Technical Report

Massachusetts Division of Marine Fisheries
Technical Report TR-16

A Survey of Anadromous Fish Passage in Coastal Massachusetts

Part 2. Cape Cod and the Islands

K. E. Reback, P. D. Brady, K. D. McLaughlin, and C. G. Milliken

Massachusetts Division of Marine Fisheries
Department of Fish and Game
Executive Office of Environmental Affairs
Commonwealth of Massachusetts

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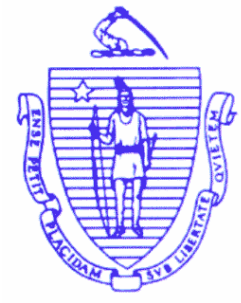

A Survey of Anadromous Fish Passage in Coastal Massachusetts
Part 2. Cape Cod and the Islands

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May 2004

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ABSTRACT

Anadromous fish species such as alewife, blueback herring, rainbow smelt, American shad, and white perch are important members of the coastal and freshwater fish faunas of Massachusetts. Providing passage through numerous man-made blockages allowing for the spawning migration of these fishes is essential to maintaining healthy populations. Information on blockages (primarily dams) and fish passage structures (fishways) has not been updated since the early 1970s. In order to update this information, a survey was conducted by the Massachusetts Division of Marine Fisheries during 2001-2002. The purpose was to provide information on the present state of fish passage in Massachusetts coastal streams and rivers and to provide guidance for future restoration efforts. The results of this survey are presented in this report.

All rivers and streams flowing into Massachusetts' coastal waters were examined. The presence of anadromous species in a system was determined from a variety of sources including past Division surveys, regional biologists, harbormasters, and local herring and shellfish wardens. If alewives or blueback herring were not specifically identified, the generic term river herring was used in the species present listing.

Most rivers and streams were surveyed from mouth to headwaters. General physical characteristics of the water bodies and data of specific importance to anadromous fish were noted. All obstructions and fishways were photographed and their locations were recorded using handheld GPS units. Site specific details were documented for the first impassable obstruction and its impoundment area to assist in the evaluation of future alterations or fish passage possibilities. On some streams, information was gathered on additional impassable obstructions as well. River obstruction type, construction material, and structural and hydraulic heights were recorded. When a fishway was present, the type of design, dimensions, construction materials, and number of baffles, pools and weirs were recorded. Fishways were rated based on their condition and function. Condition (poor, fair, good or excellent) described the physical structure and referred to the level of deterioration of the ladder. Function (not passable, inefficient passage, or passable) described how well the structure passed fish. A brief description of the state of fish passage and the potential for further improvements were provided for each river and stream.

The survey included 215 coastal streams. Along these streams, 493 lakes, ponds or reservoirs and 380 obstructions to migratory fish passage were documented. The majority of the obstructions are man-made dams that in many cases have long ceased to perform the functions for which they were originally constructed. About 68% of the dams are six feet or under in height and only 3% were 24 feet tall or greater. The survey identified 175 existing fish passage structures and more than 100 active river herring runs. Weir pool and notched weir pool fishways were by far the most common designs employed in Massachusetts followed by the denil ladder, stream baffles, Alaskan Steeppass, combination designs, vertical slot and fish lifts. About 46% of the existing fishways were judged to be in deteriorated condition and 50% were judged to function inadequately.

The survey clearly demonstrates that Massachusetts has a large investment in fish passage along our coastal rivers and streams. The survey and associated recommendations identify numerous projects that should be undertaken over the next several years. These projects include the maintenance, repair, and re-design of failing or inefficient existing fishways, and the construction of new fishways to provide access to additional spawning grounds. The information provided by this survey will guide the planning and implementation of future infrastructure work by the Massachusetts Division of Marine Fisheries necessary for the management and improvement of Massachusetts' anadromous fish populations.

This report is Part 2 in a four part series that covers the coast of Massachusetts. The information provided in this report covers the watersheds within Cape Cod and the Islands of Martha's Vineyard and Nanatucket. The other parts in the series are: Part 1 – Southeastern Massachusetts; Part 3 – South Shore; Part 4 – Boston Harbor, North Shore, and Merrimack River.

INTRODUCTION

Anadromous fishes in Massachusetts coastal waters have undergone a striking decline in abundance over the past 400 years. The combined effects of impassable dams, gross pollution, water diversion and overfishing had drastically reduced or eliminated anadromous fish populations. Twentieth century efforts at restoring depleted stocks through focused care and management led to a significant recovery in the Commonwealth. Today more than 100 coastal rivers and streams are the sites of active herring runs.

During the fall of 1967, the Massachusetts Division of Marine Fisheries (DMF) began a survey of coastal streams to determine the existence of anadromous fish resources and the potential for restoration and enhancement. The results of that survey, published as a Federal Aid completion report in 1972, have served as the basis for anadromous fish management in Massachusetts since that time. The recommendations that resulted from the survey have provided a work plan for DMF's anadromous fish project over the last 30 years. In the three decades since the completion of the survey, numerous changes have taken place. Some fishways have deteriorated or their designs have become obsolete. Dams have failed, eliminating spawning or nursery habitats. Impoundments have degraded due to eutrophication, and water withdrawals have raised fish passage issues. Other changes have been positive. Many fishways have been constructed, replaced, or repaired and designs have improved dramatically. Stocking programs have resulted in new populations and the restoration of others. Water quality has improved in many systems. Most of the recommendations made in the 1972 report have been successfully carried out.

Because of these changed conditions, continued effective management of coastal anadromous fish resources in Massachusetts required a new survey and report that would generate an updated set of recommendations. This document presents the results of a new anadromous fishway survey conducted in 2001 and 2002. The information and recommendations presented are intended to form the basis of an action plan for future DMF anadromous fish work. Recommendations are presented and prioritized for each watershed to enable the DMF to better execute its statutory mandate to develop and manage the anadromous fish resources of the Commonwealth.

This report is the second in a four part series that covers the coast of Massachusetts. Findings from the watersheds of Cape Cod and the islands of Martha's Vineyard and Nantucket are presented in this report. The first report in the series is comprised of the Southeastern portion of Massachusetts, including the Taunton River watershed and the drainage areas of Narragansett Bay and Buzzards Bay. The South Shore watersheds comprise part 3 of the series and part 4 includes Boston Harbor and the North Shore watersheds.

MATERIALS AND METHODS

All rivers and streams flowing into Massachusetts's coastal waters, from the Rhode Island to New Hampshire borders, were considered. Most were surveyed from mouth to headwaters. General physical characteristics were noted and data of specific importance to anadromous fish recorded.

All known or encountered obstructions and fishways were photographed using a high resolution digital camera, and their locations were recorded using handheld Global Positioning System (GPS) units. Site specific details were documented for the first impassable obstruction and its impoundment area to assist in the evaluation of future alterations or fish passage possibilities. On some streams, information was gathered on additional obstructions as well. River obstruction type, construction material, and structural and hydraulic heights were recorded. When a fishway was present, the type of design, construction materials, number of baffles, pools and weirs as well as operational condition were noted. Measurements including length, inside width (IW) and outside width (OW), baffle height, pool length, steep notch width and pool depth were also recorded for each fishway.

Total stream length, obstruction river mile, and impoundment acreage were calculated for all systems using Map Tech Terrain

Pro Navigator Software, version 5.02. To calculate impoundment acreage, the impoundment boundary was traced three times and resultant values averaged to achieve a better area estimate.

Water pH was tested at one point on each system using either a Horiba U-10 Waterchecker, an Oakton Waterproof pH Testr2 or a LaMotte Wide Range pH kit (model P-3100). These data should be used with caution since they represent only a single point measurement.

Distances and heights were documented via tape measures and telescoping rods or an Opti-Logic 400 LH Hypsometryx Rangefinder, Sonin Combo PRO ultrasonic electronic measurer and a DISTO classic hand-held laser meter. The electronic measuring devices were utilized when the distance was very large or physical obstructions limited access to the object to be measured.

The presence of anadromous species in a system was determined from a variety of sources including past Division surveys, regional biologist accounts, and local herring and shellfish wardens and harbormaster accounts. If alewives or blueback herring have not been specifically identified, the generic term river herring is used in the species present listing.

For the purposes of this report, an obstruction was defined as any feature, natural or manmade, that negatively effects the upstream or downstream movement of anadromous fish species. While dams were considered most often, the term also applied to natural elevation changes such as those caused by falls and severe rapids or less dramatic gradients that may result in extremely shallow stream depths. Culverts that create elevation changes, cause fish to hesitate due to abrupt lighting changes, restrict stream flow or have submerged outlets were also considered obstructions and impediments to passage.

When present, fishways were rated based on their condition and function. Condition, which was listed as poor, fair, good or excellent, described the physical structure and referred to the level of deterioration of the ladder. Function, rated as not passable, inefficient passage, or passable, described how well the structure can pass fish. A fishway was listed as not passable if fish are unable to utilize it. If there is any room for improvement in the design or placement of the ladder that would enable the structure to better pass fish, it was listed as inefficient passage. If the fishway passes fish at optimum levels and no improvements could be made to it, it was listed as passable.

LIFE HISTORIES

There are seventeen species of anadromous fish in the Commonwealth of Massachusetts (see Appendix 1). Below we discuss the life history of the four species that have been the focus of DMF's restoration efforts through the improvement of fish passage.

River Herring:

The river herring are actually two closely related members of the family Clupeidae, the alewife (*Alosa pseudoharengus*) and the blueback (*Alosa aestivalis*) herring. The two species are very difficult to tell apart and, short of a study of their morphometric characteristics, the best method to distinguish them is the color of the peritoneum, the body cavity lining. In the alewife this tissue is gray or silvery while in the blueback herring it is a sooty black color. Although the alewife tends to be larger, up to about 12 inches, there is much overlap in size.

While both species are capable of spawning in riverine or lacustrine environments, there is a decided preference for the latter on the part of alewives while bluebacks generally choose a stream or river type of habitat. In general, most systems contain both species.

Alewives tend to spawn 3 to 4 weeks earlier than bluebacks in the same system. Although actual spawning probably occurs much later, alewives have been observed in Massachusetts streams as early as February and, in one instance, January. Alewives begin spawning when water temperatures reach 51 and bluebacks 57 degrees F. Both species cease spawning when the water warms to 81º F. Blueback eggs are semi-buoyant and tend to

drift with the current while alewife eggs will remain in contact with the substrate or current. After utilizing the freshwater habitat for a nursery area for most of the summer, the juvenile herring undertake a massive migration to the ocean in the fall. In the case of alewives, a smaller but significant out migration in late spring/early summer has been documented in some systems.

Once in the marine environment, river herring feed on zooplankton such as microcrustaceans, fish eggs and fish larvae. Maturity occurs at 3 to 5 years and the fish return to their natal streams utilizing their olfactory sense to guide them to the home waters. Repeat spawning occurs more often in northern than in southern populations. Mortality during a spawning season in the south may reach up to 90%.

Formerly an important local food source, river herring were smoked, salted or pickled. Human consumption is now a minor use and the fish are primarily sought after as bait for commercial and sport fishing.

American shad:

The American shad (*Alosa sapidissima*) is also a member of the Clupeidae and, with the exception of its size, closely resembles the river herring. The series of 4 to 6 lateral dark spots on the shad's side, posterior to the gill cover, and the fact that its upper jaw extends beyond the eye serve to distinguish it from alewives and blueback herring. Adult males may weigh up to 6 pounds and females can grow to 8 pounds although larger specimens are occasionally reported. Shad may grow to 2 feet in length although individuals of 30 inches have been recorded.

Shad are river spawners, ascending the larger systems such as the Comnnecticut and Merrimack Rivers when spring water temperatures reach approximately 62 degrees F. A few smaller Massachusetts streams, notably the Palmer and Indianhead Rivers, support small but important populations. Males reach sexual maturity at 3 to 5 years old and females from 4 to 6. Eggs are semi-buoyant and tumble along the stream bottom until hatched. Juveniles spend their first summer in the river feeding on microscopic zooplankton and insects until they depart for the marine environment in the fall.

New England shad populations overwinter in the mid-Atlantic coastal region and migrate northward in the spring, using their olfactory sense to locate natal rivers. Post-spawn adults and immature fish congregate in the Gulf of Maine and Bay of Fundy during the summer before moving to their wintering grounds. There is no commercial fishery for American shad in Massachusetts, where it is considered a sportfish and is eagerly sought by anglers in rivers where the fish congregate in sufficient numbers.

Rainbow smelt:

Rainbow smelt (*Osmerus mordax*) are small fish that rarely exceed 7 to 9 inches as adults and weigh 1 to 6 ounces. Mature females are larger than their male counterparts. The smelt can be distinguished from other small coastal Massachusetts species by its deeply forked tail and adipose fin anterior to the caudal fin. Both sexes mature at about 2 years of age although some precocious one year olds may participate in spawning. Spawning begins in late winter/early spring in Massachusetts when water temperatures reach 40 to 42 degrees F.

Spawning takes place just above the head of the tide in fast flowing, often turbulent water usually associated with rocky or boulder substrate. Eggs are broadcast, fertilized and immediately become attached to the substrate or vegetation by means of a stalk-like appendage which protrudes from the egg surface. Spawning occurs at night with the adult smelt retreating to deeper water downstream during the day.

Larvae are about 1/4 inch when hatched and are carried downstream to the estuary. The juvenile fish feed on zooplankton, especially microscopic crustaceans. Adults feed on small crustaceans such as shrimp and gammarids as well as crabs, worms and small fish. Adult smelt spend the summer in relatively shallow waters less than a mile from shore and move into bays and estuaries during the fall and winter. Smelt feed actively during the winter and as a result support a small but intense rod and reel fishery from docks and piers and, when ice conditions permit, ice shanties. No com-

mercial fishery exists and in order to protect the species during its spawning run, possession of smelt during the spring is illegal according to state law.

MANAGEMENT

The management of river herring (alewives and blueback herring), American shad and rainbow smelt in coastal waters and streams is delegated to the Division of Marine Fisheries through Chapter 130 of the Massachusetts General Laws. Anadromous salmonids (trout and Atlantic salmon) come under the jurisdiction of the Division of Fisheries and Wildlife. DMF's management techniques fall into three general categories: regulation, propagation and fishway construction.

Regulations

Fisheries for anadromous fishes are subject to the General Laws of the Commonwealth. Chapter 130 of the General Laws establishes specific laws for the management of river herring, American shad, and rainbow smelt in coastal waters and empowers the Director of the Division of Marine Fisheries to create regulations for the protection of these species. Current state regulations are intended to protect existing populations while allowing reasonable usage of the resource by the public. This is accomplished by the standard fishery management techniques of imposing a no fishing period, daily bag limits, restrictions on methods of catch or some combination of the above. (Specific state regulations for all river herring can be viewed in Appendix 2).

In addition to the generic state regulations, Sections 93 and 94 of Chapter 130 allow cities and towns or anyone who creates a fishery to develop their own river herring regulations with the approval of DMF. Autonomous local control of these fisheries, as was established in the past by numerous Special Acts of Legislature, proved for a number of reasons to be ineffective. Conversely, it is not possible for the state to effectively manage the numerous populations in the Commonwealth. Consequently, the repeal of the Special Acts and an emphasis on local control with oversight by DMF has proved to be a satisfactory compromise.

Perhaps of greatest importance to the protection of anadromous fish resources is Section 19 of Chapter 130. This statute gives the Director of Marine Fisheries the authority to order removal of an obstruction to fish passage or order construction of passage facilities at the expense of the owner. Section 19 is responsible for the existence of many fishways that may not have been built otherwise. Other laws such as Section 95, which prohibits unauthorized taking of herring from created fisheries, and Section 96, which prevents the taking of herring after June 15, also aid in the management of this species.

Other anadromous fish are also protected by state law. According to Section 34, smelt may not be taken or possessed from March 15 to June 15 in order to protect spawning broodstocks. Section 100C prohibits taking of American shad by any means other than hook and line and the daily bag limit is 6 shad. Section 17 enables the Director of the Division of Marine Fisheries to set regulations for the management of anadromous fish in coastal waters as well as for other marine species.

Propagation

Propagation may be the oldest fisheries management technique and has been applied to anadromous fish in Massachusetts since the 17th century if not earlier. DMF's propagation strategy for river herring has been to collect adult fish from productive populations just prior to spawning and transport them to a new potential spawning ground that has been made accessible, usually through fishway construction. The offspring of the transplanted adults become imprinted on this habitat just prior to their seaward migration and return there to spawn when they mature. This technique has been extremely successful and is also used to restore populations that have been depleted by overfishing, drought, fish kills or other causes.

American shad propagation has been carried on by DMF since the late 1960's. Both fertilized eggs and adult shad have been transported from home streams to potential habitats. While some limited success has been

achieved, the shad stocking programs have not matched river herring propagation as an important management tool. Other states have been more successful in this area and refinement of methods and techniques in the future could result in a productive shad restoration program.

Rainbow smelt stocking has been carried on in the Commonwealth for over a hundred years. Early attempts did not take habitat requirements into consideration and accordingly the results were less than satisfactory. Both fertilized eggs and adult brood stock have been used for transplanting in the past, each with success. The current method used by DMF is to collect newly fertilized eggs on trays of sphagnum moss or some other material to which the eggs will attach and survive. Once a sufficient number of eggs have been deposited on the trays they are transported to the host stream on which the larval smelt will become imprinted.

