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N.J. ANADROMOUS FISH
INVENTORY: THE COLLECTION
OF EXISTING INFORMATION &
FIELD INVESTIGATION.

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Bureau of Fisheries
Lebanon, New Jersey 08833

New Jersey Anadromous Fish Inventory:

The Collection of Existing Information
and Field Investigation of Anadromous
Clupeid Spawning in New Jersey

By

H. E. Zich

Project Leader

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New Jersey Anadromous Fish Inventory

Date Submitted: 6 January 1977

Period of Study: 28 June 1972 - 31 December 1976

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New Jersey

AFC-2

Final Report

New Jersey Anadromous Fish Inventory

Project Objective: To develop an inventory of extant and extinct spawning runs of anadromous clupeids for New Jersey.

Job I: Collection of existing information on anadromous clupeid spawning runs.

Job II: Field investigation of anadromous clupeid spawning runs.

Period Covered: June 28, 1972--December 31, 1976

Abstract:

In New Jersey during the period extending from June 28, 1972 to December 31, 1976 one hundred and thirty three (133) anadromous clupeid spawning runs were confirmed in sixty three (63) major drainages that are physically continuous with the marine environment. These confirmations included one hundred and eight (108) alewife (Alosa pseudoharengus) runs, twenty four (24) blueback herring (Alosa aestivalis) runs and one (1) American shad (Alosa sapidissima) run.

During the project period ninety (90) anadromous clupeid spawning runs were reported from all sources (historical review, file data and personal interviews) and thirty six (36) remains unconfirmed.

It has been assessed that at least twenty eight (28) anadromous clupeid spawning runs have become extinct in New Jersey watercourses including nine (9) herring and nineteen (19) shad.

During field investigation eighty-three (83) constructed barriers were located on watercourses where spawning runs of clupeids have been reported or confirmed. These barriers were assessed to be blocking or limiting fish passage and reducing potential spawning habitat.

Recommendations are made to protect and where possible enhance the anadromous clupeid spawning populations of the state.

Introduction:

New Jersey's anadromous fish management program has been inadequate from the standpoint of protecting and enhancing the spawning runs of anadromous Clupeidae. The primary reasons for this has been a lack of timely information on (1) the location of existing runs and (2) waters where runs have become extinct but with proper management could be reestablished. The project was designed to fulfill these needs and provide a basis to develop and conduct an anadromous fish management program.

The species of Clupeidae that are of primary concern are the alewife (Alosa pseudoharengus), the blueback herring (Alosa aestivalis), the American shad, (Alosa sapidissima) and the hickory shad (Alosa mediocris) because of their sport fishing, commercial and ecological value.

Procedures:

A search of literature and records was conducted utilizing the facilities at:

Division of Fish, Game and Shellfisheries, Trenton
Bureau of Fisheries Laboratory, Lebanon
Charles O. Hayford Fish Hatchery, Hackettstown
Nacote Creek Research Laboratory, Absecon
Delaware River Anadromous Project Laboratory, Rosemont
Delaware River Basin Commission, Wilburtha
Tuckahoe Fish and Wildlife Management Area, Tuckahoe
Ichthyological Associates Laboratory, Absecon
New Jersey State Museum, Trenton
Rutgers, The State University, New Brunswick.
Central Library
Medicine and Science Library
Environmental Science Library
Agricultural Library
Flemington Public Library, Flemington
Hunterdon County Library, Flemington
Hunterdon County Historical Society, Flemington
Monmouth County Library, Freehold
Division of Water Resources, Trenton
Stocton College, Egg Harbor City
Philadelphia Academy of Science, Philadelphia

A memorandum outlining the objectives of the project and requesting information was sent to all Division administrative and field personnel in the Bureaus of Fisheries, Game, Law Enforcement and Information. Additional memorandum copies were distributed to the N.J. Federation of Sportsmen Clubs, outdoor writers (newspaper), fisheries research groups, commercial fishermen and sporting goods dealers. In all five hundred (500) memorandums were distributed.

The project was discussed with Division Conservation Officers at their District meetings and they were asked to canvas their respective assigned administrative areas for anadromous fisheries resources and information. Where necessary, Conservation Officers were personally contacted in their assigned areas and leads were run down on a drainage basis.

A list of all possible anadromous clupeid spawning run locations, regardless of existing physical and chemical limitations, was developed as a baseline from a total of ninety-nine (99) U.S. Coast and Geodetic 7.5 minute topographic maps representing sixty-three (63) major fresh water drainage basins in New Jersey continuous with the Delaware River, Delaware Bay, Atlantic Ocean and the Hudson River.

Existing physical barrier information was clearly defined on the project topographic maps at the point of upstream migration limitation. A black line across a watercourse indicates a dam, floodgate or elevated culvert. A solid red line or area indicates spoil or other landfill sites. Green and red lines indicate irrigation impoundments. Brown areas indicate commercial salt hay sites. Green areas indicate mosquito impoundments. Blue areas indicate commercial muskrat impoundments. A broken red line indicates waterfowl impoundments. A file card system was developed to cross reference this information to reported or confirmed anadromous clupeid spawning runs.

Reported and confirmed anadromous clupeid spawning was indicated on the project topographic maps by a yellow and orange line respectively superimposed over the watercourse that they were reported or confirmed to be spawning in. A numerical index was used on the maps to indicate the species of clupeid either reported or confirmed to be spawning. The numbers 1, 2, 3 and 4 respectively indicated alewife, blueback herring, hickory shad and American Shad. A file card system was developed to cross reference this information to a confirmed spawning record. That record includes each confirmed spawning run by species, water course, location drainage, county, U.S.G.S. map name and number, date of confirmation, method of confirmation, name of confirmer, date and water temperature.

Field Investigations

1973 Lacking information regarding the distribution of anadromous clupeid spawning runs in New Jersey prompted initial field investigations to be focused on a need for rapid identification of spawning streams. Therefore, starting in the last week of March 1973 emphasis was placed on watercourses in the southern counties of Cape May, Cumberland, Atlantic and Burlington because they represented the area where most runs were reported to occur. As the spring spawning season progressed field investigation activities were conducted in the more northern county areas of Salem, Gloucester, Camden, Ocean, Monmouth, Middlesex and Union. Because a "broadbrush" approach was utilized in this initial year of field investigation no set sampling schedule was used but sampling locations were incorporated into the successive following years scheduled sampling. Field activities continued through the first week in June 1973.

During the subsequent years of field investigation, prior to the spawning run season, watercourses reported or suspected to be supporting anadromous clupeid spawning runs were reconnoitered and a list of scheduled sampling stations prepared. Stations were developed into scheduled routes called "traplines" which usually enabled project personnel to investigate each station on the schedule several days a week.

1974 During the month of April four (4) "traplines" were developed to regularly investigate stations or watercourses continuous with the Delaware River in the counties of Cumberland, Salem, Gloucester, Camden, Burlington and Mercer. During the month of May two (2) "traplines" were developed to investigate stations on watercourses continuous with the Atlantic Ocean in the counties of Atlantic, Burlington, Ocean, Monmouth, and Middlesex.

1975 During the spawning runs season four (4) regularly scheduled "traplines" were developed to investigate watercourses continuous with the Atlantic Ocean in Middlesex, Monmouth, Ocean and Burlington Counties and watercourses continuous with the Delaware River in Mercer, Burlington, Camden and Gloucester Counties. Additional stations on watercourses in Hunterdon, Salem, Cape May and Atlantic Counties were also investigated on a random basis as time permitted.

1976 Six (6) "traplines" were developed and routinely maintained during the final year of field investigations. In the northeast counties of Passaic, Bergen, Hudson, Essex, Union and Middlesex two (2) "traplines" were maintained. Four (4) "traplines" were maintained elsewhere in the State on watercourses continuous with the Delaware River and Bay and Atlantic Ocean in the counties of Warren, Hunterdon, Mercer, Burlington, Camden, Gloucester, Cumberland, Cape May and Atlantic. Additional stations on watercourses continuous with the Atlantic Ocean in the Counties of Burlington, Ocean and Monmouth were also investigated on a random basis as time allowed.

