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Studies of the Ichthyofauna of Connecticut

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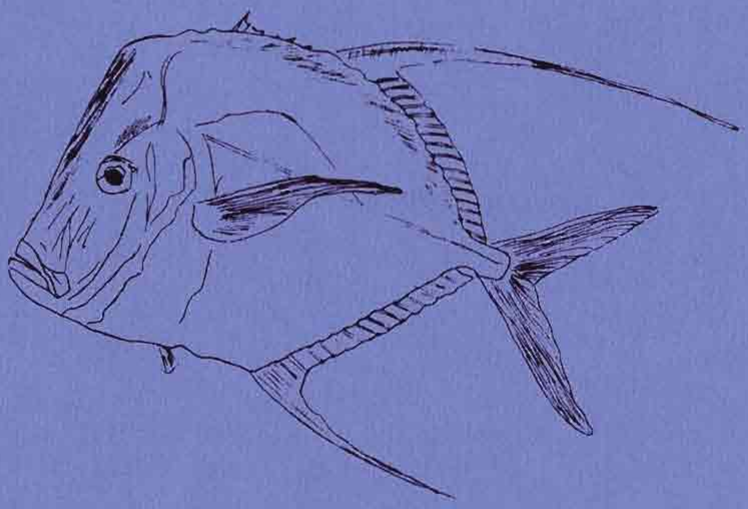
STUDIES OF THE ICHTHYOFAUNA OF CONNECTICUT



Edited by Paul M. Jacobson
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EDITOR'S FOREWORD

Studies of the Ichthyofauna of Connecticut is a compilation of four papers which update the lists of fishes known to inhabit the fresh and saltwaters of Connecticut, USA. Documentation is provided for the occurrence of twenty species previously unreported and additional evidence is given for the occurrence of certain fish species considered rare or uncommon.

Fishes of Connecticut were documented in several earlier reports dating as far back as 1844 when Reverend J. H. Linsley compiled the first catalogue of fishes for the region (Am. Journ. Sci and Arts. V47 p 55-80.) However, the current and most comprehensive listings are found in companion reports published as bulletins of the State Geological and Natural History Survey of Connecticut: "Saltwater Fishes of Connecticut" (bulletin #105) authored at Yale University by Thomson, Weed and Taruski, 1971; and "Freshwater Fishes of Connecticut" (bulletin #101) authored at the University of Connecticut by Whitworth, Berrien and Keller, 1968. These annotated lists put the total number of known fish species for Connecticut at 153.[1] A second edition of "Saltwater Fishes of Connecticut" added 18 species (Thomson, Weed, Taruski and Simanek, 1978).[2] Whitworth and Schmidt reported one additional freshwater form, Notropis rubellus, in 1971 (Univ. of Conn. Occas. papers, 2:1 p 1-4). Including the contributions of Studies of the Ichthyofauna of Connecticut, the total number of fish species now reported to inhabit or frequent Connecticut waters during some life stage is estimated to be 192. A complete listing of these fish species is given in Appendix I.

Preparation of the papers included in Studies of the Ichthyofauna of Connecticut and the compilation of these into a single report was accomplished through a cooperative effort among investigators representing diverse institutions. Included are two state universities, the state conservation management agency and an electric utility. This diversity reflects the varied support for studies of fish biology in Connecticut over recent years.

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1. Thomson, et al. reported 156 fresh and saltwater species. However, several of the same species were named according to a different nomenclature ie., Pomolobus = Alosa.

2. Thomson, et al. listed 19 species including the white catfish, Ictalurus catus, which had been reported previously in "Freshwater Fishes of Connecticut."

For example, "Further documentation for rare fishes and a list of seventeen fishes new to the marine waters of Long Island Sound", P. Perra and C. Steinmetz, Jr., is based on almost ten years of data accumulated by Northeast Utilities for the purpose of assessing the potential impact of nuclear powered electric generation on Long Island Scund near Waterford, Connecticut. "Seasonal utilization of the upper Thames Estuary, Connecticut, by fishes", W. Whitworth and P. Marsh, is a byproduct of anadromous fish restoration through state and federal funding.

While each of these investigations was conducted independently and each was designed to achieve different objectives, a common result has been a considerable advance in the knowledge of fish occurrence for the Connecticut region.

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Acknowledgement is given Northeast Utilities Service Company for its contribution of graphic and reproduction services.

FURTHER DOCUMENTATION FOR RARE FISHES AND A LISTING OF SEVENTEEN FISHES NEW TO THE MARINE WATERS OF LONG ISLAND SOUND, CONNECTICUT

Paul Perra[1] and Charles Steinmetz, Jr.[2]

Fish populations along six miles of shoreline near the Millstone Point Nuclear Power Station in Waterford, Connecticut were documented from May, 1969 through December, 1978. The purposes of this paper are to (1) provide collection data and further verification for many of the species listed by Thomson, Weed, Taruski and Simanek (1978) as occurring in Connecticut marine waters and for which no Connecticut occurrence or general collection data is given, and (2) list seventeen previously unreported fishes for Long Island Sound.

METHODS AND MATERIALS

Adult, juvenile, and larval fishes were collected by various techniques (Fig. 1). Collecting methods included the removal of impinged species from the intake screens of the Millstone Power Station. This procedure accounted for 36 percent of the adults and juveniles taken. Other methods used were beach seines, otter trawls, and gill nets. These procedures accounted for 41, 21 and 2 percent, respectively of the adults and juveniles sampled. Plankton tows accounted for all larval fishes recorded. A collection of about 80 percent of all species collected is on deposit at the Millstone Environmental Laboratory of Northeast Utilities.

RESULTS

A total of 406,532 adult and juvenile fishes as well as 450,586 larval fishes were collected comprised of 54 families, 86 genera, and 103 species. These specimens provided additional documentation (Table 1) for 86 of the 119 species listed in Thomson et al. (1978) and add 17 species not previously reported from the waters of Long Island Sound, Connecticut (Table 2). Fourteen of the seventeen new species were collected as adults and/or juveniles. Three of the species, the cusk, Brosme brosme, witch flounder, Glyptocephalus cynoglossus, and the american plaice, Hippoglossoides platessoides, were taken exclusively as larvae.

All of the species collected with the exception of the radiated shanny, Ulvaria subbifurcata, were found in the general literature to include the coast of Connecticut as part of their overall range. The radiated shanny's range was reported as Newfoundland to Cape Cod by Leim and Scott (1966), Perlmutter (1961), Bigelow and Schroeder (1953), and Nichols and Breder (1926). Thomson et al. (1978) reported its range as

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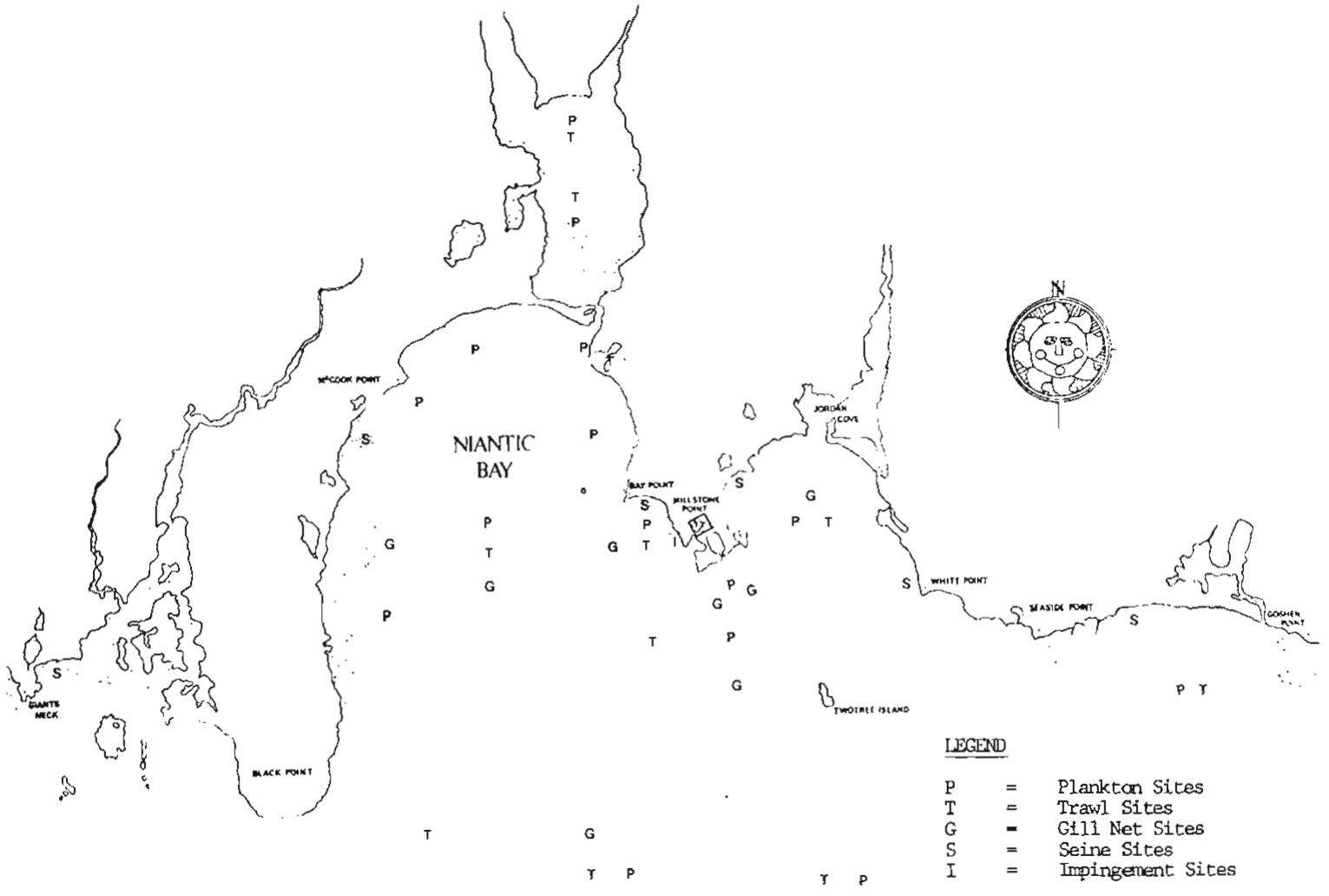