Fishway Construction

Massachusetts has been a leader in the field of fishway construction. Records indicate that 18th century colonists recognized the need for fish passage around newly built dams and passed laws requiring access for fish. This tradition has carried into the 21st century. The Commonwealth has maintained its own fishway construction crew since 1934 and, in 1967, DMF established an Anadromous Fish Project which dealt with fish ladder design as well as all the other aspects of anadromous fish management. The result has been the more than 140 fishways documented by this survey, most of which have been designed and/or constructed by DMF. Typically, funding for materials has been provided by towns, local organizations, or state and federal grants, with design expertise and labor coming from the Division's anadromous fish program.

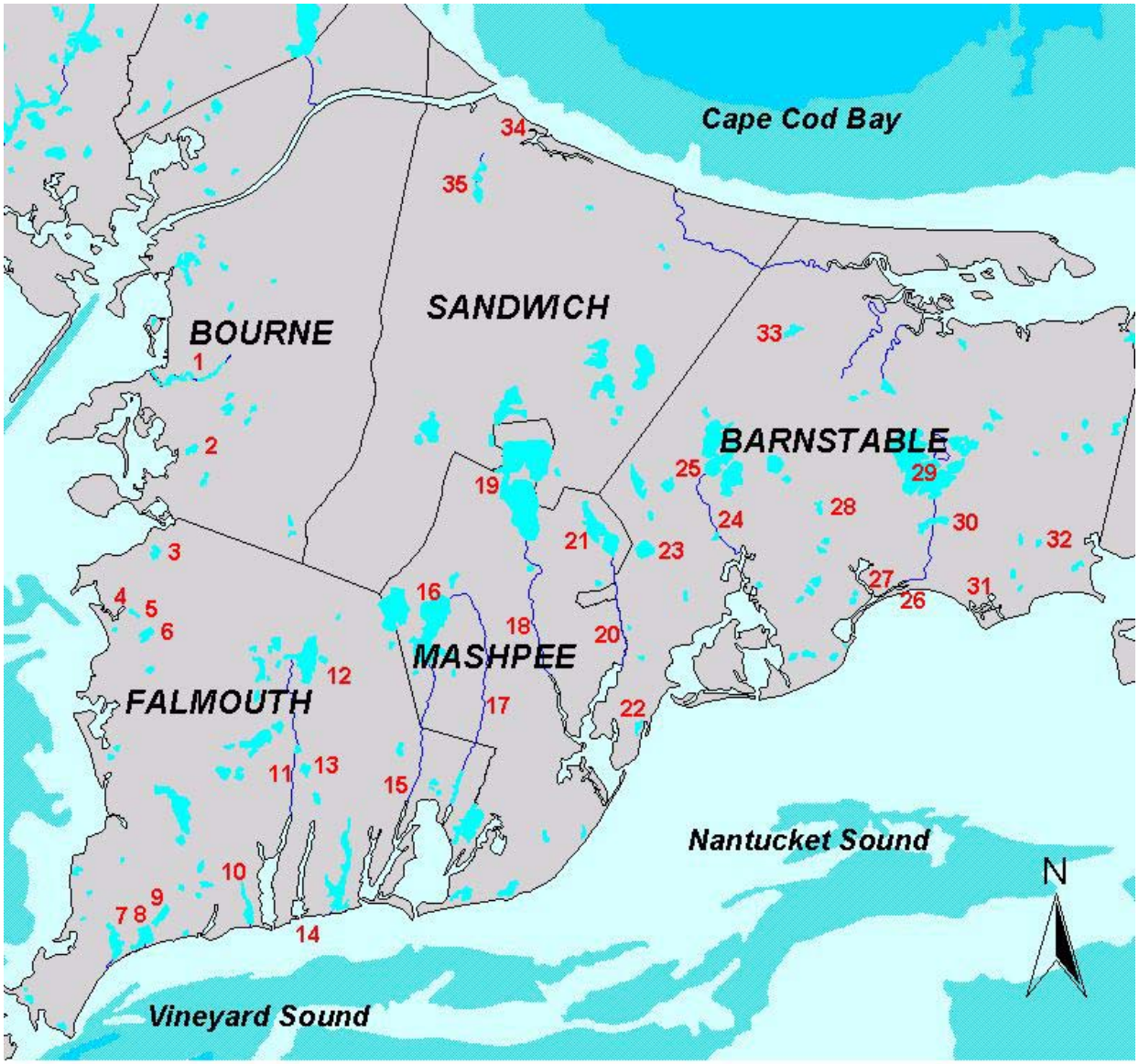
Several fishway types are currently in use on coastal Massachusetts streams. (See Appendix 3 for illustrations and photos of typical fishway designs.) The most common is some variation on the weir-pool design. This style has the advantage of adequate function under low flow regimes and is the favored design when public viewing is desired. Its drawbacks are the need for frequent manual adjustment and its inability to pass species other than river herring with any efficiency. Many of the weir-pool fishways currently in operation have been in place for fifty years or more and are both deteriorated and obsolete in design.

In the late 1960's, DMF began to use a Denil design for most of its newly constructed fishways. This type was more effective in passing species other than river herring and could operate with a minimum of flow adjustment. In addition, fish tended to move through the structure more quickly creating less backup than is experienced with the weir-pool ladder. The disadvantage is the need for relatively high flow volumes to insure fish passage. The Denil soon became the preferred design where applicable and is still frequently used.

The first installation of a prefabricated, aluminum Alaskan steeppass fishway by DMF took place in 2000. Similar to the Denil in function, this style offered the benefit of reduced costs by eliminating the need for large, labor intensive construction projects. Also, impacts to streambeds, wetlands and adjacent uplands were minimized. In addition, the steeppass has been found to be useful in the modification of dilapidated, inefficient weir-pool ladders. Its disadvantages are similar to those of the Denil type and its cost becomes a factor when many sections are required to overcome an obstruction.

A mechanical fish lift is currently in operation on the Merrimack River. Operated by CHI Energy, the lift at the Essex Dam in Lawrence is primarily designed to pass Atlantic salmon and American shad although other species such as blueback herring utilize it in substantial numbers. Also, a vertical slot or Ice Harbor fishway in addition to a lift is utilized at the Pawtucket Dam in Lowell.

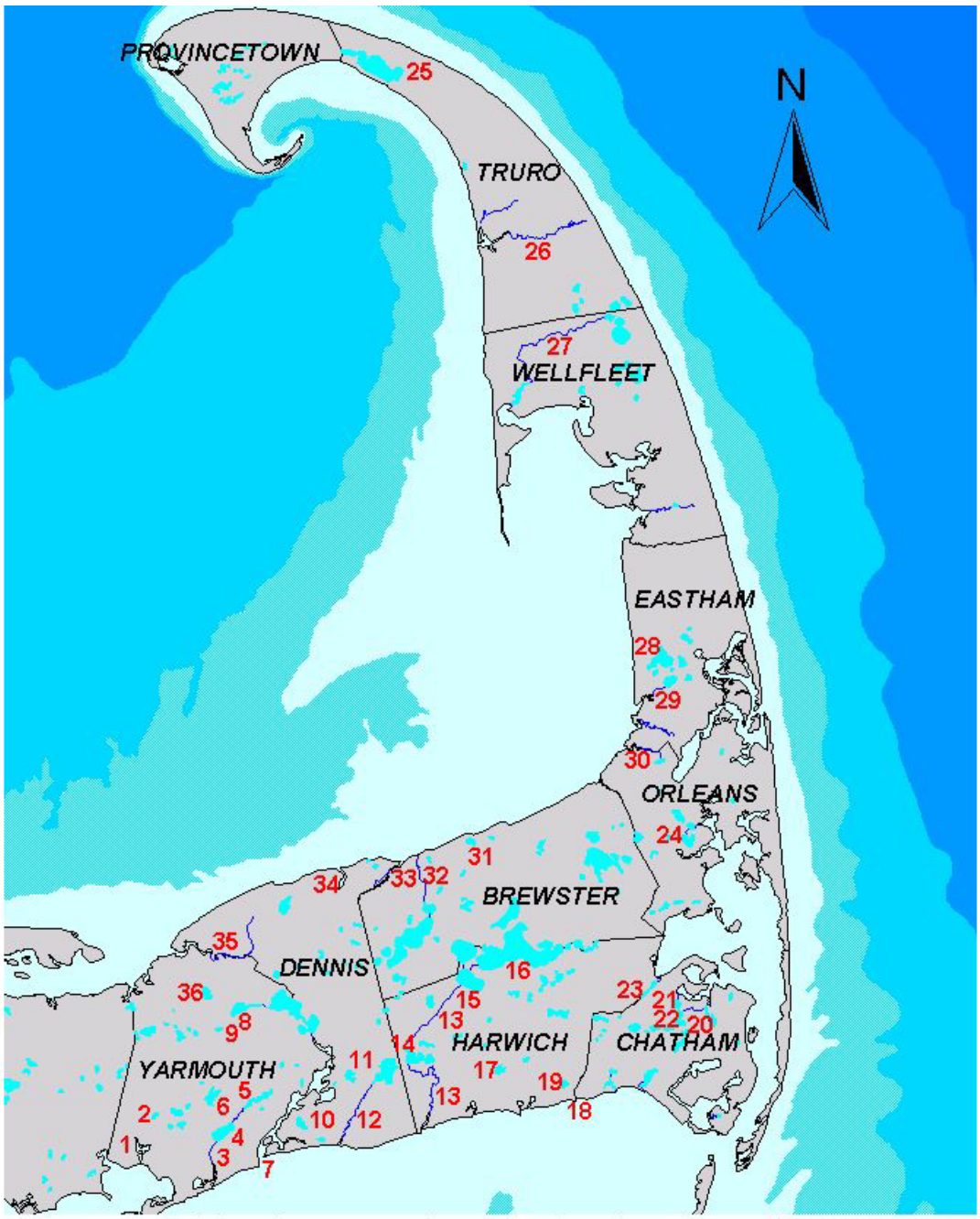
CAPE COD WATERSHEDS (Western)



Major streams and ponds of Western Cape Cod.

Stream/Pond Names:
1 - Pocasset River
2 - Red Brook Pond
3 - Cedar Lake
4 - Wild Harbor River
5 - Dam Pond
6 - Wing Pond
7 - Oyster Pond
8 - Salt Pond
9 - Siders Pond
10 - Little Pond
11 - Coonamessett River
12 - Coonamessett Pond
13 - Flax Pond
14 - Green Pond
15 - Childs River
16 - Johns Pond
17 - Quashnet River
18 - Mashpee River
19 - Mashpee - Wakeby Pond
20 - Santuit River
21 - Santuit Pond
22 - Rushy Marsh Pond
23 - Lovells Pond
24 - Marstons Mills River
25 - Middle Pond
26 - Centerville River
27 - Bumps River
28 - Lumbert Pond
29 - Wequaquet Lake
30 - Long Pond
31 - Halls Creek
32 - Aunt Bettys Pond
33 - Mill Pond
34 - Mill Creek
35 - Shawmee Lakes

CAPE COD WATERSHEDS (eastern)



Major streams and ponds of eastern Cape Cod

Stream/Pond Names:

1 - Mill Creek
2 - Little Sandy Pond
3 - Parkers River
4 - Seine Pond
5 - Long Pond
6 - Plashes Pond
7 - Bass River
8 - Mill Pond
9 - Miss Thatchers Pond
10 - Kelleys Pond
11 - Fresh Pond
12 - Swan Pond River
13 - Herring River
14 - West Reservoir
15 - Hinckleys Pond
16 - Long Pond
17 - Grass Pond
18 - Red River
19 - Skinequit Pond
20 - Frost Fish Creek
21 - Stillwater Pond
22 - Lovers Lake
23 - Muddy Creek
24 - Pilgrim Lake
25 - Pilgrim Lake
26 - Pamet River
27 - Herring River
28 - Great Pond
29 - Herring River
30 - Rock Harbor Creek
31 - Cobbs Pond
32 - Stony Brook
33 - Quivett Creek
34 - Sesuit Creek
35 - Chase Gardens Creek
36 - Matthews Pond

Cape Cod Watersheds

Pocasset River Bourne

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.2	First	6.5	Unknown

Obstruction # 1 Pocasset River control structure Bourne

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.7	Dam control structure	Concrete	3.0	3.0 (0 at high tide)	0.4	-	-	41° 41’ 48.442” N 70° 36’ 29.446” W

Pocasset River Control Structure at low tide

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete with a wooden baffle	8.5	2.9	4.1	1	0.4	-	-	Poor Not passable

Obstruction # 2 Mill Pond Dam Bourne

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.3	Dam	Stone	3.6	9	1.0	-	-	41° 41’ 48.417” N 70° 36’ 22.611” W

Mill Pond Dam

Fishway None

Obstruction # 3 County Road Dam Bourne

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.4	Dam	Concrete with wooden boards	1.9	4.6	1.9	-	Town of Bourne	41° 41’ 48.248” N 70° 36’ 18.352” W

County Road Dam

Spillway of County Road Dam

Fishway None

Remarks:

The Pocasset River drains a series of very small impoundments on its way to Buzzards Bay. Although an old bypass channel or millrace at the first impoundment appears to have been modified for use as a fishway, the surface area of 0.4 acres and the difficulty of providing passage at the second impoundment eliminate any potential for further development.

Red Brook — Bourne

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.2	First	7.0	Alewife, blueback

Obstruction # 1 — Red Brook Conrail culvert — Bourne

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.0	Culvert and riprap	Stone riprap and concrete culvert	4.0	2.0	0.6	-	-	41° 40’ 36.534” N 70° 36’ 47.367” W

Red Brook Conrail Culvert and Denil fishways

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Denil	Wood	8.0	1.5	1.7	6	2.0	-	-	Poor Inefficient passage
Denil	Wood	8.0	1.5	1.7	6	2.0	-	-	Poor Inefficient passage

Obstruction # 2 Red Brook Pond Dam Bourne

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.2	Dam	Concrete with wooden boards	2.9	7.8	16.0	1972	Town of Bourne	41° 40’ 39.295” N 70° 36’ 41.219” W

Red Brook Pond Dam and fishway

Fishway Being replaced

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete with wooden boards on upstream side of road	116.8	Varied (2.1 and 3.7)	Varied (3.4 and 4.9)	19	Varied (1.2-2.3)	Varied (1.0 and 2.3)	Varied (3.8-31.4)	Fair Passable

Remarks:

The first obstruction in this stream is a 4 foot diameter culvert. The stream is tidal at this point and fish are only able to enter the culvert on higher tidal stages. Volunteers have constructed and installed two sections of wooden Denil fishway in order to lengthen the period of time that the culvert is passable. While effective to some degree, these ladders often foul with vegetation and debris requiring frequent attention. As of this writing, the Town of Bourne is preparing a grant proposal for a project that will restore salt marsh and deepen the approach to the culvert. Included in the proposal is the installation of stone stream baffles which should greatly improve fish movement through this barrier.

Passage around the second dam is provided by a notched weir-pool fishway. This ladder currently functions adequately if flows are properly adjusted allowing herring to enter the 16-acre headwater pond.

Cedar Lake Ditch Falmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.4	First	7.8	Alewife

Obstruction # 1 Bay Road culvert Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.3	Culvert	Corrugated metal	2.5	2.5	0.4	-	Town of Falmouth	41° 38’ 56.061” N 70° 37’ 35.525” W

Bay Road Culvert and fishway

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete with steel plates	77.0	2.2	3.1	14	Variable (~1.8)	0.8- concrete; 0.5- metal	6.5	Poor Inefficient passage

Obstruction # 2 Elevation Change below Chester Street — Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.4	Elevation change	Stream bed	1.0	1.0	20.1	-	Town of Falmouth	41° 38’ 57.490” N 70° 37’ 27.565” W

Stream baffle below Chester Street

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffle	Wood and stone	175.0	2	Varied (stream width)	9	Varied (0.6)	Varied (0.7)	Varied (10-41)	Good Passable

Remarks:

This small stream flows from 20 acre Cedar Lake forming a small 0.4 acre impoundment along its course. An old notched weir-pool fishway provides access to the impoundment and a series of stream baffles allows herring to enter Cedar Lake through a small culvert. This run has not reached the potential afforded by the spawning area's acreage, probably due to the inefficiency of the ladder. Although recent repairs have improved its function, it has deteriorated to the point where replacement should be considered.

Wild Harbor River Falmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.1	First	6.4	Alewife

Obstruction # 1 Dam Pond culvert Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.8	Dam	Concrete with wooden board	2.5	2.0	6.0	-	-	41° 38’ 02.436” N 70° 37’ 56.091” W

Dam Pond Culvert and fishway

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete with wooden baffle	3.6	2.5	5.5	1	2.0	0.8	N/A	Fair Inefficient passage

Remarks:

Wild Harbor River is tidal up to a 6 acre impoundment called Dam Pond. River herring enter the impoundment by means of a notched weir placed in the control structure during the spawning season. There is little room for further improvements to this site.

Herring Brook — Falmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.7	First	7.5	Alewife

Obstruction # 1 — Herring Brook Dam — Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.6	Elevation change and dam	Concrete and stone with wooden boards	1.4	1.4	26.3	-	-	41° 37’ 24.337” N 70° 37’ 45.959” W

Herring Brook Dam

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffle	Concrete, wood and stone	594	1.4	Stream width	12	Varied (1)	1.4	Varied (51-120)	Poor Inefficient

Stream baffles at Herring Brook Dam

Bypassed stream baffles

Remarks:

Herring Brook flows from Wings Pond to Buzzards Bay. Stream baffles provide herring with enough depth to access the 26.3 acre pond. Other than insuring that the stream is clear of obstructions, no work is presently needed here.