A variety of sampling methods were employed to identify streams containing anadromous spawning runs of clupeids: 1) gill net; 2) fish trap; 3) dip net; 4) fisherman creel check; 5) electrofishing unit. 1) Monofilament gill nets of three (3) inch stretch mesh, varying from three (3) to six (6) feet deep and twenty (20) to one hundred (100) feet long were usually set for fifteen (15) minutes in small streams to two (2) hours in a large stream. 2) The sixteen (16) inch diameter, five (5) foot long one (1) inch mesh hardware cloth and funneled fish trap was designed and constructed to capture adult herring spawners over an extended period of sampling time under various stream conditions, fifteen (15) of these traps were constructed prior to the 1974 field investigation season and set at appropriate sampling stations where they could be expected to sample twenty-four (24) hours a day. Some of the fish traps were set in one (1) location for a maximum of twenty-nine (29) continuous days. 3) Dip nets ranged in head diameter from twelve (12) to twenty-four (24) inches and were used to sample adult herring in small streams or other locations where they could be easily netted. 4) Fisherman creek checks were made and used as deemed appropriate. 5) The electrofishing unit was not a formal sampling method employed by project personnel to confirm anadromous clupeid spawning runs and these confirmations were incidental to other field investigations by Bureau Fisheries personnel.

Confirmed anadromous clupeid spawning runs were designated as those rivers, streams, tributaries and other waters verified, during field investigations, to contain ripe gravid female anadromous clupeids.

Following each field season the inventory of existing barriers was expanded and updated from field notes. Information was recorded in the the file card system and information was defined on the projects topographic maps. Newly reported and confirmed anadromous clupeid spawning runs were also recorded in the file card system and defined on the maps by color coding and numerical index.

Findings:

Job 1 -- The Collection of existing information on anadromous clupeid spawning runs.

The Pennsylvania Report of the State's Commission of Fisheries 1896 indicated that the Delaware River was probably the best shad river on the Atlantic Coast. The best shad tributaries in New Jersey were reported to be: Coopers Creek (Cooper River), Rancocas Creek (Shad runs 15-30 miles upstream of the confluence with the Delaware River), Big Timber Creek (best shad fisheries located 8-10 miles from the mouth--shad usually caught 7-10 days earlier than in the Delaware River), Salem Creek (Salem River), Raccoon Creek, Oldmans Creek and Woodbury Creek.

Evidence that shad utilized the lower Delaware River and tributaries for spawning can be extrapolated from two references in the 1896 Report. (1) Because of a recognizable decline in the Delaware River fisheries in 1873 the N.J. Fish Commissioner Dr. J. H. Clark hatched and released one million (1M) shad fry at Point Pleasant, Pa. (Byran, N.J.) using Seth Green's hatching boxes at a cost of about \$3,000.00, the N.J. Legislature did not appropriate money for 1874. (2) In 1887 the U. S. Fish Commissioners using the Streamer Fish Hawk hatched and distributed thirty-five million (35M) shad fry into the Delaware River and tributaries at Gloucester (Gloucester City). From these two accounts it is obvious that gravid female shad in the lower Delaware River had eggs ripe enough to fertilize and hatch either in the main stem or tributaries.

From the Second Annual Report of the U.S. Fish Commissioners 1872, "it is feared that no spawning grounds for shad exist in the Raritan River because of waste material discharge in the New Brunswick area from gas works, India rubber works and the Delaware-Raritan Canal dam in the Raritan below Bound Brook."

"The Raritan River is supplied with young shad from the Delaware River through the Delaware-Raritan Canal but much mortality exists because of locks and eleven (11) mill wheels at Lambertville. So called "fishway" in Raritan River dam below Bound Brook is ineffective for passing shad."

It was further reported (1872) that Crosswicks Creek was clear for fish passage for ten (10) miles; Blacks Creek was now worthless from breeding season robbery and gas tar defilement; English Creek was much impounded into ponds (Crystal Lake); Rancocas Creek was much defiled, and of little use; Cohansey Creek shad fishery averaged seven hundred (700) catch.

The 1877 U.S. Fish Commission reported that the Pennsgrove Shad Hatchery hatched out four million (4M) shad ova. One hundred and fifty thousand (150,000) shad fry were planted in the Passaic River and fifty thousand (50,000) planted in the Raritan River with the rest being returned to the Delaware River.

Again in 1881 the Commissioners reported that shad fry were planted in the Raritan and Hackensack Rivers.

In 1912 shad fry were planted in the Mullica River (250,000 fry) at Green Bank and the Great Egg Harbor River (250,000 fry) at Mays Landing.

In 1913 twenty four million (24M) shad fry were planted in the Delaware from the Torresdale Hatchery.

In 1916 shad fry collected as ova from the Cohansey River were liberated at the mouth of the Rancocas Creek.

Although there were reported declines of the shad fisheries in the Delaware, Raritan and Passaic Rivers during this period of time and attempts were made to restore these fisheries through a restocking program no documentation has been found (to this date) on why stocking programs were undertaken on the Hackensack, Mullica and Great Egg Harbor Rivers. It can only be postulated that restoration of spawning runs or at least fisheries were the motivation.

In 1902 U.S. Fish Commissioners reported that in the Township of Brick, Monmouth County, several tributary rivers (Metedeconk and Manasquan Rivers) and all creeks, streams and coves of Barnegat Bay had herring runs (probably Beaverdam Creek, Cedar Bridge Branch, Kettle Creek, Tunes Branch, Long Causeway Branch and many displaced water courses on Metedeconk Neck.

The 1904 N.J. Board of Fish and Game Commissioners reported that in 1820 there was a shad fishery at the mouth of every creek and river between Bayside and Trenton which would consist of about fifty (50) fisheries.

In Beck's Jersey Genesis (a history of the Mullica River) there is the report that in old days herring ran far past Batsto almost to Atsion.

In Fowler's N.J. State Museum - Fishes of New Jersey 1900, 1905, 1906 and 1908 there are reported shad in the tidewater of Great Egg Harbor River, Lower Crosswick Creek, Cedar Swamp Creek near Petersburg, Green Creek Ponds (Cape May County), Rancocas Creek at Centerton (3 miles upstream of the Delaware River) and Raccoon Creek. Fowler also reported alewife herring in Cedar Swamp Creek at Petersburg, Tuckahoe River at Tuckahoe, Middle River, South Branch of Timber Creek at Blackwood, Mantua Creek to Venonah, Raccoon Creek at Bridgeport and Rancocas Creek to Hainesport. Several of these herring runs are reported to be existing today.

As reported earlier in 1972 it was feared that the Raritan River had been lost to shad spawning due to pollution and dam construction. It also appears (although not documented to this point) that major spawning areas throughout New Jersey were lost in about the same period of time. In 1877 a shad hatchery was set up at Penns Grove (Salem County) and shad fry were planted in the Delaware, Passaic, Raritan and Hackensack Rivers.

In 1912 shad fry hatched at the Torresdale Hatchery (Philadelphia, Pa.) were planted in the Delaware, Mullica (Burlington and Atlantic Counties) and the Great Egg Harbor River (Atlantic County).

In 1916 the New Jersey Board of Fish and Game Commissioners Annual Report, it was reported that it appears certain that pollution in the Delaware River has practically destroyed great areas of shad spawning grounds immediately below Philadelphia.

In 1926 a State shad hatchery was established at Pennsville (Salem County) where eggs could be hatched and planted in streams of South Jersey where there was no pollution (particularly the Maurice River) and in streams remote from built up portions and industrial plants. The fish liberated could thus go to sea without going through the polluted portion of the Delaware River and rehabilitate the shad industry.

The shad hatchery was moved to Mancocks Bridge (Salem County) in 1927 and the practice of liberating fertilized shad eggs and shad fry was continued until 1941.

