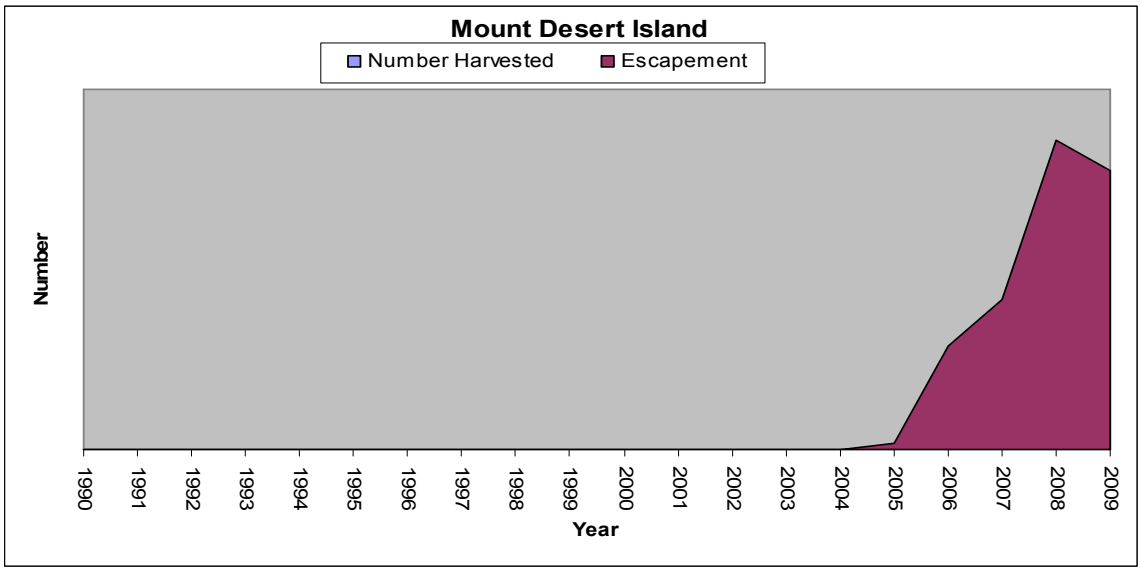
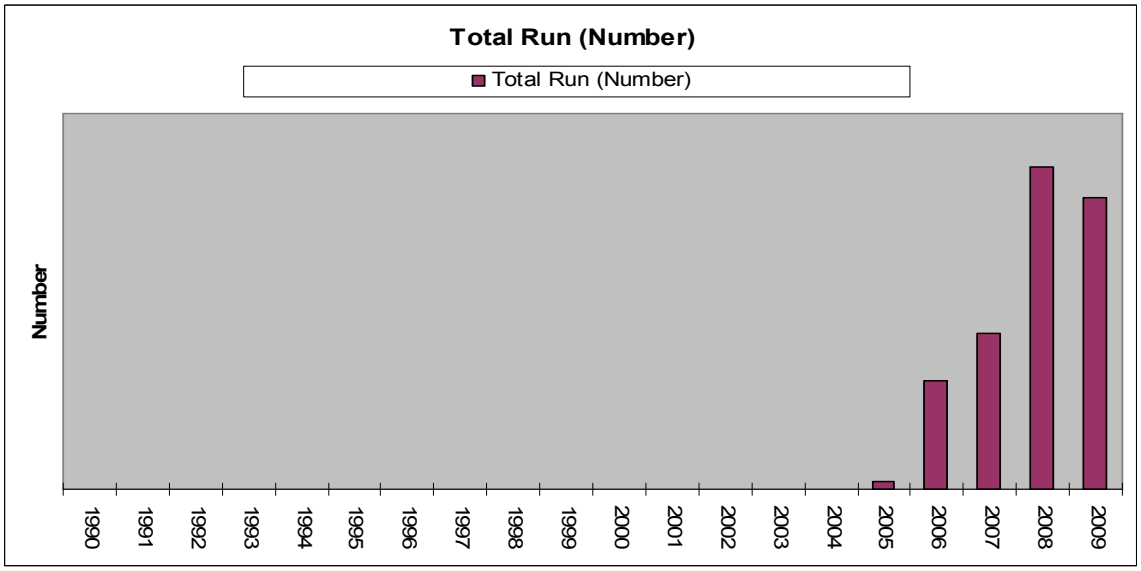