Oyster Pond — Falmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.2	First	8.4	Alewife, white perch

Obstruction # 1 — Oyster Pond Control Structure — Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
0.2	Dam control structure	Concrete with wooden boards	4.0	1.6	63.5	-	-	41° 32’ 13.330” N 70° 38’ 24.047” W

Oyster Pond control structure and fishway

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir	Concrete with wooden baffles	-	15	Edge of channel (15)	1	1.3	1.0	-	Excellent Passable

Remarks:

This 63.5 acre salt pond on the Vineyard Sound shore of Falmouth is spawning/nursery habitat for a population of river herring. Shoaling of the stream outlet has been a constant issue for fish passage, requiring frequent dredging. Recently rebuilt jetties appear to have alleviated this problem. In 2000, a weir was constructed at the pond outlet in order to reduce salt water intrusion and eliminate an anoxic water zone that had formed. A small notch was incorporated into the weir to allow fish passage while still limiting tidal impacts. This appears to have been accomplished and good numbers of river herring and white perch have been observed entering the pond.

A noteworthy fact regarding the Oyster Pond river herring population is the earliness of the spawning run. Reliable reports have the first fish arriving at the stream mouth in February and, on at least one occasion, in January.

Salt Pond

Falmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.1	First	8.0	Alewife

No Obstructions

Salt Pond culvert to Vineyard Sound

Fishway None

Remarks:

Salt Pond (66 acres) flows directly into Vineyard Sound via a concrete culvert. Although salinity ranges are quite high, the pond does support a run of herring. Other than annual removal of deposited sand from the pond outlet, little can be done to improve this resource.

Siders Pond — Falmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.0	First	7.6	Alewife

Obstruction # 1 — Shivericks Pond Dam — Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.0	Dam	Concrete with wooden boards	0.65	1.5	7.8	1961	Town of Falmouth	41° 33’ 13.623” N 70° 37’ 00.897” W

Shivericks Pond Dam with fishway

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Wood	3.7	0.7	0.9	3	0.2	-	0.8	Fair Inefficient passage

Remarks:

Siders Pond is a salt pond which is formed on Fresh River. Its headwater is 7.8 acre Shivericks Pond. River herring reach the headwater by means of wooden baffles set in the dam spillway. With proper fishway maintenance and stream cleaning, this population is probably at its potential productivity.

Little Pond — Falmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.1	First	8.0	Unknown

No photo available

No Obstructions

Fishway None

Remarks:

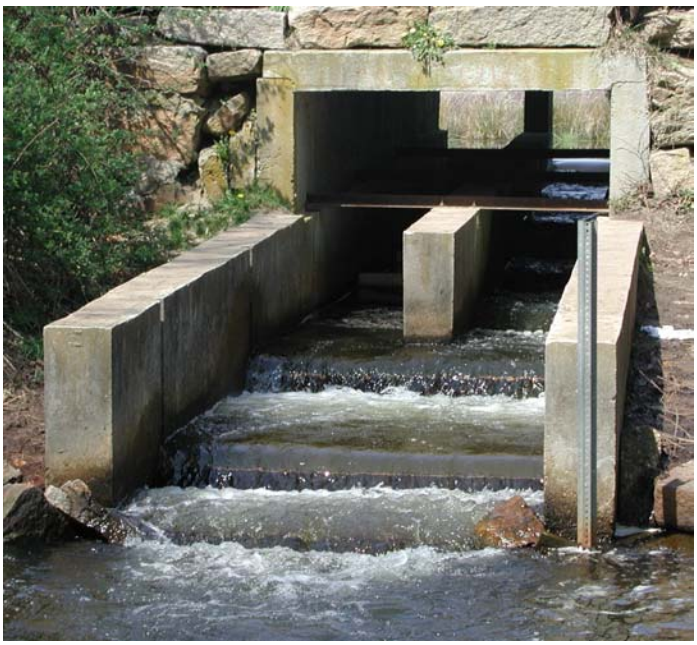
A new outlet and jetty system have allowed salinities in this salt pond to increase to the point where it is probably not suitable spawning/nursery habitat.

Coonamessett River Falmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
3.4	First	6.5	Alewife, blueback, white perch, trout

Obstruction # 1 Fishway at John Parker Road Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.3	Dam	Concrete with wooden boards	9.0	2.0	0.0	-	-	41° 34’ 54.260” N 70° 34’ 24.354” W



Fishway and dam at John Parker Road

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete with wooden baffles	33.0	6.0	8.0	7	1.5	-	8.0	Fair Passable

Obstruction # 2 Pond 14 Dam Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.2	Dam	Concrete with wooden boards	3.8	6.3	9.5	-	-	41° 35’ 35.897” N 70° 34’ 18.337” W

Pond 14 dam and Alaskan Steeppass ladder

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Alaskan Steeppass	Aluminum	30.0	1.8	-		-	-	-	Excellent Passable
Weir-pool	Concrete with wooden baffles	8.5	2.9	4.3	2	~0.6	-	7.0	Good Passable

Weir pool ladder at Pond 14 dam (bypassing Alaskan Steeppass ladder)

Obstruction # 3 Connamessett Pond Outlet Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
2.9	Elevation change and dam	Concrete with wooden boards	1.6		158.6	2002	-	41° 36’ 45.258” N 70° 34’ 24.909” W

Coonamessett Pond Outlet

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffles	Concrete with wooden baffles	2660	Varied (3.1-9.0)	Varied (4.5-10.0)	5	Varied (1-3.3)	Varied (0, 1.6)	Varied	Excellent Passable

Remarks:

This stream flows from 159 acre, Coonamessett Pond, through a complex system of cranberry bogs and their related structures and reservoirs. The first obstruction is a concrete bog flume which has been modified so that its spillway functions as a weir-pool ladder. From this point migrating herring can travel to Pond 14, a 9.5 acre bog reservoir which was fitted with a 30 foot prefabricated aluminum steeppass fishway in 2000.

The final obstruction is actually caused by shoaling of the stream below the headwater pond. This and persistent low water levels in the pond itself have made juvenile and adult out-migration difficult in many years. To overcome this, a new outlet structure was installed in 2002 which deepened the outlet stream and is capable of functioning as a fishway.

The extensive riverside cranberry bogs on this system create the potential for conflict with river herring management. Water diversions, particular for picking, which often coincides with juvenile out-migration, can cause severe losses of young fish. Screening techniques which have been developed by DMF and disseminated to growers through the Cape Cod Cranberry Growers Association should be employed where possible in systems such as this.

Flax Pond — Falmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.3	First	6.6	Alewife

Obstruction # 1 — John Parker Road culvert and bog sluice — Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.1	Bog sluice	Corrugated metal with wooden boards	3.6	0.6	0.0	-	Town of Falmouth	41° 35’ 09.769” N 70° 34’ 17.747” W

John Parker Road bog sluice

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffle	Stone and metal with a wooden baffle	126.3	3-4	Stream edge	1	0.5	0.6	N/A	Fair Inefficient passage

Fishway at John Parker Road culvert and bog sluice

Obstruction # 2 Flax Pond culvert Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.3	Bog sluice	Steel with wooden boards	2.5	2.5	20.7	-	-	41° 35’ 16.993” N 70° 34’ 08.608” W

Flax Pond Culvert and fishway

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir pool	Steel with wooden baffles	32	2.6	2.6	2	2	-	32	Excellent Passable

Remarks:

Flax Pond drains into the Coonamessett River by way of a short unnamed stream. A culvert at John Parker Road is made passable by a stream baffle just below the road. The dam at Flax Pond has recently been modified and can pass fish with proper regulation. Access to this 20.7 acre pond is highly dependent on regulation of water flow through the cranberry bogs which line the stream.

Mill Pond/Green Pond Falmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.3	First	6.5	Alewife

Obstruction # 1 Mill Pond Dam Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
2.2	Dam	Concrete and granite	2.0	7.4	12.5	-	-	41° 34’ 44.117” N 70° 33’ 49.510” W


Mill Pond Dam Spillway


Downstream end of culvert from Mill Pond Dam

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffle	Stone	131.0	Varied (1.0-3.7)	Stream edge	5	Varied (0.3-1.3)	1.0	Varied (13-27)	Poor Not passable


Mill Pond Fishway

Remarks:

Mill Pond is a 12.5 acre impoundment that flows directly in to Green Pond, a high salinity salt pond. Mill Pond is the only potential spawning area on the system and it is dammed at the Route 28 culvert. Although the remnants of an old fish ladder still exist below the culvert, the difficulty of constructing a new passage facility at this site makes it a low priority for restoration.

Childs River — Falmouth, Mashpee

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.9	First	7.4	Alewife, white perch, trout

Obstruction # 1 — Carriage Shop Road Dam — Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.9	Dam	Concrete with wooden boards	3.3	1.8	0.5	-	-	41° 35’ 32.718” N 70° 31’ 27.932” W

Carriage Shop Road Dam

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffle	Concrete and granite	100.0	3.0	Stream edge	6	1.5	0.8	10	Poor Not passable

Carriage Shop Road Fishway

Obstruction # 2 John's Pond Control Structure Falmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
5.1	Culvert, circular	Metal	3	N/A	317.0	-	-	41° 37' 00.515" N 70° 31' 17.505" W

John's Pond Outlet Control Structure

Fishway None

Remarks:

This is one of two outlet streams from Johns Pond, a 317 acre natural water body. The first obstruction to fish passage is a small dam at Carriage Shop Road. A series of stream baffles once enabled fish to enter the pond but are now badly deteriorated. The second barrier is a control box below Johns Pond which regulates flow from a subsurface outlet in the pond.

The lack of adequate spawning area downstream of Johns Pond, the difficulties involved in providing access to the headwaters and the problems inherent in maintaining flow from two outlets make this stream a poor candidate for development. Resources should be directed toward improving passage conditions in the second outlet stream, the Quashnet River.

Quashnet River

Falmouth, Mashpee

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
5.0	First	6.3	Alewife, blueback, white perch, trout

Obstruction # 1

Stream Improvement Structure on Fish & Wildlife Property — Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.6	Dam	Wood	17	3.0	0.0	-	U.S. Fish & Wildlife	41° 36’ 27.269” N 70° 30’ 07.090” W

Stream improvement structure on Fish & Wildlife Property

Fishway None

Obstruction # 2 Second Unnamed Fish & Wildlife Property Dam — Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
2.4	Dam	Concrete with wooden boards	4.5	4.5	2.2	-	U.S. Fish & Wildlife	41° 36’ 31.766” N 70° 30’ 07.321” W

Second Unnamed Dam and Fish Ladder on U.S. Fish & Wildlife Property

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete with wooden baffles	24.5	4.5	4.7	4	0.9	-	6.0	Poor Inefficient passage

Obstruction # 3 Quashnet River Valley Golf Bridge Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
3.6	Dam	Steel and concrete with wooden boards	8.0	2.2	0.0	-	-	41° 37’ 28.884” N 70° 30’ 03.045” W

Quashnet River Valley Golf Bridge Dam

Fishway None

Obstruction # 4 First Bog Sluice upstream of Quashnet River Valley Golf Course Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
4.3	Bog sluice	Corrugated metal with wooden boards	8.0	4.0	0.0	-	-	41° 38’ 00.375” N 70° 30’ 17.782” W

First Bog Sluice upstream of Quashnet Golf Course

Fishway None

Obstruction # 5 Second Bog Sluice upstream of the Quashnet River Valley Golf Course — Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
4.6	Bog sluice	Corrugated metal	6.0	6.0	0.0	-	-	41° 38’ 11.616” N 70° 30’ 25.765” W

Second Bog Sluice, submerged.

Fishway None

Obstruction # 6 Uppermost Bog Sluice Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
4.7	Bog sluice	Corrugated metal	6.0	6.0	0.0	-	-	41° 38’ 12.718” N 70° 30’ 34.446” W

Uppermost bog sluice between Quashnet River Valley Golf Course and John’s Pond

Fishway None

Obstruction # 7 Outlet of John's Pond Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
5.0	Dam	Wood with steel control structure	6.6	4.5	317.0	1950	Town of Mashpee	41° 38' 08.146" N 70° 30' 49.054" W

Dam and Fishway at outlet of John's Pond

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Denil	Wood	25.0	1.7	1.8	17	Varied (1.7 and 2.0)	-	-	Poor Inefficient passage

Remarks:

Although not the original outlet stream from Johns Pond, the Quashnet River now provides river herring with the only access to that spawning area. The stream is lined with cranberry bogs for much of its length and consequently numerous bog related obstructions affect fish passage. The first obstruction, however, is not associated with a bog. A small log dam intended to improve stream conditions for trout is passable but creates some difficulty for migrating adult herring. This structure could be easily modified to correct this. Some distance above this is an old concrete flume which was part of an abandoned bog system. A dilapidated wooden weir-pool fishway provides passage at this point but will soon become unusable. Since there is absolutely no need to maintain this dam and there is virtually no impoundment behind it, removal of the stoplogs is a simple and cost effective alternative to replacement of the fishway. This section of the river is owned and maintained as a catch and release trout fishery by the Division of Fisheries and Wildlife. Removal of the dam would provide several benefits to this resource as well.

Immediately upstream of this first impoundment is a second bog flume in the process of collapsing into the stream. While currently passable under high flow conditions, further deterioration could create a barrier to fish movement. Other obstructions include several bog flumes and a small wooden stoplog dam at a golf course, all of which are passable when properly adjusted.

The final obstruction is the control structure at the Johns Pond outlet. A wooden Denil ladder which has provided passage at this point is badly in need of a replacement and, as of this writing, a design has been developed.

The most critical issue affecting the anadromous fish production of this system is diversion of water for cranberry bog irrigation. Johns Pond water is used to irrigate bogs on two outlet streams often resulting in lower than adequate pond levels for both adult and juvenile migration. In some instances juveniles have been stranded on bog surfaces after dewatering. In order to reach the potential that the headwater pond's 317 acres provides, cranberry bog operations must be coordinated with needs of the river herring population.

Mashpee River — Mashpee

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
4.8	First	7.6	Alewife, blueback, white perch, trout

Obstruction # 1 — Bog sluice downstream of Washburn Pond — Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
4.2	Bog sluice	Wood	5.6	0.8	0.0	-	Town of Mashpee	41° 38’ 41.724” N 70° 29’ 01.582” W

Bog Sluice downstream of Washburn Pond

Fishway None

Obstruction # 2a — Washburn Pond Control Structure — Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
4.2	Dam control structure	Concrete with wooden boards	3.6	2.4	6.9	-	-	41° 38’ 41.500” N 70° 29’ 02.019” W

Washburn Pond Control Structure

Fishway None

Obstruction # 2b Washburn Pond Dam Spillway Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
4.2	Dam	Concrete with wooden boards	3.4	4.0	6.9	-	-	41° 38’ 39.647” N 70° 28’ 57.576” W

Washburn Pond Dam

Fishway None

Obstruction # 3 Bog Sluice Above Washburn Pond Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
4.4	Bog sluice	Wood	6	0.8	0.0	-	Town of Mashpee	41° 38’ 47.816” N 70° 29’ 10.173” W

Bog Sluice and Ladder above Washburn Pond

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Wood	8.0	6.0	6.2	2	0.7	2.4	8.0	Poor Inefficient passage

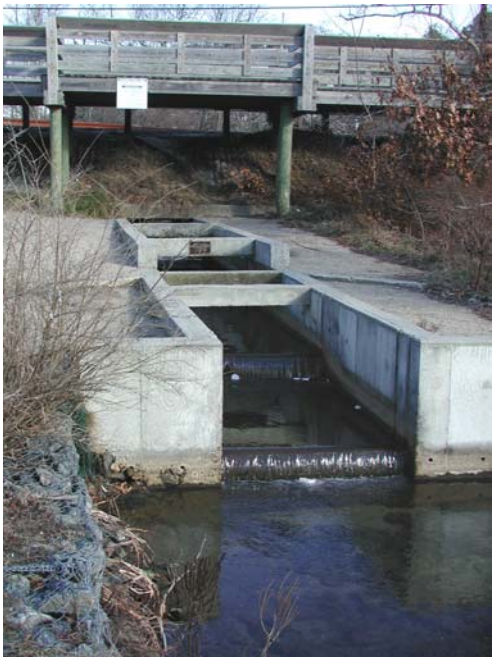
Obstruction # 4 Dam at Route 130 Crossing Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
4.6	Dam	Concrete with wooden boards	6.0	3.8	1.3	-	-	41° 38’ 58.279” N 70° 29’ 06.767” W

Dam at Route 130 Crossing

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete with wooden baffles	219.0	Varied (3.0 and 5.0)	Varied (4.6 and 6.6)	10	Varied (1.1-2.1)	-	Varied (8.0-35.0)	Excellent Passable



Fishway at Route 130 Crossing

Obstruction # 5 Mashpee Pond Control Structure Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
4.8	Dam	Concrete	5.6	Varied (max=4)	729.0	-	-	41° 39’ 07.862” N 70° 29’ 07.101” W

Mashpee Pond Control Structure

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete with wooden baffles	20	5.6	7.6	5	0.5	-	3	Excellent Passable

Fishway at Mashpee Pond Control Structure

Remarks:

The first obstruction on this river is an old wooden bog sluice just downstream of Washburn Pond. Wooden stoplogs allowed fish to pass this point but in recent years erosion has created a bypass channel which the herring can use. At Washburn Pond itself, boards are removed from the outlet structure to permit fish to pass through. Just upstream of the pond is a small town-owned, weir-pool fishway. The need for this structure is questionable and it may in fact function more as a barrier than a fish ladder. Consideration should be given to removing it.