Since other anadromous Clupeids (e.c. hickory shad, alewife and bluback herring) are inherently subjected to limited range and high water quality requirements it is reasonable to assume that much of their spawning and nursery habitat has been lost over the years and is still being lost through the ever increasing environmental crisis of water pollution, stream blockages and habitat displacement.

In the twenty (20) years from 1953 to 1973 61,678 acres of coastal wetlands and an uncounted acreage of adjacent transitional upland habitat have been lost to filling and diking in New Jersey (Ferrigno, Widjeskog and Toth 1973).

About half of the total loss, 32,874 acres was completely lost by dredging and filling of marshes and the displacement, relocation or disturbance of water courses that were in part maintained by a fresh water influence.

The other half of the marsh loss, 28,804 acres, was by in large responsible for an interruption in the tidal cycle, fisheries spawning and nursery habitat.

Salt Hay Agriculture: Dikes and sluice boxes keep the marshes well drained and prevent tidal inundation destroying the tidal food web.

Upland Agriculture: Usually creek tributaries of rivers are diked off to prevent tidal flooding of agricultural area and provide fresh water for irrigation.

Mosquito Impoundments: Marshes are diked off and either sluice boxes or pumps are installed, to exclude the daily tides.

Muskrat Impoundments: In the past some tidal inundation offset to some extent losses to the tidal blockage by these dikes but in recent years poor management has been responsible for the loss of tidal inundation into these impoundments.

Waterfowl Impoundments: Current water level management of these impoundments does in some cases allow spring tides to inundate these impoundments.

Road Like Impoundments: Poor planning of railroads and highways across marshes has interrupted tidal inundation.

Dredge Spoils Fill: Marshes are filled with dredging spoils to an elevation well above tidal inundation and the value of the tidal food web is lost.

Construction Landfill: Usually the marshes are diked and dredged material from lagoons, creeks, rivers and bays are pumped in destroying the marsh and disrupting the natural water courses.

From the combined efforts of researching background information, feedback from the distributed project memorandums and personal interviews a total of ninety (90) reported anadromous clupeid spawning runs were received from June 1972 to July 1976. Those reported spawning runs that were confirmed by field investigation and data review are identified by the designation (C).

1. Delaware River (C)
2. Alexauken Creek
3. Moore Creek
4. Crosswick Creek (C)
5. Blacks Creek (C)
6. Crystal Lake
7. Crafts Creek
8. Assicunk Creek

9. Rancocas Creek (C)
10. Mill Creek-Rancocas Creek (C)
11. Pompton Creek
12. Pennsauken Creek
13. Cooper River
14. Big Timber Creek
15. Woodbury Creek
16. Mantua Creek (C)
17. Depaupo Creek
18. Raccoon Creek (C)
19. Oldmans Creek (C)
20. Richmond Branch-Oldmans Creek (C)
21. Salem River (C)
22. Alloway Creek (C)
23. Stow Creek (C)
24. Cohansey River (C)
25. Rocaps Run-Cohansey River
26. Mill Creek-Cohansey River (C)
27. Cedar Creek-Delaware River (C)
28. Nantuxent River
29. Dividing Creek
30. Cub Swamp-Dividing Creek
31. Mill Creek-Dividing Creek
32. Cedar Creek-Dividing Creek
33. Maurice River (C)
34. Menantico Creek-Maurice River (C)
35. Manumuskin River-Maurice River (C)
36. West Creek-Delaware River (C)
37. Dennis Creek
38. Green Creek
39. Taylor Creek
40. Tuckahoe River (C)
41. Cedar Swamp Creek-Tuckahoe River (C)
42. Bog Branch-Tuckahoe River (C)
43. Flat Creek-Tuckahoe River (C)
44. Mill Creek-Tuckahoe River (C)
45. Halfway Creek-Tuckahoe River
46. Patcong Creek-Great Egg Harbor Bay (C)
47. Great Egg Harbor River (C)
48. Middle River-Middle G.E.H. River
49. Peters Run-G.E.H. River
50. Hawkins Creek-G.E.H. River (C)
51. Gibson Creek-G.E.H. River (C)
52. English Creek-G.E.H. River
53. South River-G.E.H. River (C)
54. Miry Run-G.E.H. River (C)
55. Gravelly Run-G.E.H. River (C)

56. Absecon Creek-Atlantic Ocean
57. Doughty Creek-Atlantic Ocean (C)
58. Mullica River (C)
59. Lucas Branch-Mullica River
60. Hammonton Creek-Mullica River (C)
61. Nescocchagus Creek-Mullica River (C)
62. Merrygold Cove-Mullica River
63. Bass River-Mullica River (C)
64. Tuckerton Creek (C)
65. Mill Creek-Manahawkin Bay (C)
66. Cedar Run-Manahawkin Bay
67. Fresh Creek-Barnegat Bay (C)
68. Gunning River-Barnegat Bay (C)
69. Double Creek-Barnegat Bay (C)
70. Oyster Creek
71. Forked River
72. Stouts Creek-Barnegat Bay
73. Cedar Creek (C)
74. Toms River (C)
75. Jefferys Creek-Toms River (C)
76. Mill Creek-Toms River (C)
77. Metedeconk River (C)
78. Haystack Brook-Metedeconk River
79. Manasquan River
80. Wreck Pond Creek (C)
81. Deal Lake (C)
82. Shark River
83. Takanassee Lake (C)
84. Swamp Brook-Havesink River (C)
85. Swimming River-Havesink River (C)
86. Raritan River
87. South River-Raritan River (C)
88. Lawrence Brook-Raritan River (C)
89. Passaic River
90. Hackensack River (C)

From the historical research of literature, personal interviews and field investigations it is assessed that a relatively large number of Clupeid spawning runs (especially American shad) have become extinct in New Jersey from the combined effects of pollution, habitat displacement, man made water course blockages and overfishing.

Extinct anadromous clupeid spawning:

shad = American shad (Alosa sapidissima)

herring = alewife (Alosa pseudoharengus) and blueback
(Alosa aestivalis)

| | |
|----------------------------|------------------|
| 1. Crosswick Creek | shad |
| 2. Blacks Creek | shad |
| 3. Rancocas Creek | shad |
| 4. Pennsauken Creek | herring |
| 5. Cooper River | shad and herring |
| 6. Woodbury Creek | shad |
| 7. Big Timber Creek | shad and herring |
| 8. Repaupo Creek | shad and herring |
| 9. Raccoon Creek | shad |
| 10. Oldmans Creek | shad |
| 11. Salem River | shad |
| 12. Cohansey River | shad |
| 13. Dividing Creek | herring |
| 14. Maurice River | shad |
| 15. Dennis Creek | herring |
| 16. Green Creek | shad |
| 17. Cedar Swamp Creek | shad |
| 18. Great Egg Harbor River | shad |
| 19. Absecon Creek | herring |
| 20. Mullica River | shad |
| 21. U. B. Forked River | herring |
| 22. Shark River | herring |
| 23. Raritan River | shad |
| 24. Passaic River | shad |
| 25. Hackensack River | shad |

Job 2--Field investigations of anadromous clupeid spawning runs.

From sixty-three (63) major drainages containing sixteen (16) primary rivers forty-one (41) secondary rivers, three hundred and ten (310) tertiary streams, two hundred and fifty-three (253) quaternary water courses and eleven (11) fresh water lakes (outer coastal plain) that are physically continuous with the marine environment a total of one hundred and thirty-three (133) anadromous clupeid spawning runs were confirmed.

Method of confirmation:

- (g) gill net = 56
- (d) dip net = 33
- (fc) fisherman creel check = 30
- (t) fish trap = 10
- (e) electrofishing unit = 4

Number in parenthesis e.c. (1) refers to confirmed spawning run on map in report.

U.S.G.S. #63--Lumberville Quadrangle e.c. refers to N.J. Bureau of Fisheries index number cross reference to the standard U.S. Geological Survey Quadrangle 7.5 minute series (topographic) maps.