Benton Commercial Fishery:

The Benton municipal fishery resumed for the first time in 198 years as the result of the removal of the Edwards Dam in Augusta, Maine and a ten-year restoration program. Repeat spawning rate for the Benton fishery is unknown. Maine fisheries staff collected scale samples in 2010 and will analyze these scales this winter. The Maine Department of Marine Resources currently manages this system for a

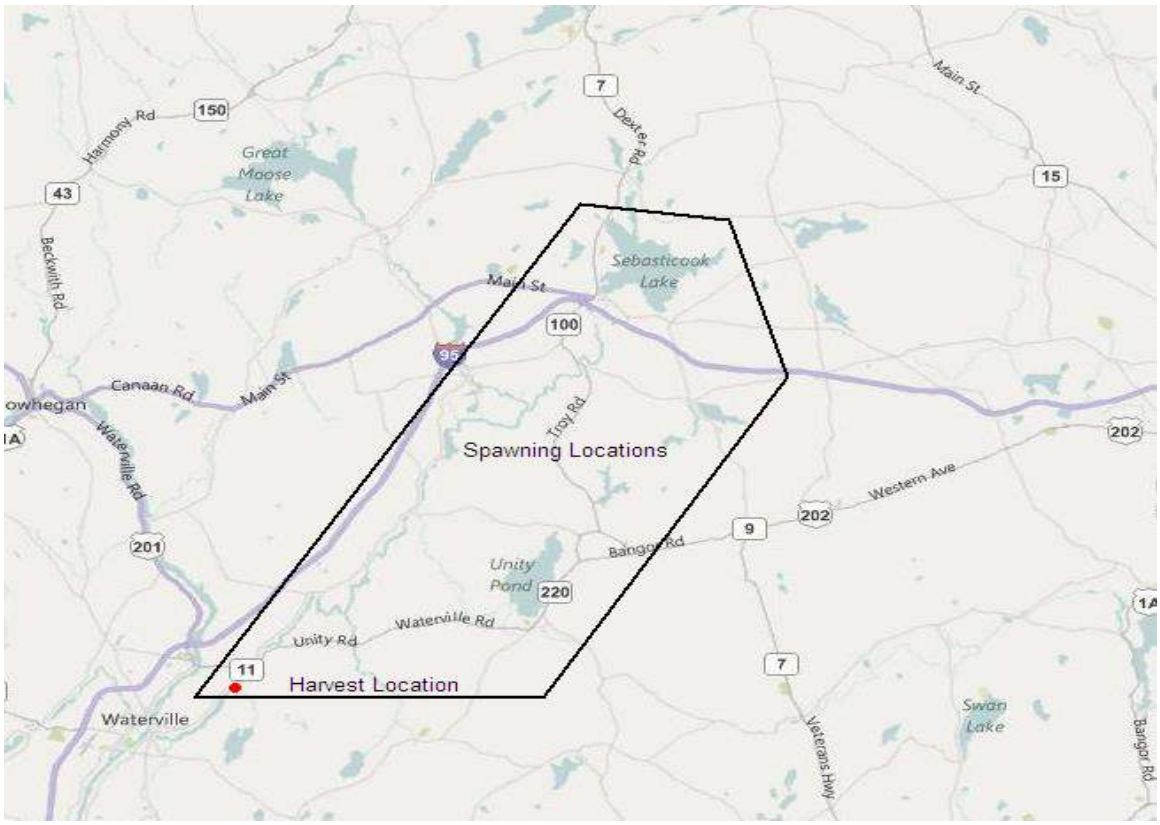
commercial escapement of 35 fish per acre. The spawning escapement need for this system is 379,890 river herring passed upstream into spawning habitat. The Maine Department of Inland Fisheries and Wildlife did permit a limited dip net fishery in the river, below the first dam, for seven years (2000-2006). MDMR staff believes landings for this period were underreported based on the numbers of fishing permits issued and the number of landings reported at the end of the year. The MDMR closed the fishery in 2007 to allow the municipality of Benton to reacquire historical rights to the fishery. The Town of Benton conducted its first commercial dip net fishery in 2009.