A small impoundment at Route 130 is made accessible by a concrete and wood weir-pool ladder. The lower section of the fishway was modified and the upper section completely replaced by DMF in 1997. This ladder now functions very well with proper flow adjustment. A short section of stream connects this impoundment to the outlet of Mashpee-Wakeby Pond. The control structure at the outlet is equipped with wooden baffles to allow fish to access the pond. Jetties have been installed at the outlet to reduce sand build up in the stream, a condition which has prevented juvenile out migration on a number of occasions.

Perhaps the greatest impediment to this system reaching the production potential afforded by its 737 acres of spawning area is the uncontrolled regulation of flows from Mashpee-Wakeby Pond by unauthorized individuals. The outlet control structure is frequently vandalized to adjust pond levels for self-serving purposes. The result has been fish kills numbering in the hundreds of thousands. Security at the site should be increased if possible and local and state law enforcement agencies should be made aware of the situation.

Santuit River — Mashpee, Barnstable

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.3	First	7.0	Alewife, blueback, white perch

Obstruction # 1 — Bog off Route 130 — Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.8	Dam	Wood	1.7	1.5	0.0	-	-	41° 38’ 21.566” N 70° 27’ 10.146” W

Dam and Ladder at Bog off Route 130

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Wood	13.9	4.9	5.1	4	Varied (0.2-0.9)	1.7	Varied (3.9 and 4.5)	Poor Inefficient passage

Obstruction # 2 Santuit Pond Dam Mashpee

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
2.3	Dam	Wood	4.0	4.3	166.0	-	Town of Mashpee - transfer in progress	41° 38' 47.632" N 70° 27' 13.477" W

Santuit Pond Dam and Ladder

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Denil	Wood	32.0	1.5	1.8	24	2.0	-	-	Good Passable

Remarks:

The Santuit River flows from 166 acre Santuit Pond through Popponessett Bay into Nantucket Sound. Two obstructions to passage occur along its course. The first is a wooden bog flume off Cotuit Road. Boards are placed in the flume serve as a weir-pool fishway but passage is extremely inefficient and the structure needs to be redesigned and rebuilt.

The final obstruction is the outlet dam at Santuit Pond. This site was fitted with a new wooden Denil fishway by DMF in 1997. The ladder functions adequately, however, the dam is leaking badly and, if replaced, should be equipped with a more permanent fish passage structure.

As with many Cape Cod streams, cranberry bog operations have had an impact on the Santuit River herring population. A number of fish kills have occurred due to stranding on dewatered bogs. This situation could be remedied if bog owners would utilize the screening system developed by DMF and follow BMP (Best Management Plan) practices. A bog impact unique to the Santuit system is the diversion of thousands of juvenile herring to Lovells Pond due to withdrawals from Santuit Pond. Lovells Pond is essentially land locked and the loss to the Santuit population may be significant. This situation is also correctable with proper screening.

Rushy Marsh Pond Barnstable (Cotuit)

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.0	First	6.7	Alewife, white perch

Obstruction # 1 Rushy Marsh Pond culvert Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.0	Culvert, circular	Corrugated plastic	0.8	0.8	13.9	-	-	41° 35’ 57.796” N 70° 26’ 32.610” W

Rushy Marsh Pond culvert (Nantucket Sound end)

Fishway None

Remarks:

This 13.9 acre pond drains directly into Nantucket Sound by way of a long 12 inch plastic pipe. River herring and white perch had access to the pond via a tide gate which became inoperable due to coastal erosion. As of this writing, a design for a new outlet structure is being developed and will include provisions for fish passage.

Little River — Barnstable (Cotuit)

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.1	First	6.9	Unknown

Obstruction # 1 — Old Post Road culvert — Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.3	Culvert, circular	Concrete	3	1.7	0.0	-	-	41° 37’ 35.627” N 70° 25’ 35.224” W

Old Post Road Culvert

Fishway None

Obstruction # 2 — Lovells Pond Outlet — Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
2.1	Culvert, rectangular	Concrete	3.0	0.3	54.0	-	-	41° 38’ 46.621” N 70° 26’ 34.141” W

Lovells Pond Outlet

Fishway None

Remarks:

Little River drains Lovells Pond by way of a submerged culvert. The culvert and the stream below it are clogged with debris and very little flow actually occurs in the stream. Although 54 acres of potential habitat are available in the pond, the cost of providing adequate passage and the question of adequate outflow make development questionable.

Marstons Mills River Barnstable (Marstons Mills)

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.7	First	6.7	Alewife, blueback, white perch, trout

Obstruction # 1 Stream baffles below Route 28 Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.9	Elevation change	-	-	-	0.1	-	-	41° 39’ 01.576” N 70° 24’ 51.657” W

Stream Baffles below Route 28

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffle	Stone	130	Varied (16-18)	Varied (16-18)	6	1.6	Varied (1.3-1.8)	15	Good Passable

Obstruction # 2 Mill Pond Dam Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.1	Dam, stepped	Granite and stone	34.0	6.0	6.0	-	-	41° 39’ 04.841” N 70° 24’ 52.920” W

Mill Pond Dam

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete	53.0	4.0	6.0	6	Varied (1.8-2.3)	1.5	5.0	Poor Inefficient passage

Mill Pond Fishway

Obstruction # 3 Old Bog Sluice Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.9	Culvert	Concrete	3.0	0.2	0.0	-	-	41° 39’ 38.800” N 70° 25’ 06.180” W

Old Bog Sluice between Mill Pond and Middle Pond

Fishway None

Obstruction # 4 Middle Pond control structure Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
2.6	Dam control structure and elevation change	Concrete with wooden boards	1.9	2.5	104.0	-	Town of Barnstable	41° 40’ 08.253” N 70° 25’ 12.240” W

Middle Pond Control Structure

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Wood	1001	1.9	2.2	13	2.5	0.8	Varied (11.8-425)	Fair Inefficient passage
Denil	Concrete and wood	10.0	1.9	3.5	4	4.5	-	-	Fair Inefficient passage

Notched weir-pool fishway at Middle Pond

Remarks:

This river system provides over 400 acres of spawning/nursery habitat to river herring. For a number of reasons the potential production has never been approached. One reason has been fishways of less than ideal function and condition. Another is the frequent lack of adequate outflow from the headwater ponds to insure juvenile downstream migration.

The first obstruction on the stream is an elevation change at Route 28. This is nicely surmounted with stone stream baffles. After passing this and moving through the Route 28 culvert, fish must ascend a concrete, notched weir-pool ladder which is in poor condition and not functioning well. A third barrier is a large concrete flume which, though passable, presents a difficult elevation change.

The final obstruction is the outlet control structure for Middle Pond. This is overcome by a ditch, over 1000 feet in length and fitted with wooden sidewall and baffles to create a notched weir-pool fishway. This ditch is actually an artificial connection to Middle and Hamblin Ponds constructed around the turn of the 20th century in order to establish a herring run there. This fishway, maintained by the Town of Barnstable and volunteers, functions well with adequate flow although a barrier dam at its entrance to discourage fish from bypassing it would increase its efficiency greatly.

The most limiting factor to this system's productivity is the inconsistent availability of adequate flows from Middle Pond. Seasonally low water levels, occasional drought conditions, and sediment deposition at the outlet have combined to result in the loss or at least reduction in size of several year classes. In order to increase the available flows, the elevation of the concrete flume at the top of the ladder must be lowered and an outlet control structure, which will maintain an outlet channel, should be designed and installed.

Lake Elizabeth/Red Lily Pond

Barnstable (Craigville)

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.3	Third	7.4	Alewife

Obstruction # 1

Lake Elizabeth Dam — Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
2.2	Dam	Wood, concrete and stone	1.2	1.0	5.9	-	-	41° 38’ 16.016” N 70° 20’ 01.623” W

Lake Elizabeth Dam and Ladder

Fishway

Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Wood	5.0	1.0	1.2	3	0.5	0.3	~1.5	Poor Inefficient passage

Remarks:

These two small ponds, totaling 9.6 acres drain into the Centerville River estuary via a small stream. River herring access the lower pond by means of a small, wooden notched weir-pool ladder. The upper pond is connected by a corrugated metal culvert that should be passable although the extent to which herring utilize it is unknown. The dam at Lake Elizabeth is deteriorating and, if replaced, a more efficient fishway should be incorporated into it.

Bumps River — Barnstable (Centerville)

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.8	Second	6.9	Unknown

Obstruction # 1 — Bumps River Road culvert — Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.1	Culvert, circular	Concrete	2.6	2.6	4.5	-	-	41° 38’ 54.131” N 70° 21’ 46.355” W

Bumps River Road Culvert

Fishway None

Obstruction # 2 — Bumps River Road Dam — Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.1	Dam	Concrete with wooden boards	3.0	4.0	4.5	Repaired in 1989	-	41° 38’ 54.569” N 70° 21’ 46.247” W

Bumps River Road Dam

Fishway None

Remarks:

The Bumps River, also a tributary to the Centerville River, has little potential habitat available and is not considered for anadromous fish development.

Skunknett River Barnstable

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.0	First	6.4	Alewife

Obstruction # 1 Lumbert Mill Road culvert Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.5	Culvert, circular	Corrugated metal	2	0.5	9.7	-	-	41° 39’ 26.876” N 70° 22’ 38.989” W

Lumbert Mill Road culvert

Fishway None

Obstruction # 2 Lumbert Pond Dam Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.5	Dam	Concrete with wooden boards	4.0	3.0	9.7	-	-	41° 39’ 27.421” N 70° 22’ 38.855” W

Lumbert Pond Dam

Fishway None

Remarks:

The Skunknett River is a tributary to the Bumps River estuary. Two small impoundments that are shown on current topographic maps have been drained and their dams removed. Consequently the first obstructions are the culvert at Lumbert Mill Road and the dam at Lumbert Mill Pond. Due to the pond's small size, development of a river herring population here is a low priority.

Wequaquet Lake/Long Pond Barnstable (Centerville)

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.6	First	7.6	Alewife

Obstruction # 1 Wequaquet Lake control structure Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
1.5	Dam control structure	Concrete and wood	3.0	1.4	654.0	-	-	41° 39' 36.635" N 70° 20' 05.489" W

Wequaquet Lake Control Structure/Ladder

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete	60	3.0	-	2	1.4	-	60	Fair Inefficient passage

Remarks:

Access to Lake Wequaquet and 48 acre Long Pond is provided by a long, artificial ditch excavated privately in the 19th century in order to establish a herring fishery. The fact that this is not a natural stream is the source of most of the problems limiting the production of this population. Shoaling of the pond outlets, erosion of stream banks and conflicting thoughts on how water flow should be regulated have all led to a resource which is far below the potential size afforded by the 700 acres of habitat available in the two ponds.

In order to increase the size of this run it will be necessary to install outlet retention structures which provide a deeper outlet channel without constant sediment removal and to take measures to reduce erosion in the section of stream below Long Pond. Of greatest importance to the management of this resource is to establish a strict protocol which has the upstream and downstream passage of herring as its primary purpose.

Halls Creek Barnstable

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.8	First	7.5	None known

Obstruction # 1 Marchant Mill Road culvert Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.0	Culvert	Concrete	2.2	2.0	1.7	-	-	41° 38’ 06.799” N 70° 18’ 32.994” W

Marchants Mill Road culvert

Fishway None

Remarks:

Fish passage is obstructed by a culvert at Marchant Mill Road and the amount of potential habitat upstream does not warrant fishway construction.

Stewarts Creek Barnstable

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.5	Second	7.0	None known

Obstruction # 1 Aunt Betty's Pond Control Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.2	Dam control structure	Concrete and metal	2.6	0.0	10.0	-	-	41° 38' 56.554" N 70° 17' 42.533" W

Aunt Betty's Pond control structure

Fishway None

Remarks:

This stream has little potential for development due to low stream flows and relatively little acreage available in its impoundments.

Mill Creek Yarmouth

Stream Length	Stream Order	pH	Anadromous Species Present
0.9	Second	6.6	Alewife

Obstruction # 1 Mill Pond Dam at Baxter Grist Mill Yarmouth (W.

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.9	Dam	Concrete with wooden boards	3.6	3.8	4.7	1950	Town of Yarmouth	41° 39’ 27.290” N 70° 15’ 40.069” W

Mill Pond Dam (at Baxter Grist Mill)

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete with wooden baffles	39.0	3.6	4.9	5	2.0	2.2	6.0	Good Passable

Mill Pond Fishway (at Baxter Grist Mill)

Remarks:

Mill Creek is a tidal estuary that has 4.7 acre Mill Pond at its head. A concrete and wood fishway functions well and allows fish to reach the impoundment.

Town Brook — Yarmouth (West Yarmouth)

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.7	First	7.4	Unknown

Obstruction # 1 — Above Mill Pond — Yarmouth (W.

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.0	Dam	Concrete and metal with wooden boards	4.0	0.5	14.0	-	-	41° 39’ 30.272” N 70° 15’ 36.784” W

Dam/Ladder above Mill Pond

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Box culvert with baffles	Concrete with metal slots and wooden baffles	49.0	4.0	5.0	1	0.6	-	N/A	Excellent Passable

Remarks:

Town Brook is a tributary to the Mill Creek system and flows from Little Sandy Pond to Mill Pond. A concrete box culvert with wooden baffles functions as a fishway and enables herring to reach the 14 acre pond.

Parkers River Yarmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.6	Second	5.5	Alewife, white perch

Obstruction # 1 Seine Pond Inlet Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
2.0	Dam	Concrete	1.7	2	0.0	-	-	41° 39’ 37.904” N 70° 12’ 36.426” W

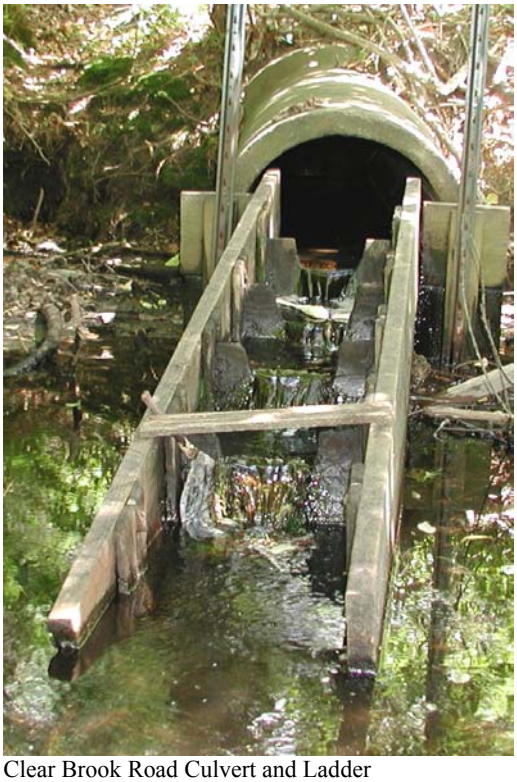
Seine Pond Inlet

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Wood and concrete	7.7	1.2	1.4	3	0.4	0.6	0.8	Good Passable

Obstruction # 2 Clear Brook Road Culvert Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
2.2	Culvert, circular	Concrete	2.0	1.2	0.0	-	-	41° 39’ 42.456” N 70° 12’ 35.195” W



Clear Brook Road Culvert and Ladder

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Wood	8.0	2.0	2.4	4	0.4	0.7	1.2	Good Inefficient passage

Obstruction # 3 Forest Road Culvert Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
2.2	Culvert, circular	Concrete	3.8	3.8	0.0	-	-	41° 39’ 44.132” N 70° 12’ 32.687” W

Forest Road Culvert and Ladder

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Wood	8.0	2.0	2.4	5	0.4	0.8	1.2	Good Inefficient passage

Obstruction # 4 Long Pond Control Structure Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
2.6	Dam control structure	Concrete with wooden boards	3	4	57.0	1966	Town of Yarmouth	41° 39’ 57.793” N 70° 12’ 19.028” W

Long Pond Control Structure and Ladder

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Wood	8.0	2.0	2.2	5	0.4	0.6	1.3	Good Inefficient passage

Remarks:

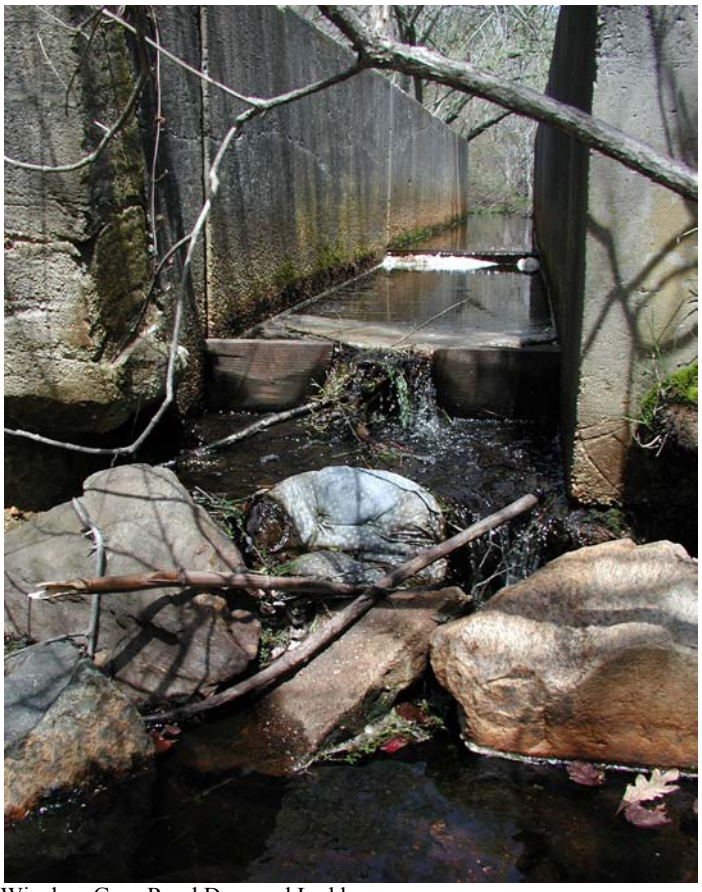
The Parker River flows from 57 acre Long Pond through a tidal estuary called Seine Pond and into Nantucket Sound. While some spawning may occur in Seine Pond, the headwaters provide the majority of the habitat. The first obstruction is a concrete resting pool with a wooden notched weir-pool ladder. This structure provides water depth for herring to enter the stream on lower tidal stages. A concrete culvert forms the second obstruction and is made passable by another wooden weir-pool fishway. A third wooden weir-pool ladder allows fish to enter a culvert at Forest Road and a fourth enables herring to pass the Long Pond control structure. With proper maintenance of these ladders and stream clearing this run should continue to remain productive.