Confirmer:

AFC = N.J. Anadromous Fish Inventory personnel

BF = N.J. Bureau of Fisheries personnel

AFS = Delaware River Anadromous Project personnel

Ich = Ichthyological Associates personnel

Confirmed alewife (Alosa pseudoharengus) and blueback herring (Alosa aestivalis) spawning runs:

Hunterdon County-Delaware River Drainage

- (1) Lockatong Creek-alewife above Rt. 29
6/10/76 @ 68°F. (d) AFC
U.S.G.S. #63-Lamberville Quadrangle
- (2) Delaware River-alewife @ Lambertville Wing Dam
5/12/75 @ 59°F. (d) AFC
U.S.G.S. #72-Lumberville Quadrangle

Mercer County-Delaware River Drainage

- (3) Fiddlers Creek-alewife above Rt. 29
5/8/75 @ 62°F. (fc) AFC
U.S.G.S. #72-Lambertville Quadrangle
- (4) Steele Run-alewife @ Washington Crossing State Park
5/8/75 @ 62°F. (d) AFC
U.S.G.S. #73-Pennington Quadrangle
- (5) Jacobs Creek-alewife above Rt. 29
5/17/75 @ 66°F. (g) AFC
U.S.G.S. #73-Pennington Quadrangle
- (6) Assumpink Creek-alewife @ Warren Street
5/6/75 @ 56°F. (g) AFC
U.S.G.S. #80-Trenton West Quadrangle
- (7) Delaware River-alewife @ Trenton Falls
4/20/74 @ 52°F. (fc) AFC
U.S.G.S. #80-Trenton West Quadrangle

- (8) Delaware River-blueback @ Trenton Falls
4/22/73 @ 58°F. (fc) AFC
U.S.G.S. #80-Trenton West Quadrangle
- (9) Back Brook-alewife @ Gropps Lake Dam
5/6/75 @ 56°F. (g) AFC
U.S.G.S. #81-Trenton East Quadrangle
- (10) Crosswicks Creek-blueback above Rt. 206
5/7/75 @ 57°F (g) AFS
U.S.G.S. #81-Trenton East Quadrangle
- (11) Doctors Creek-alewife @ Yardville-Groveville Road
5/10/75 @ 63°F. (fc) AFC
U.S.G.S. #81-Trenton East Quadrangle

Mercer Burlington Counties-Delaware River Drainage

- (12) Crosswicks Creek-alewife @ North Crosswicks Dam
5/6/75 @ 58°F. (q) AFC
U.S.G.S. #81-Trenton East quadrangle

Burlington County-Delaware River Drainage

- (13) Blacks Creek-alewife @ Rt. 301
4/13/76 @ 52°F. (g) AFC
U.S.G.S. #81-Trenton East Quadrangle
- (14) South Branch Rancocas Creek-blueback at Rancocas Woods
4/30/75 @ 55° F. (g) AFS
U.S.G.S. #99-Mt. Holly Quadrangle
- (15) South Branch Rancocas Creek-alewife @ Rancocas Heights
4/15/75 @ 50°F. (g) AFS
U.S.G.S. #99-Mt. Holly Quadrangle
- (16) North Branch Rancocas Creek-alewife @ Mill Dam Park
4/17/75 @ 53°F. (fc) AFC
U.S.G.S. #9-Mt. Holly Quadrangle

Gloucester County-Delaware River Drainage

- (17) Mantua Creek-blueback @ N.J. Turnpike Bridge
5/19/76 @ 70° F. (g) AFS
U.S.G.S. #108-Woodbury Quadrangle
- (18) Mantua Creek-alewife @ N.J. Turnpike Bridge
5/19/76 @ 70°F. (g) AFS
U.S.G.S. #108-Woodbury Quadrangle

- (19) Raccoon Creek-blueback @ Swedesboro
5/28/75 @ 75°F. (g) AFS
U.S.G.S. #107-Bridgeport Quadrangle
- (20) South Branch Raccoon Creek-blueback @ Hill Street
5/9/73 @ 58°F. (fc) AFC
U.S.G.S. #120-Woodstown Quadrangle
- (21) Raccoon Creek-alewife @ Rt. 322
4/29/74 @ 66°F. (g) AFC
U.S.G.S. #121-Pitman West Quadrangle
- (23) Richmonds Branch-alewife @ Porches Mill Dam
Oldmans Creek Drainage AFC
4/29/74 @ 68°F. (g)
U.S.G.S. #120-Woodstown Quadrangle

Gloucester and Salem Counties - Delaware River Drainage

- (24) Oldmans Creek-alewife @ Rt. 74
4/29/74 @ 64°F. (g) AFC
U.S.G.S. #120-Woodstown Quadrangle

Salem County - Delaware River Drainage

- (22) Beaver Creek-alewife @ Kay Gardens
Oldmans Creek Drainage
5/6/70 @ 61°F. (e) BF
U.S.G.S. #106 and 119-Marcus Hook and Penns Grove Quadrangles
- (25) Fenwick Creek-alewife @ R.R. Floodgates
Salem River Drainage
5/4/76 @ 58°F. (d) AFC
U.S.G.S. #132-Salem Quadrangle
- (26) Mannington Creek-alewife @ Rt. 540
Salem River Drainage
4/19/74 @ 59°F. (g) AFC
U.S.G.S. #132-Salem Quadrangle
- (27) Salem River-alewife @ Beaverdam
5/3/76 @ 64°F. (d) AFC
U.S.G.S. #119-Penns Grove Quadrangle
- (28) Deep Run-alewife @ Elkinton Millpond Dam
Alloway Creek Drainage
4/23/74 @ 61°F. (t) AFC
U.S.G.S. #132-Salem Quadrangle

- (29) Alloway Creek-alewife @ Alloway Lake Dam
4/17/74 @ 56°F. (g) AFC
U.S.G.S. #133-Alloway Quadrangle

Salem and Cumberland Counties-Delaware River Drive

- (30) Raccoon Ditch-alewife @ Davis Mill Dam
Stow Creek Drainage
5/1/74 @ 67°F. (g) AFC
U.S.G.S. #144 and 145-Canton and Shiloh Quadrangle
- (31) Stow Creek-alewife @ Buckhorn Road
5/1/74 @ 68°F. (g) AFC
U.S.G.S. #145-Shiloh Quadrangle
- (32) Mill Creek-blueback @ Clarks Pond Dam
Cohansey River Drainage
5/31/76 @ 72°F. (fc) AFC
U.S.G.S. #146-Bridgeton Quadrangle
- (33) Mill Creek-alewife @ Clarks Pond Dam
Cohansey River Drainage
5/16/73 61°F. (fc) AFC
U.S.G.S. #146-Bridgeton Quadrangle
- (34) Cohansey River-blueback @ Sunset Lake Dams (2)
5/1/74 @ 66°F. (g) AFC
U.S.G.S. #146-Bridgeton Quadrangle
- (35) Cohansey River-Alewife @ Sunset Lake Dams (2)
4/8/74 @ 53°F. (g) AFC
U.S.G.S. #146-Bridgeton Quadrangle
- (36) Cedar Creek-blueback @ Cedarville Lake Dam
5/31/76 @ 73°F. (fc) AFC
U.S.G.S. #156-Cedarville Quadrangle
- (37) Cedar Creek-alewife @ Cedarville Lake Dam
4/16/74 @ 69°F. (t) AFC
U.S.G.S. #156-Cedarville Quadrangle
- (38) Muskee Creek-alewife @ Rt. 47
Marice River Drainage
5/1/74 @ 70°F. (g) AFC
U.S.G.S. #159-Port Elizabeth Quadrangle
- (39) Manumuskin River-alewife @ R.R. Bridge
Maurice River Drainage
4/23/74 @ 62°F. (g) AFC
U.S.G.S. #158-Port Elizabeth Quadrangle