The Maine Department of Marine Resources began the Sebaticook River Restoration Project by stocking 6 fish/acres into available historic spawning habitat as permitted by the Maine Department of Inland Fisheries and Wildlife. The initial stocking, which placed 57,533 pre-spawn adults within the 10,854 acres of spawning habitat, created an estimated run on the Sebasticook River ranging between 1.5 and 3.5 million fish within six years. There was no permanent upstream passage available until the State of Maine and conservation groups removed the Fort Halifax Dam in 2008. Prior to 2007, a limited commercial dip net harvest below the first dam on the river captured returning adults. The fish escaping the fishery remained below the dam until they dropped out of the system during early summer. Estimates of the number of river herring remaining below the dam range from 1.25– 3 million individuals.

Several ponds within the Sebasticook River drainage provide excellent spawning and nursery habitat. These habitats currently support the largest monitored river herring run in Maine. Continued restoration efforts in the watershed will open additional historic spawning areas over the next several years. Two hydropower dam remain on the main stem of the river. Both dams have dedicated upstream and downstream passage. There are no passage efficiency numbers establish for either site at this time.

Upstream passage counts during the past two seasons ranged from 1.3 to 1.6 million individuals. The municipal commercial harvest plan restricts harvest gear at the base of the hydropower dam to dip nets and cast nets (Figure 32). These gear types severely limit the numbers of fish that the harvester can access during the season. The Maine Department of Marine Resources in conjunction with the hydropower company, operates and monitors upstream passage. Upstream passage is a priority at this location with 100,000 fish required to pass prior to commencing harvest activities. Spawning habitat is available above and below the dam for blueback herring but not alewife. There is a mix of blueback herring in the commercial alewife catch toward the end of the season. Most of the blueback herring escape the commercial alewife fishery due to the early closed date of June 5 each year. Blueback passage numbers at the Benton fish lift exceeded 400,000 for the season.

Town	River	lake size (acres)	Target (N/acre)
Benton	Sebasticook	10,854	6


Spawning Locations
Harvest Location
Waterville
Great Moose Lake
Sebasticook Lake
Unity Pond
Swan Lake
Harmony Rd
Beckwith Rd
Canaan Rd
Main St
Waterville Rd
Unity Rd
Troy Rd
Dexter Rd
Bangor Rd
Western Ave
Veterans Hwy
owhegan
150
43
7
15
100
95
202
9
201
220
11