Plashes Brook — Yarmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.6	First	5.3	Unknown

Obstruction # 1 — Winslow Gray Road Dam and Fishway — Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.4	Dam control structure	Concrete with wooden boards	2.8	1.7	1.9	1966	Town of Yarmouth	41° 39’ 19.342” N 70° 13’ 26.634” W



Winslow Gray Road Dam and Ladder

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete with wooden baffles	38.0	2.8	4.4	2	0.7	-	11.0	Good Inefficient passage

Obstruction # 2 First bog sluice below Plashes Pond Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.1	Bog sluice	Metal with wooden boards	4.0	0.2	0.0	-	-	41° 39’ 56.700” N 70° 13’ 22.967” W

First bog sluice below Plashes Pond

Fishway None

Obstruction # 3 Second bog sluice below Plashes Pond Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.1	Bog sluice	Metal with wooden boards	3.0	0.7	0.0	-	-	41° 39’ 59.819” N 70° 13’ 22.422” W

Second Bog Sluice below Plashes Pond

Fishway None

Obstruction # 4 Third bog sluice below Plashes Pond Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.2	Bog sluice	Metal with wooden boards	3.0	2.3	0.0	-	-	41° 40’ 00.994” N 70° 13’ 23.102” W

Third Bog Sluice below Plashes Pond

Fishway None

Obstruction # 5a 1st Pumphouse to Plashes Pond Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.2	Pumphouse	Wood and metal	-	-	44.0	-	-	41° 40’ 03.642” N 70° 13’ 23.417” W

1st Pumphouse to Plashes Pond

Fishway None

Obstruction # 5b Fourth bog sluice below Plashes Pond Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.2	Bog sluice	Metal with wooden boards	3.5	0.1	0.0	-	-	41° 40’ 08.420” N 70° 13’ 33.145” W

No photo available

Fishway None

Obstruction # 6 5th Plashes Pond Sluice Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.4	Bog sluice	Aluminum with wooden boards	4.5	3.5	44.0	-	-	41° 40’ 10.266” N 70° 13’ 30.730” W

5th Plashes Pond Bog Sluice

Fishway None

Obstruction # 7 Plashes Pond 2nd Pumphouse Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.4	Pumphouse	Wood and metal	6.8	7.0	0.1	-	-	41° 40’ 10.968” N 70° 13’ 28.378” W

2nd Plashes Pond Pumphouse

Fishway None

Remarks:

Plashes Brook is a small tributary to the lower Parkers River. A concrete control structure at Winslow Gray Road forms a 1.9 acre impoundment. Wooden baffles incorporated into the structure create a fishway which allows herring to reach the impoundment. In order to reach the headwater, 44 acre Plashes Pond, fish would have to negotiate a complex system of cranberry bogs with numerous impassable culverts. While access to Plashes Pond is desirable, the difficulty of ensuring passage through the bogs reduces it to a low priority site.

Bass River/ Muddy Creek/ Weir Creek/ Hamblins Brook

Yarmouth, Dennis

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
7.5	Second	6.9	Alewife, white perch

Obstruction # 1

Miss Thachers Pond Outlet — Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
7.5	Dam	Concrete with wooden boards	2.8	3.2	6.5	-	-	41° 41’ 52.327” N 70° 13’ 03.547” W

Miss Thachers Pond Dam and Ladder

Fishway

Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete with wooden baffles	19.0	2.8	4.0	5	Varied (0.8-2.6)	-	3.8	Good Inefficient passage

Remarks:

Bass River is a large Cape Cod estuary which is completely tidal up to and including 56 acre Mill Pond. Salinities in Mill Pond, however, are low enough to allow successful river herring and white perch spawning. A weir-pool fishway above Mill Pond provides a small amount of additional habitat in 6.5 acre Miss Thachers Pond, providing sufficient flow exists and the ladder is properly regulated. Little potential exists for further development of this resource.

Weir Creek — Dennis

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.1	First	7.6	Alewife, blueback

No photo available

No Obstructions

Fishway None

Remarks:

This tributary to Bass River flows unobstructed from Kellys Pond to the estuary. River herring are able to access the 31 acre headwater pond and the system is probably at the peak of its potential.

Fresh Pond Tributary — Dennis

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.7	First	4.5	Unknown

No photo available

No Obstructions

Fishway None

Remarks:

Fresh Pond is the 31 acre headwater for an unnamed tributary to Bass River. The stream is badly overgrown and, although it supported a small run of herring in the past, none have been reported in recent years. Stream clearing could rectify this condition.

Swan Pond River Dennis

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.4	First	7.8	Alewife

No Obstructions

Mouth of Swan Pond River

Fishway None

Remarks:

Swan Pond River flows from Swan Pond to Nantucket Sound. The 142 acre pond itself is tidal but some limited spawning may occur despite salinities in the high teens. There are no obstructions to passage and no potential for development.

Herring River — Harwich

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
6.8	Second	7.4	Alewife, blueback

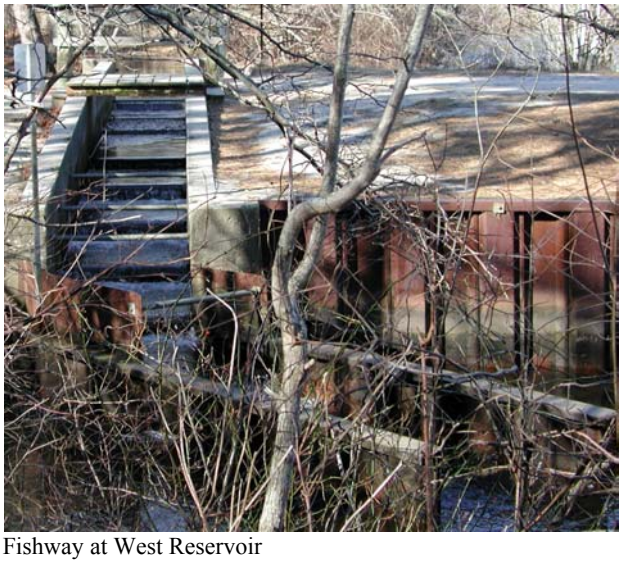
Obstruction # 1 — West Reservoir Dam — Harwich

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
3.9	Dam	Concrete with wooden boards	3.5	2.6	65.0	1979	Town of Harwich	41° 40’ 55.442” N 70° 07’ 19.680” W

Spillway at West Reservoir Dam

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete and metal with wooden baffles	88.0	4.7	6.7	10	Varied (2.4 - 4.4)	-	Varied (6 - 16)	Good Passable



Fishway at West Reservoir

Obstruction # 2 Hinckleys Pond Control Structure Harwich

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
6.8	Dam control structure	Concrete with wooden boards	4.0	2.5	171.0	1979	Town of Harwich	41° 42’ 42.644” N 70° 05’ 42.291” W

Hinckleys Pond Control Structure and Ladder

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete with wooden baffles	18.0	4.0	6.0	5	1.2	-	8.0	Excellent Passable

Hinckleys Pond Fishway

Obstruction # **3** Long Pond Outlet Structure Harwich

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
6.8	Dam control structure	Concrete and wood	4.0	0.9	711.7	-	-	41° 43’ 07.910” N 70° 05’ 08.662” W

Long Pond Control Structure/Ladder

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete and wood	100	Varied (1.6 and 4.0)	Varied (1.8 and 5.4)	2	Varied (0.9 and 1.2)	-	25	Good Passable

Remarks:

This system provides 1119 acres of spawning habitat in its three headwater ponds and downstream impoundments. An efficient weir-pool fishway provides access at West Reservoir dam and a second weir-pool ladder at Hinckleys Pond allows fish to reach that habitat. From Hinkleys Pond fish have unimpeded access to Seymours and Long Ponds providing flow is sufficient. The primary limiting factor to production in this system is the frequent low water conditions that may prevent juvenile herring from making a successful downstream migration. The installation of outlet retention structures and frequent dredging of deposited materials from the outlets of Seymours and Long Ponds would improve this situation.

Andrews River Harwich

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.8	First	7.4	Alewife

No Obstructions

Grass Pond Outlet

Fishway None

Remarks:

The Andrews River flows from 24 acre Grassy Pond to Saquatucket Harbor. The stream has low flow and no defined channel below Grassy Pond. There is little potential for development.

Skinequit Pond Harwich

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.3	First	7.3	Alewife

Obstruction # 1 Skinequit Pond elevation Harwich

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.3	Elevation change	-	-	~4	15.0	-	-	41° 40’ 19.048” N 70° 02’ 38.001” W

First Stream Baffle leading to Skinequit Pond

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffle	Stone	1075	Varied (3 - 5)	Varied (3 - 5)	4	Varied (0.4 - 1.0)	Varied 1.3-3.0	Varied (50 - 300)	Poor Inefficient passage

Remarks:

Skinequit Pond flows into Red River via a short unnamed tributary. Stream baffles in the tributary allow fish to reach the 15 acre pond. With stream cleaning and maintenance of the baffles, this system should be at its capacity.

Frost Fish Creek Chatham

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.8	First	6.7	Alewife

Obstruction # 1 Frost Fish Creek Trail culvert (former bog sluice) Chatham

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.3	Bog sluice	Concrete and corrugated metal	0.89	0.89	5.8	-	-	41° 42’ 07.328” N 69° 58’ 13.451” W

Frost Fish Creek Trail Culvert

Fishway None

Remarks:

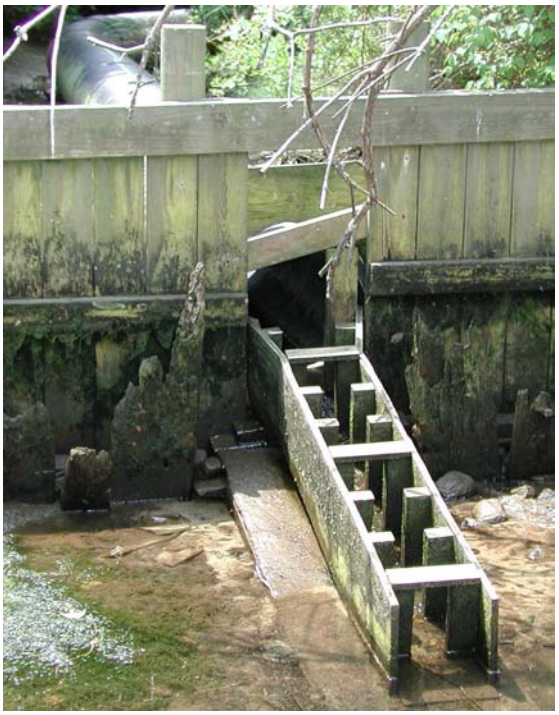
This tidal creek drains three small impoundments. What had been obstructions have been removed and fish may enter the impoundments. The uppermost which is shown on topographic maps as being 14 acres in size has been greatly reduced by removal of stoplogs and eutrophication. There is little development potential here.

Stillwater Pond/Lovers Lake Chatham

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.4	First	7.1	Alewife

Obstruction # 1 Stillwater Pond Elevation Change Chatham

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.1	Elevation change	-	-	-	0.0	-	Private	41° 42’ 20.079” N 69° 59’ 05.091” W



Vertical Slot at Stillwater Pond Elevation Change

Notched Weir-pool at Stillwater Pond Elevation Change

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Vertical slot	Wood	8.0	1.0	1.0	8	1.0	0.3	1.0	Poor Inefficient passage
Notched weir-pool	Corrugated plastic pipe with wooden baffles	147.0	1.4	1.4	28	0.8	0.5	5.0	Good Passable

Obstruction # 2 Stillwater Pond Control Structure Chatham

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.2	Dam control structure and elevation change	Concrete with wooden boards	1.5	0.9	16.0	-	-	41° 42’ 16.124” N 69° 59’ 06.638” W

Stream Baffles below Stillwater Lake

Ladder at Stillwater Pond

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffle	Concrete	274	8.0 (stream width)	8.0	4	1.2	Varied (0.6 - 1.8)	Varied (48 - 100)	Fair Inefficient passage
Vertical slot	Aluminum, wood and concrete	11.0	Varied (0.5 and 1.3)	Varied (1.9)	10	Varied (0.6)	-	-	Good Inefficient passage

Obstruction # 3 Lovers Lake Culvert Chatham

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.4	Elevation change	-	4	4	0.0	-	-	41° 42’ 05.094” N 69° 59’ 05.847” W

Lovers Lake Culvert

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Corrugated plastic with wooden baffles	60.0	1.4	2.0	6	0.3	0.7	6.0	Good Passable

Notched Weir-pool at Lovers Lake Culvert

Obstruction # 4 Lovers Lake Outlet Control Chatham

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
0.4	Elevation change	-	0.5	1.5	36.0	-	Private	41° 42’ 01.914” N 69° 59’ 05.337” W

Fishway at Lovers Lake Outlet

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Vertical slot	Wood and aluminum	4.6	0.5	0.5	9	0.5	0.3	0.5	Fair Passable

Remarks:

These ponds drain into Ryders Cove, Chatham by way of an unnamed stream. The first obstruction occurs at the head of the tide where a wooden vertical slot fishway allows herring to enter the stream over a wide range of tidal conditions. The second fishway overcomes an elevation change and control structure at Stillwater Pond. The unique design of this ladder, developed by the local herring warden, deserves mention. It consists of 147 feet of 2 foot diameter, corrugated plastic pipe which has been fitted internally with wooden notched baffles. This appears to function adequately for passage over low gradient elevation changes. A 60 foot length of this type of fishway allows fish to enter the third obstruction, a culvert below Lovers Lake. A wooden vertical slot fishway enables fish to overcome the final obstruction, the outlet control structure at Lovers Lake. The 55 acres of habitat in these ponds should support a productive fishery providing the fish passage facilities are well maintained.

Muddy Creek Chatham, Harwich

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.6	First	7.7	Alewife

No Obstructions

Removed Tide Gate at Muddy Creek

Fishway None

Remarks:

This creek formerly flowed through a tide gate which has been removed. The resulting high salinities and lack of spawning area eliminate any potential for development.

Pilgrim Lake Orleans

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.6	First	6.7	Alewife

Obstruction # 1 Elevation change to Pilgrim Lake Orleans

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.4	Elevation change	-	-	-	0.0	-	-	41° 46’ 07.807” N 69° 58’ 41.848” W


Entrance to Pilgrim Lake Ladder


Ladder below Pilgrim Lake

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete	415.0	1.7	2.5	55	1.2	0.4	7.0	Fair Inefficient passage

Obstruction # 2 Pilgrim Lake control structure Orleans

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.6	Dam control structure	Concrete with wooden boards	1.9	0.8	39.0	-	-	41° 46’ 00.404” N 69° 58’ 43.757” W

Pilgrim Lake Control Structure/Ladder

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete with wooden baffles	4.0	1.9	3.3	2	0.7	0.6	4.0	Fair Inefficient passage

Remarks:

Two fishways provide passage to 39 acre Pilgrim Lake. The first, which overcomes an elevation change, is a concrete notched weir-pool structure which is functional but in a state of deterioration. The second, a concrete and wood weir-pool design is passable with proper flow regulation. In order to maintain this population the first ladder will require replacement in the near future.

Pilgrim Lake — Truro, Provincetown

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.4	First	8.4	Alewife, white perch

Obstruction # 1 — Pilgrim Lake Control Structure — Provincetown

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
0.3	Dam control structure	Concrete with wooden boards	8.7	0	319.2	-	-	42° 03’ 09.800” N 70° 07’ 05.900” W

Pilgrim Lake Control Structure

Fishway None

Remarks:

This 319 acre pond lies within the borders of the Cape Cod National Seashore. It was completely tidal until the original opening was closed and a new outlet consisting of a tide gated culvert was installed. Since that time, Pilgrim Lake has had a history of episodic low oxygen levels and troublesome midge hatches presumably attributable to the lack of adequate tidal flushing. In an attempt to rectify this, the National Seashore has experimented with opening the tide gate for an extended period to increase flushing while making observations on the new salinity regimes this has created.

