

MAINE STATE LEGISLATURE

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*Report of the Maine Atlantic Salmon Authority
to the
Joint Standing Committee on Inland Fisheries and Wildlife*

**Maine Atlantic Salmon Management Plan
with
Recommendations Pertaining to Staffing and Budget Matters**

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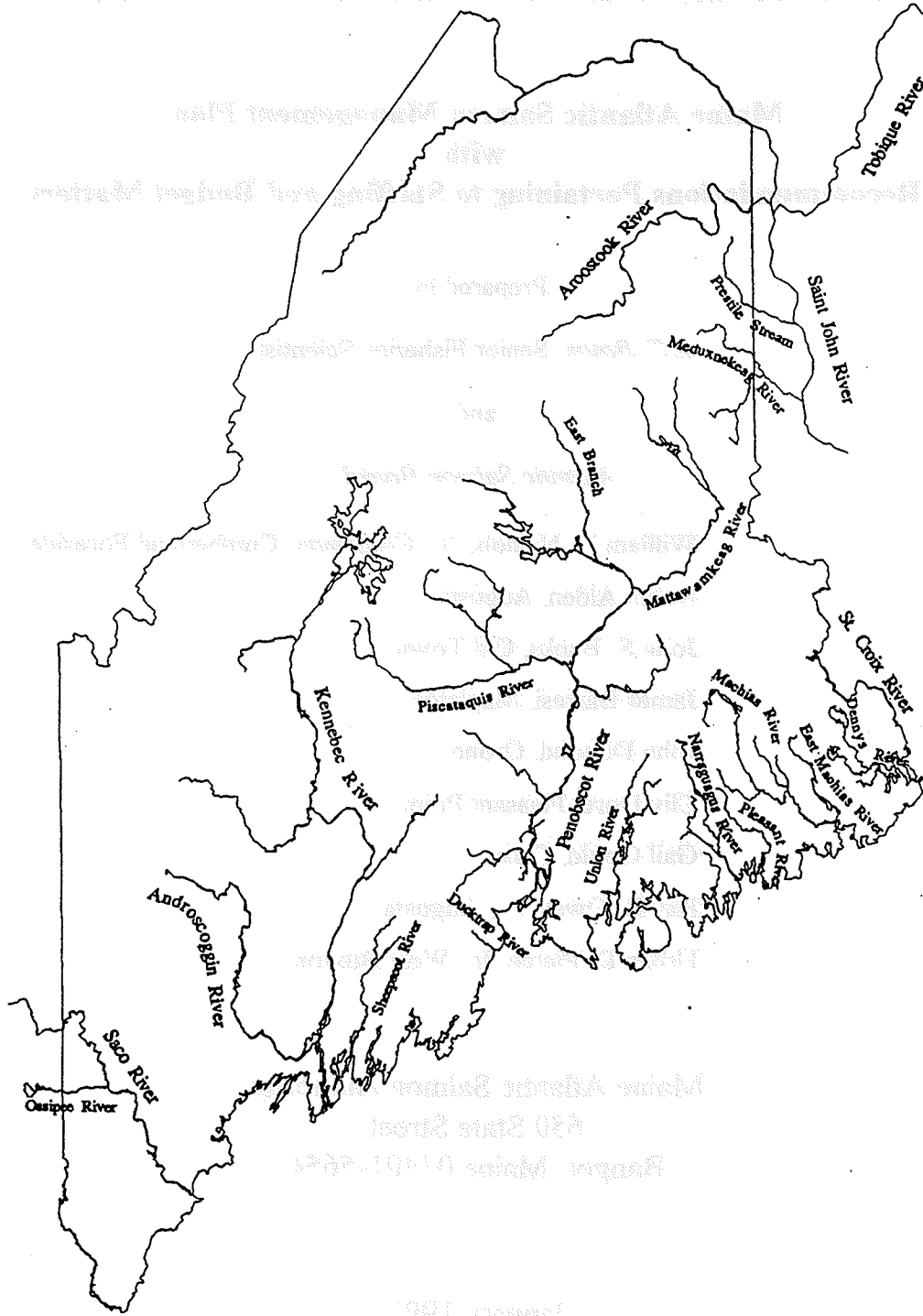
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January 1997

Figure 1. Maine Atlantic Salmon Rivers



Executive Summary

The Atlantic Salmon Authority was formed by the Maine Legislature in September 1995, replacing the Atlantic Sea Run Salmon Commission. The law establishing the Authority required that a report outlining plans for managing the Atlantic salmon fishery be submitted to the Joint Standing Committee on Inland Fisheries and Wildlife by December 1996. That report is attached.

The first section of the report outlines the structure of the Authority and its governing Atlantic Salmon Board. The current staffing available to the Atlantic Salmon Authority is also described, as well as statewide Atlantic salmon restoration goals and management objectives, and problems which impede reaching those goals and objectives.

The second section of the report presents profiles for sixteen individual Maine rivers which have existing salmon runs or the potential for significant salmon runs in the future. These profiles discuss the current status of salmon populations, specific restoration goals, current problems and issues, and estimated costs to achieve goals.

The third section of the report describes estimated costs of achieving Atlantic salmon restoration and management goals in greater detail. Moderate short-term, immediate needs are described followed by projections of costs through FY 2006 for different regions of the State. Finally, an analysis of the potential economic benefits that the State may expect from restored Atlantic salmon is appended.

Due to the current financial atmosphere in state government the Atlantic Salmon Authority realizes that it may not be possible to obtain all of the resources requested in this plan at this time; therefore, the Salmon Board has chosen to phase in implementation of this plan over a ten year time period. Beginning with the current FY 1997 General Fund appropriation of about \$110,000., the Authority requests that the Maine Legislature gradually increase appropriations to about \$1 million annually by the year 2002. The time frame and schedule for implementation of this plan will depend upon the levels of funding provided. Consequently, the economic benefits to the State from restored salmon runs and sport fisheries will also depend upon how quickly - and to what degree - the plan is funded.

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I. Background

As a result of an act of the Maine legislature (PL 1995, Chapter 406), on September 29, 1995 the Maine Atlantic Sea Run Salmon Commission (ASRSC), which had been in existence since 1947, was abolished and replaced by the Maine Atlantic Salmon Authority (ASA). The Authority is governed by the Atlantic Salmon Board which consists of the following nine members who are appointed by the Governor:

The Commissioner of Inland Fisheries & Wildlife;

The Commissioner of Marine Resources;

One member who resides within the land area comprising the Penobscot River or Ducktrap River drainages;

One member who resides within the land area comprising the Saco River or Sheepscot River drainages;

One member who resides in the Aroostook River drainage;

One member who resides within those land areas that comprise the drainage for the St. Croix, Dennys, East Machias, Machias, Pleasant or Narraguagus rivers;

One member of the Passamaquoddy Tribe;

One member of the Penobscot Nation; and

One member at-large representing the public from a geographical area not specified above.

The Salmon Board annually elects a Chair from among its members, except that neither commissioner may serve as Chair. The Chair directs the administrative and financial matters of the Authority, while the hiring and management of the staff of the Authority are the responsibility of the Board.

The Authority has sole authority (except for those rights lawfully held by Maine's Native American Indian Tribes) and responsibility to manage the Atlantic salmon fishery in the state, including the sole authority to introduce Atlantic salmon into Maine inland waters.¹ The Authority also has sole authority to limit or prohibit the harvest of Atlantic salmon, issue licenses

¹ This sole authority does not take effect for the *inland* waters of the Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap and Sheepscot rivers until July 1, 1997.

for the taking of Atlantic salmon and adopt rules establishing the time, place and manner of Atlantic salmon fishing in all waters of the state.

In March of 1996 the Maine legislature amended (PL 1996, Chapter 535) various provisions of the original law which had established the Atlantic Salmon Authority and included a provision requiring the Chair of the Atlantic Salmon Board to submit, not later than December 1, 1996, a report to the Joint Standing Committee on Inland Fisheries and Wildlife. The report must include the Board's plan for managing the Atlantic salmon fishery in the state and any statutory recommendations pertaining to staffing or budget matters that the Board determines is necessary to implement that plan. This report represents the Atlantic Salmon Board's compliance with the Maine legislature's directive.