Figure 1. Sampling locations where fishes were collected for monitoring studies.

TABLE 1. List of 103 species of saltwater fishes taken from the Millstone Point area by various sampling techniques from May, 1969, through December, 1978.

Taxa Collected	No. of Adults and/or Juveniles	No. of Larvae
Petromyzontidae - lampreys		
Petromyzon marinus	2	
Chondrichthyes - cartilaginous fishes		
Chondrichthyes spp.	1	
Carcharhinidae - requiem sharks		
Mustelus canis	154	
Squalidae - dogfish sharks		
Squalus acanthias	86	
Rajidae - skates		
Raja spp.	5,044	
Raja laevis	1	
Raja ocellata	417	
Raja erinacea	530	
Anguillidae - freshwater eels		
Anguilla rostrata	950	7
Congridae - conger eels		
Conger oceanicus	69	
Clupeidae		
Alosa aestivalis	3,538	
Alosa mediocris	7	
Alosa pseudoharengus	1,558	
Alosa sapidissima	97	
Brevoortia tyrannus	7,123	247
Clupea harengus	3,209	
Clupeidae spp.	10	24,308
Etrumeus teres	5	
Engraulidae - anchovies		
Anchoa spp.	8,061	114,518
Anchoa hepsetus	37	
Anchoa mitchilli	4,264	
Salmonidae - trouts		
Salmo trutta	1	
Osmeridae - smelts		
Osmerus mordax	2,450	
Synodontidae - lizardfishes		
Synodus foetens	2	
Ictaluridae - freshwater catfishes		
Ictalurus catus	1	
Batrachoididae - toadfishes		
Opsanus tau	1,128	
Lophiidae - goosefishes		
Lophius americanus	13	7

TABLE 1. (continued)

Taxa Collected	No. of Adults and/or Juveniles	No. of Larvae
Gadidae - codfishes		
Brosme brosme		5
Enchelyopus cimbrius	32	8,844
Gadidae spp.	443	15
Gadus morhua	75	270
Melanogrammus aeglefinus	6	1
Merluccius bilinearis	6,158	483
Microgadus tomcod	3,777	65
Pollachius virens	502	34
Urophycis spp.	251	10
Urophycis chuss	768	130
Urophycis regius	65	1
Urophycis tenuis	137	
Ophidiidae - cusk-eels		
Ophiidae spp.	122	
Rissola marginata	26	150
Zoarcidae - eelpouts		
Macrozoarces americanus	16	
Belonidae - needlefishes		
Strongylura marina	16	
Scomberesocidae - sauries		
Scomberesox saurus	6	
Cyprinodontidae - killifishes		
Cyprinodon variegatus	1,382	
Fundulus diaphanus	15	
Fundulus heteroclitus	8,687	
Fundulus majalis	7,848	
Fundulus spp.	115	5
Lucania parva	10	
Atherinidae - silversides		
Menidia beryllina	4,728	
Menidia menidia	66,408	
Menidia spp.	81,748	1,213
Gasterosteidae - sticklebacks		
Apeltes quadracus	3,713	9
Gasterosteus aculeatus	17,474	10
Gasterosteidae spp.	3	1
Pungitius pungitius	782	
Fistulariidae - cornetfishes		
Fistularia tabacaria	15	
Syngnathidae - pipefishes & seahorses		
Hippocampus erectus	12	32
Syngnathus fuscus	3,521	2,174

TABLE 1. (continued)

Taxa Collected	No. of Adults and/or Juveniles	No. of Larvae
Percichthyidae - temperate basses		
Morone americana	4,350	1
Morone saxatilis	39	
Serranidae - sea basses		
Centropristis striata	133	37
Percidae - perches		
Etheostoma spp.	2	
Priacanthidae - bigeyes		
Pristigenys alta	5	
Pomatomidae - bluefishes		
Pomatomus saltatrix	570	17
Carangidae - jacks and pompanos		
Alectis crinitus	9	
Caranx crysos	28	
Caranx hippos	27	
Decapturus punctatus	1	
Selar crumenophthalmus	7	
Selene vomer	36	
Seriola zonata	7	
Trachinotus falcatus	13	
Vomer setapinnus	41	
Sparidae - porgies		
Stenotomus chrysops	15,101	2,880
Sciaenidae - drums		
Cynoscion regalis	932	349
Leiostomus xanthurus	176	
Menticirrhus saxatilis	51	6
Sciaenidae spp.		2
Mullidae - goatfishes		
Mullus auratus	1	
Chaetodontidae - butterflyfishes		
Chaetodon ocellatus	1	
Labridae - wrasses		
Tautoga onitis	6,195	20,705
Tautogolabrus adspersus	10,943	21,595
Mugilidae - mullets		
Mugil cephalus	374	
Sphyraenidae - barracudas		
Sphyraena borealis	28	
Stichaeidae - pricklebacks		
Ulvaria subbifurcata	19	2,871
Pholidae - gunnels		
Pholis gunnellus	493	718
Ammodytidae - sand lances		
Ammodytes americanus	12,400	
Ammodytes spp.	11	14,683

TABLE 1. (continued)

Taxa Collected	No. of Adults and/or Juveniles	No. of Larvae
Gobiidae - gobies		
Gobiidae spp.	20	743
Scombridae - mackerels		
Scomber japonicus	7	
Scomber scombrus	69	131,376
Stromateidae - butterfishes		
Peprilus triacanthus	1,671	7,964
Triglidae - searobins		
Prionotus carolinus	661	
Prionotus evolans	465	
Prionotus spp.	2,223	2,074
Cottidae - sculpins		
Cottidae spp.	2	
Hemitripterus americanus	260	
Myoxocephalus aenaeus	16,690	
Myoxocephalus octodecemspinosus	168	
Myoxocephalus spp.	209	4,388
Myoxocephalus scorpius	49	
Cyclopteridae - lumpfishes & snailfishes		
Cyclopterus lumpus	1,574	
Liparis atlanticus	555	
Liparis liparis	19	
Liparis spp.		808
Dactylopteridae - flying gurnards		
Dactylopterus volitans	8	
Bothidae - lefteye flounders		
Etropus microstomus	207	188
Paralichthys dentatus	1,697	105
Paralichthys oblongus	174	538
Scophthalmus aquosus	11,054	58,286
Pleuronectidae - righteye flounders		
Glyptocephalus cynoglossus		8
Hippoglossoides platessoides		10
Limanda ferruginea	14	1,341
Pseudopleuronectes americanus	68,023	26,161
Soleidae - soles		
Trinectes maculatus	89	92
Balistidae - triggerfishes & filefishes		
Aluterus schoepfi	2	
Aluterus spp.	46	
Monocanthus hispidus	136	
Tetradontidae - puffers		
Sphaeroides maculatus	818	101
Diodontidae - porcupine fishes		
Chilomycterus schoepfi	8	
TOTAL	406,532	450,586

Table 2. Life stages, number collected, and lengths of 17 species of marine fishes not previously listed for the waters of Long Island Sound, Connecticut.