- (40) Buckshutem Creek-alewife @ Laurel Lake Dam
Maurice River Drainage
4/6/74 @ 52°F (d) AFC
U.S.G.S. #157-Dividing Creek Quadrangle
- (41) Menantico Creek-alewife @ R.R. Bridge
Maurice River Drainage
4/7/74 @ 62°F (g) AFC
U.S.G.S. #148 and 157-Five Points and Dividing Creek
- (42) Greenies Sandwash-alewife
Maurice River Drainage
4/29/74 @ 70°F. (d) AFC
U.S.G.S. #147-Millville Quadrangle
- (43) Hankins Brook-alewife @ Rt.47
Maurice River Drainage
4/6/74 @ 54°F. (d) AFC
U.S.G.S. #147-Millville Quadrangle
- (44) White Marsh Run-alewife @ Silver Lake Dam
Maurice River Drainage
4/5/74 @ 53°F. (d) AFC
U.S.G.S. #147-Millville Quadrangle
- (45) Maurice River-blueback @ Union Lake Dam
4/30/74 @ 70°F. (g) AFC
U.S.G.S. #147-Millville Quadrangle
- (46) Raceway-alewife @ Sharp Street
Maurice River Drainage
4/7/74 @ 52°F. (g) AFC
U.S.G.S. #147-Millville Quadrangle
- (47) Maurice River-alewife @ Union Lake Dam
4/6/74 @ 52°F. (g) AFC
U.S.G.S. #147-Millville Quadrangle

Cumberland and Cape May Counties-Delaware Bay Drainage

- (48) West Creek-alewife @ Rt.47
Delaware Bay Drainage
5/1/74 @ 70°F. (g) AFC
U.S.G.S. #165-Heislerville Quadrangle

Cape May County-Atlantic Ocean Drainage

- (49) Mill Creek-alewife @ Magnolia Lake Dam
Townsend Sound Drainage
4/11/73 @ 51°F. (d) AFC
U.S.G.S. #167-Sea Isle City Quadrangle
- (51) Bog Branch-alewife @ Cape May Impoundment #2
Cedar Swamp Creek-Tuckahoe River Drainage
4/10/73 @ 54°F. (d) AFC
U.S.G.S. #160-Marmora Quadrangle
- (52) Cedar Swamp Creek-alewife @ Rt. 50
Tuckahoe River Drainage
4/19/75 @ 50°F. (g) AFC
U.S.G.S. #160 and 167-Marmora and Sea Isle City Quads.
- (53) Flat Creek-alewife @ Cape May Impoundment #3
Tuckahoe River Drainage
4/19/75 @ 54°F (d) AFC
U.S.G.S. #160-Marmora Quadrangle
- (54) Back Run-alewife @ Leamings Pond
Mill Creek-Tuckahoe River Drainage
4/29/75 @ 54°F. (d) AFC
U.S.G.S. #159-Tuckahoe Quadrangle

Cape May and Atlantic Counties-Atlantic Ocean Dr.

- (57) Tuckahoe River-alewife @ the Peaslee Tract
4/23/73 @ 55°F. (d) AFC
U.S.G.S. #159-Tuckahoe Quadrangle

Atlantic County-Atlantic Ocean Drainage

- (50) Patcong Creek-alewife @ Bargaintown Lake Dam
Great Egg Harbor Bay Drainage
4/25/74 @ 59°F. (fc) AFC
U.S.G.S. #161-Ocean City Quadrangle
- (55) Warner Mill Stream-alewife @ Aetna Road
Tuckahoe River Drainage
5/15/76 @ 65°F. (g) AFC
U.S.G.S. #159-Tuckahoe Quadrangle
- (56) McNeals Branch-alewife @ Aetna Road
Tuckahoe River Drainage
4/23/73 @ 53°F. (d) AFC
U.S.G.S. #159-Tuckahoe Quadrangle
- (58) Hawkins Creek-alewife @ Atlantic County Impoundment #2
Great Egg Harbor River Drainage
5/16/76 @ 64 ° F. (d) AFC
U.S.G.S. #160-Marmora Quadrangle

- (59) Atlantic County Impoundment #1-alewife
Gibson Creek-Great Egg Harbor River Drainage
6/1/76 @ 63°F. (d) AFC
U.S.G.S. #160-Marmora Quadrangle
- (60) Gibson Creek-alewife above Gibson Landing
Great Egg Harbor River Drainage
6/1/76 @ 68°F. (g) AFC
U.S.G.S. #160-Marmora Quadrangle
- (61) Stephan Creek-alewife @ Stephan Lake Dam
Great Egg Harbor River Drainage
4/26/74 @ 58°F. (g) AFC
U.S.G.S. #150-Mays Landing Quadrangle
- (62) South River-alewife @ 11th Street
Great Egg Harbor River Drainage
4/21/73 @ 54°F. (fc) AFC
U.S.G.S. #150-Mays Landing Quadrangle
- (63) Miry Run-alewife above Rt. 559
Great Egg Harbor River Drainage
4/21/73 @ 55 °F. (fc) AFC
U.S.G.S. #150-Mays Landing Quadrangle
- (64) Gravelly Run-alewife above Rt. 559
Great Egg Harbor River Drainage
4/21/73 @ 55°F. (fc) AFC
U.S.G.S. #150-Mays Landing Quadrangle
- (65) Watering Race Branch-alewife @ Babcock Creek
Great Egg Harbor River Drainage
4/22/73 @ 54°F. (fc) AFC
U.S.G.S. #150-Mays Landing Quadrangle
- (66) Great Egg Harbor River-alewife @ Lenape Lake Dam
4/21/73 @ 56°F. (fc) AFC
U.S.G.S. #150-Mays Landing Quadrangle
- (67) Doughty Creek-alewife @ Brigantine East Pool Dam
Grassy Bay-Atlantic Ocean Drainage
4/25/76 @ 58°F. (d) AFC
U.S.G.S. #152-Oceanville Quadrangle
- (68) Doughty Creek-alewife @ Brigantine West Pool Dam
Reeds Bay-Atlantic Ocean Drainage
4/25/76 @ 58°F. (d) AFC
U.S.G.S. #152-Oceanville Quadrangle
- (70) Macote Creek-alewife @ Mill Pond Dam
Mullica River Drainage
1973 (g) Ich
U.S.G.S. #140-New Gretna Quadrangle

- (74) Negro Creek-alewife above Pt. 563
Mullica River Drainage
4/22/74 @ 63°F. (d) AFC
U.S.G.S. #139-Green Bank Quadrangle
- (76) Hammonton Creek-alewife @ Nescochague Lake Dam
Mullica River Drainage
4/16/76 @ 58°F. (fc) AFC
U.S.G.S. #125-Atsion Quadrangle
- (77) Nescochague Creek-alewife above old dam site
Mullica River Drainage
4/16/76 @ 56°F. (fc) AFC
U.S.G.S. #125-Atsion Quadrangle

Atlantic and Burlington Counties-Atl. Ocean Dr.

- (78) Mullica River-alewife @ Constable Bridge
4/16/76 @ 58°F. (fc) AFC
U.S.G.S. #125-Atsion Quadrangle

Burlington County-Atl. Ocean Drainage

- (71) Jobs Creek-alewife below Rt. 9
Bass River-Mullica River Drainage
5/11/76 @ 63°F. (g) AFC
U.S.G.S. #140-New Gretna Quadrangle
- (72) Bass River-alewife @ Bass River State Forest
Mullica River Drainage
5/11/76 @ 64°F. (g) AFC
U.S.G.S. #140-New Gretna Quadrangle
- (73) Wading River-alewife above Rt. 542
Mullica River Drainage
5/7/76 @ 63°F (g) AFC
U.S.G.S. #140-New Gretna Quadrangle
- (74) Batsto River-alewife @ Batsto Lake Dam
Mullica River Drainage
4/22/74 @ 62°F. (fc) AFC
U.S.G.S. #125-Atsion Quadrangle

Burlington and Ocean Counties-Atlantic Ocean Dr.

- (69) Ballanger Creek-alewife above Pollys Ditch
Mullica River Drainage
5/11/76 @ 64°F. (g) AFC
U.S.G.S. #140-New Gretna Quadrangle

Ocean County-Atlantic Oc. Dr.

