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.

Alphabetical Index of Streams

Alphabetical Index of Towns

Appendix 1: Anadromous species of the Commonwealth of Massachusetts

Alewife (*Alosa psuedoharengus*)
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*).

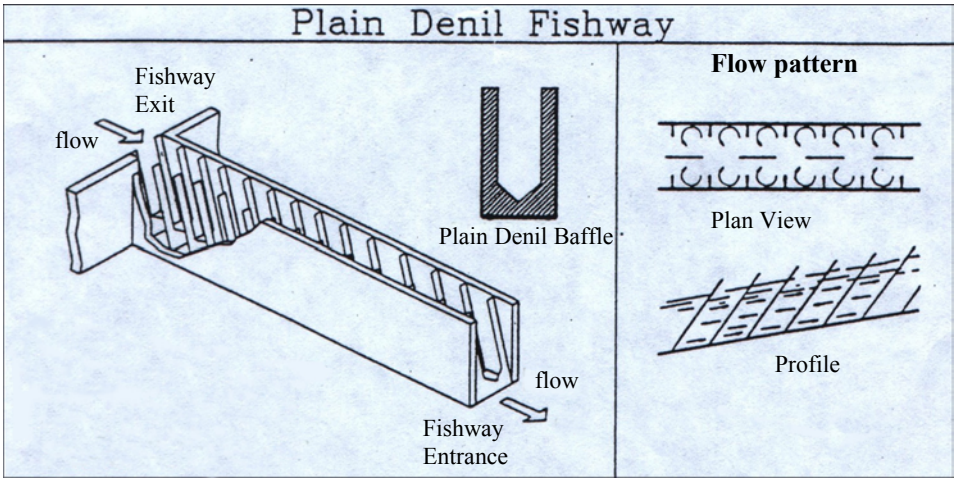
3) Catching Days. It is prohibited and unlawful for any person to catch river herring on Tuesdays, Thursdays, and Sundays.

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.

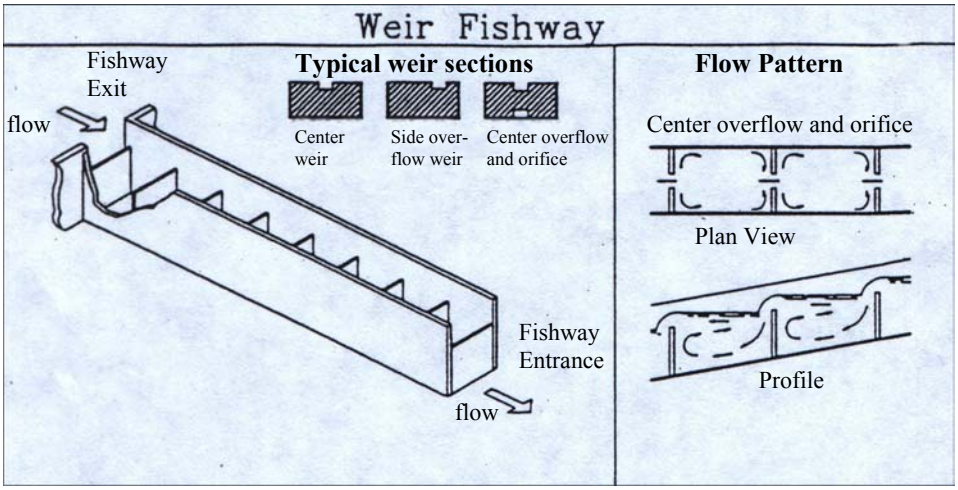
6) Exception. These regulations shall not apply to the catching of river herring in cities and towns which have acquired local control by operation of M. G. L. c. 130, section 94, or to the catching of herring authorized by the Director under 322 CMR 4.02 (1)(b) and (1)(c).