Scientific Name	Number Collected		Total length mm or Standard length mm			
	Adults and/or Juveniles	Larvae	Range	Mean	Range	Mean
Brosme brosme		5				
Melanogrammus aeglefinus	6	1				
Rissola marginata	26	150	15-360	228		
Scomberesox saurus	6				32-64	55
Fistularia tabacaria	15		201-310	261		
Hippocampus erectus	12	32	15-160	115		
Pristigenys alta	5		64-96	77		
Caranx crysos	28				27-236	71
Selar crumenophthalmus	7		73-203	142		
Vomer setapinnis	41		25-64	39		
Trachinotus falcatus	13				30-35	32
Chaetodon ocellatus	1				55-55	55
Mugil cephalus	374				96-589	227
Liparis atlanticus	555		42-100	75		
Dactylopterus volitans	8		50-150	94		
Glyptocephalus cynoglossus		8				
Hippoglossoides platessoides		10				

Newfoundland to New England which suggests a more southerly limit, and is confirmed by the relatively large number of radiated shannies collected (19 adults and juveniles; 2,871 larvae) in our study.

The sea snail, Liparis atlanticus, listed in several publications including Bigelow and Schroeder (1953) and Perlmutter (1961) as a stray south of Cape Cod, was found to be very common (555 adults and juveniles) in our collections.

LISTING OF SEVENTEEN NEW SPECIES FOR THE MARINE WATERS OF CONNECTICUT

Gadidae - Codfishes

Brosme brosme, cusk

Five larval specimens were collected between 1973 and 1977; no adults were taken. The larvae were collected at various stations in July of 1973, May of 1976, and August of 1977. Leim and Scott (1966) and Perlmutter (1961) report that this fish is found from Newfoundland to Cape Cod and occurs as a stray as far south as New Jersey, existing between the depths of 60 and 1,800 ft. These depths are considerably deeper than most stations sampled at Millstone. The eggs and larvae are buoyant, however, and were probably transported into the Millstone area from greater depths. The cusk can be considered as very rare in Connecticut waters.

Melanogrammus aeglefinus, haddock

Six juvenile haddock were collected by impingement at the intakes of the power station between May and June, 1978. One larva was collected in plankton samples in April of 1977. Perlmutter (1961) and Bigelow and Schroeder (1953) both report the western Atlantic range of haddock as Greenland to Cape Hatteras being most abundant from Newfoundland to Cape Cod. The haddock can be considered very rare in Connecticut waters.

Ophidiidae - Cusk-Eels

Rissola marginata, striped cusk-eel

Twenty-six adult and juvenile specimens were collected at the water intakes of the power station in 1976 (25 specimens between March and April and one specimen was taken on November 30, 1976). Striped cusk-eel larvae were also collected in 1973, 1974, and 1975 between the months of June and October. Perlmutter (1961) reports this fish's range as New York to Texas, and generally rare in abundance. The striped cusk-eel can be considered uncommon in Connecticut waters.

Scomberesocidae - Sauries

Scomberesox saurus, Atlantic saury

Six juvenile specimens were taken by beach seines in Jordan Cove in July, 1969. Leim and Scott (1966) report this fish's American Atlantic Coast range as North Carolina to southern Newfoundland, most commonly

north of Cape Cod. The Atlantic saury can be considered a very rare occurrence in Connecticut waters.

Fistulariidae - Cornetfishes

Fistularia tabacaria, cornetfish

Fifteen adults were collected at various stations in the Millstone Bight area during the months of September and October between 1976 and 1978. Hoese and Moore (1977) and Perlmutter (1961) describe this fish as a tropical species ranging from Brazil to Cape Cod and as a stray to Nova Scotia. It has been reported uncommon for Long Island Sound, New York (Alperin and Shaefer, 1965) and uncommon for the coast of New Jersey (Milstein and Thomas, 1976). This fish can be considered as uncommon in Connecticut waters.

Syngnathidae - Pipefishes and Seahorses

Hippocampus erectus, lined seahorse

Twelve adults were collected in 1974, 1975, and 1976 at various trawl stations and at the water intakes of the power station between the months of May and November.

Thirty-two seahorse post larvae were also taken by plankton nets between July and October in 1974 and 1975. Perlmutter (1961) and Bigelow and Schroeder (1953) list this fish's range from South Carolina to Cape Cod and as a stray to Nova Scotia. The lined seahorse can be considered uncommon in Connecticut waters.

Priacanthidae - Bigeyes

Pristigenys alta, short bigeye

Five juveniles were collected during August, September, and October of 1975 and November of 1973. Caldwell (1962) reports this fish as a straggler north of Cape Hatteras, North Carolina. Perlmutter (1961) gives this fish's range as the Caribbean to South Carolina, with young straying north to Cape Cod. It has also been listed as uncommon for the coast of New Jersey (Milstein and Thomas, 1976). The short bigeye can be considered a very rare occurrence in Connecticut waters.

Carangidae - Jacks and Pompanos

Caranx crysos, blue runner

Twenty-eight adults and juveniles were collected in the Millstone Bight area from July to November between 1969 and 1977. Hoese and Moore (1977) report this fish's range as Nova Scotia to Brazil and Perlmutter (1961) reports that it is regularly found from Brazil to Cape Cod. It has also been listed as uncommon to the coast of New Jersey by Milstein and Thomas (1976). The blue runner can be considered uncommon in the waters of Connecticut.

Selar crumenophthalmus, bigeye scad

Seven adults and juveniles were taken during July, October and November from 1974 to 1976. Randall (1968) reports this fish's range as Nova Scotia to Rio de Janeiro. It has also been reported as uncommon for the coast of New Jersey (Milstein and Thomas, 1976). The bigeye scad can be considered a very rare occurrence in Connecticut waters.

Trachinotus falcatus, permit

Thirteen juveniles under 35 mm in standard length were collected by beach seine, in September of 1974, 1975 and 1978 and in August of 1977 and 1978. Perlmutter (1961) reports this fish's range as Brazil to Cape Cod with mostly small fish, less than 125 mm., found north of Chesapeake Bay. It has also been reported as rare for Long Island Sound by Alperin and Shaefer (1965). The permit can be considered a very rare occurrence in Connecticut waters.

Vomer setapinnis, moonfish

Forty-one juveniles were collected in April, August and September to November between 1973 and 1976. Hoese and Moore (1977) list the general range of this fish as the Eastern Pacific and both sides of the Atlantic. Perlmutter (1961) reports its western Atlantic range as Uruguay to Cape Cod and straying north to Nova Scotia, but most common from Chesapeake Bay south. The moonfish can be considered an uncommon occurrence in the waters of Connecticut.

Chaetodontidae - Butterflyfishes

Chaetodon ocellatus, spotfin butterflyfish

One juvenile was collected by impingement at the power station intakes in November of 1978. Hoese and Moore (1977) list the overall range of this fish as New England through the Caribbean to Brazil. The spotfin butterflyfish can be considered very rare for Connecticut waters.

Mugilidae - Mullets

Mugil cephalus, striped mullet

Throughout the entire study period a total of 374 adult and juvenile specimens was collected. The striped mullet was collected at least once during every year of the entire study. The majority of captures was by beach seines during the summer and fall.

Perlmutter (1961) and Bigelow and Schroeder (1953) report this fish's western Atlantic range as Brazil to Cape Cod and as a straggler to Nova Scotia. The striped mullet can be considered uncommon in Connecticut waters.

Cyclopteridae - Lumpfishes and Snailfishes

Liparis atlanticus, seasnail

Five hundred and fifty-five adult and juvenile seasnails were taken in the Millstone Bight area between December and April from 1974 through 1978. Perlmutter (1961), Bigelow and Schroeder (1953) and Leim and Scott (1966) all report this fish's range as from Newfoundland to New Jersey but rare south of Cape Cod. The seasnail can be considered very common in Connecticut waters.

Dactylopteridae - Flying Gurnards

Dactylopterus volitans, flying gurnard

Eight adults and juveniles were collected between July and October in 1975 and 1977. Perlmutter (1961) reports the flying gurnard as rare north of North Carolina and as a stray as far north as Cape Cod. It has been reported as rare in Long Island Sound, New York by Alperin and Shaefer (1965). This fish can be considered uncommon for Connecticut waters.