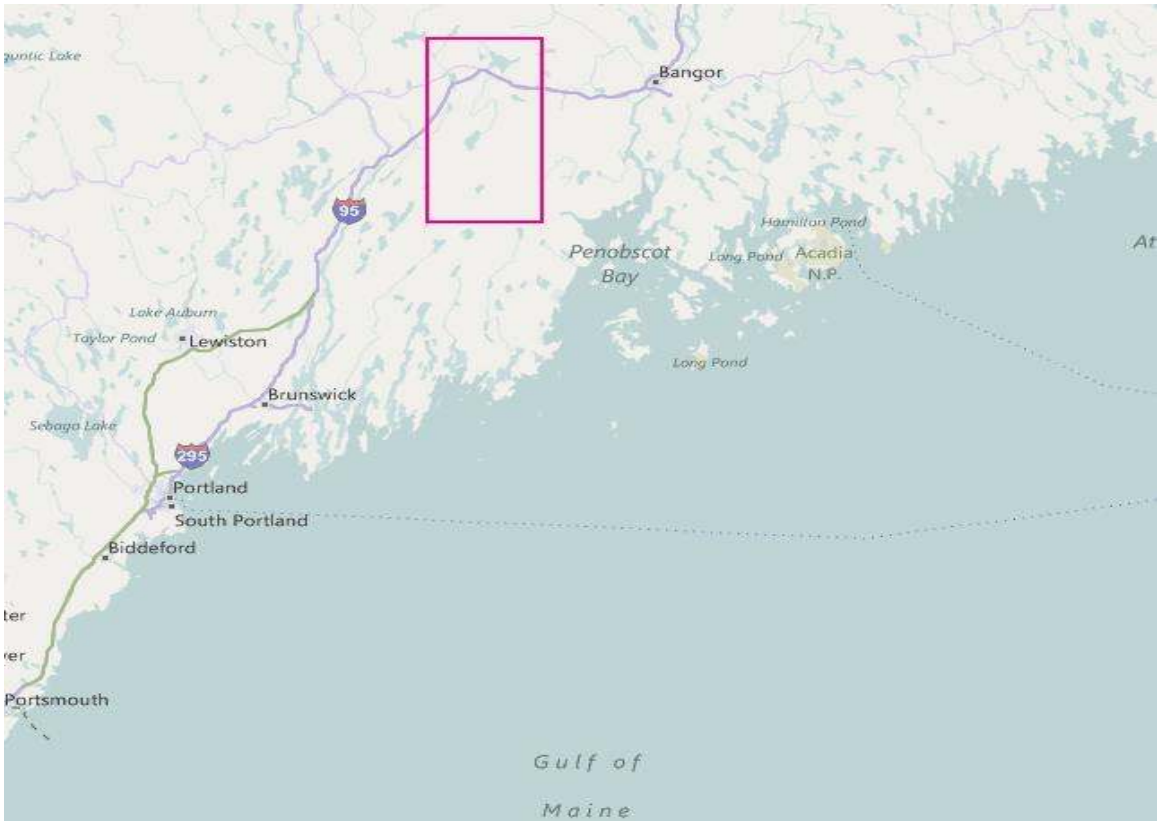
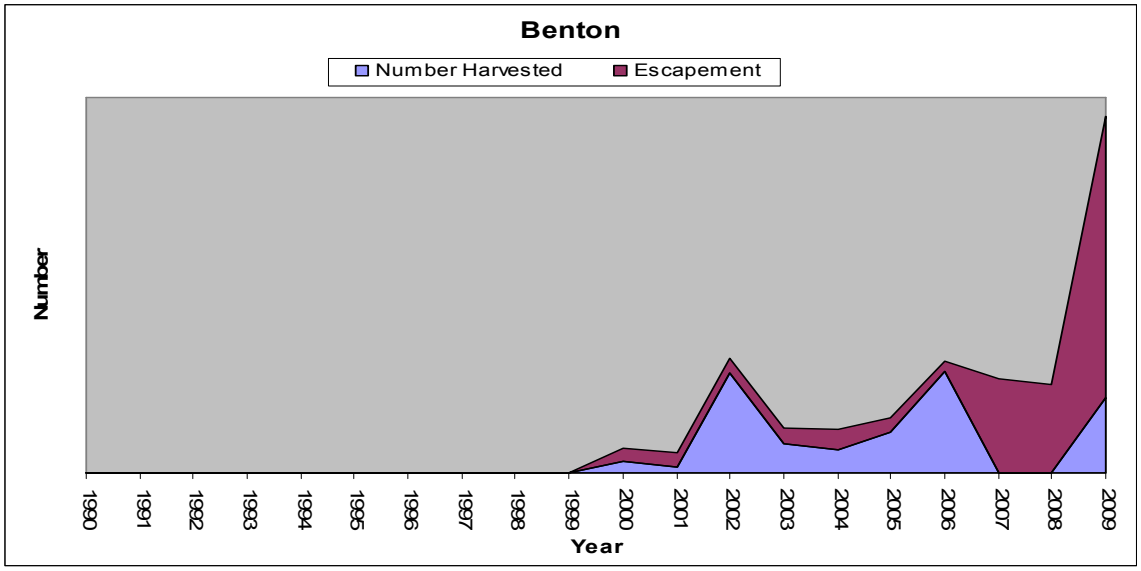
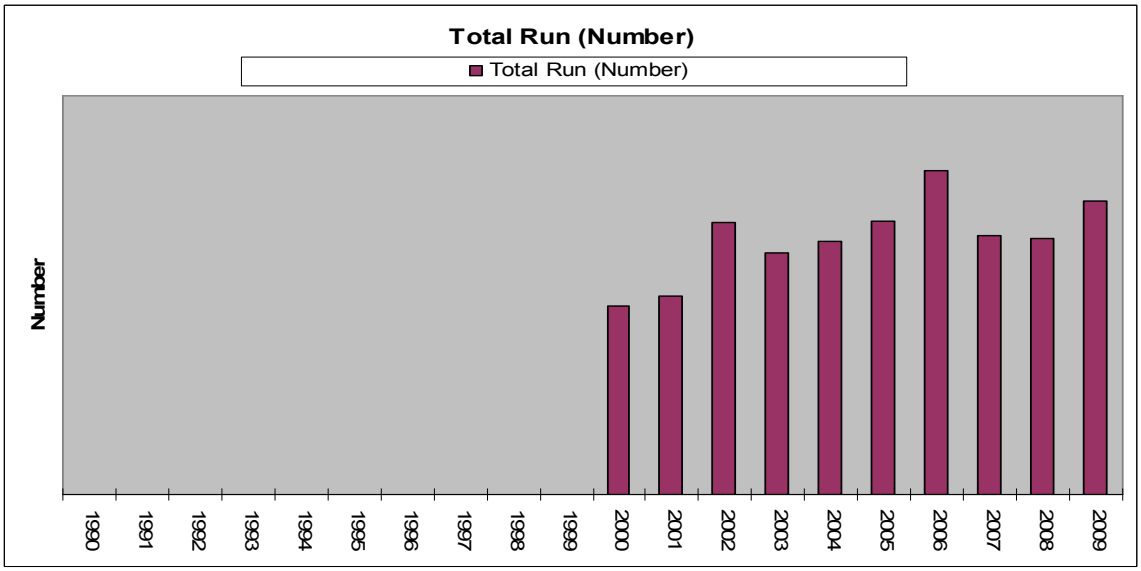