The Atlantic Salmon Board was appointed by the Governor and approved by the Maine Senate in August 1996. Initial meetings of the Board (in August, September, October, November and December) have focused upon general program planning and future budgetary needs. During 1997 the Atlantic Salmon Authority will be revising and updating the existing Statewide Atlantic Salmon Restoration and Management Plan² in order to comply with PL 1995, Chapter 705, which requires all state agencies to implement a Strategic Planning and Performance Based Budgeting program. The brief overviews for the rivers which are included in this document are intended to present general recommendations for possible Atlantic salmon restoration programs and the resources which would be necessary to carry out those programs. Since this report was produced during a very short time period, with little opportunity for input from many potential stakeholders, the Atlantic Salmon Authority intends to further define and refine the short and long-term management objectives for Maine Atlantic salmon rivers after submitting this report to the Joint Standing Committee on Inland Fisheries and Wildlife in January of 1997.

² In one of its final actions as a state agency, the Atlantic Sea Run Salmon Commission adopted a new 5-year (1995-2000) Statewide Atlantic Salmon Restoration and Management Plan for 16 Maine Atlantic salmon rivers.

II. Current Atlantic Salmon Authority Staffing

The Atlantic Salmon Authority currently employs the following personnel at its headquarters in Bangor and a field office in Cherryfield:

A. State (General) Funds: one Biologist/program coordinator and one Clerk-typist II (while this position has been vacant since November, 1994 due to insufficient funding it appears that the ASA will be able to fill the position early in 1997).

B. Federal Funds: six full-time and four part-time (seasonal) biological personnel under three federal grants (two with the US Fish & Wildlife Service, and one with the National Marine Fisheries Service). Due to the source of funding for these positions, the duties and responsibilities of these personnel are strictly limited to the seven rivers proposed for federal listing under the Endangered Species Act (ESA), operation of the Veazie fishway trap on the lower Penobscot River, and to maintaining statewide databases such as stocking and adult returns.

In addition to the staff listed above, the Atlantic Salmon Authority receives technical support and assistance from the following: US Fish and Wildlife Service staff (Maine Office of Fisheries Assistance and Craig Brook and Green Lake National Fish Hatcheries); National Marine Fisheries staff (Woods Hole and Gloucester, Massachusetts); various other public and private entities involved in the statewide Atlantic salmon restoration program (e.g., Penobscot Indian Nation, Maine Council - Atlantic Salmon Federation, local salmon angling clubs, other state and federal agencies, Central Maine Power Co., Bangor Hydro-Electric Co., etc.).

III. Atlantic Salmon Restoration and Management Goals and Objectives

The statewide goal of the Atlantic Salmon Authority is to protect, conserve, restore, manage, and enhance Atlantic salmon habitat, populations, and fisheries within historical habitat in Maine. Current management objectives, as outlined in the 1995 ASRSC plan, include: restoration of self-sustaining runs of Atlantic salmon, increasing natural reproduction of existing Atlantic salmon

populations, providing recreational angling opportunities and compatible non-consumptive uses of Maine's Atlantic salmon resources, improving fish passage for Atlantic salmon where there are natural and artificial barriers to migration, establishing partnerships which will benefit salmon restoration and management programs (e.g., with the Maine aquaculture industry), and increasing public awareness and broadening support for attainment of the Authority's overall goal through development of a public education program.

IV. Economic Impact of Atlantic Salmon Restoration

The potential economic benefits to the State of Maine accruing from restored Atlantic salmon runs and sport fisheries could be substantial. A detailed estimate of those potential, long-term benefits is appended to this plan (See Appendix I).

V. Restoration and Management Problems

The complex life history of Maine Atlantic salmon populations has resulted in a wide range of biological, environmental, and sociopolitical problems which pose unique challenges to restoration and management of the species. Most of these problems were documented in the existing Statewide Atlantic Salmon Restoration and Management Plan, and many of these problems have existed for a long time, illustrating the degree of difficulty in ultimately resolving them. Many of the challenges facing restoration and management of Atlantic salmon runs are found within the State of Maine, including the following: inadequate or incomplete information and biological data pertaining to salmon habitat and populations³, upstream and downstream fish passage at hydroelectric dams, land-use practices, conflicts with other fishery programs, insufficient broodstock and inadequate numbers of juvenile salmon for restocking efforts. Additionally, there are challenges facing restoration of the species to Maine rivers which are located outside of the boundaries of the state (e.g., insufficient spawning escapements related to low marine survival,

³ With pessimistic future projections (for example, one smolt per unit of habitat and 1% marine survival) Maine rivers would be incapable of self-sustaining salmon runs. Conversely, with optimistic future projections (for example, five smolts per unit of habitat and 5% marine survival) all Maine rivers would be capable of self-sustaining salmon runs. Actual smolt production and marine survival will probably occur somewhere between these two extremes.

distant commercial fisheries, global warming, etc.). The Atlantic Salmon Authority recognizes that any particular restoration and management strategy or group of strategies must be tailored to meet the biological potential and constraints of individual Maine rivers. Thus, salmon restoration and management programs for all of the rivers which are the focus of this plan (see Figure 1) will take into consideration the applicable biological, environmental and social-political challenges which can be identified and reasonably addressed for each river.

VI. Maine Atlantic Salmon Restoration Program: Current Available Information

The potential for Atlantic salmon restoration, and status of Atlantic salmon restoration and management efforts on most of Maine's major river systems has been extensively and thoroughly documented in the following previously published documents (note: partial list):

Anonymous. 1988. Long-Term Management Plan For the Diadromous Fisheries of the St. Croix River. Canadian Manuscript Report of Fisheries and Aquatic Sciences No. 1969. Halifax, N.S. 73p.

Atlantic Salmon Conservation Plan for Seven Maine Rivers. 1996. (Draft). Governor's Task Force on Maine Atlantic Salmon, R.B. Owen, Chairman. Augusta, Maine.

Atlantic Sea Run Salmon Commission. 1982. Atlantic Salmon Fisheries Management Plan. In: State of Maine: Statewide River Fisheries Management Plan. Section 2, pp 1-14. Maine State Planning Office, Augusta, Maine.

Baum, E.T. 1982. Saint John River Watershed (Aroostook River, Meduxnekeag River, Prestile Stream, Upper Saint John): An Atlantic Salmon River Management Report. Atlantic Sea Run Salmon Commission, Bangor, Maine. 60p.

Baum, E.T. 1983. The Penobscot River: An Atlantic Salmon River Management Report. Atlantic Sea Run Salmon Commission, Bangor, Maine. 67p.

Baum E.T. 1995. Maine Atlantic Salmon Restoration and Management Plan, 1995-2000. Atlantic Sea Run Salmon Commission, Bangor, Maine. 55p.

Baum E.T. and K.F. Beland. 1982. The Union River and Minor Coastal Drainages East of the Penobscot (Orland River, Tunk Stream, Chandler River, Orange River, Pennamaquan River): An Atlantic Salmon River Management Report: Atlantic Sea Run Salmon Commission, Bangor, Maine. 60p.

Baum, E.T. and R.M. Jordan 1982. *The Narraguagus River: An Atlantic Salmon River Management Report*. Atlantic Sea Run Salmon Commission, Bangor, Maine. 41p.

Baum, E.T., J. Marancik and P.F. Nickerson. 1992. *Prelisting Recovery Plan for Maine Wild Atlantic Salmon Populations*. Atlantic Sea Run Salmon Commission, and US Fish & Wildlife Service, Bangor, Maine. 14p.

Beland, K.F. 1984. *Management of Atlantic Salmon in the State of Maine: A Strategic Plan*. Atlantic Sea Run Salmon Commission, Bangor, Maine.

Beland, K.F., J.S. Fletcher and A.L. Meister. 1982. *The Dennys River: An Atlantic Salmon River Management Report*. Atlantic Sea Run Salmon Commission, Bangor, Maine. 40p.

Dube, N.R. 1983. *The Saco River: An Atlantic Salmon River Management Report*. Atlantic Sea Run Salmon Commission, Bangor, Maine. 29p.

Dube, N.R. and R.M. Jordan. 1982. *The Pleasant River: An Atlantic Salmon River Management Report*. Atlantic Sea Run Salmon Commission, Bangor, Maine. 27p.

Fletcher, J.S. and A.L. Meister. 1982. *The St. Croix River: An Atlantic Salmon River Management Report*. Atlantic Sea Run Salmon Commission, Bangor, Maine. 41p.