Pleuronectidae - Righteye Flounders

Glyptocephalus cynoglossus, witch flounder

Eight larval specimens were collected during the months of March, April, May and August between 1974 and 1977. Leim and Scott (1966) list this fish's range as both sides of the Atlantic Ocean occurring from the Gulf of St. Lawrence to Cape Hatteras. Perlmutter (1961) reports its range in the American Atlantic from Newfoundland to Virginia, found most abundantly north of Cape Cod. The witch flounder can be considered very rare in Connecticut waters.

Hippoglossoides platessoides, American plaice

Collections of this species were exclusively larval. A total of ten specimens was taken between 1973 and 1976 by plankton nets. The larvae were captured at various stations during the months of May and June. Leim and Scott (1966) list the range of this fish as both sides of the Atlantic and in the west from the Gulf of St. Lawrence to Cape Hatteras. Perlmutter (1961) lists its range in the American Atlantic from Labrador to Cape Cod and as a straggler south of Cape Cod. The American plaice can be considered a very rare occurence in Connecticut waters.

DISCUSSION

Eleven species previously unlisted for Long Island Sound were generally found to have ranges south and six had ranges north of Connecticut. Most of the 17 new species should be considered as strays for Connecticut waters. However, the seasnail, which is reported as rare south of Cape Cod should be considered as common to the Connecticut coast; it has been collected regularly as adults and juveniles at Millstone since our trawl and impingement studies began. Since the seasnail is a small and

secretive fish (Bigelow and Schroeder, 1953), it has probably existed undetected along the Connecticut coast for some time.

Several of the species which are most southerly in distribution have been listed as uncommon for the coasts of New York and New Jersey. The cornetfish, the permit, and the flying gurnard are considered rare for the coast of Long Island, New York by Alperin and Shaefer (1965). The cornetfish, the blue runner, the short bigeye and the bigeye scad have been listed as uncommon for the coast of New Jersey by Milstein and Thomas (1976). These fishes have also been found to be very rare to uncommon in our study.

Long Island Sound functions as a giant "mixing bowl" with respect to fish species. It contains a year-round resident population able to withstand high summer and cold winter water temperatures. The influence of the Gulf Stream provides a warm water surface pathway for more southerly and even tropical species to enter the Sound in summer. Cold water fishes from more northerly areas move into the Sound during the winter when the waters become quite cold under the influence of the Labrador Current. Thus many temporary additions to the resident population can be found in both summer and winter, with summer visitors apparently predominating.

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SEASONAL UTILIZATION OF THE UPPER THAMES ESTUARY, CONNECTICUT, BY FISHES

Walter R. Whitworth and Paul C. Marsh[1]

The freshwater ichthyofauna of Connecticut was described by Whitworth, Berrien, and Keller (1968), and the saltwater fishes were listed by Thomson, Weed, and Taruski (1971). Fishes of the Mystic River (Pearcy and Richards, 1962) and Thames River estuaries (Tolderlund, 1975; Whitworth, Gibbons, Heuer, Johns, and Schmidt, 1975) have also been described, but seasonal utilization of the upper estuaries has not been documented. Although saltwater species have penetrated far inland (Tagatz, 1967) and freshwater species were found in the lower Thames estuary (Whitworth et al. 1975) a complete description of fishes in the upper estuary is of interest because significant numbers of individuals of both saltwater and freshwater species may interact. The purpose of this study was to characterize the seasonal occurrence of fishes in the upper 5 km of the Thames Estuary, Connecticut.

This information was obtained during a study of anadromous fishes in the Thames River supported, in part, by funds provided by Anadromous Fish Act (P.L. 89-304) through the Bureau of Sports Fisheries and Wildlife, and the Connecticut Department of Environmental Protection.

MATERIALS AND METHODS

The Thames Estuary (Fig. 1) is formed by the junction of the Quinebaug-Shetucket and Yantic Rivers at Norwich, in eastern Connecticut, and flows south approximately 26 km to Long Island Sound near New London, Connecticut. The upper 5 km of the estuary, which receives additional freshwater from one tributary, has a saltwater wedge approximately 1-7 m below the surface, except during periods of extremely high freshwater flow in early spring. Salinities were rarely less than 10 ppt below 5 m (Soderberg and Bruno, 1971; Whitworth, et al. 1975) and annual water temperatures ranged from 0 to 28 C. The upper estuary is 3.5 to 2.0 km downstream from dams on the Quinebaug-Shetucket and Yantic Rivers and these structures are complete barriers to upstream movement by fish. Freshwaters between the upper estuary and these dams were unsuitable for fish much of the year because of low oxygen, low water flow, high temperature, and pollutants (Whitworth et al. 1975).

Fishes were collected by gill nets set at 2 wk intervals from October 1972 through Novemher 1973. Nine to 17 sinking nylon nets (1.1 to 3.1 m deep by 10.7 to 21.3 m long with 2.5 to 10.2 cm bar mesh) were set from the bank toward the middle at randomly selected sites for about 26 hours beginning in the late afternoon. Six samples for juveniles were taken

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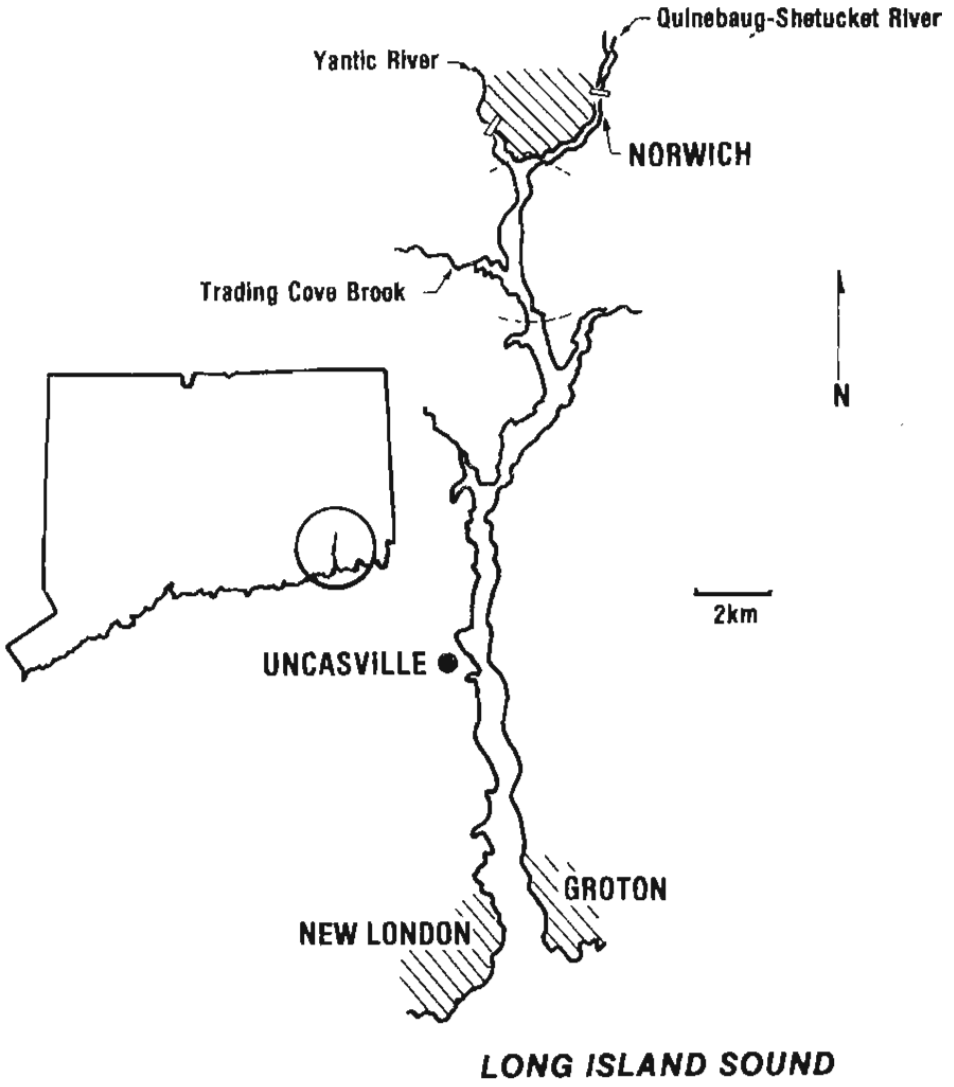

Figure 1. The Thames Estuary, Connecticut. Upper estuary delineated by broken lines; solid lines are dams. Insert shows location in Connecticut.

by seine between June and September 1973 at three sites with a 1.2 by 15.2 m seine (6.4 mm nylon stretch mesh). Specimens were occasionally collected by angling from April through October 1973. These collections of fishes and those from the previous four years reported from the upper 5 km of the estuary by Whitworth et al. (1975) were summarized by season (winter was January through March, spring was April through June, summer was July through September and fall was October through December).