The increase in salinities in the pond will almost surely decrease the available spawning/nursery habitat available for the small population of river herring and white perch that currently utilized it. While DMF does not generally endorse the loss of anadromous fish habitat, the benefits to be gained such as improved water quality and the creation of habitat for equally valuable marine resources may outweigh the impacts on these small anadromous populations. Ideally a salinity regime will be achieved and maintained that will eliminate water quality and insect problems while still allowing a reasonable amount of river herring and white perch reproduction.

Pamet River Truro

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
4.0	First	6.3	Alewife, blueback, trout

Obstruction # 1 Tide Gate Truro

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.6	Tide gate	Steel	4.0		0.3	-	-	41° 59’ 37.500” N 70° 03’ 01.100” W

Tide Gate at Route 6A

Fishway None

Remarks:

This tidal stream nearly bisects the upper arm of Cape Cod. The salinity in its upper reaches is reduced by a tide gate. The fish passage problems caused by the tide gate and the lack of a significant amount of habitat above it make this stream a low priority for anadromous fish work.

Herring River Wellfleet

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
4.7	First	6.3	Alewife, blueback, white perch

Obstruction # 1 Tide Gate at Chequesett Road Wellfleet

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.0	Tide gate	Steel and concrete	35	0.0	45.9	-	-	41° 55’ 51.991” N 70° 03’ 52.150” W

Tide Gate at Chequesett Road

Fishway None

Remarks:

Herring River has its source in four kettle hole ponds within the Cape Cod National Seashore which provide a total of 157 acres of habitat for herring. The first of these, Herring Pond, is connected to the remaining three by artificial ditches. The only obstruction to passage on the system is the Herring River dike and tide gate. This structure is impacting the river herring population in a number of ways. Most obvious is that passage through the tide gate is only possible during a limited portion of the tidal cycle. While the effect this has on population size is unknown, it is certainly an important limiting factor. Another impact is the frequent loss of juvenile herring to low oxygen levels caused by the lack of flushing action in the stream. Due to the poor access to the sections of stream where this occurs, little is known about the actual extent of these losses.

In addition to the effects of the dike, the issue of low water levels at the pond outlets, so common on Cape Cod, impacts the river resource in this system as well. The connecting ditches often become dry and require dredging to insure movement of the juveniles out of the system. With the exception of removal of the dike, little can be done to improve this population.

Herring Brook Eastham

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.6	First	6.4	Alewife

Obstruction # 1 Herring Brook Road Control Eastham

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.4	Dam	Concrete with wooden boards	2.9	2.2	6.3	-	-	41° 49’ 51.983” N 69° 59’ 52.242” W

Herring Brook Road Control Structure/Ladder

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Weir-pool	Concrete with wooden baffles	5.4	2.9	4.6	1	2.2	-	-	Good Passable

Remarks:

This short stream drains 115 acres of river herring habitat in Bridge and Great Ponds. The outlet control structure at Herring Brook Road, which also functions as a weir-pool fishway, is regulated by the Town of Eastham to allow herring to enter the headwater ponds. A frequent problem on this system is the deposition of sand at the mouth of the stream often requiring removal prior to the spring run.

Herring River — Eastham

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.3	First	7.4	Alewife

Obstruction # 1 — Herring Pond Dam — Eastham

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
1.2	Dam	Concrete with wooden boards	3.4	0.9	42.3	-	-	41° 49’ 22.133” N 69° 59’ 18.434” W

Herring Pond Control Structure

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffle	Wood	86.0	8.6	8.6	2	2.0	1.0	Varied (35.0 and 51.0)	Good Passable
Notched weir-pool	Concrete with wooden baffles	66.0	3.4	4.8	3	2.8	-	Varied (14.2-24.7)	Good Passable

Herring Pond Stream Baffles

Notched Weir-pool at Herring Pond

Remarks:

Herring River flows from 42.3 acre Herring Pond to Cape Cod Bay. The stream is tidal for most of its length and a combination of stream baffles and weir-pool fishway allows herring to ascend the upper portion of the stream and enter the pond. Aside from maintenance of the fishway and removal of sand from the pond's outlet little can be done to improve this run.

Rock Harbor Creek Eastham, Orleans

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.5	First	7.1	Alewife, white perch

Obstruction # 1 Rock Harbor Road culvert Orleans

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.4	Culvert, circular	Concrete	3.0	0.0	0.0	-	-	41° 47’ 50.100” N 69° 59’ 29.700” W

Rock Harbor Road Culvert

Fishway None

Obstruction # 2 Cedar Pond control structure Orleans

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.5	Dam control structure	Concrete with wooden boards	5.0	3.3	17.0	-	-	41° 47’ 46.749” N 69° 59’ 29.533” W

Cedar Pond Control Structure

Fishway None

Remarks:

Rock Harbor Creek has supported small river herring and white perch runs in the past. Two obstructions currently affect fish passage. A small culvert under Rock Harbor Road is partially filled with sediments making movement through it difficult. A second obstruction is the Route 6 culvert which is associated with the Cedar Pond outlet control structure. The culvert was not designed with fish passage in mind and consequently it is difficult to adjust the outlet flows for optimal passage. While some fish do reach the pond, this is an important factor in limiting the population. This resource is also impacted by water quality issues, including high salinities and seasonally low dissolved oxygen content due to eutrophication.

Cobbs Pond — Brewster

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.2	First	7.6	None known

Obstruction # 1 — Cobbs Pond Culvert — Brewster

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.0	Culvert, circular	Corrugated metal	3.0	0.0	21.0	-	-	41° 46’ 06.881” N 70° 05’ 04.489” W

Cobbs Pond Culvert

Fishway None

Remarks:

Cobbs Pond in Brewster drains into Cape Cod Bay via a 3 foot diameter plastic pipe. Despite the 21 acres provided by the pond, the limitation of access to higher stages of the tidal cycle and the 250 foot length of the pipe severely limit this system's potential.

Stoney Brook — Brewster

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
3.1	First	6.9	Alewife, blueback, white perch

Obstruction # 1 — Lower Mill Pond Dam — Brewster

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.8	Dam and elevation change	Concrete with wooden boards	1.5	8.8	40.0	1920	Town of Brewster	41° 44’ 40.473” N 70° 06’ 45.011” W

Lower Mill Pond Dam

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete and stone	490.0	Varied (3 - 4)	Varied (3 – 4)	27	Varied (0.4 - 1.2)	Varied (1)	Varied (8 – 25)	Good Passable

Lower Mill Pond Ladder (downstream side of Stony Brook Road)

Lower Mill Pond Ladder (upstream side of Stony Brook Road)

Remarks:

Stoney Brook has long been one of the Commonwealth's most popular herring runs. The annual migration of river herring up this stream attracts numerous Cape Cod tourists every year. A series of connected weir-pool fishways and stone baffles allow the fish to surmount a natural elevation change and mill pond dam, enabling them to reach the 386 acres available in the headwater ponds. The connecting stream between Lower and Upper Mill Ponds tends to fill with sand deposits and although attempts have been made by the Town of Brewster to correct it, this remains a problem for fish passage.

Quivett Creek Brewster, Dennis

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.4	First	7.2	Alewife

Obstruction # 1 Airline Road Fishway Dennis, Brewster

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
2.4	Elevation change	-	-	-	4.2	-	-	41° 44’ 37.334” N 70° 08’ 43.385” W

Airline Road Fishway

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Stone	55.0	3.3	4.0	11	2.3	0.5	Varied (4 – 15)	Good Passable

Remarks:

Primarily a tidal stream, Quivett Creek drains a 4.2 acre impoundment on the Brewster/Dennis line. A stone, notched weir-pool ladder provides passage into the pond. Available habitat is limited and other than fishway regulation and maintenance there is limited opportunity for further development.

Sesuit Creek — Dennis

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.1	First	7.4	Alewife, rainbow smelt

Obstruction # 1 — Scargo Lake Outlet — Dennis

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
2.1	Elevation change	-	-	-	53.0	-	-	41° 44’ 46.328” N 70° 10’ 45.966” W

Scargo Lake Outlet

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete with wooden baffles	45.0	2.6	4.0	3	Varied (1.2-1.6)	0.3	Varied (7 – 15)	Poor Inefficient passage

Scargo Lake Fishway

Remarks:

This stream flows from 53 acre Scargo Lake to Cape Cod Bay. The system's most pressing fish passage problem is the shoaling of the pond's outlet. The town has attempted to overcome this with the installation of a concrete outlet retention structure which has provided a measure of relief. In addition, the culvert under Route 6A is deteriorating and may cause a blockage to migration. Additional shoaling of the creek and road culverts may impact this run through periodic blockages. Efforts should be made to deepen and stabilize the channel and improve passage through the street culverts.

Whites Brook — Yarmouth

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.2	Second	7.6	Alewife

Obstruction # 1 — Matthews Pond Outlet — Yarmouth

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.2	Dam	Concrete with wooden boards	1.3	2.3	35.7	-	-	41° 42’ 45.316” N 70° 13’ 27.741” W

Ladder at Matthews Pond Outlet

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Denil	Wood	24.0	1.3	1.4	15	1.5	-	-	Good Passable

Remarks:

This stream is a tributary to Chase Garden Creek, a tidal stream that drains into Cape Cod Bay. The headwaters, Matthews Pond, provides 35.7 acres of spawning habitat and is accessed by a 24 foot Denil fishway. Other than fishway regulation and maintenance, there is little room for improvement.

Mill Pond — Barnstable

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.5	Second	8.0	Alewife

Obstruction # 1 — Mill Pond Dam — Barnstable

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
2.2	Dam	Stone and concrete	1.2	1.1	21.0	2000	-	41° 42’ 33.151” N 70° 22’ 54.822” W

Mill Pond Dam and Ladder

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Denil	Wood	8.0	1.3	2.0	8	Varied (2.0-2.5)	-	-	Excellent Passable

Remarks:

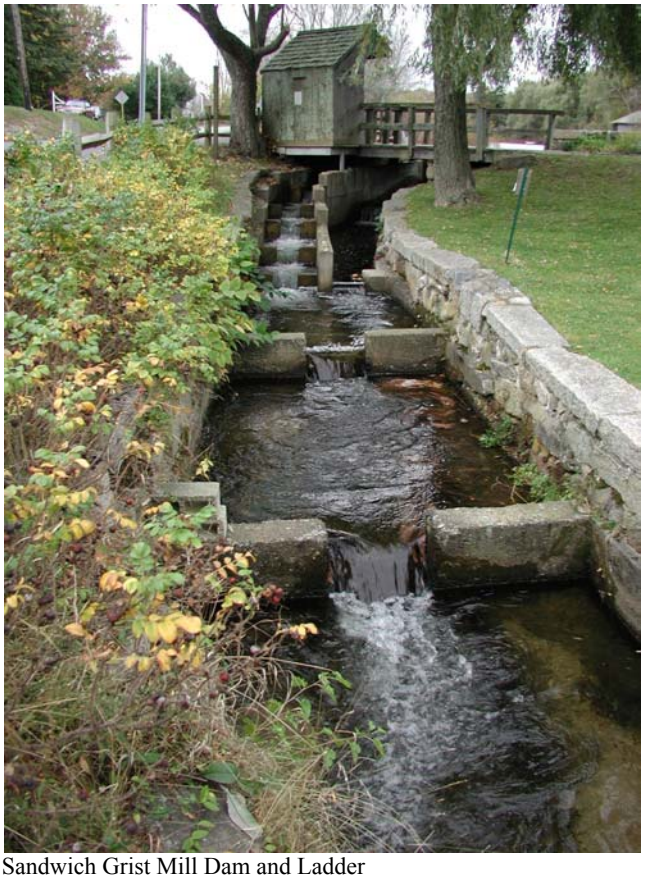
This 21 acre pond flows into Barnstable Harbor by way of Boat Cove Creek. A wooden Denil fishway constructed by DMF in 2000 provides access to the pond. There is no opportunity for further development.

Mill Creek — Sandwich

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.6	First	7.3	Alewife, blueback, American shad, white perch

Obstruction # 1 — Sandwich Grist Mill Dam — Sandwich

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
2.1	Dam	Concrete	6.7	8.0	24.1	1654	Town of Sandwich	41° 45’ 27.531” N 70° 30’ 01.498” W



Sandwich Grist Mill Dam and Ladder

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete	40.8	3.0	4.2	10	Varied (1.8-4.7)	1.3	Varied (4.9-12.2)	Good Passable

Obstruction # 2 Upper Shawme Pond Dam Sandwich

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
2.6	Dam	Wood	17.0	2.7	20.9	-	Private	41° 45’ 03.251” N 70° 30’ 10.152” W

Upper Shawme Dam

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete	71.9	3.0	4.3	11	1.1	1.6	7.0	Poor Not passable

Upper Shawme Fishway

Remarks:

Mill Creek is largely a tidal stream that drains Upper and Lower Shawme Ponds. A fishway leading into 24.1 acre Lower Shawme Pond was reconstructed by DMF in 1993 and currently provides adequate passage. A fishway that formerly connected the two ponds has been bypassed and the upper pond is inaccessible. The dam at Upper Shawme Pond has been designated unsafe and is being considered for replacement. A functional fishway should be incorporated into a design for a new dam. This stream has historically supported a small American shad run in its lower reaches.

Cape Cod Recommendations

1. Screening of cranberry bog intakes that have or may cause diversion or loss of migrating herring should be made mandatory through Section 19 of Chapter 130 or through new legislation if necessary.

2. A permanent fishway should be incorporated into the new outlet structure to be built at Johns Pond on the Quashnet River.

3. The concrete flume at the head of the uppermost fishway on the Marstons Mills River should be lowered to match the elevation of the adjacent bog flume. Also, an outlet retention structure should be installed at Middle Pond.

4. Security measures to discourage tampering with the outlet control structure of Mashpee-Wakeby Pond should be increased and local and state enforcement agencies should be apprised of the problem.

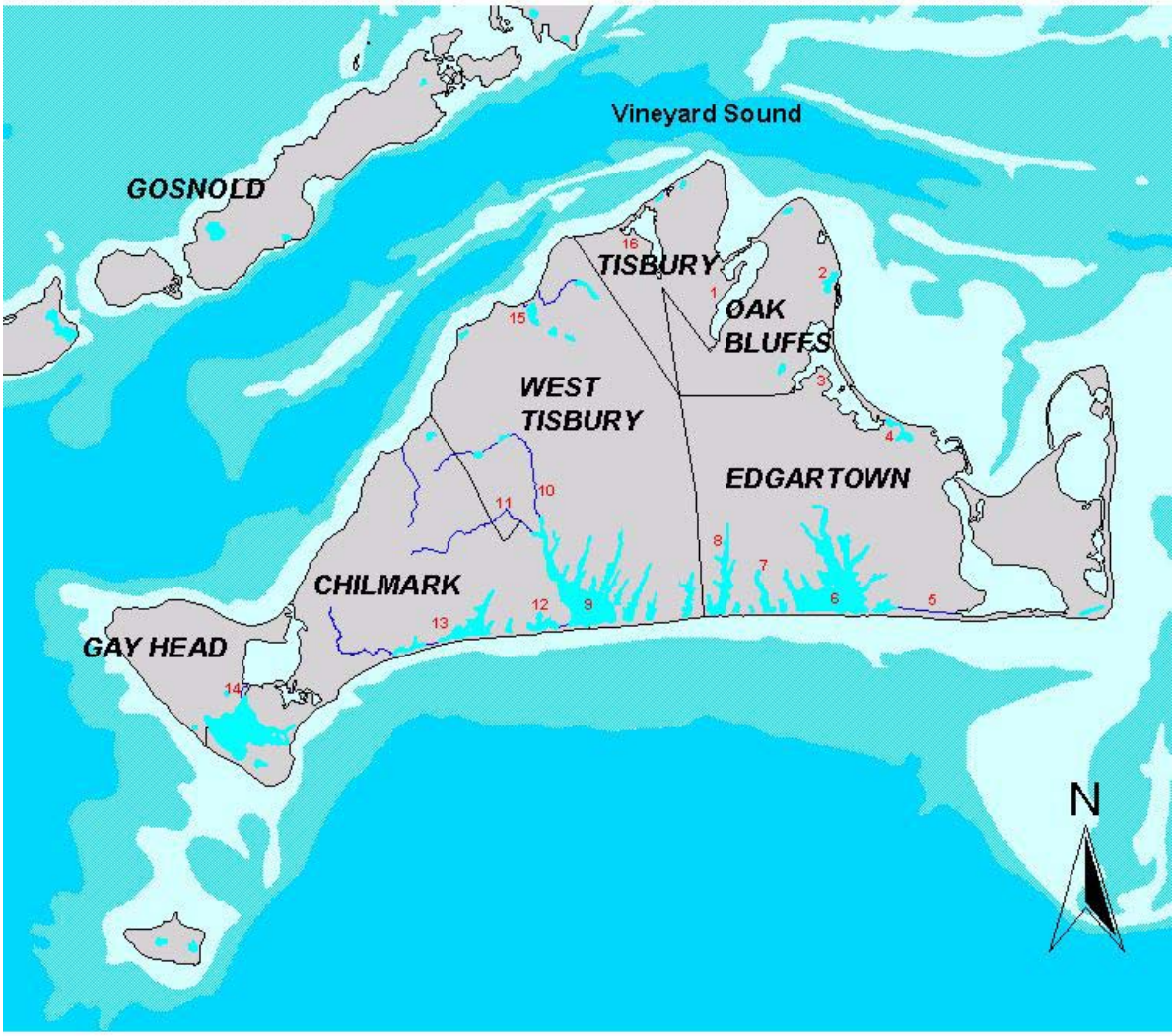
5. A new fishway should be incorporated into any work done on the dam at Upper Shawme Pond in Sandwich.