Appendix 3: Fishway Designs and Examples



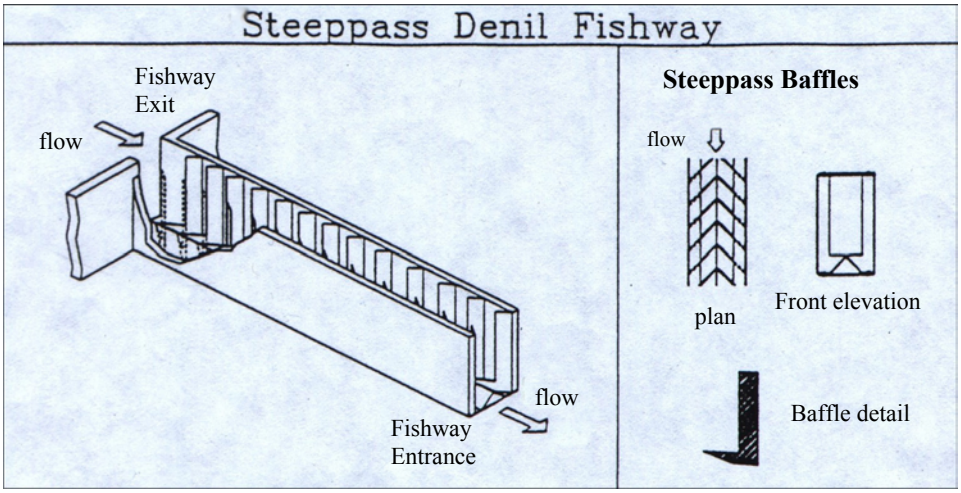
Denil Fishway

- 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

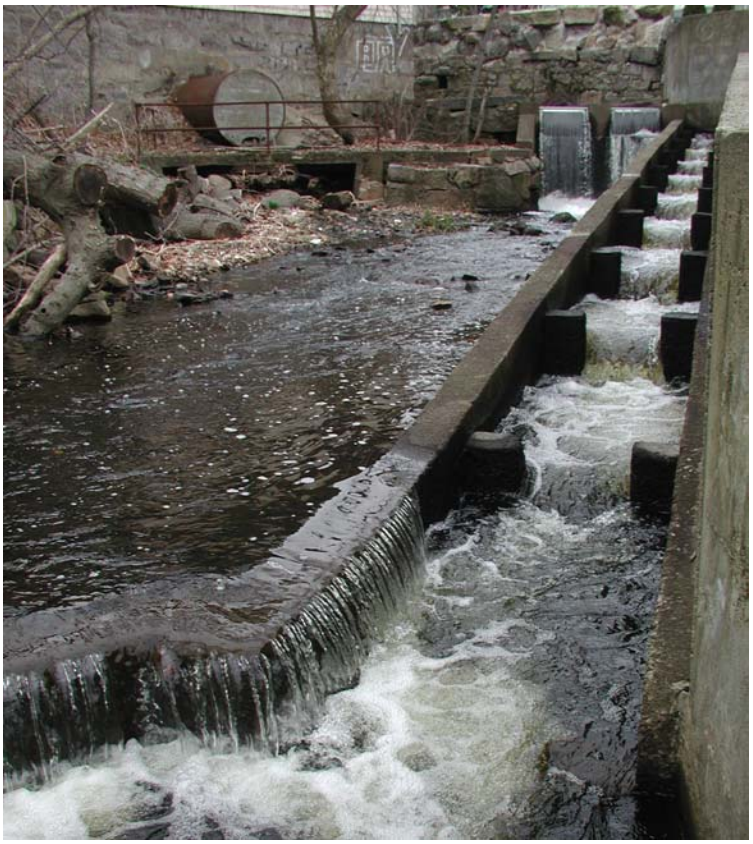
Examples of fishways in use:

Denil Fishways

Denil – Newton Lower Falls, Newton

Denil – Ipswich Mills Dam, Ipswich

Weir pool fishways



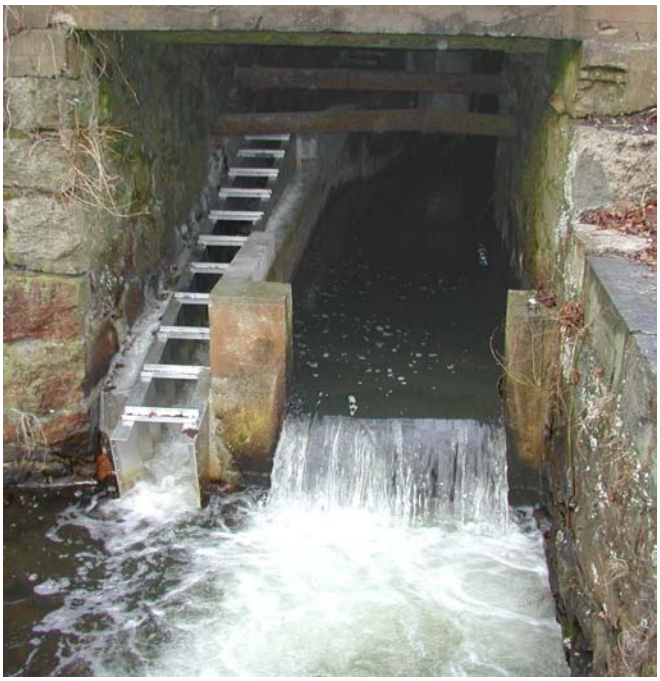
Notched weir pool fishway – Pleasant St. Dam, Weymouth

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).