Seasonal utilization of the upper estuary was evaluated by calculating (1) the percent use of the estuary each season by saltwater and freshwater species (number of species/total number of species for the year), (2) the percent of saltwater and freshwater species that occurred 1, 2, 3, and 4 seasons, and (3) the percent of saltwater and freshwater species that were only found in one season that utilized each season, and graphically interpreting the data.

RESULTS AND DISCUSSION

The number of saltwater species (Table 1) that utilized the upper Thames Estuary was similar in spring, summer, and fall and lower in winter whereas many more freshwater species (Table 2) occurred in spring and summer than in fall and winter (Table 3). Both freshwater and saltwater species that occurred in only one season (Table 4) followed the same general pattern as total species except that freshwater species were confined to spring and summer only.

Percentage occurrence during all four seasons was greater for freshwater than saltwater species (Table 5). The number of freshwater species present and the ratio of number of freshwater to saltwater species were both greater than in other areas (Table 6). Furthermore, over 34% of individuals collected by gill nets in 1972-1973 and over 61% of those taken by seine in 1973 were freshwater species. These relative abundances of freshwater fish were far greater than previously reported from upper estuaries (Pearse, 1936, 1950; Gunter, 1956, 1961).

The unique abundance of freshwater species and individuals in the upper Thames Estuary was probably due primarily to the two dams which prevented movement upstream. Although available freshwater habitat was severely restricted in the upper estuary, freshwater species had access to the limited freshwater areas and may have been present in the saltier water for only short periods of time during feeding or other activities. The paucity of freshwater species in other upper estuaries is probably not due to inability of fish to survive in that habitat, but rather because more favorable areas are available upstream and their movement to those regions is not restricted.

Table 1. Seasonal checklist of saltwater fishes found in the northern 5 km of the Thames Estuary, Connecticut.

Species	Season Sp	Su	F	W
Alosa aestivalis (Mitchill) blueback herring	X	X	X	
A. mediocris (Mitchill) hickory shad			X	
A. pseudoharengus (Wilson) alewife	X	X	X	
A. sapidissima (Wilson) American shad	X	X	X	
Anchoa mitchilli (Valenciennes) bay anchovy		X	X	
Anguilla rostrata (Lesueur) American eel	X	X	X	
Apeltes quadracus (Mitchill) fourspine stickleback	X	X	X	X
Brevoortia tyrannus (Latrobe) Atlantic menhaden		X	X	
Caranx hippos (Linnaeus) crevalle jack		X	X	
Clupea harengus Linnaeus Atlantic herring	X		X	X
Cynoscion regalis (Bloch and Schneider) weakfish		X		
Cyprinodon variegatus Lacépède sheepshead minnow		X		
Fundulus heteroclitus (Linnaeus) mummichog	X	X	X	X
F. majalis (Walbaum) striped killifish	X	X	X	X
Gasterosteus aculeatus Linnaeus threespine stickleback		X		
Gobiosoma bosci (Lacépède) naked goby	X			
Menidia beryllina (Cope) tidewater silverside	X	X	X	
M. menidia (Linnaeus) Atlantic silverside	X	X	X	
Merluccius bilinearis (Mitchill) silver hake			X	
Microgadus tomcod (Walbaum) Atlantic tomcod	X	X	X	X
Morone americana (Gmelin) white perch	X	X	X	X
M. saxatilis (Walbaum) striped bass	X	X	X	X
Mugil curema Valenciennes white mullet		X		
Myoxocephalus octodecemspinosus (Mitchill) longhorn sculpin	X		X	X
Osmerus mordax (Mitchill) rainbow smelt	X	X	X	X
Paralichthys dentatus (Linnaeus) summer flounder	X			
P. oblongus (Mitchill) fourspot flounder	X			
Pomatomus saltatrix (Linnaeus) bluefish		X	X	
Prionotus carolinus (Linnaeus) northern searobin	X	X		
Pseudopleuronectes americanus (Walbaum) winter flounder	X	X	X	X
Pungitius pungitius (Linnaeus) ninespine stickleback		X		
Scomber scombrus Linnaeus Atlantic mackerel			X	
Scophthalmus aquosus (Mitchill) windowpane	X			X
Squalus acanthias Linnaeus spiny dogfish			X	
Strongylura marina (Walbaum) Atlantic needlefish			X	
Syngnathus fuscus Storer northern pipefish				X
Tautoga onitis (Linnaeus) tautog	X			
Trinectes maculatus (Block and Schneider) hogchoker	X	X		
Urophycis chuss (Walbaum) red hake				X

Table 2. Seasonal checklist of freshwater fishes found in the northern 5 km of the Thames Estuary, Connecticut.

Species	Season			
	Sp	Su	F	W
Castostomus commersoni (Lacépède) white sucker	X	X	X	X
Cyprinus carpio Linnaeus carp	X	X	X	X
Esox niger Lesueur chain pickerel	X	X	X	X
Etheostoma olmstedi Storer tessellated darter		X		
Fundulus diaphanus (Lesueur) banded killifish	X	X	X	X
Ictalurus catus (Linnaeus) white catfish	X	X	X	X
I. nebulosus (Lesueur) brown bullhead	X	X	X	X
Lepomis auritus (Linnaeus) redbreast sunfish		X		
L. cyanellus Rafinesque green sunfish	X	X		
L. gibbosus (Linnaeus) pumpkinseed	X	X	X	X
L. macrochirus Rafinesque bluegill	X	X		
Micropterus dolomieui Lacépède smallmouth bass		X		
M. salmoides (Lacépède) largemouth bass	X	X		
Notemigonus crysoleucas (Mitchill) golden shiner	X	X	X	X
Notropis cornutus (Mitchill) common shiner	X	X		
N. hudsonius (Clinton) spottail shiner	X	X	X	X
Perca flavescens (Mitchill) yellow perch	X	X	X	X
Pomoxis nigromaculatus (Lesueur) black crappie	X	X	X	
Salmo gairdneri Richardson rainbow trout	X			
S. trutta Linnaeus brown trout	X			
Salvelinus fontinalis (Mitchill) brook trout	X			
Semotilus corporalis (Mitchill) fallfish	X	X		

Table 3. Percentage of total saltwater or freshwater species that utilized the Upper Thames Estuary during each season.

Species	Number of Species	Spring	Summer	Fall	Winter
Freshwater	22	86	91	54	50
Saltwater	39	59	64	64	33

Table 4. Percentage distribution by season of saltwater or freshwater species found in only one season in the Upper Thames Estuary.

Species	Number of Species	Spring	Summer	Fall	Winter
Freshwater	22	40	60	0	0
Saltwater	39	25	31	31	12

Table 5. Percentage distribution of total saltwater or freshwater species by number of seasons of occurrence in the Upper Thames Estuary, Connecticut.

Species	Number of Species	Number of Seasons 1	2	3	4
Freshwater	22	23	23	4	50
Saltwater	39	41	18	20	20

Table 6. Utilization of upper estuaries by fishes.

Location	No. of Freshwater Species (F)	No. of Saltwater Species (S)	(F:S) Ratio	Authority
Yaquina R., Or.	0	29	0	Pearcy and Meyers (1974)
Sheepscot R., Me.	0	34	0	Stickney (1959)
Mystic R., Ct.	1	58	.017	Pearcy and Richards (1962)
Salt Marsh Estuary, Ga.	3	67	.044	Dahlberg & Odum (1970)
East Lagoon, Tx.	2	42	.048	Arnold (et al.) (1960)
Copano & Aransas Bays, Tx.	3	48	.062	Gunter (1969)
St. John R., N.S.	1	13	.076	Trites (1960)
Vermillion Bay, La.	8	76	.105	Norden (1966)
Newport, R., N.C.	5	22	.227	Turner & Johnson (1973)
East R., Fl.	15	62	.241	Tagatz & Wilkens (1973)
Neusey, N.C.	12	45	.266	Tagatz & Dudley (1961)
Carquinez St., Ca.	11	39	.282	Messersmith (1966)
Newport R., Ga.	18	61	.295	Dahlberg (1972)
Miramichi R., N.B.	18	60	.300	McKenzie (1959)
Delaware R., Dl.	12	38	.315	Raney, Schuler & Denocourt (1968)
San Pablo & Suisun Bays, Ca.	16	44	.364	Ganssle (1966)
St. Johns R., Fl.	55	115	.478	Tagatz (1967)
North R., Ma.	12	25	.480	Fiske, Watson & Coates (1966)
Delaware R., Dl.	16	34	.490	deSylva, Kalber & Schuster (1962)
Thames R., Ct.	22	39	.564	Present Study

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A LOCALIZED, OVER-WINTERING POPULATION OF THE MOSQUITOFISH, GAMBUSIA AFFINIS IN CONNECTICUT

Charles Steinmetz, Jr. and Bruce Boehm[1,2]

On October 12, 1973, an accidental find of a large population of mosquitofish, Gambusia affinis, was made in a small pond located on the campus of Southern Connecticut State College in New Haven, Connecticut. Subsequently, mosquitofish were also collected in a small lagoon and pond near the site of the original find. The purpose of our study was to determine the factors responsible for the survival of these fish in an area north of their reported range and also to delineate their distribution in the surrounding watershed.