- (79) Willis Creek-alewife @ Radio Road
Little Egg Harbor Drainage
5/15/75 @ 67°F. (g) AFC
U.S.G.S. #141-Tuckerton Quadrangle
- (80) Tuckerton Creek-blueback @ Pohatcong Lake Dam
Little Egg Harbor/Bay Drainage
5/7/75 @ 58°F. (d) AFC
U.S.G.S. #141-Tuckerton Quadrangle
- (81) Mill Creek-alewife @ Beach Haven West
Manahawkin Bay Drainage
5/26/76 @ 640°F (g) AFC
U.S.G.S. #129-Ship Bottom Quadrangle
- (82) Fresh Creek-alewife above Taylor Road
Barnegat Bay Drainage
5/24/76 @ 63°F (g) AFC
U.S.G.S. #129-Ship Bottom Quadrangle
- (83) Gunning River-alewife below Collinstown Road
Barnegat Bay Drainage
5/24/76 @ 63°F. (g) AFC
U.S.G.S. #129-Ship Bottom Quadrangle
- (84) Double Creek-alewife above East Bay Avenue
Barnegat Bay Drainage
5/24/76 @ 66°F. (g) AFC
U.S.G.S. #129-Ship Bottom Quadrangle
- (85) South Branch Double Creek-alewife below East Bay Avenue
Barnegat Bay Drainage
5/24/76 @ 71°F. (g) AFC
U.S.G.S. #129-Ship Bottom Quadrangle
- (86) South Branch Stouts Creek-alewife @ Bayview Parkway
Barnegat Bay Drainage
4/30/75 @ 56°F. (d) AFC
U.S.G.S. #116-Forked River Quadrangle
- (87) Cedar Creek-alewife @ Rt. 9
5/6/75 @ 54°F. (fc) AFC
U.S.G.S. #116-Forked River Quadrangle
- (88) Potter Creek-alewife @ Bluejay Avenue
Barnegat Bay Drainage
5/27/76 @ 73°F. (g) AFC
U.S.G.S. #104-Toms River Quadrangle

- (89) Jeffreys Creek-alewife @ Lily Pond
Toms River Drainage
5/6/75 @ 56°F. (g) AFC
U.S.G.S. #104-Toms River Quadrangle
- (90) Mill Creek-alewife @ Pine Beach
Toms River Drainage
4/16/74 @ 56°F. (g) AFC
U.S.G.S. #104-Toms River Quadrangle
- (91) Long Swamp Creek-alewife below Washington Avenue
Toms River Drainage
4/18/75 @ 54°F. (d) AFC
U.S.G.S. #104-Toms River Quadrangle
- (92) Jakes Branch-blueback above Flint Road
Toms River Drainage
5/8/74 @ 59°F. (g) AFC
U.S.G.S. #104-Toms River Quadrangle
- (93) Jakes Branch-alewife above Flint Road
Toms River Drainage
5/8/74 @ 59°F. (g) AFC
U.S.G.S. #104-Toms River Drainage
- (94) Toms River-blueback above Rt. 9
5/8/74 @ 60°F. (fc) AFC
U.S.G.S. #104-Toms River Quadrangle
- (95) Toms River-alewife above Rt. 9
4/16/74 @ 54°F. (fc) AFC
U.S.G.S. #104-Toms River Quadrangle
- (96) Wrangle Brook-alewife @ Gem Street
Toms River Drainage
4/18/75 52°F. (g) AFC
U.S.G.S. #104-Toms River Quadrangle
- (97) Davenport Branch-alewife @ Silver Ridge Park
Toms River Drainage
4/28/75 @ 58°F. (d) AFC
U.S.G.S. #104-Toms River Quadrangle
- (98) Silver Bay Creek-alewife @ Hooper Avenue
Barnegat Bay Drainage
4/30/75 @ 57°F. (d) AFC
U.S.G.S. #94-Lakewood Quadrangle
- (99) Polhemus Creek-alewife @ Hooper Avenue
Barnegat Bay Drainage
5/6/75 @ 55°F. (t) AFC
U.S.G.S. #94-Lakewood Quadrangle

- (100) Tunes Branch--alewife @ Brick Boulevard
Barnegat Bay Drainage
4/28/75 @ 60°F. (g) AFC
U.S.G.S. #94-Lakewood Quadrangle
- (101) Kettle Creek-blueback @ Brick Boulevard
Barnegat Bay Drainage
5/15/75 @ 68°F. (fc) AFC
U.S.G.S. #94-Lakewood Quadrangle
- (102) Kettle Creek-alewife @ Brick Boulevard
Barnegat Bay Drainage
4/16/74 @ 57°F. (g) AFC
U.S.G.S. #94-Lakewood Quadrangle
- (103) North Branch Beaverdam Creek-alewife @ Rt. 88
Metedeconk River Drainage
5/17/74 @ 68°F. (t) AFC
U.S.G.S. #95-Point Pleasant Quadrangle
- (104) South Branch Beaverdam Creek-blueback @ Lenape Terrace
Metedeconk River Drainage
4/6/76 @ 54°F. (d) AFC
U.S.G.S. #95-Point Pleasant Quadrangle
- (105) South Branch Beaverdam Creek-alewife @ Lenape Terrace
Metedeconk River Drainage
4/14/75 @ 55°F. (d) AFC
U.S.G.S. #95-Point Pleasant Quadrangle
- (106) Parkway Pond-alewife
N.B Metedeconk River-Metedeconk River Drainage
4/21/74 @ 61°F. (fc) AFC
U.S.G.S. #94-Lakewood Quadrangle
- (107) North Branch Metedeconk River-alewife @ Rt. 88
Metedeconk River Drainage
5/23/74 @ 62°F. (g) AFC
U.S.G.S. #94-Lakewood Quadrangle
- (108) Shenandoah Lake-blueback
S.B. Metedeconk River Drainage
5/6/74 @ 61°F. (t) AFC
U.S.G.S. #94-Lakewood Quadrangle
- (109) Shanandoah Lake-alewife
S.B. Metedeconk River-Metedeconk River Drainage
5/5/74 @ 53°F. (t) AFC
U.S.G.S. #94-Lakewood Quadrangle

- (110) Twilight Lake-alewife
Metedeconk River Drainage
4/26/76 @ 56°F. (fc) AFC
U.S.G.S. #95-Point Pleasant Quadrangle
- (111) Lake of the Lillies-alewife
Metedeconk River Drainage
4/26/76 @ 56°F. (t) AFC
U.S.G.S. 95-Point Pleasant Quadrangle
- (112) Little Silver Lake-alewife
Manasquan River Drainage
4/9/76 @ 53°F. (d) AFC
U.S.G.S. #95-Point Pleasant Quadrangle

Monmouth County-Atlantic Ocean Drainage

- (113) Watson Creek-alewife @ Stockton Lake
Manasquan River Drainage
4/21/76 @ 53°F. (g) AFC
U.S.G.S. #95-Point Pleasant Quadrangle
- (114) Mill Run-alewife @ Allaire State Park
Manasquan River Drainage
4/3/76 @ 52°F. (d) AFC
U.S.G.S. #85-Farmingdale Quadrangle
- (115) Wreck Pond Creek-blueback @ Old Mill Pond Dam
5/11/74 @ 62°F. (g) AFC
U.S.G.S. #86-Asbury Park Quadrangle
- (116) Wreck Pond Creek-alewife @ Old Mill Pond Dam
5/8/74 @ 57°F. (g) AFC
U.S.G.S. #86-Asbury Park Quadrangle
- (117) Deal Lake-blueback @ dam
5/4/76 @ 66°F. (d) AFC
U.S.G.S. #86-Asbury Park Quadrangle
- (118) Deal Lake-alewife @ Main Street
5/24/74 @ 68°F. (g) AFC
U.S.G.S. #86-Asbury Park Quadrangle
- (119) Whale Pond Creek-alewife @ Lake Takanassee Flume
4/29/76 @ 56°F. (d) AFC
U.S.G.S. #79-Long Branch Quadrangle
- (120) Swamp Brook-blueback @ Shadow Lake Dam
Navesink River Drainage
5/31/73 @ 64°F. (fc) AFC
U.S.G.S. #79-Long Branch Quadrangle