Bangor
Penobscot Bay
Hamilton Pond
Long Pond
Acadia N.P.
Lake Auburn
Taylor Pond
Lewiston
Brunswick
Sebago Lake
Portland
South Portland
Biddeford
Portsmouth
Gulf of Maine
95
295

Figure 32. Benton Falls Hydropower Station. The commercial fishery occurs below the dam.

Year	Escapement Number (based on target)	spawning below barrier?	exploitation rate
2000	65,124	n/y	0.48
2001	65,124	n/y	0.31
2002	65,124	n/y	0.86
2003	65,124	n/y	0.65
2004	65,124	n/y	0.50
2005	65,124	n/y	0.75
2006	65,124	n/y	0.91
2007	379,890	n/y	0.00
2008	379,890	n/y	0.00
2009	379,890	n/y	0.20
2010	379,890	n/y	0.12





a. Recreational

All locations not controlled by a joint state/municipal management plan will be open to recreational harvest. Recreational harvest limit reductions will occur throughout the state. The number of river herring caught for personal use will be 20 river herring per person per day with associated gear restrictions (hook and line, dip net) down from 120 fish per day. Most recreational catches of river herring are used as bait to catch striped bass or smoked and used as food. Very little recreational fishing occurs for river herring in the State of Maine. Municipalities control most locations with river herring runs through exclusive rights granted by the Department of Marine Resources.