Fletcher, J.S., R.M. Jordan and K.F. Beland. 1982. *The Machias and East Machias Rivers: An Atlantic Salmon River Management Report*. Atlantic Sea Run Salmon Commission, Bangor, Maine. 68p.

Meister A.L. 1982. *The Sheepscot River: An Atlantic Salmon River Management Report*. Atlantic Sea Run Salmon Commission, Bangor, Maine. 45p.

Rounsefell, G.A. and L.H. Bond. 1949. *Salmon Restoration in Maine*. Atlantic Sea Run Salmon Commission, Augusta, Maine. Research Report No. 1. 52p.

Saco River Coordinating Committee. 1996. *Saco River Fish Passage Assessment Plan, 1996-1999*. 137p. + 1 Annex.

U.S. Fish and Wildlife Service, Maine Department of Inland Fisheries and Wildlife, Maine Atlantic Sea Run Salmon Commission and Maine Department of Marine Resources. 1987. *Saco River Strategic Plan for Fisheries Management*. 153 p + 11 App.

U.S. Fish and Wildlife Service. 1986. Baseline Data For Fishery Managers of the Saco River Watershed. 109p. + 10 App.

U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1995. Status Review of Anadromous Atlantic Salmon in the United States. 131 p.

In addition to the publications listed above, the Atlantic Salmon Authority (Atlantic Sea Run Salmon Commission prior to September, 1995) and the US Fish & Wildlife Service has published annual reports which document state and federal Atlantic salmon restoration and management activities in Maine. Since nearly all available Atlantic Salmon Authority personnel and other resources are committed to the seven Maine rivers⁴ with wild salmon runs, most of the information in recent annual reports pertains to those rivers.

⁴ The seven rivers are: Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap and Sheepscot.

VII. River Profiles: Restoration Potential, Present Status, Available Resources, Future Needs

Sixteen Maine rivers are profiled in the following section of this report. Due to time constraints, the river profiles which follow are intended to provide only *general* summaries of the current status, future potential and resources which would be required to restore self-sustaining populations of Atlantic salmon. Over time, and with additional resources, the Atlantic Salmon Authority will expand upon this information and develop more specific individual operational plans for all of Maine's Atlantic salmon rivers. River profiles for the following sixteen Maine rivers are presented:

- | | |
|-----------------------|------------------------|
| 1. Dennys River | 9 Prestile Stream |
| 2. East Machias River | 10. Meduxnekeag River |
| 3. Machias River | 11. St. Croix River |
| 4. Pleasant River | 12. Union River |
| 5. Narraguagus River | 13. Penobscot River |
| 6. Ducktrap River | 14. Kennebec River |
| 7. Sheepscot River | 15. Androscoggin River |
| 8. Aroostook River | 16. Saco River |

Although the Governor's Task Force⁵ on Atlantic Salmon was given the responsibility for developing a long-term Conservation Plan for the Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap and Sheepscot rivers, the Atlantic Salmon Authority will undoubtedly be responsible for its implementation as of July 1, 1997 when the ASA's "sole authority" takes effect for the freshwater portions of those rivers.

⁵ In response to the proposed listing (by the US Fish & Wildlife Service and National Marine Fisheries Service) of the Atlantic salmon populations in the Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap and Sheepscot rivers as threatened under the Endangered Species Act, Maine Governor Angus King, by executive order on 20 October, 1995, created the Maine Atlantic Salmon Task Force. Inland Fisheries and Wildlife Commissioner Ray Owen is Chairman of the Task Force, which is composed of the following additional members: the Commissioner of Marine Resources, the Commissioner of Agriculture, the State Forester, representatives of private recreational fisheries interests and Native American Sustenance fishers, and representatives of the agriculture, aquaculture, paper and forestry sectors, and the Governor's office.

1. Dennys River

*Current Status of Atlantic Salmon Restoration and Management Program*⁶: Active, one of seven rivers of highest priority in Maine. Dennys River broodstock are currently held at Craig Brook NFH for an annual fry stocking program. Up to 250,000 fry may be required for full habitat utilization; sufficient numbers of fry are available through the year 2000.

Current Atlantic Salmon Population Status: 25-50 adult salmon annually in recent years. High numbers of aquaculture-origin escapees have been observed in recent years in the lower Dennys River.

10-Year Restoration Goal: Increase average annual adult return to 161 salmon (target spawning escapement).

*Estimated Units of Atlantic Salmon Habitat*⁷: Total: 2,415 Accessible: 2,415.

*Estimated Potential Adult Return*⁸: 145 - 290

Water Quality: Excellent (hazardous waste site in upper drainage being addressed by EPA).

Fish Passage Status: All artificial obstructions have operational fishways; some natural obstructions (debris jams and beaver dams) occur in localized areas.

Potential for Achieving Restoration Goal: High

Current Problems and Issues: See Atlantic Salmon Conservation Plan for Seven Rivers.

Program Needs: See Atlantic Salmon Conservation Plan for Seven Rivers.

Estimated Costs: See Atlantic Salmon Conservation Plan for Seven Rivers and summary table for Central Zone on page 44.

⁶ The following terms are used to define restoration status: active = active restoration and management activities undertaken by the ASA (and/or US Fish and Wildlife) annually; passive = limited activities occurring as resources allow; inactive = no salmon restoration activities occurring or contemplated in the near future.

⁷ Atlantic salmon spawning and nursery habitat is measured in "units" where one unit = 100 m².

⁸ See page 36 for explanation.

2. East Machias River

Current Status of Atlantic Salmon Restoration Program: Active, one of seven rivers of highest priority in Maine. East Machias River broodstock are currently held at Craig Brook NFH for an annual fry stocking program. Up to 225,000 fry may be required for full habitat utilization; sufficient numbers of fry are available through the year 2000.

Current Atlantic Salmon Population Status: Estimated 50-75 adult salmon annually in recent years. High numbers of aquaculture-origin escapees have been observed in recent years in the lower East Machias River.

10-Year Restoration Goal: Increase average annual adult return to 143 salmon (target spawning escapement).

Estimated Units of Atlantic Salmon Habitat: Total: 2,145 Accessible: 2,145.

Estimated Potential Adult Return : 129 - 257

Water Quality: Excellent.

Fish Passage Status: All artificial obstructions have operational fishways; some natural obstructions (debris jams and beaver dams) occur in localized areas.

Potential for Achieving Restoration Goal: High

Current Problems and Issues: See Atlantic Salmon Conservation Plan for Seven Rivers.

Program Needs: See Atlantic Salmon Conservation Plan for Seven Rivers.

Estimated Costs: See Atlantic Salmon Conservation Plan for Seven Rivers and summary table for Central Zone on page 44.

3. Machias River

Current Status of Atlantic Salmon Restoration Program: Active, one of seven rivers of highest priority in Maine. Machias River broodstock are currently held at Craig Brook NFH for an annual fry stocking program. Up to 675,000 fry may be required for full habitat utilization; sufficient numbers of fry are available through the year 2000.

Current Atlantic Salmon Population Status: Estimated 100-150 adults annually in recent years; it is likely that there are aquaculture escapees in the Machias River, although this has not been documented to date.

10-Year Restoration Goal: Increase average annual adult return to 300 salmon.

Estimated Units of Atlantic Salmon Habitat: Total: 6,685 Accessible: 6,685.

Estimated Potential Adult Return : 401 - 802

Water Quality: Excellent.

Fish Passage Status: No artificial obstructions to fish passage; some natural obstructions (debris jams and beaver dams) occur in localized areas.

Potential for Achieving Restoration Goal: High

Current Problems and Issues: See Atlantic Salmon Conservation Plan for Seven Rivers.

Program Needs: See Atlantic Salmon Conservation Plan for Seven Rivers.

Estimated Costs: See Atlantic Salmon Conservation Plan for Seven Rivers and summary table for Central Zone on page 44.

4. Pleasant River

Current Status of Atlantic Salmon Restoration Program: Active, one of seven rivers of highest priority in Maine. Pleasant River broodstock are currently held at North Attleboro NFH for an annual fry stocking program. Up to 110,000 fry may be required for full habitat utilization; sufficient numbers of fry will be available beginning in 1998 and continuing through the year 2000.

Current Atlantic Salmon Population Status: Estimated 20-40 adults annually in recent years; it is likely that there are aquaculture escapees in the Pleasant River, although this has not been documented to date.

10-Year Restoration Goal: Increase average annual adult return to 72 salmon (target spawning escapement).