- (121) Swamp Brook-alewife @ Shadow Lake Dam
Navesink River Drainage
5/31/73 @ 64°F. (fc) AFC
U.S.G.S. #79-Long Branch Quadrangle
- (122) Pine Brook-blueback @ Riverdale Avenue
Swimming River-Navesink River Drainage
5/13/75 @ 66°F. (fc) AFC
U.S.G.S. #79-Long Branch Quadrangle
- (123) Pine Brook-alewife @ Riverdale Avenue
Swimming River-Navesink River Drainage
4/28/75 @ 57°F. (t) AFC
U.S.G.S. #79-Long Branch Quadrangle
- (124) Swimming River-blueback @ Normandy Road
Navesink River Drainage
5/23/75 @ 74°F. (t) AFC
U.S.G.S. #79-Long Branch Quadrangle
- (125) Swimming River-alewife @ Swimming River Reservoir Dam
Navesink River Drainage
4/22/76 @ 68°F. (d) AFC
U.S.G.S. #79-Long Branch Quadrangle
- (126) Comptons Creek-alewife @ Broadway Avenue
Raritan Bay Drainage
4/24/75 @ 53°F. (d) AFC
U.S.G.S. #71-Sandy Hook Quadrangle

Middlesex County-Atlantic Ocean Drainage

- (127) Hooks Creek-blueback @ Hooks Creek Lake Dam
Cheesequake Creek-Raritan Bay Drainage
5/16/75 @ 70°F. (t) AFC
U.S.G.S. #69-South Amboy Quadrangle
- (128) South River-alewife @ Duhernal Lake Dam
Raritan River Drainage
5/16/74 @ 65°F. (fc) AFC
U.S.G.S. #69-South Amboy Quadrangle
- (129) Lawrence Brook-alewife @ Westons Mill Pond Dam
Raritan River Drainage
5/31/73 @ 62°F. (fc) AFC
U.S.G.S. #63-New Brunswick Quadrangle

Somerset County-Atlantic Ocean Drainage

- (130) Millstone River-blueback @ Rt. 518
Raritan River Drainage
5/23/75 @ 68°F. (e) BF
U.S.G.S. #56-Monmouth Junction Quadrangle

Bergen County-Atlantic Ocean Drainage

- (131) Hackensack River-blueback @ Oradell
6/3/76 @ 69°F. (e) BF
U.S.G.S. #31-Hackensack Quadrangle
- (132) Hackensack River-alewife @ Oradell
6/3/76 @ 69°F. (e) BF
U.S.G.S. #31-Hackensack Quadrangle

Confirmed American shad (Alosa sapidissima) spawning run:

Warren County

Delaware River at Phillipsburg

4/26/69 @ 54°F. (g) AFS

U.S.G.S. #44-Easton Quadrangle

The Delaware River Anadromous Project reported taking one (1) American shad ripe running female by gill net in Raccoon Creek at Swedesboro, Gloucester County, U.S.G.S. #107-Bridgeport Quadrangle on 6/5/75 at 73°F. but it was assessed this was insufficient evidence to confirm a spawning run.

No hickory shad (Alosa mediocris) spawning runs were confirmed. The one (1) hickory shad run reported in Alloway Creek was assessed to be misidentified and it is thought that the species was the gizzard shad (Dorosoma cepedianum). New Jersey water are now assessed to be out of the natural spawning range for hickory shad. Reports have been received that sport fishermen catch adult hickory shad in the lower tidal waters of Great Egg Harbor Bay and the Mullica River in the fall of the year.

During field investigations eighty-three (83) constructed barriers were located on watercourses where spawning runs of clupeids have been reported or confirmed. These barriers were assessed to be blocking or limiting fish passage and reducing potential spawning habitat.

(C) Confirmed spawning

(R) Reported spawning

1. Lockatong Creek Feeder Dam-Delaware River (C)
2. Gropps Lake Dam-Back Creek-Crosswicks Creek (C)
3. North Crosswicks Creek Dam-Crosswicks Creek (C)
4. N.J. Route 130 Culverts-Blacks Creek-Delaware River (C)
5. Crystal Lake Dam-Delaware River (R)
6. Crafts Creek Dam-Delaware (R)
7. Cotoxen Lake Dam-Rancocas Creek (R)
8. Vincentown Lake Dam-Rancocas Creek (R)
9. Mill Park Dam-Rancocas Creek (C)
10. Strawbridge Lake Dam-Pennsauken Creek (R)
11. Wenonah Lake Dam-Mantua Creek (R)
12. Cooper River Dam (R)
13. Repaupo Creek Floodgates-Delaware River (R)
14. Narraticon Lake Dam-Raccoon Creek (R)
15. Basgalore Lake Dam-Raccoon Creek (R)

16. Mullica Hill Pond Dam-Raccoon Creek (R)
17. Beaver Creek Floodgate-Oldmans Creek (C)
18. Porches Mill Dam-Oldmans Creek (C)
19. Harrisonville Lake Dam-Oldmans Creek (R)
20. Fenwick Creek Floodgates-Salem River (C)
21. Mannington Creek Floodgates-Salem River (R)
22. Salem Canal Floodgates-Salem River (R)
23. Laurel Lake Dam-Alloway Creek (R)
24. Elkinton Mill Dam-Alloway Creek (C)
25. Alloway Lake Dam-Alloway Creek (C)
26. Canton Drain Floodgates-Stow Creek (R)
27. Davis Mill Dam-Stow Creek (C)
28. Larkspur Lake Dam-Stow Creek (R)
29. Clarks Pond Floodgate and Dam-Cohansey River (C)
30. East Lake Dam-Cohansey River (R)
31. Sunset Lake Dams-Cohansey River (C)
32. Cedar Lake Dam-Cedar Creek-Delaware River (C)
33. Middle Pond Dam-Nantuxent River (R)
34. Shaws Mill Dam-Nantuxent River (R)
35. Laurel Lake Dam-Maurice River (C)
36. Silver Lake Dam-Maurice River (C)
37. Union Lake Dam-Maurice River (C)
38. Pickle Factory Pond Dam-West Creek-Delaware River (R)
39. Green Creek Mosquito Impoundment (R)
40. Magnolia Lake Dam-Mill Creek-Townsend Sound (C)
41. Tuckahoe Imp. #1 Halfway Creek-Tuckahoe (R)
42. Tuckahoe Imp. #2-Bog Branch-Tuckahoe (C)
43. Tuckahoe Imp. #3-Flat Creek-Tuckahoe (C)
44. Leamings Pond Dam-Mill Creek-Tuckahoe (C)
45. Warners Mill Dam-Tuckahoe (R)
46. U.S.G.S. Gage Dam-Tuckahoe (C)
47. Corbin City Imp. #1-Gibson Creek-Great Egg River (C)
48. Corbin City Imp. #2-Hawkins Creek-Great Egg River (C)
49. Corbin City Imp. #3-Peters Run-Great Egg River (R)
50. Hogans Pond Dam-English Creek-Great Egg River (R)
51. Stephans Lake Dam-Great Egg River (C)
52. Lenape Lake Dam-Great Egg River (C)
53. Bargaintown Lake Dam-Patcong Creek-Great Egg Bay (C)
54. Atlantic City Reservoir Dam-Absecon Creek (R)
55. Brigantine West Pool Dam-Doughty Creek-Reeds Bay (C)
56. Brigantine East Pool Dam-Doughty Creek-Grassy Bay (C)
57. Mill Pond Dam-Macote Creek-Mullica River (C)
58. Harrisville Lake Dam-Oswego River-Mullica River (R)
59. Batsto Lake Dam-Mullica River (C)
60. Nescochague Lake Dam-Mullica River (C)
61. Pohatcong Lake Dam-Tuckerton Creek-Little Egg Bay (C)
62. Willis Creek Dam-Little Egg Bay (C)
63. Manahawkin Lake Dam-Mill Creek-Manahawkin Bay (R)
64. Fire Pond Dam-Oyster Creek-Barnegat Bay (R)
65. Lower Lake Dam-North Branch-Forked River (R)