The critical northern geographic boundary of native mosquitofish in the United States is 40° N latitude (Krumholz, 1948). Many introductions have been made north of this boundary particularly in the western and central United states (Rees, 1945; Trautman, 1957; and Otto, 1973; among others). In the northeastern United States, New Jersey is generally cited as the northern limit of surviving populations of mosquitofish (Hubbs and Lagler, 1964 and Perlmutter, 1961). No successful introductions have been reported for Connecticut waters.

METHODS AND MATERIALS

Study Area. The original find of the mosquitofish was made in the Campns Pond. Subsequent finds were also made in the Campus Lagoon and nearby Beaver Pond. The three water bodies are known collectively as the Beaver Ponds. The Campus Pond and Campus Lagoon are relatively small bodies of water with a surface area of about 2.6 and 32.2 hectares respectively and are located on the Southern Connecticut State College Campus. The Beaver Pond is adjacent to the Southern Campus and has a surface area of about 6.4 hectares. The Beaver Ponds and the surrounding watershed area of the West River were extensively sampled in order to determine the extent of the distribution of the mosquitofish.

A water connection exists between the Campus Pond and the Campus Lagoon through an underground pipeline that functions as both au inlet and an outlet. The Campus Pond is also supplied with water from some campus buildings and adjacent surface run-off. The Campus Lagoon waters and Beaver Pond are connected by an underground pipeline. All three bodies of water flow eventually into the West River.

Collecting Methods. Specimens for our study were collected from February, 1976 through February, 1977. The Beaver Ponds were sampled at least once a month. Captures were not always made even when sightings of

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mosquitofish were frequent. A selected number of mosquitofish were preserved, measured and sexed (Table 1). Nineteen additional collecting sites were also selected in the general water shed area of the Beaver Ponds and West River. Each of these sites was sampled at least three times during the spring, summer and fall of the sampling period. Fish were collected primarily by standard minnow seines with a smaller meshed section of about 3.2 mm sewn into the center and by a dipnet of about 3.0 mm mesh.

RESULTS AND DISCUSSION

Sightings in addition to the captnres of 243 fish during the period of sampling and also at various other times from 1973 to the present showed that the Connecticut mosquitofish appear to be restricted in their distribution to the Beaver Ponds. Not a single sighting or capture was made in the 19 selected sites in the West River and drainage area.

Further, the number of fish captured and sightings strongly indicate that mosquitofish survive and over-winter in only the Campus Pond. The waters of this pond were generally 2-5 C higher during the sampling period due to an influx of heated water (10 C) released on an intermittent basis from the college Power Plant. The surface of the Campus Pond never froze completely in 1976 or 1977 even though complete ice cover was recorded on hoth the Campus Lagoon and Beaver Pond in 1977. The Campus Pond is thus an environment in which temperatures are artifically elevated so that mosquitofish are capable of surviving during the relatively cold Connecticut winters.

While mosquitofish can successfully over-winter in the Campus Pond, they are apparently eliminated in the colder waters of the Campus Lagoon and Beaver Pond in the winter. The populations in these two ponds are then apparently replenished by migration and subsequent reproduction of mosquitofish from the Campus Pond during the warmer months of the year.

It should be noted here that field observations have revealed no evidence to date that mosquitofish pass the winter hibernating in the mud at the bottom of the ponds. Rees (1945) also made the same observation in Utah waters.

Mosquitofish have survived at least six winters to date in the heat-augmented waters of the Campus Pond. These fish have been maintained at only some 2-5 C above ambient temperatures and thns seem to be a fairly cold-resistant species. Should their survival continue through the years, it is likely these Connecticut mosquitofish will withstand cold beyond the present limits. This future population would thus be an excellent source of fish for possible introduction into other ponds in Connecticnt and nearby states.

Table 1. Number, sexual composition and total lengths (mm) of 153 selected[a] mosquitofish collected in the beaver ponds from 2-12-76 to 2-4-77.

Where Collected	No. Male	No. Female	Mean Length Male	Length Range Male	Mean Length Female	Length Range Female
Campus Pond	2	6	27.5	21.5 - 28.0	38.3	26.0 - 45.4
	5	7	29.7	24.0 - 31.0	36.2	29.5 - 43.0
	1	4	32.5	32.5	35.1	27.0 - 41.5
	3	16	28.3	26.0 - 30.0	33.2	25.0 - 36.4
	-	2	-	-	34.3	31.0 - 37.5
	1	11	20.5	20.5	26.5	19.0 - 30.5
	2	3	28.3	26.5 - 29.0	27.7	25.0 - 29.5
	3	11	24.3	21.5 - 27.0	21.0	12.5 - 34.5
	-	8	-	-	21.8	14.5 - 27.0
	3	18	13.6	12.0 - 14.0	21.0	21.0
	2	1	26.8	26.5 - 27.0	21.0	21.0
	1	13	26.0	26.0	26.7	21.0 - 34.5
	2	8	27.5	27.0 - 28.0	24.2	19.0 - 31.0
Campus Lagoon	4	9	25.0	21.0 - 27.5	19.5	16.5 - 21.0
	-	1	-	-	20.0	20.0
Beaver Pond	-	6	-	-	21.5	18.0 - 22.0

a. Ninety fish were not sexed or measured.

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FURTHER ADDITIONS TO, AND NOTES ON, THE FRESHWATER ICHTHYOFAUNA OF CONNECTICUT

Walter R. Whitworth[1], Peter Minta[2], and Robert Orciari[3]

Fishes found within the freshwaters of Connecticut were documented by Behnke and Wetzel (1960), Kendall (1908), Linsley (1844), Marcy (1976a and b), Steinmetz and Boehm (1980), Thorpe (1942), Whitworth, Berrien, and Keller (1968), Whitworth, Gibbons, Heuer, Johns and Schmidt (1975), Whitworth and Marsh (1980), and Whitworth and Schmidt (1971). The purpose of this paper is to add additional fishes to those that may be found in the freshwaters of Connecticut, and to add more information about two species previously reported within the freshwaters of this state.

Charles Phillips, Connecticut Department of Environmental Protection, and Ronald Klattenberg and Martin Solomon, Northeast Utilities, graciously shared their knowledge of the freshwater fish fauna of Connecticut with us.

INTRODUCED FRESHWATER FISHES

Amia calva Linnaeus, bowfin.

This species was stocked by individuals in lakes as a sport fish during the last 6 years. All known populations were chemically treated by the Department of Environmental Protection. Introductions motivated by sport fishing may have been the source of the stock reported by Thorpe (1942), however, that population failed to reproduce.

Ictalurus natalis (Lesueur), yellow bullhead.

Numerous (gill net samples) in Candlewood Lake since 1976.

Ictalurus punctatus (Rafinesque), channel catfish.

More widely distributed than reported (Whitworth et al. 1968), throughout most of the Connecticut River below Enfield Dam.

Umbra limi (Kirtland), central mudminnow.

Occasional specimens have been caught on the intake screens at the Connecticut Yankee plant, East Haddam, Connecticut, since 1976.

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ADVENTITIOUS VISITORS FROM SALTWATER

Bairdiella chrysura (Lacépède), silver perch.

Numerous specimens captured in trap net at the mouth of the Connecticut River from September to October, 1973.

Leiostomus xanthurus Lacépède, spot.

Numerous specimens captured in a trap set at the mouth of the Connecticut River from September to October, 1973.

Menticirrhus saxatilis (Bloch and Schneider), northern kingfish.

Collected in the Thames River Estuary October, 1970, at the mouth of Poquetunuck Cove.