Estimated Units of Atlantic Salmon Habitat: Total: 1,085 Accessible: 1,085.

Estimated Potential Adult Return : 65 - 130

Water Quality: Excellent.

Fish Passage Status: No artificial obstructions to fish passage; some natural obstructions (debris jams and beaver dams) occur in localized areas.

Potential for Achieving Restoration Goal: High

Current Problems and Issues: See Atlantic Salmon Conservation Plan for Seven Rivers.

Program Needs: See Atlantic Salmon Conservation Plan for Seven Rivers.

Estimated Costs: See Atlantic Salmon Conservation Plan for Seven Rivers and summary table for Central Zone on page 44.

5. Narraguagus River

Current Status of Atlantic Salmon Restoration Program: Active, one of seven rivers of highest priority in Maine. Narraguagus River broodstock are currently held at Craig Brook NFH for an annual fry stocking program. Up to 600,000 fry may be required for full habitat utilization; sufficient numbers of fry are available through the year 2000.

Current Atlantic Salmon Population Status: 50-100 adult salmon in recent years (average = 70) small numbers of aquaculture escapees documented in 1996.

10-Year Restoration Goal: Increase average annual adult return to 250 salmon.

Estimated Units of Atlantic Salmon Habitat: Total: 6,015 Accessible: 6,015.

Estimated Potential Adult Return: 361 - 722

Water Quality: Excellent.

Fish Passage Status: All artificial obstructions have operational fishways; some natural obstructions (debris jams and beaver dams) occur in localized areas.

Potential for Achieving Restoration Goal: High

Current Problems and Issues: See Atlantic Salmon Conservation Plan for Seven Rivers.

Program Needs: See Atlantic Salmon Conservation Plan for Seven Rivers.

Estimated Costs: See Atlantic Salmon Conservation Plan for Seven Rivers and summary table for Central Zone on page 44.

6. Ducktrap River

Current Status of Atlantic Salmon Restoration Program: Active, one of seven rivers of highest priority in Maine; no stocking anticipated.

Current Atlantic Salmon Population Status: 20-40 adults in recent years.

10-Year Restoration Goal: Maintain existing run, increase (if possible) to 30-60.

Estimated Units of Atlantic Salmon Habitat: Total: 800 Accessible: 800.

Estimated Potential Adult Return : 48 - 96

Water Quality: Excellent.

Fish Passage Status: All artificial obstructions have operational fishways; some natural obstructions (debris jams and beaver dams) occur in localized areas.

Potential for Achieving Restoration Goal: High

Current Problems and Issues: See Atlantic Salmon Conservation Plan for Seven Rivers.

Program Needs: See Atlantic Salmon Conservation Plan for Seven Rivers.

Estimated Costs: See Atlantic Salmon Conservation Plan for Seven Rivers and summary table for Central Zone on page 44.

7. Sheepscot River

Current Status of Atlantic Salmon Restoration Program: Active, one of seven rivers of highest priority in Maine. Sheepscot River broodstock are currently held at Craig Brook NFH for an annual fry stocking program. Up to 285,000 fry may be required for full habitat utilization; sufficient numbers of fry are available through the year 2000.

Current Atlantic Salmon Population Status: 20-40 adult salmon annually in recent years.

10-Year Restoration Goal: Increase average annual adult return to 100 salmon.

Estimated Units of Atlantic Salmon Habitat: Total: 2,845 Accessible: 2,845.

Estimated Potential Adult Return : 171 - 341

Water Quality: Excellent.

Fish Passage Status: All artificial obstructions have operational fishways; some natural obstructions (debris jams and beaver dams) occur in localized areas.

Potential for Achieving Restoration Goal: High

Current Problems and Issues: See Atlantic Salmon Conservation Plan for Seven Rivers.

Program Needs: See Atlantic Salmon Conservation Plan for Seven Rivers.

Estimated Costs: See Atlantic Salmon Conservation Plan for Seven Rivers and summary table for Central Zone on page 44.

8. Aroostook River

Current Status of Atlantic Salmon Restoration Program: Passive, since state funding reductions beginning in 1989 (was active from 1982-1989). Stocking in recent years by Atlantic Salmon for Northern Maine (ASFNM) hatchery has amounted to less than 50,000 fry annually, although plans are underway to obtain 1,000,000 eggs in February for stocking in 1997 and possibly 2,000,000 in 1998. A full-scale restoration program would require 6 million fry to fully utilize the available Atlantic salmon habitat.

Current Atlantic Salmon Population Status: 100-300 adults, based upon numbers trucked into the lower river from Canada and those migrating naturally into the system. Origin of adults: hatchery and wild origin.

10-Year Restoration Goal: Increase adult salmon returns to 500 annually.

Estimated Units of Atlantic Salmon Habitat: Total: 60,775; Accessible: 60,775

Estimated Potential Adult Return : 1,823 - 5,470

Water Quality: Excellent.

Fish Passage Status: All Atlantic salmon entering the Saint John River are captured at the first obstruction in the system (Mactaquac Dam, Fredericton, NB) and trucked to various portions of the drainage. Both dams on the Aroostook River have fish passage facilities (a fish trapping and transportation facility at the Tinker Dam in NB and a pool-type fishway at the Caribou Dam in Maine). The Tinker Dam fish trapping facility is operated from June 1 - November 1 by hydropower company personnel.

Potential for Achieving Restoration Goal: High

Current Problems and Issues:

1. Inadequate resources to initiate, monitor and evaluate an Atlantic salmon restoration program (no biological personnel to work on the system).

2. Insufficient numbers of juvenile salmon for stocking programs (only one private hatchery available for restocking efforts, and eggs must be imported from Canada each year.).
3. Potential conflicts with other fishery management programs: a.) all Maine-origin salmon intercepted in Canada and potentially trucked to other areas of the drainage, b.) conflicts with Maine Inland Fisheries & Wildlife trout management programs persist. c.) fish health/importation regulations inconsistencies between US and Canadian government agencies.
4. Efficiency of upstream fish passage facilities at Tinker and Caribou Dams needs to be evaluated. Downstream fish passage facilities are needed at the Tinker Dam, also possibly at the Caribou Dam. Downstream fish passage facilities are needed at St. John River dams in Canada (Beechwood and Mactaquac).
5. Salmon Stream Dam in Washburn needs upstream fish passage facilities.
6. Inadequate and/or outdated information on Atlantic salmon habitat and existing salmon runs.

Program Needs:

1. Joint comprehensive fisheries management planning with DFO in Canada is required for the entire Saint John River system to address "free-swim" of Maine-origin salmon, fish health and importation issues, and conflicts with other programs (e.g., trout).
2. Annual biological information on existing salmon population (assess natural reproduction, survival of stocked and naturally-spawned juveniles, smolt production and survival, fate of adult returns to Mactaquac, etc.).
3. Broodstock collection, holding and spawning facility, and expanded stocking program. Current stocking being carried out by Atlantic Salmon for No. Maine hatchery in Ashland.
4. Trained personnel to operate trapping facility at the Tinker Dam (must be Canadian citizen, funding should come from either dam owner or Canadian government).
5. Upstream fish passage facilities at Salmon Stream Dam in Washburn.
6. Comprehensive survey of Atlantic salmon habitat in the Aroostook River drainage (existing information was collected in the 1950's).

Estimated Costs: See summary table for Northern Zone on page 42.

9. Prestile Stream

Current Status of Atlantic Salmon Restoration Program: Passive

Current Atlantic Salmon Population Status: Atlantic salmon exist in the lower portions of the stream, total returns in any given year and status of juvenile salmon population unknown.

10-Year Restoration Goal: Inventory potential and, if feasible, initiate a restoration program and monitor adult returns annually.

Estimated Units of Atlantic Salmon Habitat: Total: 835; Accessible: unknown. (assume 400)

Estimated Potential Adult Returns: 25 to 75.

Water Quality: Excellent.

Fish Passage Status: All Prestile Stream-origin salmon are intercepted at Mactaquac Dam (see Aroostook River). First two dams on Prestile Stream in Maine (Robinson's and Town of Mars Hill) need upstream fish passage facilities.

Potential For Achieving Restoring Goal: High.

Current Problems and Issues:

1. Inadequate resources to initiate, monitor and evaluate an Atlantic salmon restoration program (no biological personnel to work on the system).
2. Lack of information on existing habitat and salmon populations.
3. Potential conflicts with other fishery management programs (Canadian interception adult returns, brook trout management conflicts with I F&W, etc.).
4. Lack of upstream fish passage facilities at Maine dams, lack of downstream fish passage facilities at Canadian dams.