66. Bayside Parkway Culvert-S.P. Stouts Creek-Barnegat Bay (C)
67. U.S.G.S. Gage Dam-Cedar Creek-Barnegat Bay (C)
68. Brick Boulevard Culvert-Kettle Creek-Barnegat Bay (C)
69. Lake of the Lillies Dam-Metedeconk River (C)
70. Shenandoah Lake Dam-Metedeconk River (C)
71. U.S.G.S. Gage Dam-Manasquan River (R)
72. Little Silver Lake Dam-Manasquan River (C)
73. Old Mill Pond Dam-Wreck Pond Creek (C)
74. Remsen Mill Dam-Shark River (R)
75. Deal Lake Dam-Atlantic Ocean (C)
76. Takanassee Lake Dam-Atlantic Ocean (C)
77. Shadow Lake Dam-Havesink River (C)
78. Swimming River Reservoir Dam-Havesink River (C)
79. Hooks Lake Dam-Cheesequake Creek-Raritan Bay (C)
80. Duhermal Lake Dam-South River-Raritan Bay (C)
81. Weston Mill Dam-Lawrence Creek-Raritan River (C)
82. Fieldsville Dam-Raritan River (R)
83. Dundee Dam-Passaic River (R)

Analysis:

Job 1-The collection of existing information on anadromous clupeid spawning runs.

The search of literature and records for information on historical Clupeid spawning runs was found to be fragmentary and isolated. Most clupeid information refers to commercial American shad fisheries rather than spawning runs. Information on herring was found to be almost nonexistent. It is speculated that New Jersey has lost far more anadromous clupeid spawning runs than the record indicates.

Job 2-Field investigations of anadromous clupeid spawning runs.

The confirmation of anadromous clupeid spawning runs by field investigation and the identification of physical conditions that inhibit existing and potential spawning runs has provided a broad base upon which to develop and conduct an effective anadromous fish management program in New Jersey.

Recommendations:

1. The results of this inventory should be made available to the natural resource management and protection agencies of New Jersey, federal, interstate commissions and others involved in fisheries management and/or environmental review of proposed water and related land development projects. These agencies should give priority planning consideration to projects affecting existing and potential fish propagation of identified spawning streams in the intrastate and interstate waters of New Jersey.
2. The present inventory should be updated annually on a regional basis to ascertain additional streams utilized by anadromous clupeids and conditions along watercourses affecting fish passage and spawning success. Priority should be given to those watercourses where reported or potential runs have not been confirmed especially in areas of expanding domestic populations and watershed developments where stream alterations are likely to occur.
3. Fishways should be recommended when an existing or proposed obstruction of a river, stream, brook or impoundment outlet is or will exclude or inhibit the upstream movement or migratory run of clupeids or other desirable fish in cases where there is insufficient spawning and nursery area below the obstruction and where the fishway will provide access to an upstream spawning and nursery area that will appreciably increase natural propagation and escapement.
4. Legislation and regulations should be developed and implemented to protect and enhance the anadromous fish resources of New Jersey.
5. Consideration should be given to the restoration or establishment of anadromous clupeid spawning in watercourses that are now devoid of the species.
6. A program of public information and education should be developed and implemented to emphasize the benefit of the anadromous clupeid species in the New Jersey aquatic ecosystem and offshore fisheries and the importance of the anadromous clupeids in the food web as well as their esthetic, sport fishing and commercial values.

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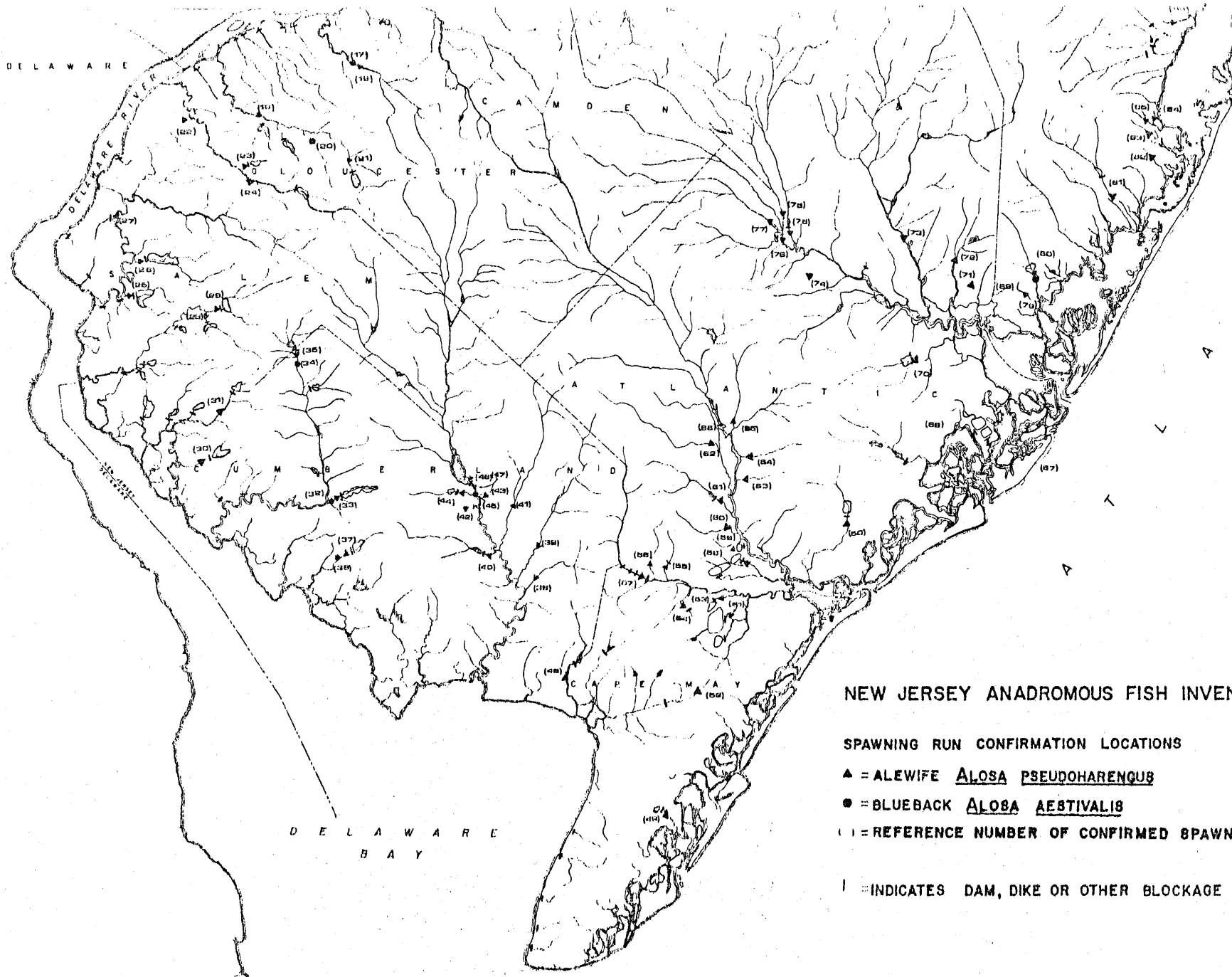
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NEW JERSEY ANADROMOUS FISH INVENTORY AFC-2

SPAWNING RUN CONFIRMATION LOCATIONS

▲ = ALEWIFE Alosa pseudoharengus

● = BLUEBACK Alosa aestivalis

() = REFERENCE NUMBER OF CONFIRMED SPAWNING RUN

| = INDICATES DAM, DIKE OR OTHER BLOCKAGE OR LIMITATION