Selene vomer (Linnaeus), lookdown.

Captured in a trap net October, 1973, at the mouth of the Connecticut River.

POSSIBLE ANADROMOUS FISHES

Dorosoma cepedianum (Lesueur), gizzard shad.

Caught by commercial shad fisherman in 1976 abont 1.5 miles north of the mouth of the Connecticut River. Apparently specimens of this species are moving up the coast from stocks in the mid Atlantic states and were recently reported in the Hudson River (Beebe, personal commuuication).

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APPENDIX I

CHECKLIST OF KNOWN CONNECTICUT FISH SPECIES

KEY: M = marine; F = freshwater; (I) = introduced

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Myxinidae-hagfishes	
Atlantic hagfish	M	*Myxine glutinosa* Linnaeus
	Petromyzontidae-lampreys	
American brook lamprey	F	*Lampetra lamottei* (Lesueur)
Sea lamprey	M-F	*Petromyzon marinus* Linnaeus
	Odontaspididae-sand tigers	
Sand tiger	M	*Odontaspis taurus* (Rafinesque)
	Alopiidae-thresher sharks	
Thresher shark	M	*Alopias vulpinus* (Bonnaterre)
	Lamnidae-mackerel sharks	
Shortfin mako	M	*Isurus oxyrinchus* Rafinesque
	Carcharhinidae-requiem sharks	
Sandbar	M	*Carcharhinus milberti* (Valenciennes)
Blue shark	M	*Prionace glauca* (Linnaeus)
Smooth dogfish	M	*Mustelus canis* (Mitchill)
	Sphyrnidae-hammerhead sharks	
Smooth hammerhead	M	*Sphyrna zygaena* (Linnaeus)
	Squalidae-dogfish sharks	
Spiny dogfish	M	*Squalus acanthias* Linnaeus

NAMES OF CONNECTICUT FISHES

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Rajidae-skates	
Clearnose skate	M	*Raja eglanteria* Bosc
Little skate	M	*Raja erinacea* Mitchill
Barndoor skate	M	*Raja laevis* Mitchill
Winter skate	M	*Raja ocellata* Mitchill
	Dasyatidae-stingrays	
Roughtail stingray	M	*Dasyatis centroura* (Mitchill)
	Myliobatidae-eagle rays	
Bullnose ray	M	*Myliobatis freminvillei* Lesueur
Cownose ray	M	*Rhinoptera bonasus* (Mitchill)
	Acipenseridae-sturgeons	
Shortnose sturgeon	M-F	*Acipenser brevirostrum* Lesueur
Atlantic sturgeon	M-F	*Acipenser oxyrhynchus* Mitchill
	Amiidae-bowfin	
Bowfin	F(I)	*Amia calva* Linnaeus
	Elopidae-tarpons	
Ladyfish	M	*Elops saurus* Linnaeus
	Anguillidae-freshwater eels	
American eel	M-F	*Anguilla rostrata* (Lesueur)
	Congridae-conger eels	
Conger eel	M	*Conger oceanicus* (Mitchill)

NAMES OF CONNECTICUT FISHES

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Clupeidae-herrings	
Blueback herring	M-F	*Alosa aestivalis* (Mitchill)
Hickory shad	M	*Alosa mediocris* (Mitchill)
Alewife	M-F	*Alosa pseudoharengus* (Wilson)
American Shad	M-F	*Alosa sapidissima* (Wilson)
Large-scaled menhaden	M	*Brevoortia brevicaudata* Goode
Atlantic menhaden	M	*Brevoortia tyrannus* (Latrobe)
Atlantic herring	M	*Clupea harengus* Linnaeus
Gizzard Shad	M-F	*Dorosoma cepedianum* (Lesueur)
Round herring	M	*Etrumeus teres* (DeKay)
	Engraulidae-anchovies	
Striped anchovy	M	*Anchoa hepsetus* (Linnaeus)
Bay anchovy	M	*Anchoa mitchilli* (Valenciennes)
	Salmonidae-salmon and trout	
Sockeye salmon	F(I)	*Oncorhynchus nerka* (Walbaum)
Round whitefish	F	*Prosopium cylindraceum* (Pallas)
Rainbow trout	F(I)	*Salmo gairdneri* Richardson
Atlantic salmon	M-F(I)	*Salmo salar* Linnaeus
Brown trout	M-F(I)	*Salmo trutta* Linnaeus
Brook trout	F	*Salvelinus fontinalis* (Mitchill)
Lake trout	F(I)	*Salvelinus namaycush* (Walbaum)
	Osmeridae-smelts	
Rainbow smelt	M-F	*Osmerus mordax* (Mitchill)
	Umbridae-mudminnows	
Central mudminnow	F(I)	*Umbra limi* (Kirtland)
	Esocidae-pikes	
Redfin pickerel	F	*Esox americanus* Gmelin
Northern pike	F(I)	*Esox lucius* Linnaeus
Chain pickerel	F	*Esox niger* Lesueur

NAMES OF CONNECTICUT FISHES

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Synodontidae-lizardfishes	
Inshore lizardfish	M	*Synodus foetens* (Linnaeus)
	Cyprinidae-minnows and carps	
Stoneroller	F(I)	*Campostoma anomalum* (Rafinesque)
Goldfish	F(I)	*Carassius auratus* (Linnaeus)
Carp	F(I)	*Cyprinus carpio* Linnaeus
Cutlips minnow	F	*Exoglossum maxillingua* (Lesueur)
Ide	F(I)	*Leuciscus idus* (Linnaeus)
Golden shiner	F	*Notemigonus crysoleucas* (Mitchill)
Bridle shiner	F	*Notropis bifrenatus* (Cope)
Common shiner	F	*Notropis cornutus* (Mitchill)
Spottail shiner	F	*Notropis hudsonius* (Clinton)
Rosyface shiner	F	*Notropis rubellus* (Agassiz)
Bluntnose minnow	F	*Pimephales notatus* (Rafinesque)
Fathead minnow	F(I)	*Pimephales promelas* Rafinesque
Blacknose dace	F	*Rhinichthys atratulus* (Hermann)
Longnose dace	F	*Rhinichthys cataractae* (Valenciennes)
Creek chub	F	*Semotilus atromaculatus* (Mitchill)
Fallfish	F	*Semotilus corporalis* (Mitchill)
Pearl dace	F	*Semotilus margarita* (Cope)
Tench	F(I)	*Tinca tinca* (Linnaeus)
	Catostomidae-suckers	
White sucker	F	*Catostomus commersoni* (Lacépède)
Creek chubsucker	F	*Erimyzon oblongus* (Mitchill)
	Ictaluridae-freshwater catfishes	
White catfish	F(I)	*Ictalurus catus* (Linnaeus)
Black bullhead	F(I)	*Ictalurus melas* (Rafinesque)
Yellow bullhead	F(I)	*Ictalurus natalis* (Lesueur)
Brown bullhead	F	*Ictalurus nebulosus* (Lesueur)
Channel catfish	F(I)	*Ictalurus punctatus* (Rafinesque)
	Percopsidae-trout-perches	
Trout-perch	F	*Percopsis omiscomaycus* (Walbaum)

NAMES OF CONNECTICUT FISHES

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Batrachoididae-toadfishes	
Oyster toadfish	M	*Opsanus tau* (Linnaeus)
	Lophiidae-goosefishes	
Goosefish	M	*Lophius americanus* Valenciennes
	Gadidae-codfishes	
Cusk	M	*Brosme brosme* (Müller)
Fourbeard rockling	M	*Enchelyopus cimbrius* (Linnaeus)
Atlantic cod	M	*Gadus morhua* Linnaeus
Burbot	F	*Lota lota* (Linnaeus)
Haddock	M	*Melanogrammus aeglefinus* (Linnaeus)
Silver hake	M	*Merluccius bilinearis* (Mitchill)
Atlantic tomcod	M	*Microgadus tomcod* (Walbaum)
Pollack	M	*Pollachius virens* (Linnaeus)
Red hake	M	*Urophycis chuss* (Walbaum)
Spotted hake	M	*Urophusis regius* (Walbaum)
White hake	M	*Urophycis tenuis* (Mitchill)
	Ophidiidae-cusk-eels and brotulas	
Striped cusk-eel	M	*Rissola marginata* (DeKay)
	Zoarcidae-eelpouts	
Ocean pout	M	*Macrozoarces americanus* (Bloch and Schneider)
	Exocoetidae-flyingfishes and halfbeaks	
Halfbeak	M	*Hemiramphus sp.*
	Belonidae-needlefishes	
Atlantic needlefish	M	*Strongylura marina* (Walbaum)
	Scomberesocidae-sauries	
Atlantic saury	M	*Scomberesox saurus* (Walbaum)