Program Needs:

1. Comprehensive fisheries management plan (see Aroostook River).
2. Survey of existing habitat and Atlantic salmon restoration potential.
3. Annual biological information on existing adult and juvenile salmon populations.
4. Upstream fish passage facilities at Robinson's and Mars Hill dams.

Estimated Costs: See summary table for Northern Zone on page 42.

10. Meduxnekeag River

Current Status of Atlantic Salmon Restoration Program: Passive. The Meduxnekeg River was last stocked (in Maine) in 1980. A full-scale restoration program would require the stocking of up to 500,000 fry to fully utilize available Atlantic salmon habitat.

Current Atlantic Salmon Population Status: Atlantic salmon exist in South Branch, total adult returns in any given year and status of juvenile population unknown.

10-Year Restoration Goal: Initiate a restoration program and monitor adult returns annually.

Estimated Units of Atlantic Salmon Habitat: Total: 10,000; Accessible: 5,000 (estimated).

Estimated Potential Adult Returns: 150 - 450.

Water Quality: Good to Excellent.

Fish Passage Status: Two natural falls on North Branch may be barriers to salmon migration. All Meduxnekeag River-origin salmon are intercepted in Canada at Mactaquac Dam (see Aroostook River).

Potential For Achieving Restoration Goal: High

Current Problems and Issues:

1. Inadequate resources to initiate, monitor and evaluate an Atlantic salmon restoration program (no biological personnel to work on the system).
2. Lack of information on existing habitat and salmon populations.
3. Potential conflicts with other fishery management programs (Canadian interception of adult returns, brook and brown trout management conflicts with I F&W, etc.).
4. Natural falls on North Branch may be barriers to salmon migration; lack of downstream passage facilities at Canadian dams.
5. Water withdrawal and water use for agriculture purposes.

Program Needs:

1. Comprehensive fisheries management plan (see Aroostook River), to evaluate feasibility of initiating a restoration program for the Meduxnekeg River.
2. Survey of existing habitat, obstructions to fish passage and salmon restoration potential.
3. Annual biological information on existing adult and juvenile salmon populations.
4. Participate in ongoing state agency (e.g., I F&W, DEP, etc.) efforts to address potential agricultural water use/withdrawal issues to assume that Atlantic salmon restoration is not adversely affected.
5. Evaluate need for fish passage at natural barriers on North Branch.

Estimated Costs: See summary table for Northern Zone on page 42.

11. Saint Croix River

Current Status of Atlantic Salmon Restoration Program: Active: existing strategic and operational plans being implemented by Maine and Canadian fishery agencies and the St. Croix Waterway Commission. From 1984 through 1994 the St. Croix was being stocked in most years with 40,000 - 65,000 smolts, 40,000 - 100,000 parr and 50,000 - 250,000 fry (all reared at Green Lake NFH). Fish health issues at GLNFH in 1995-1996 (enteric redmouth disease, ERM) have precluded stocking from Maine sources in 1995-1996. Canadian sources have stocked small numbers of fry, parr (\pm 50,000/year) and smolts (\pm 17,000/year) in recent years. A full-scale restoration program would require up to 3,000,000 fry to be stocked annually for full habitat utilization.

Current Atlantic Salmon Population Status: Annual returns of 100-300 adult salmon, excluding aquaculture escapees. Origin of runs: mixture of hatchery origin and natural reproduction, aquaculture escapees comprise 13-30% of runs in recent years.

10-Year Restoration Goal: Increase adult returns to 300 - 500 annually.

Estimated Units of Atlantic Salmon Habitat: Total: 29,260; Accessible 29,260.

Estimated Potential Adult Returns: 878 - 2,633.

Water Quality: Good to excellent.

Fish Passage Status: Existing upstream fishways were upgraded in recent years, although additional fish passage improvements may be needed at spillways at Woodland and Grand Falls Dams. Downstream fish passage facilities are needed at the Grand Falls Dam. A recent Maine law requires that fishways at Woodland and Grand Falls be blocked during the alewife run to prevent access to upriver areas, resulting in unnecessary delays to Atlantic salmon migration.

Potential For Achieving Restoration Goal: High.

Current Problems and Issues:

1. Inadequate resources to maintain, monitor and evaluate an Atlantic salmon restoration program (no biological personnel to work on the system).
2. Passage efficiency of existing upstream and downstream fish passage facilities needs further evaluation.
3. Recent law barring alewife access delays salmon migration.
4. Insufficient juvenile salmon available for restocking purposes.
5. Disposition of aquaculture escapees.

Program Needs:

1. Secure long-term funding for the St. Croix Waterway Commission to continue annual anadromous fish restoration and assessment program.
2. Additional hatchery production for Atlantic salmon stocking programs.
3. Complete ongoing resurvey of salmon habitat which is being conducted by the St. Croix Waterway Commission.
4. Biological personnel to coordinate salmon restoration activities in Maine and work with Canadian fishery agencies, St. Croix Waterway Commission and others. Note: proposed additional personnel for the Penobscot/Union programs could be assigned these duties, as was the case until 1990 state funding cut backs.
5. Work with Canadian fishery agencies and other appropriate authorities to develop a protocol for the disposition of aquaculture-origin salmon in the St. Croix River.

Estimated Costs: Initially, \$35,000 annually for the St. Croix Waterway Commission to fund the ongoing active restoration and management program on the St. Croix River. See summary table for Central Zone on page 44.

12. Union River

Current Status of Atlantic Salmon Restoration Program: Passive (active program discontinued by the Atlantic Sea Run Salmon Commission in 1990) because of declining adult returns and priority of available resources.

Current Atlantic Salmon Population Status: Small numbers of adult salmon returns annually from sporadic parr stocking in recent years. Future returns are likely to be extremely variable; little information available on salmon returns on an annual basis. A full-scale restoration program would require the stocking of up to 850,000 fry to be stocked annually for full habitat utilization.

10-Year Restoration Goal: Initiate an Atlantic salmon restoration program.

Estimated Units of Atlantic Salmon Habitat: Total 8,360; Accessible: 8,360 (assuming trapping and trucking program from Ellsworth Dam).

Estimated Potential Adult Returns: 251 - 752

Water Quality: Excellent

Fish Passage Status: The Atlantic Salmon Authority owns the fish trapping facility at the Ellsworth Dam, however, there is no fish passage at the Graham Lake dam. Downstream fish passage facilities are located at the Ellsworth dam, although passage effectiveness for salmon is unknown. River herring are trapped and transported annually during the alewife harvesting season (May 1-June 30); occasionally (e.g., in 1996) the USFWS provides personnel from Green Lake NFH to operate the trap and transport salmon upriver.

Potential For Achieving Restoration Goal: Moderate

Current Problems and Issues:

1. Inadequate resources to initiate, monitor and evaluate an Atlantic salmon restoration program (no biological personnel to work on the system).
2. Lack of a permanent upstream fish passage solution.
3. Insufficient juvenile salmon available for restocking efforts.

4. Downstream survival of Atlantic salmon smolts through Graham and Leonard Lakes and by the 65 ft. high dam in Ellsworth needs to be evaluated.
5. Predation by cormorants and seals in lower river appears to be high.
6. Green Lake NFH is located in this drainage, extreme caution must be exercised to protect the facility from the introduction of new diseases, etc.

Program Needs:

1. Resurvey habitat and evaluate potential for Atlantic salmon restoration.
2. Obtain reliable source of additional juvenile Atlantic salmon for restocking efforts.
3. Personnel to operate existing trapping and trucking facility until permanent fish passage issues are resolved and to work with stake holders in initiating and monitoring a salmon restoration program.
4. Evaluate potential predation by cormorants and seals in the lower Union River.

Estimated Costs: See summary table for Central Zone on page 44.

13. Penobscot River

Current Status of Atlantic Salmon Restoration Program: Active. Annual stocking in recent years consists of \pm 1,000,000 fry, 200,000 parr and 575,000 smolts annually. A full-scale restoration program would require up to 10,000,000 fry annually to be stocked for full habitat utilization. The ASA contract with NMFS provides funding to operate the Veazie trapping facility each year; all other ASA restoration activities were discontinued in 1990 due to state funding cutbacks. The Penobscot Indian Nation, and the USFWS are able to participate in limited salmon restoration and management activities. The only ongoing fish passage evaluation studies are being conducted by Great Northern Paper Co. at the Weldon Dam (B.H.E. Co. conducted various upstream and downstream studies in the 1980's-early 1990's).