5. Fisheries Requested to be Closed (if more specific than statewide)

a. Commercial

*Arrowsic	Blue Hill	Boothbay Harbor	*Breman
Cape Elizabeth	Hampden	Kennebunk	*Phippsburg (Center Pond)
Lincolnville	Bristol	Northport	South Berwick
*Surry	*Waldoboro	West Bath	*Bath (North Bath)
*Gardiner			

The state and/or municipality will close, or keep closed, one or more waters in these towns to the harvest of river herring until these runs can produce harvestable numbers in excess of escapement requirements. Commercial fisheries occurred at all these locations in the past. Currently, some of these runs are under restoration (*****), while others return viable numbers of fish without supplemental stocking. Most of these runs have passage problems that prevent the current stock from increasing to commercially harvestable numbers. Typical returns to these rivers range from 50 to 120,000 individuals based on counts in Cape Elizabeth and Waldoboro.

b. Recreational

All locations statewide outside and below locations controlled by municipal fisheries will remain open. A limited recreational catch/possession limit of 20 fish per person per day and gear restrictions will apply.

c. Incidental

Incidental catch of river herring may occur in small mesh trawl fisheries, weir, bait gill net, and seine fisheries for other species. There is mandatory catch/bycatch reporting for some of these fisheries. Based on Vessel Trip Reports (VTR) and Dealer Reports (DR), bycatch in state waters appears to be low. The new law requiring all commercial fishermen who fish for pelagic or anadromous species to purchase the “Pelagic and Anadromous Commercial Fishing License” will make reporting of all river herring landings mandatory (Appendix).

6. Sustainability Target(s)

Definition – The number of alewife broodstock needed per surface area of spawning habitat in Maine to provide alewife populations capable of sustaining annual alewife runs at current levels while providing surplus broodstock for harvest or increasing run size in the future.

The sustainability target will provide an escapement number equal to 35-fish per surface acre of spawning habitat. This plan will achieve escapements numbers through passage counts above commercial fisheries, closed fishing days, season length, or continuous escapement.

Escapement levels of six fish per surface acre provide initial spawning populations of anadromous alewife in Maine lakes and ponds consistent with multi-species fisheries management plans developed with other Maine state agencies. This escapement number allows for a small commercial harvest or will allow managers to increase spawning stock by passing all returns upstream.

Method Used to Develop Spawning Target

The sustainability target of 35-fish per acre of spawning habitat is the result of a combination of studies, observations, and documented commercial catches over a number of years. Maine uses this sustainability target for continuing commercial fisheries that require escapement of broodstock from river specific populations.

Since 1984, MDMR has used 235 fish/acre to estimate alewife production. The Department established this unit production value from the commercial harvest in six Maine watersheds for the years 1971-1983. Based on these data, commercial yield was assumed to be 100 pounds/surface acre of ponded habitat. This value is slightly less than the average of the lowest yield/acre for all six rivers and within the range of yields experienced in other watersheds. Assuming a weight of 0.5 pounds per adult, the commercial yield equals 200 adults/surface acre. The commercial harvest was assumed to represent an exploitation rate of 85%, because most alewife runs were harvested six days per week. Exploitation rates on the Damariscotta River, for example, ranged from 85-97% for the years 1979-1982. When commercial yield is adjusted for the 15% escapement rate, the total production is 235 adult alewives/acre.

Results from studies conducted at one of these lakes in the 1970s-1980s, Damariscotta Lake, located in mid-coast Maine, indicate that increasing escapement of spawning alewives ranging from 40 to 60 fish per acre caused the parent progeny relationship to trend downward. (Walton, C.J. 1987. Parent-Progeny relationship for an Established Population of Anadromous Alewives in a Maine Lake. American Fisheries Society Symposium 1:451 – 454, 1987)

The relationship between increased number of spawning individuals and returns 4-5 years later does not support increased stocking rates for many Maine runs. Analysis of escapement numbers and commercial catches in fisheries with a sustained level of stocking over a number of years indicates large variation in run size unassociated with the number of spawning fish.

The State of Maine uses an alternative 6-fish per acre target for runs under restoration or when establishing new or existing runs. The 6-fish per acre target was established through fisheries work

conducted to examine the effect of anadromous alewives on existing fish populations in lakes without anadromous alewives (Lake George Study).