NAMES OF CONNECTICUT FISHES

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Cyprinodontidae-killifishes	
Sheepshead minnow	M	*Cyprinodon variegatus* Lacépede
Banded killifish	M-F	*Fundulus diaphanus* (Lesueur)
Mummichog	M	*Fundulus heteroclitus* (Linnaeus)
Spotfin killifish	M	*Fundulus luciae* (Baird)
Striped killifish	M	*Fundulus majalis* (Walbaum)
Rainwater killifish	M	*Lucania parva* (Baird)
	Poeciliidae-livebearers	
Mosquitofish	F(I)	*Gambusia affinis* (Baird and Girard)
	Atherinidae-silversides	
Tidewater silverside	M	*Menidia beryllina* (Cope)
Atlantic silverside	M	*Menidia menidia* (Linnaeus)
	Gasterosteidae-sticklebacks	
Fourspine stickleback	M-F	*Apeltes quadracus* (Mitchill)
Brook stickleback	F	*Culaea inconstans* (Kirtland)
Threespine stickleback	M	*Gasterosteus aculeatus* Linnaeus
Blackspotted stickleback	M	*Gasterosteus wheatlandi* Putnam
Ninespine stickleback	M	*Pungitius pungitius* (Linnaeus)
	Fistulariidae-cornetfishes	
Bluespotted cornetfish	M	*Fistularia tabacaria* Linnaeus
	Syngnathidae-pipefishes and seahorses	
Lined seahorse	M	*Hippocampus erectus* Perry
Northern pipefish	M	*Syngnathus fuscus* Storer
	Percichthyidae-temperate basses	
White perch	M-F	*Morone americana* (Gmelin)
Striped bass	M-F	*Morone saxatilis* (Walbaum)
	Serranidae-sea basses	
Black sea bass	M	*Centropristis striata* (Linnaeus)

NAMES OF CONNECTICUT FISHES

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Centrarchidae-sunfishes	
Rock bass	F(I)	*Ambloplites rupestris* (Rafinesque)
Banded sunfish	F	*Enneacanthus obesus* (Girard)
Redbreasted sunfish	F	*Lepomis auritus* (Linnaeus)
Green sunfish	F(I)	*Lepomis cyanellus* Rafinesque
Pumpkinseed	F	*Lepomis gibbosus* (Linnaeus)
Bluegill	F(I)	*Lepomis macrochirus* Rafinesque
Smallmouth bass	F(I)	*Micropterus dolomieui* Lacépède
Largemouth bass	F(I)	*Micropterus salmoides* (Lacepede)
White crappie	F(I)	*Pomoxis annularis* Rafinesque
Black crappie	F(I)	*Pomoris nigromaculatus* (Lesueur)
	Percidae-perches	
Swamp darter	F	*Etheostoma fusiforme* (Girard)
Tessellated darter	F	*Etheostoma olmstedi* Storer
Yellow perch	F	*Perca flavescens* (Mitchill)
Walleye	F(I)	*Stizostedeion vitreum* (Mitchill)
	Priacanthidae-bigeyes	
Short bigeye	M	*Pristigenys alta* (Gill)
	Pomatomidae-bluefishes	
Bluefish	M	*Pomatomus saltatrix* (Linnaeus)
	Rachycentridae-cobias	
Cobia	M	*Rachycentron canadum* (Linnaeus)
	Echeneidae-remoras	
Shark sucker	M	*Echeneis naucrates* Linnaeus

NAMES OF CONNECTICUT FISHES

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Carangidae-jacks and pompanos	
African pompano	M	*Alectis crinitis* (Mitchill)
Blue runner	M	*Caranx crysos* (Mitchill)
Crevalle jack	M	*Caranx hippos* (Linnaeus)
Round scad	M	*Decapterus punctatus* (Agassiz)
Pilotfish	M	*Naucrates ductor* (Linnaeus)
Bigeye scad	M	*Selar crumenophthalmus* (Bloch)
Lookdown	M	*Selene vomer* (Linnaeus)
Banded rudderfish	M	*Seriola zonata* (Mitchill)
Florida pompano	M	*Trachinotus carolinus* (Linnaeus)
Permit	M	*Trachinotus falcatus* (Linnaeus)
Atlantic moonfish	M	*Vomer setapinnis* (Mitchill)
	Sparidae-porgies	
Scup	M	*Stenotomus chrysops* (Linnaeus)
	Sciaenidae-drums	
Silver perch	M	*Bairdiella chrysura* (Lacépède)
Weakfish	M	*Cynoscion regalis* (Bloch and Schneider)
Spot	M	*Leiostomus xanthurus* Lacepède
Northern kingfish	M	*Menticirrhus saxatilis* (Bloch and Schneider)
	Mullidae-goatfishes	
Red goatfish	M	*Mullus auratus* Jordan and Gilbert
	Chaetodontidae-butterflyfishes	
Foureye butterflyfish	M	*Chaetodon capistratus* Linnaeus
Spotfin butterflyfish	M	*Chaetodon ocellatus* Bloch
	Labridae-wrasses	
Tautog	M	*Tautoga onitis* (Linnaeus)
Cunner	M	*Tautogolabrus adspersus* (Walbaum)

NAMES OF CONNECTICUT FISHES

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Mugilidae-mullets	
Striped mullet	M	*Mugil cephalus* Linnaeus
White mullet	M	*Mugil curema* Valenciennes
	Sphyraenidae-barracudas	
Northern sennet	M	*Sphyraena borealis* DeKay
	Stichaeidae-pricklebacks	
Radiated shanny	M	*Ulvaria subbifurcata* (Storer)
	Pholidae-gunnels	
Rock gunnel	M	*Pholis gunnellus* (Linnaeus)
	Anarhichadidae-wolfishes	
Atlantic wolffish	M	*Anarhichas lupus* Linnaeus
	Ammodytidae-sand lances	
American sand lance	M	*Ammodytes americanus* DeKay
	Gobiidae-gobies	
Naked goby	M	*Gobiosoma bosci* (Lacépède)
Seaboard goby	M	*Gobiosoma ginsburgi* Hildebrand and Schroeder
	Trichiuridae-cutlassfishes	
Atlantic cutlassfish	M	*Trichiurus lepturus* Linnaeus
	Scombridae-mackerels and tunas	
Chub mackerel	M	*Scomber japonicus* Houttuyn
Atlantic mackerel	M	*Scomber scombrus* Linnaeus
	Stromateidae-butterfishes	
Butterfish	M	*Peprilus triacanthus* (Peck)

NAMES OF CONNECTICUT FISHES

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Triglidae-searobins	
Northern searobin	M	*Prionotus carolinus* (Linnaeus)
Striped searobin	M	*Prionotus evolans* (Linnaeus)
	Cottidae-sculpins	
Slimy sculpin	F	*Cottus cognatus* Richardson
Sea raven	M	*Hemitripterus americanus* (Gmelin)
Grubby	M	*Myoxocephalus aenaeus* (Mitchill)
Longhorn sculpin	M	*Myoxocephalus octodecemspinosus* (Mitchill)
Shorthorn sculpin	M	*Myoxocephalus scorpius* (Linnaeus)
	Cyclopteridae-lumpfishes	
Lumpfish	M	*Cyclopterus lumpus* Linnaeus
Seasnail	M	*Liparis atlanticus* (Jordan and Evermann)
Striped seasnail	M	*Liparis liparis* (Linnaeus)
	Dactylopteridae-flying gurnards	
Flying gurnard	M	*Dactylopterus volitans* (Linnaeus)
	Bothidae-lefteye flounders	
Smallmouth flounder	M	*Etropus microstomus* (Gill)
Summer flounder	M	*Paralichthys dentatus* (Linnaeus)
Fourspot flounder	M	*Paralichthys oblongus* (Mitchill)
Windowpane flounder	M	*Scophthalmus aquosus* (Mitchill)
	Pleuronectidae-righteye flounders	
Witch flounder	M	*Glytocephalus cynoglossus* (Linnaeus)
American plaice	M	*Hippoglossoides platessoides* (Fabricius)
Yellowtail flounder	M	*Limanda ferruginea* (Storer)
Smooth flounder	M	*Liopsetta putnami* (Gill)
Winter flounder	M	*Pseudopleuronectes americanus* (Walbaum)
	Soleidae-soles	
Hogchoker	M	*Trinectes maculatus* (Bloch and Schneider)