Current Atlantic Salmon Population Status: Annual run of 1,000 - 3,000 in recent years, origin averages 10% from natural production, 90% from stocking (fry, parr, smolts). Runs 3,000 - 5,000 prior to recent declines in marine survival of North American salmon stocks.

10-Year Restoration Goal: Increase adult returns to 3,000-5,000 annually.

Estimated Units of Atlantic Salmon Habitat¹⁰: Total: 125,000; Accessible: 125,000

Estimated Potential Adult Returns: 3,750 - 11,250

Water Quality: Good to excellent

Fish Passage Status: All major dams - except those on the Stillwater branch - have upstream fish passage facilities, but additional and/or retrofitted facilities are needed to be considered "state-of-the-art". Downstream facilities at Weldon appear to be effective, while those at West Enfield and Veazie are probably ineffective. Additional downstream facilities are needed at many other dams.

Potential For Achieving Restoration Goal: High

¹⁰ Many areas of the drainage have never been surveyed - total available habitat could be 200,000 units.

Current Problems and Issues:

1. Inadequate resources to monitor and evaluate the existing Atlantic salmon restoration program (no biological personnel to work on system above the Veazie Dam).
2. Inadequate upstream and downstream fish passage facilities, especially in lower mainstem dams.
3. Insufficient juvenile salmon available for restocking efforts.
4. Potential conflicts with other fishery management programs (e.g., I F & W re: brook trout/salmon interactions and I F&W re: brown trout introductions in the Piscataquis River Drainage).
5. Proposed new dam at Basin Mills has effectively halted the ability to make much-needed upstream fish passage improvements at the Veazie Dam.
6. Inadequate Atlantic salmon habitat information (river was partially surveyed in 1950's, lower mainstem surveyed in 1985).

Program Needs:

1. Comprehensive fishery management plan for entire drainage.
2. Additional upstream and downstream fish passage facilities.
3. Personnel and funding to conduct biological monitoring, habitat assessment, and population evaluation programs.
4. Additional juvenile salmon for stocking programs.
5. Comprehensive survey of Atlantic salmon habitat.

Estimated Costs: See summary table for Central Zone on page 44.

14. Kennebec River

Current Status of Atlantic Salmon Restoration Program: Passive. The only salmon stocking to occur in the Kennebec River in the last 100+ years was the release of 2,167 surplus, captive domestic broodstock (originating from the Penobscot and Union rivers) from Green Lake NFH during the period 1990-1993. A full-scale restoration program would require the stocking of up to 11.5 million fry annually. It appears that 50-100 adult salmon return to the river annually. These salmon originate from natural spawning in tributaries to the Kennebec River below the Edwards Dam and from hatchery and wild-origin strays from other rivers.

Current Atlantic Salmon Population Status: Small population below Edwards Dam in Augusta (est. 50-100), originating from natural spawning in tributaries and hatchery and wild-origin strays to river.

10-Year Restoration Goal: Phase I: The first five years will focus upon improving salmon habitat and fish passage in the Kennebec River and tributaries below the Edwards Dam. The ASA will support ongoing efforts to have the dam removed or, at the least, obtain upstream and downstream fish passage. Phase II: The second five years will focus upon the development of a plan for the river above the Edwards Dam and the initiation of a restocking program for the entire drainage.

Estimated Units of Atlantic Salmon Habitat: Total: 114,300; Accessible: 1,000 (estimated).

Estimated Potential Adult Returns¹¹: Unknown, due to a lack of current information.

Water Quality: Good to Excellent

Fish Passage Status: All seven major mainstem dams need upstream and downstream fish passage facilities. (Note: upstream passage could consist of trapping and trucking from lowermost

¹¹ For habitat in headwater areas, based upon 2.5 smolts/unit of habitat and 0.5-1.5% survival to adult return due to the large number of mainstem hydroelectric dams and to existing populations of other salmonids (e.g., brown and/or rainbow trout). These production and survival estimates have also been applied to the Androscoggin and Saco rivers.

obstruction while fish numbers are relatively small). Additionally, numerous tributaries to the mainstem need to be evaluated to determine the need for fish passage facilities.

Potential for Achieving Restoration Goal: Low in headwater areas; high in lower river below Edwards Dam.

Current Problems and Issues:

1. Inadequate resources to initiate, monitor and evaluate an Atlantic salmon restoration program (no biological personnel to work on the system).
2. Inadequate upstream and downstream fish passage facilities.
3. Potential conflicts with other fishery management programs (e.g., brown trout and landlocked salmon stocking programs)
4. Lack of and/or inadequate data about existing salmon habitat and populations and feasibility of initiating a restoration program..
5. Incidental take of salmon by anglers fishing for other species.

Program Needs:

1. Complete Atlantic salmon habitat inventory to evaluate potential for salmon restoration above Augusta Dam.
2. Upstream and downstream fish passage facilities.
3. Monitor existing salmon population in tributaries below the Augusta Dam and prepare a feasibility plan for future restoration program in other areas of the drainage.
4. Development of suitable source of broodstock and sufficient numbers of juvenile salmon for stocking program.
5. Work with local steering committees and advocacy groups to coordinate and accelerate future plans for monitoring and restoration programs.
6. Work with other resource agencies (I F & W, DMR) to provide angling regulations for other species which will reduce the current incidental take of Atlantic salmon.

Estimated Costs: See summary table for Southern Zone on page 47.

15. Androscoggin River

Current Status of Atlantic Salmon Restoration Program: Passive. The Androscoggin River has not been stocked with Atlantic salmon for over 100 years. A full-scale restoration program would require the stocking of up to 5,000,000 fry annually.

Current Population Status: Small run annually (25-100, average = 30), originating from natural spawning and wild and hatchery-origin strays.

10-Year Restoration Goal: Maintain existing run and increase if possible by initiating a restoration program.

Estimated Units of Atlantic Salmon Habitat: Total: 47,900; Accessible: 8,500 (estimated habitat to Lewiston Falls; could trap and transport salmon to all historical habitat from existing Central Maine Power Co. facility to Brunswick Dam).

Estimated Potential Adult Returns¹¹: 106 - 319

Water Quality: Good

Fish Passage Status: State-of-art upstream facilities exist at the first 3 dams (Brunswick, Pjepscot, Worumbo); both upstream and downstream passage facilities are presently being evaluated for passage of other anadromous species (shad, alewives, etc.).

Potential For Achieving Restoration Goal: High in lower portions of the drainage; low in headwater areas of the drainage (above Lewiston Falls).

Current Problems and Issues:

1. Inadequate resources to initiate, monitor and evaluate an Atlantic salmon restoration program (no biological personnel to work on the system).
2. Potential conflicts with other fishery management programs (e.g., brown trout).
3. Lack of and/or inadequate data about existing salmon habitat and populations.
4. Suitable stocks for restoration program.
5. Inadequate upstream and downstream fish passage (above Lewiston Falls).

¹¹ Current goal is to limit restoration of salmon run to Lewiston Falls area; smolt production assumed to be 2.5 and smolt survival assumed at 0.5-1.5%.

Program Needs:

1. Complete Atlantic salmon habitat inventory (main stem and tributaries below Lewiston Falls only).
2. Development of suitable broodstock source and stocking program (existing salmon run would be the best source).
3. Monitor existing salmon population and prepare plan for future restoration program.

Estimated Costs: See summary table for Southern Zone on page 47.

16. Saco River

Current Status of Atlantic Salmon Restoration Program: Passive (was active until state funding cutbacks in 1990). The Saco River is stocked annually with 20,000 smolts which are reared at Green Lake NFH (Penobscot-origin). These fish are stocked in order to assist C.M.P. Co. with studies to evaluate the passage efficiency of newly-constructed upstream and downstream fish passage facilities. In recent years the Saco River Salmon Club has built a hatchery (expected capacity of 1,000,000 eggs) and stocked the Saco River with 150,000-200,000 fry annually (eggs obtained from Penobscot-origin, captive broodstock at Green Lake NFH). A full-scale restoration program would require the release of up to 1.2 million fry annually in Maine portions of the drainage, and another 1.5 million in the NH portions of the drainage.