6. The fish passage improvements that have been designed for Red Brook in Pocasset should be funded and implemented.

7. Outlet retention structures for the connecting stream between Upper and Lower Mill Ponds in Brewster should be redesigned to be more effective in preventing sediments from entering the stream.

8. A protocol for release of water and outlet dredging at Wequaquet and Long Ponds in Barnstable, which is directed toward insuring the upstream and downstream movement of river herring into these habitats, should be established and implemented.

MARTHA'S VINEYARD WATERSHEDS



Major Streams and Ponds of Martha's Vineyard

Stream Names:

1 - Lagoon Pond
2 - Farm Pond
3 - Sengekontacket Pond
4 - Trapps Pond
5 - Mattakeset Herring Creek
6 - Edgartown Great Pond
7 - Jobs Neck Pond
8 - Oyster Pond
9 - Tisbury Great Pond
10 - Mill Brook
11 - Tiasquam River
12 - Black Point Pond
13 - Chilmark Pond
14 - Gay Head Herring Creek
15 - James Pond
16 - Lake Tashmoo

Martha's Vineyard Watersheds

Lagoon Pond — Tisbury, Oak Bluffs

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.2	First	6.7	Alewife

Obstruction # 1 — Richard Madieras Fish Ladder — Tisbury, Oak Bluffs

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
2.2	Dam	Concrete with wooden boards	2	2.5	9.0	-	-	41º 25' 47.137" N 70º 35' 59.186" W

Richard Madieras Ladder

Fishway — Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Denil & notched weir Pool	Concrete with wooden baffles	75.3	2.1	3.5	14	3.3	1.1	13.0	Good Passable

Remarks:

Lagoon Pond is a large salt pond that has a 9 acre freshwater impoundment at its head. A concrete and wood, combination Denil and weir-pool ladder functions well and provides river herring with access to the spawning habitat. There is little opportunity for further development.

Farm Pond

Oak Bluffs

Stream Length (mo)	Stream Order	pH	Anadromous Species Present
0.0	First	8.3	Alewife

No Obstructions

Farm Pond Outlet

Fishway None

Remarks:

This 33 acre salt pond is connected to Vineyard Sound by a 6 foot diameter culvert. The high salinities which occur in the pond eliminate any possibility of development for anadromous fish.

Sengekontacket Pond Oak Bluffs, Edgartown

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.1	Second	6.1	Alewife

Obstruction # 1 Sengekontacket development Oak Bluffs, Edgartown

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
1.6	Dam and elevation change	Stone and wood	0.9	0.6	0.0	-	-	41º 25' 05.720" N 70º 34' 23.528" W

Sengekontacket Development Dam

Fishway Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Stream baffle	Stones and wood	120	Varied (3-10)	Stream walls	6	Varied (0.5-1.3)	Varied (0.3-4)	Varied (8 – 35)	Good Inefficient passage

Fishway at Sengekontacket Development

Remarks:

A small impoundment has recently been created on a stream that drains into Sengekontacket Pond. Baffles have been incorporated into this short stream making access to the potential spawning grounds possible and there has been local interest in developing a fishery. It will probably be necessary to stock the impoundment with adult herring to insure a stock that is imprinted on the site. Because of the small size of the pond and lack of public access, it is not recommended that DMF commit its resources to this project.

Trapps Pond Edgartown

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.0	First	8.2	River herring

No Obstructions

Outlet of Trapps Pond

Fishway None

Remarks:

Forty four acre Trapps Pond is connected to Sengekontacket Pond by a short tidal creek. Salinities are high and, although herring have been reported here, there is little opportunity for development.

Mattakeset Herring Creek Edgartown

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.2	First	6.9	Alewife, blueback

No Obstructions

Mattakeset Herring Creek

Fishway None

Remarks:

This long artificial ditch, excavated in 1889, connected Edgartown Great Pond, an 1157 acre salt pond, to Katama Bay by way of Crackatuxet Cove. This access to the Great Pond enabled the establishment of a productive, private alewife fishery. In more recent years the connection between Crackatuxet Cove and Edgartown Great Pond has filled in and, with no passage available and little flow down the creek, the run no longer exists.

The Town of Edgartown with the cooperation of state and Federal agencies and NGOs has proposed to reestablish the connection with a control structure that will allow regulation of salinities within Crackatuxet Cove and provide restored spawning habitat in this 38 acre pond. This in combination with the extended opening of Edgartown Great Pond and dredging of the approach from Katama Bay should allow a new population to become established providing salinities in pond can be kept within an acceptable range for spawning and survival.

Edgartown Great Pond Edgartown

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.1	First	6.7	Alewife, American shad, white perch

Obstruction # 1 Edgartown Great Pond Barrier Edgartown

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
0.0	Barrier beach	-	-	-	1157.	-	-	N/A

Barrier Beach at Edgartown Great Pond

Fishway None

Remarks:

This large salt pond is opened to the sea annually in order to maintain salinity for shellfish propagation. Salinities are low enough to allow some river herring reproduction. How the proposed extended opening of the outlet to the sea for the purpose of improved shellfish production will affect this population is unknown. A restored population in Crackatuxet Cove, however, should offset any reduction in size brought on by increased salinities in the Great Pond.

Jobs Neck Pond Edgartown

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.0	First		None known

No photo available

No Obstructions

Fishway None

Remarks:

This 59.6 acre pond was once connected to Edgartown Great Pond by an artificial ditch, creating a privately owned fishery. The ditch is now filled in and the fishery no longer exists.

Oyster Pond Edgartown

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.0	First	6.5	Alewife

No Obstructions

Oyster Pond

Fishway None

Remarks:

Oyster Pond was once opened on an annual basis and supported a commercial fishery. The town continues this practice but there is no way to significantly improve the anadromous fish resource here.

Tisbury Great Pond Chilmark, West Tisbury

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.0	First	8.4	Alewife

No Obstructions

Tisbury Great Pond

Fishway None

Remarks:

River herring access to Tisbury Great Pond is dependent upon annual opening of the barrier beach. Freshwater input from two feeder streams maintains salinity levels in the upper portion of the pond that are conducive to spawning and survival. The 915 acres of habitat have supported a productive commercial fishery in the past.

Mill Brook West Tisbury

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
6.3	Second	6.5	Alewife

Obstruction # 1 Edgartown Road culvert West Tisbury

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.3	Culvert, circular	Stone	10.0	0.9	2.0	1890	Town of West Tisbury	41º 22' 57.636" N 70º 40' 17.413" W

No photo available

Fishway None

Obstruction # 2 Old Millpond Dam West Tisbury

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.4	Dam	Concrete with wooden boards	10.0	2.0	2.0	1890	Town of West Tisbury	41º 22' 58.109" N 70º 40' 17.500" W

Spillway at Old Millpond Dam

Fishway None

Remarks:

This tributary to Tisbury Great Pond has a number of small impoundments. The acreage available in these impoundments is insignificant compared to that provided by the Great Pond. As a result, the expense of providing passage at each dam is not justified.

Tiasquam River — Chilmark, W. Tisbury

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
3.5	First	6.5	Alewife

Obstruction # 1 — Unnamed Dam below Looks Pond — West Tisbury

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.3	Dam	Concrete	4	1.8	0.9	-	-	N/A

No photo available

Fishway None

Obstruction # 2 — Looks Pond Dam — West Tisbury

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.6	Dam	Concrete and stone	10.0	5.6	4.6	-	Private	41º 22' 40.814" N 70º 40' 44.601" W

Looks Pond Dam

Fishway None

Remarks:

Another tributary to Tisbury Great Pond, Tiasquam River flows through several small impoundments. As with Mill Brook, the benefits to be gained in terms of total population increase by constructing a fishway here are limited and likely costly.

Black Point Pond Chilmark

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.2	First	8.0	Alewife

No Obstructions

Outlet of Black Point Pond

Fishway None

Remarks:

Alewives have access to this 65 acre brackish pond from Tisbury Great Pond via a 1200 foot man made ditch. It is not known how much this pond contributes to the production of the system. In the past a commercial white perch fishery was carried on here.

Chilmark Pond

Chilmark

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.0	Second	6.5	Unknown

No Obstructions

Chilmark Pond

Fishway None

Remarks:

Chilmark Pond is a 221 acre salt pond which once supported a productive white perch fishery and a smaller alewife fishery. The Pond is artificially opened to raise salinity for shellfish propagation and allow alewife passage.

Gay Head Herring Creek Chilmark, Aquinnah

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.3	First	7.7	Alewife, white perch

No Obstructions

Outlet of Gay Head Herring Creek

Fishway None

Remarks:

This artificial stream connects Squibnocket Pond to Menemsha Pond, a large tidal inlet. River herring enter Menemsha Pond from Vineyard Sound and ascend the stream to the 604 acre headwater pond. An active fishery is maintained and conducted by the Wampanoag tribe of Aquinnah, formerly the town of Gay Head, who have legal control of this resource. Other than shoaling of the stream mouth, this system functions well and there is little room for further development.

James Pond West Tisbury

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.3	First	7.6	Alewife

No Obstructions

Entrance to James Pond

Fishway None

Remarks:

Herring have been reported to enter this 37 acre pond that is connected to Vineyard Sound by a short tidal stream. The stream has a history of shoaling due to beach sand deposition and must be kept open to insure passage.

Lake Tashmoo

Tisbury, Vineyard Haven

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
1.5	First	6.8	Alewife

Obstruction # 1

Old water supply pond (above Lake Tashmoo)

Tisbury, Vineyard Haven

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Impoundment Acreage	Year Built	Owner	GPS
0.1	Dam	Concrete with wooden boards	2.5	3.8	1.3	-	Town of Tisbury	41º 26' 55.199" N 70º 37' 20.101" W

Lake Tashmoo Control Structure/Ladder

Fishway

Present

Design	Material	Length (ft)	Inside W (ft)	Outside W (ft)	# of Baffles	Baffle H (ft)	Notch W (ft)	Pool L (ft)	Condition/ Function
Notched weir-pool	Concrete with wooden baffles	49.4	2.5	2.8	7	Varied (3.8)	0.6	6	Excellent Passable

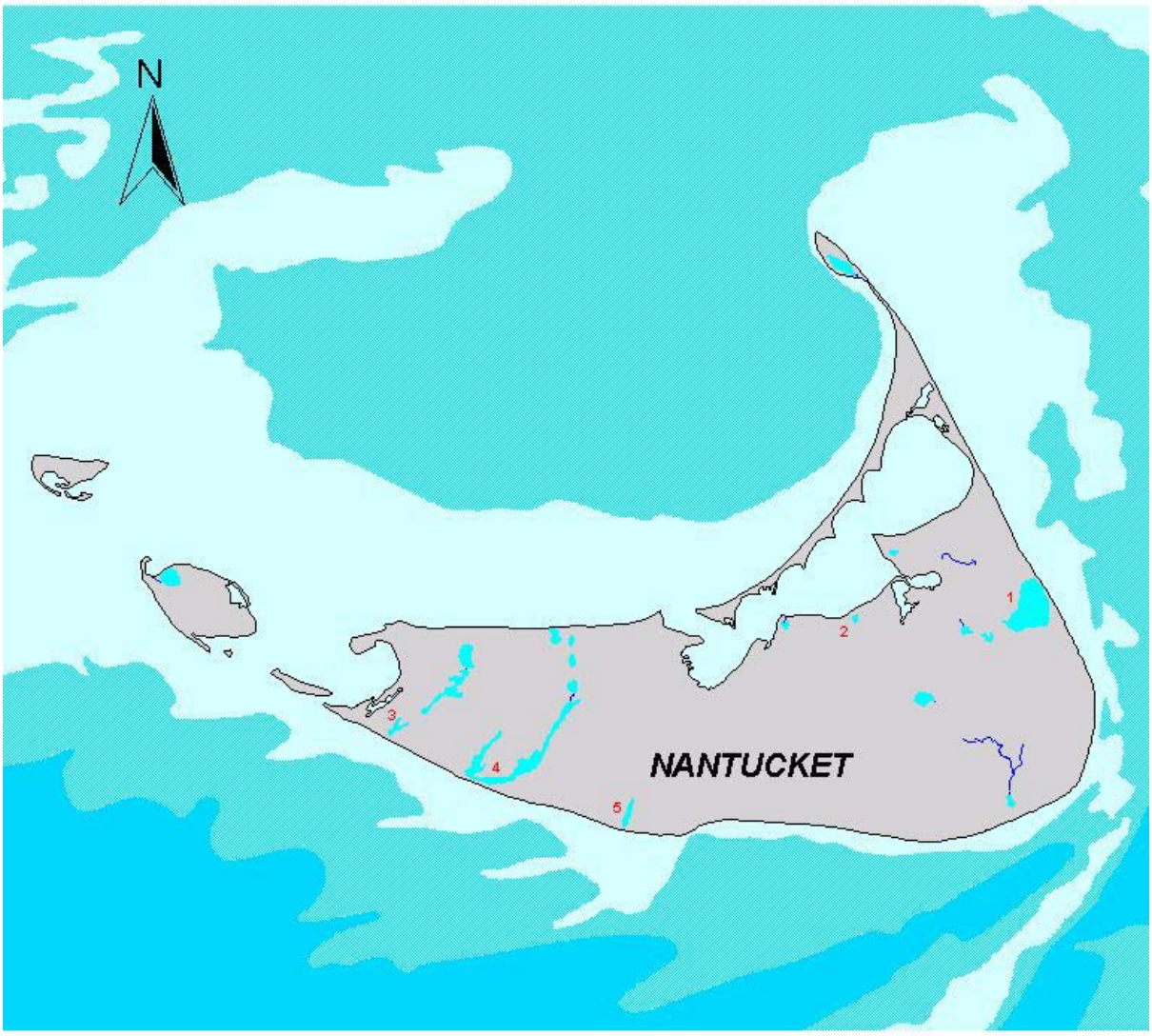
Remarks:

Lake Tashmoo is a large salt pond which has a 1.3 acre freshwater impoundment at its head. In 2001, a fishway was designed by DMF and installed by the Town of Tisbury in order to provide passage to the impoundment. Since a small river herring spawning population already existed in the upper reaches of the salt pond, fish were observed using the new structure in the spring of 2002. It is not known if this new access to such a small spawning area will have any effect on the total population size of the system.

Martha's Vineyard Recommendations:

1. Other than the above mentioned restoration project on Edgartown Great Pond and Mattakeset Herring Creek, there is little opportunity for further development of anadromous fish resources. This is primarily due to the paucity of freshwater bodies with connecting coastal streams and resulting lack of spawning/nursery habitat on Martha's Vineyard.

NANTUCKET WATERSHEDS



Major Streams and Ponds of Nantucket

Stream Names:

1 - Sesachacha Pond
2 - Folgers Marsh
3 - Long Pond / Hither Creek
4 - Hummock Pond
5 - Miacomet Pond

Nantucket Watersheds

Sesechacha Pond Nantucket

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.0	First	8.4	River herring

Obstruction #1

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
0.0	Barrier beach	-	-	-	276.0	-	-	41º 18’ 02.037” N 68º 58’ 33.423” W

Outlet of Sesechacha Pond

Fishway None

Remarks:

This 276 acre salt pond is opened in the spring and fall in order to increase salinities for shellfish and in the process allows herring to enter. There is no opportunity for improvements to the anadromous fish resource.

Folgers Marsh

Nantucket

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.8	First	7.7	Alewife

No Obstructions

Folgers Marsh (downstream of Polpis Road)

Fishway None

Remarks:

Several small tidal pools drain into Nantucket Harbor via this small marsh. Although herring have been reported in the system there is little opportunity to further develop the resource.

Hither Creek and Long Pond Nantucket

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.2	First	7.9	River herring

No Obstructions

No photo available

Fishway None

Remarks:

This tidal creek at the western end of Nantucket allows herring to enter Long Pong and its upstream extension, North Head Long Pond, providing a total of 125 acres of spawning area. The stream tends to become choked with vegetation and requires regular cleaning to maintain passage to the headwaters.

Hummock Pond Nantucket

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
2.4	First	7.7	River herring

Obstruction #1

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
0.0	Barrier beach	-	-	-	17.0	-	-	41º 15’ 18.353” N 70º 09’ 50.602” W

Hummock Pond

Fishway None

Remarks:

Hummock Pond is a 144 acre salt pond with a lower salinity 17 acre headwater pond. The barrier beach is breached in spring and fall allowing herring to reach the unobstructed headwaters.

Miacomet Pond Nantucket

Stream Length (mi)	Stream Order	pH	Anadromous Species Present
0.0	First	8.7	None known

Obstruction #1

River Mile	Type	Material	Spillway W (ft)	Spillway H (ft)	Pond Acreage	Year Built	Owner	GPS
0.0	Barrier beach	-	-	-	34.0	-	-	41º 14’ 36.516” N 70º 07’ 05.219” W

Miacomet Pond

Fishway None

Remarks:

This 34 acre salt pond has a broad barrier beach which is not opened to the sea and the site has little potential for anadromous fish development.

Nantucket Recommendations:

1) A lack of freshwater bodies, difficulties maintaining access to the sea, and the resulting lack of spawning/nursery habitat limit the opportunities for further development of anadromous fish resources on the island of Nantucket.