A 10-year study conducted by the Maine Department of Inland Fisheries and Wildlife, Department of Environmental Protection, and Department of Marine Resources, named the "Lake George Study" determined that stocking six prespawn fish per surface acre does not negatively effect growth of inland game-fish species including trout, landlocked salmon, or rainbow smelts. There were indications that increased numbers of alewives changed the zooplankton structure in the nursery habitat. This study is the basis for multispecies fisheries management plans in lakes that have anadromous alewives.

Monitoring to be Conducted to Support Target(s)

Fisheries staff will continue to use landings data, escapement counts, mortality estimates, escapement estimates, and scale sample data to track relative health of river specific stocks. Additional data comes from the JAI survey conducted in Merrymeeting Bay and associated rivers to track populations of river herring possibly spawning in the Merrymeeting Estuary. These monitoring efforts will continue for all commercial fisheries and will occur for all directed commercial fisheries that wish to open in the future.

7. Proposed Rule-Making to Support Target(s)

Fisheries that cannot support commercial harvest levels will remain closed for conservation. In addition, this plan proposes to eliminate the directed harvest, possession, and sale of any river herring within state waters other than the approved directed fisheries contained within this plan. The state rulemaking process will occur prior to the 2011 fishing season for river herring and will proceed once this plan is approved. A draft of our proposed regulatory changes can be found in the Appendix. The state has recently enacted statutory changes to our commercial fishing license and has created a Pelagic and Anadromous Fisheries Fund (see Appendix). Funds from this license will allow MDMR to monitor existing small mesh fixed and mobile gear fisheries that focus on catching bait for the commercial lobster fishery. Monitoring of these fisheries will give us improved data needed to make additional changes, such as time and area closures if bycatch of river herring remains an issue.

8. Adaptive Management

a. Evaluation schedule

The Maine Department of Marine Resources reviews all municipal fisheries plans annually. Many plans carry over year to year because they provide adequate protection for the river herring resource. Plan reviews incorporate landings data, escapement counts, broodstock needs, and effort controls. There is no plan to change the review schedule for river herring management plans at this time.

b. Consequences or control rules

All Maine directed commercial river herring runs operate under a 72-hour closed period or conservation equivalent. The Maine Department of Marine Resources will extend closed periods, modify conservation equivalencies, or close fisheries that cannot sustain existing commercial fisheries.

1) Additional management review and/or changes will occur based on decreasing trends in running three-year averages of annual landings, increasing time series trends in total mortality (z), and trends in repeat spawning rates for fishery dependent and fishery independent sites.

2) Fisheries staff will review harvest and age data collected from annual returns to assess the need to increase the number of closed days in the fishery. Due to the variability of river herring runs in Maine under stable stocking rates, run size, and age class structure are expected to exhibit wide swings in annual values.

3) The management objective is to ensure that the commercial fisheries maintain a minimum (35 fish/acre) spawning stock goal into the future. A commercial fishery that does not meet the minimum spawning stock escapement established for that system will be required to close the following season until fishery achieves the escapement goal for that year.

The 2012 ASMFC River Herring Stock Assessment may provide additional guidelines to review and monitor river herring fisheries coastwide.

References:

Kircheis, F.W., J.G Trial, D.P Boucher, B. Mower, Tom Squiers, Nate Gray, Matt O'Donnell, and J.S. Stahlnecker. 2002. Analysis of Impacts Related to the introduction of Anadromous Alewife into a Small Freshwater Lake in Central Maine, USA. Maine Inland Fisheries & Wildlife, Maine Department of Marine Resources, Maine Department of Environmental Protection. 53 pp.

Rounsefell,G.A.,L.D, Stringer. 1943. Restoration and Management of the New England Alewife Fisheries with Special Reference to Maine. United States Department of the Interior Fish and Wildlife Service Fishery Leaflet 42.

Walton, C. J. 1987. Parent-progeny relationship for an established population of anadromous alewife in a Maine lake. American Fisheries Society Symposium 1: 451-454.