The 1987 Saco River Strategic Plan for Fisheries Management, which was prepared by state and federal fisheries agencies, remains in effect. In May of 1994, a Settlement Agreement was signed by dam owners (Central Maine Power Co. and Swans Falls Corporation) and 15 other parties, including state and federal fisheries agencies, the cities of Biddeford and Saco, and a coalition of conservation agencies to resolve licensing issues relating to fish passage at seven hydroelectric projects on the mainstem of the Saco River. The Agreement includes specific deadlines and criteria for the construction of fish passage facilities at the Cataract and Skelton Projects and delineates an Assessment Process for scheduling the future construction of fish passage facilities at the Bar Mills, West Buxton, Bonney Eagle, Hiram and Swans Falls projects. A Coordinating Committee, comprised of representatives of all of the parties to the Agreement is responsible for implementing the assessment process. A Fisheries Agency Assessment Committee (FAAC) functions as the Executive Committee for the Coordinating Committee. The FAAC is comprised of representatives of the Atlantic Salmon Authority, Departments of Marine Resources and Inland Fisheries and Wildlife, the US Fish and Wildlife Service, National Marine Fisheries Service, US Forest Service and the N.H. Fish and Game Department. The assessment process is designed around a four-year cycle which describes the planning and execution of data collection which is used to answer the following questions: 1) what is the present status of the anadromous fish populations in the Saco River; 2) are current management goals and objectives still valid; 3) is

progress being made; 4) is rate of progress as expected; 5) what conclusions can be drawn regarding the need, timing, and design for fish passage facilities at the five dams above Skelton?

Current Population Status: Small annual run (50-100) resulting from experimental stocking (fish passage evaluation) and fry/parr releases from Saco River Salmon Club Hatchery.

10-Year Restoration Goal: Increase adult salmon run to 150-250 annually.

*Estimated Units of Atlantic Salmon Habitat*¹²: Total: 12,540; Accessible: 12,540 (assuming trapping and trucking from Cataract Dam).

Estimated Potential Adult Returns: 157 - 470 (Maine portions of the drainage)

Water Quality: Excellent

Fish Passage Status: State-of-art upstream and downstream passage facilities constructed at the first obstruction (Cataract Project = 4 dams). Existing fish passage agreement (1994) and fish passage assessment plan (1996) agreed to by dam owners, state and federal fishery agencies and private interest groups. Ongoing monitoring schedule and future fish passage construction plans are well documented.

Potential For Achieving Goal: Moderate (due to cumulative effects of dams)

Current Problems:

1. Inadequate resources to initiate, monitor and evaluate an Atlantic salmon restoration program (no biological personnel to work on the system).
2. Lack of broodstock holding facilities and suitable numbers of juvenile salmon for restocking programs.
3. Insufficient information about existing salmon run and habitat utilization.
4. Lack of interest in the program by New Hampshire fishery management agencies and opposition to reintroduction of salmon by some private organizations (e.g., trout anglers) in NH.

¹² Maine habitat only; similar amount in New Hampshire. Assume all habitat is accessible via trap and truck from Cataract Dam.

5. Potential conflicts with other fishery management programs (brook, brown and rainbow trout stocking in Maine and New Hampshire.
6. Inadequate upstream and downstream fish passage facilities.

Program Needs:

1. Biological personnel to work directly on the program and with other stakeholders (e.g., Saco River Salmon Club, CMP, etc.).
2. Broodstock holding facilities (existing run would be best) and expanded stocking capabilities.

Estimated Costs: See summary table for Southern Zone on page 47.

17. Summary: All Rivers

A summary of the 16 rivers profiled in this plan and the Atlantic Salmon Authority's management goals for the next 10 years are presented in the following table:

River	Drainage Area (mi ²)	Est. Salmon Habitat Units (one unit= 100m ²) (1)		Est. Smolts(2)	Est. Adults (3)			Target (+) Spawners	Est. Run Last 5-Yr	10-yr Goal
		Total	Accessible		Min.		Max.			
Aroostook	2,290	60,775	60,775	182,325	1,823	to	5,470	4052	100-300	500
Prestile	217	835	400	1,200	25	to	75	54	Unknown	see pg 20
Meduxnekeg	497	10,000	5,000	15,000	150	to	450	333	Unknown	see pg 21
St. Croix	1,500	29,260	29,260	87,780	878	to	2,633	1951	100-300	300
Dennys	132	2,415	2,415	7,245	145	to	290	161	25-50	161
E. Machias	251	2,145	2,145	6,435	129	to	257	143	50-75	143
Machias	460	6,685	6,685	20,055	401	to	802	446	100-150	300
Pleasant	85	1,085	1,085	3,255	65	to	130	72	20-40	72
Narraguagus	232	6,015	6,015	18,045	361	to	722	401	70	250
Union	500	8,360	8,360	25,080	251	to	752	557	Unknown	see pg 25
Penobscot	8,500	125,000	125,000	375,000	3,750	to	11,250	8,333	1,700	3,500
Ducktrap	36	800	800	2,400	48	to	96	53	20-40	see pg 16
Sheepscoot	228	2,845	2,845	8,535	171	to	341	190	20-40	100
Kennebec	6,000	114,300	1,000	3,000	50	to	100	67	Unknown	see pg 29
Androscoggin	2,500	47,900	8,500	25,500	106	to	319	567	30	see pg 31
Saco	1,697	12,540	12,540	37,620	157	to	470	836	45	100-250
Totals	25,125	430,960	272,825	818,475	8,510		24,157	18,216		

1. Assume trap and truck in some instances (e.g., Union River). Accessible habitat for Androscoggin River is to Lewiston Falls only; for the Kennebec River accessible habitat is below Edwards Dam; for the Saco River only Maine habitat is listed (similar amount in NH).
2. Assumes 3.0 smolts/unit of habitat, EXCEPT Kennebec, Androscoggin and Saco rivers, where production in headwater areas is estimated at 2.5 smolts/unit.
3. Assumes 2-4% smolt survival in the following rivers: Dennys, E. Machias, Machias, Pleasant, Narraguagus, Ducktrap, Pleasant. Assumes 1-3% smolt survival in the following rivers: Aroostook, Prestile, Meduxnekeag, St. Croix, Union, Penobscot. Assumes 0.5-1.5 % smolt survival in the following rivers: Kennebec, Androscoggin and Saco. Note: these are estimates based upon current knowledge and may change as new information becomes available.
4. Based upon estimated amount of accessible habitat, egg deposition of 240 eggs/unit, 7,200 eggs/female, and 50:50 sex ratio.

VIII. Recommendations and Estimated Costs:

VIII-1. Short-Term Program Requirements.

The Atlantic Salmon Authority has identified an immediate need for the following additional resources which are required to start implementing the statewide Atlantic salmon restoration and management program for the next 10 years:

1.) Two additional full-time fishery scientists (Biologist II and Biologist I) to work with stakeholders and volunteers to leverage the probability for significant accomplishments in addressing some of the needs listed above. Minimum estimated cost: \$150,000. Highest priority will be assigned to those rivers with existing salmon runs, fish passage facilities, stocking programs and ongoing programs with active, local initiatives (e.g., Aroostook, St. Croix, Penobscot and Saco).

2.) An annual appropriation of \$35,000 for the St. Croix International Waterway Commission for the ongoing anadromous fish restoration program on the St. Croix River.

3.) A \$100,000 appropriation for five consecutive years (FY 1999 - FY 2003) which the Atlantic Salmon Authority would use solely for the propagation of additional Atlantic salmon. These funds would be used on a 50/50 matching basis with private initiatives instituted by salmon clubs and other conservation organizations in Maine.

VIII-2. Long-Term Program Requirements.

In order to effectively restore and manage salmon runs and fisheries on a long-term statewide basis, the Atlantic Salmon Authority estimates that the following resources will be required:

Rivers to be Managed	Personnel Required	Current and/or Addl. Requirements	Estimated Annual Cost (in 1997 \$\$)
Dennys, E. Machias Machias, Pleasant, Narraguagus, Ducktrap Sheepscot	Existing: 6 F.T. 4 P.T. Addl: 2 F.T. 2 P.T.	Additional office space and equipment and supplies	(E) \$350,000 (New) \$150,000
Aroostook, Meduxnekeg, Prestile Stream	Addl: 2 F.T.* 2 P.T.	Regional office in northern Maine and equipment and supplies	(New) \$195,000
Penobscot, Union St. Croix	Addl: 2 F.T., 3 P.T.	Expanded office space and equipment and supplies. Funding for St. Croix WW Commission	(New) \$287,000
Saco, Kennebec, Androscoggin	Addl: 2 F.T.* 2 P.T.	Regional office in southern Maine and equipment and supplies	(New) \$169,000

* One of these positions was listed under short-term needs.