General Recommendations

1. With a small number of exceptions, the important river herring spawning/nursery habitats on coastal streams have been made accessible through the construction of fishways. Many of these structures have become deteriorated and are often of obsolete design. The emphasis of future work should be on the replacement of these fish ladders in order to preserve or augment the populations they serve rather than to create new populations by accessing minor habitats.

2. Most river herring fisheries are under local control through the authority granted by Section 94 of Chapter 130. Many towns having this control, however, are unaware that approval of the Director of the Division of Marine Fisheries is required by the statute and often change their regulations without consulting DMF. In order to insure biologically sound and legally valid local management, the Director should inform cities and towns of this condition and request them to submit current regulations and subsequent changes for approval.

3. River herring passage issues have dealt primarily with upstream migration of adults. Downstream passage of adults and more importantly juveniles has been largely ignored and, in some systems, may be an important limiting factor in population productivity. Future work should take this into consideration and place appropriate emphasis on this phase of the life cycle and the problems which are associated with it.

4. Large numbers of juvenile herring are killed each year due to cranberry bog operations. A simple, inexpensive screening system has been developed which will prevent most of these losses. Despite publicizing the availability of this system through industry media, growers have been reluctant to utilize it. Appropriate screening of water withdrawal intakes to prevent stranding, mutilation, entrainment or impingement of young herring should be made a condition of any state permits required for the agricultural operation.

5. Shoaling of pond outlets and encroachment of vegetation has seriously impacted river herring populations in some systems. Deposition of sandy material at the outlets in combination with low late summer/fall water levels has prevented the escapement of large segments of year classes and caused them to be lost to the population either through winter kill or greatly reduced growth rates. Outlet structures which would retain depth, reduce deposition and provide for easier maintenance should be developed and installed at stream outlets where appropriate.

6. The emphasis of anadromous fish management in coastal streams has been on river herring, American shad and rainbow smelt. Consequently little is known about white perch and tomcod populations in the Commonwealth. In the future more attention should be directed toward these species and management strategies which would protect them should be developed.

7. Several large coastal streams, notably the Taunton, Charles and Neponset Rivers, appear to have excellent potential for development of American shad populations. Many years of stocking with adult fish and eggs have yielded negligible results, however. Other states have had success through hatchery egg taking and rearing to fry size before release. This technique should be developed in Massachusetts and applied to the above streams.

8. Removal of dams should be considered as an alternative to fishway construction where appropriate.

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	Wequaquet Lake/Long Pond	57
Bourne	Pocasset River	8
	Red Brook	11
Brewster	Cobbs Pond	95
	Quivett Creek	98
	Stoney Brook	96
Chatham	Frost Fish Creek	79
	Muddy Creek	84
	Stillwater Pond/Lovers Lake	80
Dennis	Bass River/Muddy Creek/Weir Creek/Hamblins	71
	Fresh Pond Tributary	72
	Quivett Creek	98
	Sesuit Creek	99
	Swan Pond River	73
	Weir Creek	72
Eastham	Herring Brook	90
	Herring River	91
	Rock Harbor Creek	93
Falmouth	Cedar Lake Ditch	13
	Childs River	28
	Coonamessett River	21
	Flax Pond	24
	Herring Brook	16
	Little Pond	20
	Mill Pond/Green Pond	26
	Oyster Pond	17
	Quashnet River	30
	Salt Pond	18
	Siders Pond	19
	Wild Harbor River	15
Harwich	Andrews River	77
	Herring River	74
	Muddy Creek	84
	Skinequit Pond	78
Mashpee	Childs River	28
	Mashpee River	37
	Quashnet River	30
	Santuit River	43
Orleans	Pilgrim Lake	85
	Rock Harbor Creek	93

Cape Cod Towns, cont.	Stream Name	Page
Provincetown	Pilgrim Lake	87
Sandwich	Mill Creek	103
Truro	Pamet River	88
	Pilgrim Lake	87
Wellfleet	Herring River	89
Yarmouth	Bass River/Muddy Creek/Weir Creek/Hamblins	71
	Mill Creek	60
	Parkers River	62
	Plashes Brook	66
	Town Brook	61
	Whites Brook	101
Martha's Vineyard Towns	**Stream Name**	**Page**
Aquinnah	Gay Head Herring Creek	121
Chilmark	Black Point Pond	119
	Chilmark Pond	120
	Gay Head Herring Creek	121
	Tiasquam River	118
	Tisbury Great Pond	116
Edgartown	Edgartown Great Pond	114
	Jobs Neck Pond	114
	Mattakeset Herring Creek	113
	Oyster Pond	115
	Sengekontacket Pond	110
	Trapps Pond	112
Oak Bluffs	Farm Pond	109
	Lagoon Pond	108
	Sengekontacket Pond	110
Tisbury	Lagoon Pond	108
	Lake Tashmoo	123
Vineyard Haven	Lake Tashmoo	123
West Tisbury	James Pond	122
	Mill Brook	117
	Tiasquam River	118
	Tisbury Great Pond	116
Nantucket Towns	**Stream Name**	**Page**
Nantucket	Folgers Marsh	128
	Hither Creek and Long Pond	129
	Hummock Pond	130
	Miacomet Pond	131
	Sesechacha Pond	127

Appendix 1: Anadromous species of the Commonwealth of Massachusetts

Alewife (*Alosa pseudoharengus*)
Blueback (*Alosa aestivalis*)
American shad (*Alosa sapidissima*)
Rainbow smelt (*Osmerus mordax*)
White perch (*Morone americana*)
Atlantic salmon (*Salmo salar*)
Brook trout (aka Salter trout) (*Salvelinus fontinalis*)
Rainbow trout (aka Steelhead trout) (*Oncorhynchus mykiss*)
Brown trout (sea run) (*Salmo trutta*)
Coho salmon *(Oncorhynchus kisutch*)
Lamprey (*Petromyzon marinus*)
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)
Shortnose sturgeon (*Acipenser brevirostrum*)
Gizzard shad (*Dorosoma cepedianum*)
Hickory shad (*Alosa mediocris*)
Tomcod (*Microgadus tomcod*)
Striped bass (*Morone saxatilis*)

Appendix 2: State River Herring Regulations

The following regulations affect the catch of river herring (alewives and bluebacks) in cities and towns without local control. These regulations establish catching days, daily catch limits, and gear restrictions and are being promulgated to establish consistent state management of river herring not under the local control of a city or town by operation of M. G. L. c. 130, s.94. These regulations are easily understood, readily enforceable, and will help assure adequate escapement of river herring for spawning.

Below is section 6.17 of 322 CMR:

6.17 River Herring

1) Purpose. This regulation is promulgated to establish consistent state management of river herring fisheries not under local control of a city or town by operation of M. G. L. c. 130 s. 94.

2) Definition. For purpose of this regulation, the term River Herring means those species of fish known as alewives (*Alosa pseudoharengus*) and bluebacks (*Alosa aestivalis*).

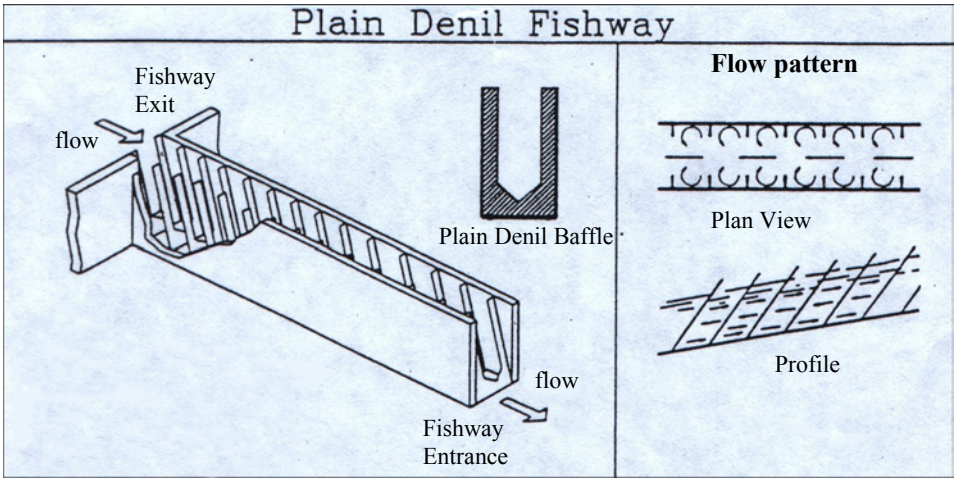
3) Catching Days. It is prohibited and unlawful for any person to catch river herring on Tuesdays, Thursdays, and Sundays.

4) Daily Catch Limit. It is prohibited and unlawful for any person to catch more than 25 river herring per day.

5) Gear Restrictions. It is prohibited and unlawful to catch river herring with any net other than hand-held dip nets.

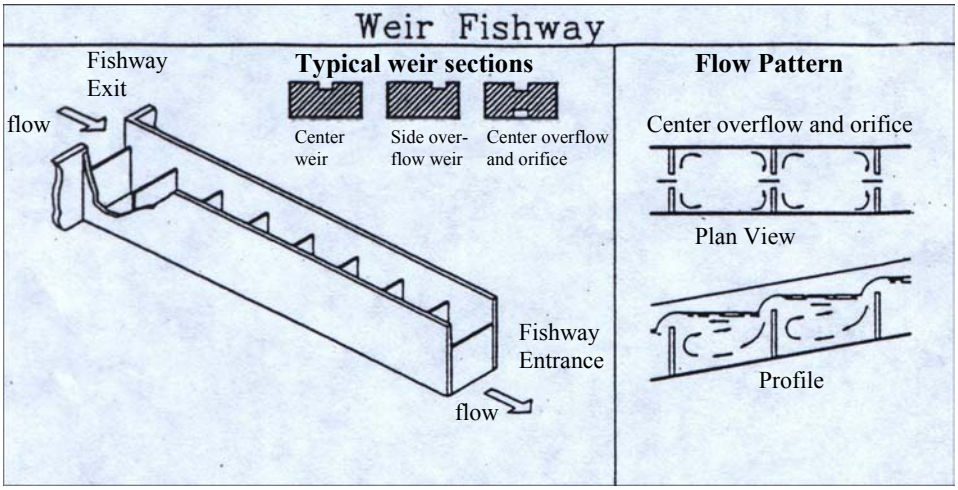
6) Exception. These regulations shall not apply to the catching of river herring in cities and towns which have acquired local control by operation of M. G. L. c. 130, section 94, or to the catching of herring authorized by the Director under 322 CMR 4.02 (1)(b) and (1)(c).

Appendix 3: Fishway Designs and Examples



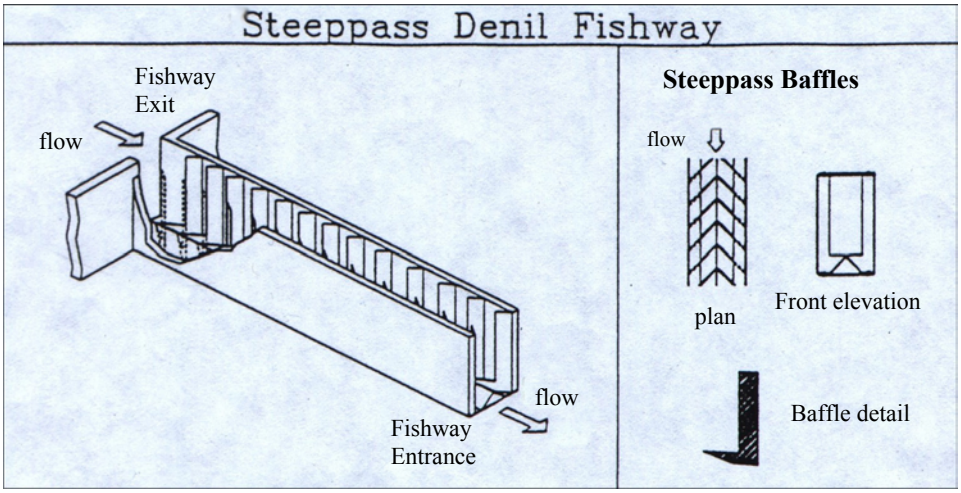
Denil Fishway

- Slope: 10-25%
- Resting pools are required between long segments
- Limited by large water depths
- Greater discharge of water than the other fishways, and therefore a greater attraction capability.



Weir Fishway

- Slope usually 10%
- Sensitive to water level fluctuations



Steeppass Fishway

Fishway designs taken from:

Fish Passageways and Diversion Structures
Section 3
United States Fish & Wildlife Service
Presented by:
Branch of Aquatic Resources Training
National Education and Training Center
June 17-21, 1996
Richland, Washington

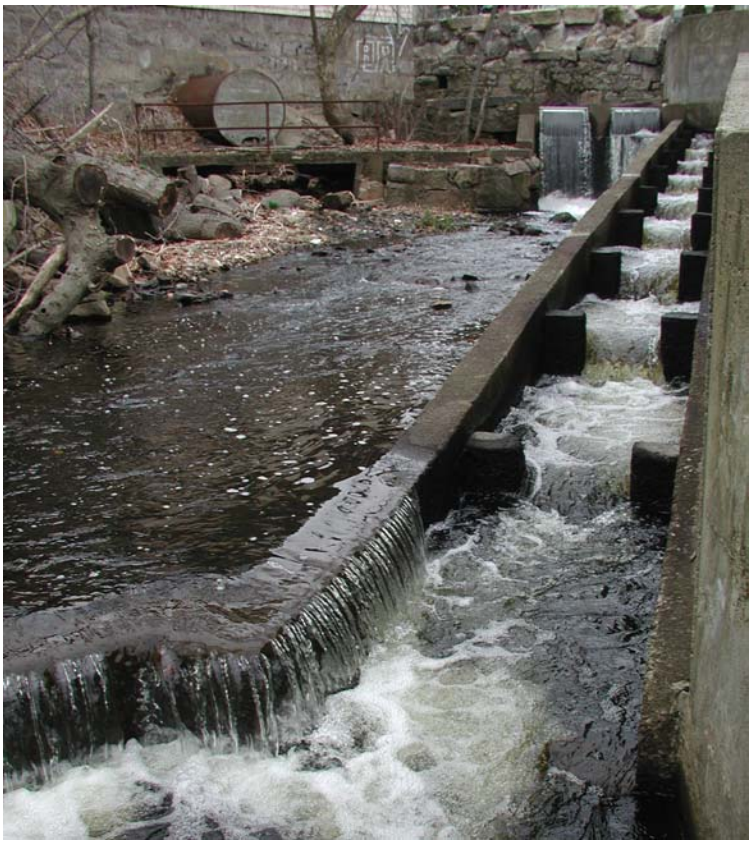
Examples of fishways in use:

Denil Fishways

Denil – Newton Lower Falls, Newton

Denil – Ipswich Mills Dam, Ipswich

Weir pool fishways



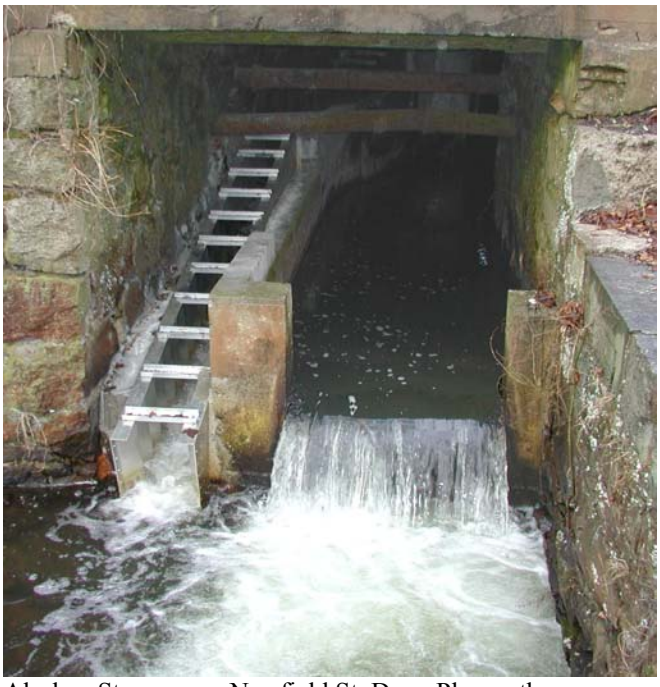
Notched weir pool fishway – Pleasant St. Dam, Weymouth

Notched weir-pool – Broad St. Dam, Weymouth

Weir pool – Triphammer Pond Dam, Hingham

Weir pool – Benoit's Pond Dam, Bourne

Steeppass Fishways



Alaskan Steeppass – Newfield St. Dam, Plymouth

Alaskan Steeppass – Elm St. Dam, Kingston

Stream Baffles

Stream baffles – Brook St. Culvert, Kingston

Vertical Slot Fishways

Modified Ice Harbor vertical slot fishway – Pawtucket Dam, Lowell

Fish Lifts

Fish lift – hopper rising with fish – Essex Dam, Lawrence

Appendix 4: Abbreviations used in this publication:

DCR**	Department of Conservation and Recreation
DMF	Division of Marine Fisheries
DPW	Department of Public Works
EOEA	Executive Office of Environmental Affairs
GPS	Global Positioning System
NOAA	National Oceanic and Atmospheric Administration
USFWS	United States Fish and Wildlife Service

**DCR is a new agency that was once two separate agencies: Department of Environmental Management (DEM) and the Metropolitan District Commission (MDC)