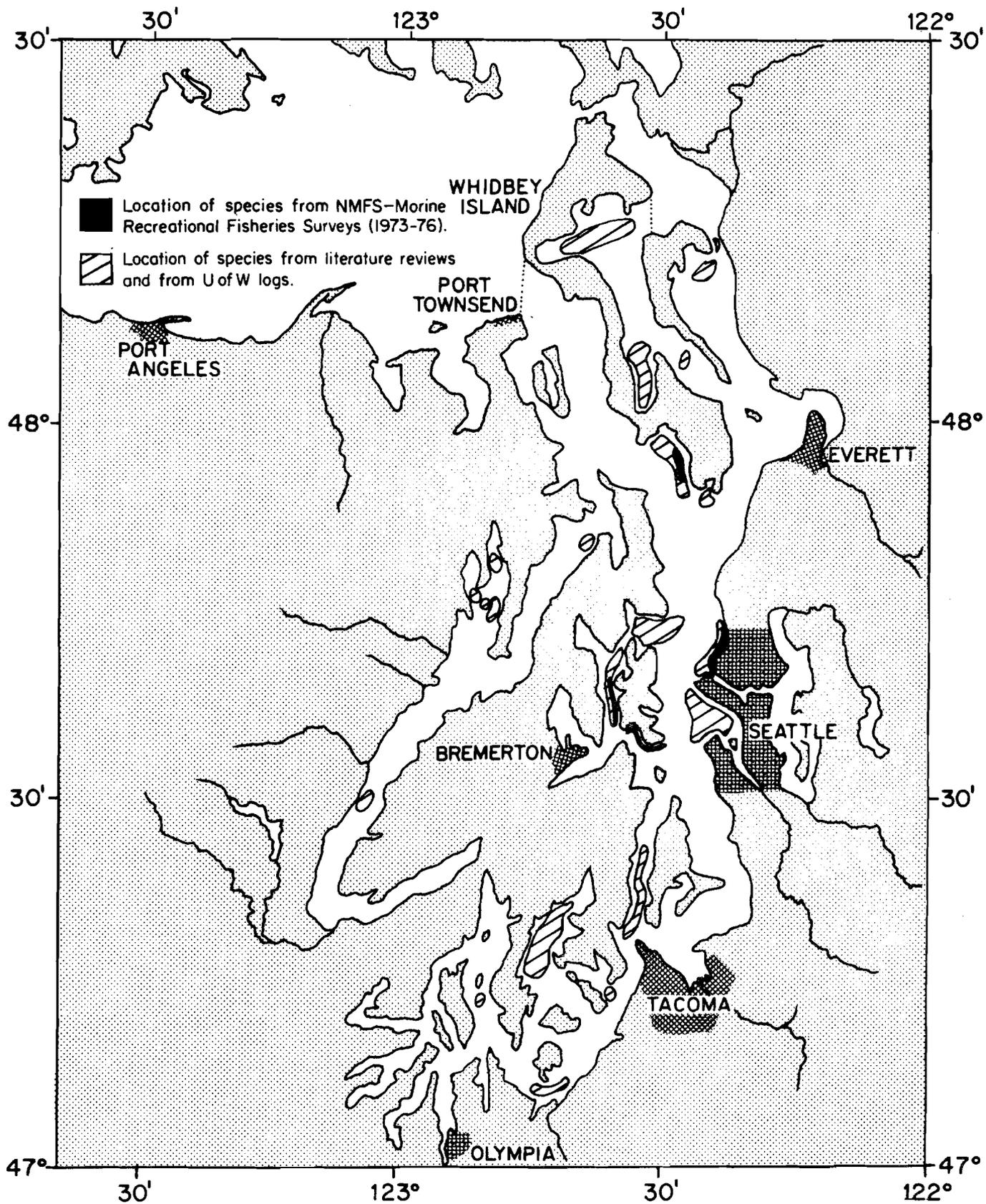


Figure 41 Known distribution of C-O sole, *Pleuronichthys coenosus*, in Puget Sound.

Sand sole, Psettichthys melanostictus

Local Names: Sand dabs, spotted flounder, fringe sole.

Recognition: Rather large mouth. The fin rays near the head are free from the fin membrane. Variable color. Eyed side may be light green to brown, speckled throughout with small black spots.

Distribution: Southern California to Bering Sea.^{7,13}

Washington Distribution: Very common in all marine waters of Washington.

Habitat: Prefers water less than 100 feet deep over sandy bottoms.

Utilization: A rather small commercial fishery exists for this species.

Size: To 25 inches.⁷ Generally smaller in Puget Sound.

Baits and Lures: Herring, jigs, rubber worms.

Eating Qualities: Very good, much in demand.

Additional References:

1. Alverson, Pruter, and Ronholt 1964. 2. Batts 1964. 3. Clemens and Wilby 1961. 4. DeLacy, Miller, and Borton 1972. *5. English 1966. 6, 7. Hart 1944, 1973. 8. Haw and Buckley 1971. 9. Hickman 1959. 10. Manzer 1947. 11, 12. Miller 1965, 1967. 13. Miller and Lea 1972. 14. Roedel 1948. 15. Smith 1936. 16. Sommani 1969. 17. Townsend 1936.

*See footnote 1 page 40.

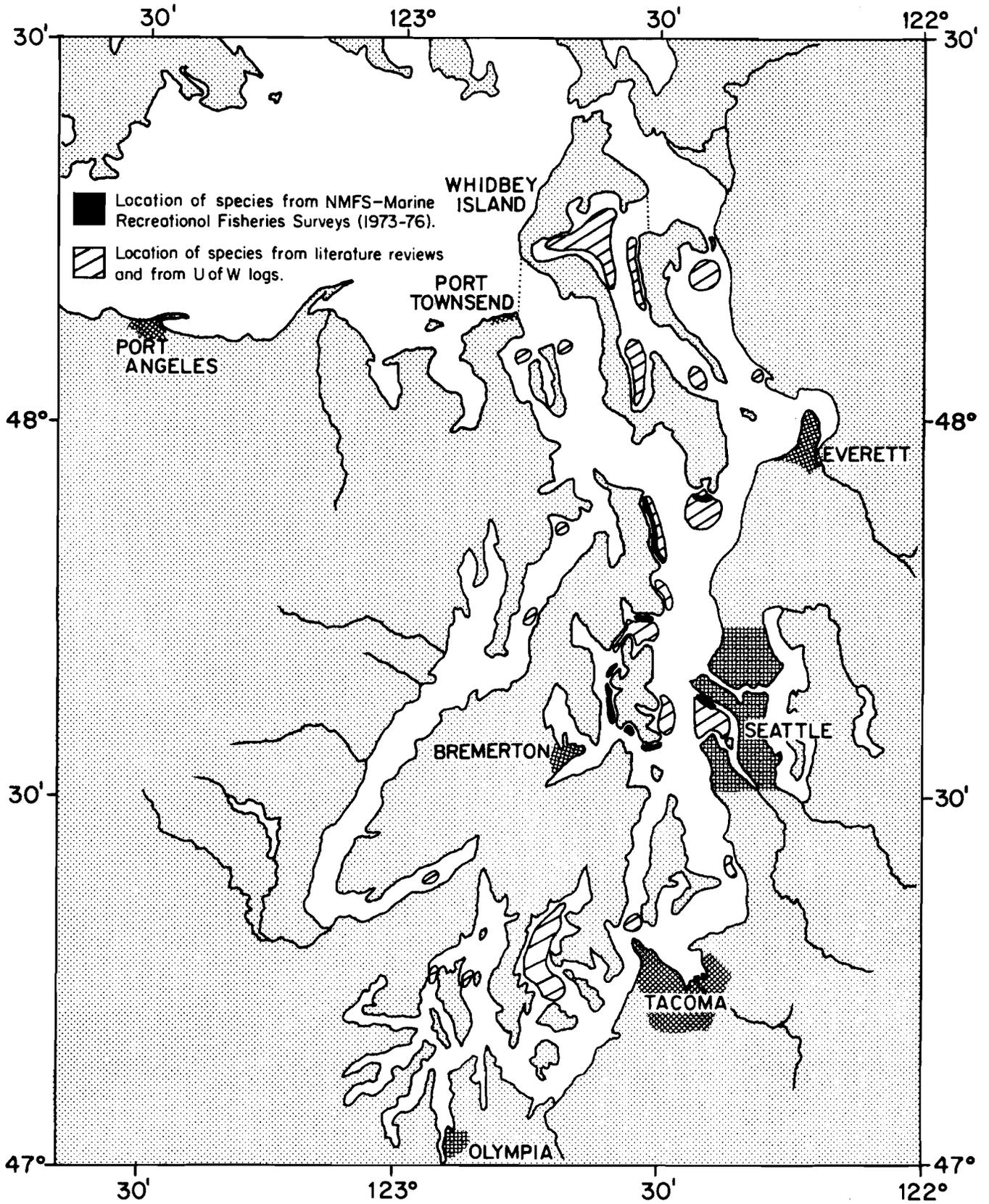


Figure 42 Known distribution of sand sole, Psettichthys melanostictus, in Puget Sound.

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