In addition to the above resources (which includes provisions for new, regional offices in northern and southern Maine) the Atlantic Salmon Authority has identified the need for an Executive Director to oversee the overall operations of the agency. This position would be a purely administrative one, with duties which would include fund raising, grant applications, and acting as liaison between the Salmon Board and with the state legislature and other stakeholders to achieve the long-term goal and objectives of the ASA. The estimated cost for this position (salary, benefits, and "all other" expenses) is \$80,000 annually. The need for this position isn't anticipated until the year 2002, although it could also serve as the Coordinator for the Seven Rivers Conservation Plan between FY 1998 and FY 2001.

The existing statewide Atlantic Salmon Restoration and Management Plan (Baum 1995) identified the need for more than 40,000,000 fry for stocking in Maine rivers if full-scale salmon restoration

programs were implemented simultaneously on all 16. This could require the collection of a minimum of 45,000,000 salmon eggs annually, which in turn, would require more than 12,000 sea run broodstock (6,000 each sex) to be collected each year (assuming all were 2 sea-winter salmon). Current broodstock holding facilities at Craig Brook NFH are at full capacity (with about 4,000 captive broodstock from the Dennys, E. Machias, Machias, Narraguagus and Sheepscot rivers and 600 sea run Penobscot River broodstock); therefore, additional broodstock holding facilities are necessary to hold any new stocks in Maine (e.g., Aroostook, St. Croix,¹³ Union, or Saco). The USFWS has proposed expanding the facilities at Craig Brook NFH in the future; however, funding for that project has not been appropriated yet.

Current (short-term) projections of future fry production in Maine from all sources (two federal hatcheries, Canadian government and private hatcheries on the Saco, Pleasant and Aroostook rivers) totals about 5,000,000 fry annually. The Atlantic Salmon Authority estimates that to double the current production could be accomplished through any one or a combination of the following options: a.) contract with a new broodstock holding facility, such as the one which is being considered in Milo by Unity College (with assistance from the aquaculture industry); b) contracting directly with the Maine aquaculture industry for egg production in concert with expanded facilities at existing and planned private fry production hatcheries throughout Maine; c) assessing options for future salmon rearing outside of the State of Maine (e.g., other federal hatcheries in New England and/or public or private hatcheries in New Brunswick).

Long-term, state-of-the-art fish passage facilities which are required for some of the rivers listed in this plan (e.g., Kennebec, Union, etc.) would be extremely costly, although those costs are the responsibility of the dam owners. A river-by-river analysis of fish passage options and detailed cost estimates could be provided by current dam owners and/or USFWS and NMFS hydraulic engineering staff (especially for those rivers where cost estimates do not currently exist). This may require site visits and numerous discussions between fishery agencies, dam owners, and other stakeholders.

¹³ The Department of Fisheries and Oceans in Canada annually holds 25-50 St. Croix River broodstock at Mactaquac Hatchery in Fredericton, N.B.

The following is a more detailed summary of anticipated resources required and the associated expenses by year for the next 10 years. As previously explained, additional facilities for holding broodstock and expanded egg production are necessary. In the following summary the term "PBF" refers to any private broodstock facility that the Atlantic Salmon Authority might contract with to produce eggs for statewide fry stocking programs.

Keep in mind that this document is designed to identify all the resources necessary to accomplish our mission. The Authority has chosen a 10-year time period which starts out modestly in the first year and builds to an "ideal" level of support over time. The Atlantic Salmon Authority recognizes that the "ideal" level may be impossible to achieve given today's financial conditions.

The summary of activities and cost estimates which follows is presented on a regional basis for the following regions of Maine:

- I. Northern Zone: Aroostook River, Prestile Stream, and Meduxnekeag River.
- II. Central Zone: St. Croix River, Downeast Rivers (Dennys, E. Machias, Machias, Pleasant, Narraguagus, Ducktrap, Sheepscot), Union River, and Penobscot River.
- III. Southern Zone: Kennebec, Androscoggin, and Saco Rivers.

VIII-3. Estimated Costs for Northern Zone

Rivers to be Managed: Aroostook/Prestile Stream/Meduxnekeg

	1998	1999	2000	2001	2002	2003	2004	2005	2006
	(1) Biologist II	(1) Biologist II	(1) Biologist II (1) Biologist I (1) Conservation Aide (6-month)	(1) Biologist II (1) Biologist I (2) Conservation Aide (6-month)	(1) Biologist II (1) Biologist I (2) Conservation Aide (6-month)	(1) Biologist II (1) Biologist I (2) Conservation Aide (6-month)	(1) Biologist II (1) Biologist I (2) Conservation Aide (6-month)	(1) Biologist II (1) Biologist I (2) Conservation Aide (6-month)	(1) Biologist II (1) Biologist I (2) Conserv. Aide (6-month)
Personnel Costs	\$50,000	\$50,000	\$102,000	\$118,000	\$118,000	\$118,000	\$118,000	\$118,000	\$118,000
Annual Oper. & Maintenance	\$2,500	\$2,500	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Office & Equip	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000
Total Personnel Expenses	\$63,500	\$63,500	\$118,000	\$134,000	\$134,000	\$134,000	\$134,000	\$134,000	\$134,000
Fish Rearing Expenses (see page 42)	0	0	\$35,000	\$35,000	\$70,000	\$105,000	\$105,000	\$105,000	\$105,000
Total Expenses	\$63,500	\$63,500	\$153,000	\$169,000	\$204,000	\$239,000	\$239,000	\$239,000	\$239,000

Northern Zone Stocking Programs

3a. Aroostook River Stocking Plan

<u>Fiscal Year</u>	<u>Fry Stocked*</u>	<u>Fry Hatchery</u>	<u>Egg Source**</u>	<u>Added Cost from using PBF***</u>
1997	800,000	ASFNM	DFO	-
1998	800,000	ASFNM	DFO	-
1999	1,200,000	ASFNM	DFO+CBNFH	-
2000	1,600,000	ASFNM	DFO+CB+PBF	\$35,000
2001	1,600,000	ASFNM	DFO+CB+PBF	\$35,000
2002	2,000,000	ASFNM	DFO+CB+PBF	\$70,000
2003	2,360,000	ASFNM	DFO+CB+PBF	\$101,500
2004	2,320,000	ASFNM	DFO+CB+PBF	\$98,000
2005	2,320,000	ASFNM	DFO+CB+PBF	\$98,000
2006	2,280,000	ASFNM	DFO+CB+PBF	\$94,500

3b. Meduxnekeag River Stocking Plan

Start stocking program in 2003

<u>Fiscal Year</u>	<u>Fry Stocked*</u>	<u>Fry Hatchery</u>	<u>Egg Source**</u>	<u>Added Cost from using PBF</u>
2003	40,000	ASFNM	PBF	\$3,500
2004	80,000	ASFNM	PBF	\$7,000
2005	80,000	ASFNM	PBF	\$7,000
2006	80,000	ASFNM	PBF	\$7,000

3c. Prestile Stream Stocking Plan

Start stocking program in 2006

<u>Fiscal Year</u>	<u>Fry Stocked*</u>	<u>Fry Hatchery</u>	<u>Egg Source**</u>	<u>Added Cost from using PBF</u>
2006	40,000	ASFNM	PBF	\$3,500

* Assumes 80% survival from eggs to fry stocked.

** Assumes DFO continues to provide 1 million free eggs annually, and that Craig Brook NFH starts providing 500,000 eggs/year beginning in 1999, and that PBF provides the balance @ .07 per egg.

*** PBF = any private broodstock/egg production facility.

VIII-4. Estimated Costs for Central Zone

Rivers to be managed: St.Croix, Penobscot, Union, Dennys, E.Machias, Machias, Pleasant, Narraguagus, Ducktrap, and Sheepscot

Fiscal Year	1998	1999	2000	2001	2002	2003	2004	2005	2006
			(1) Biologist II (1) Cons. Aide	(1) Bio II (1) Bio I (2) Cons. Aide	(1) Bio. II (1) Bio. I (3) Cons. Aide (1) Fish + Game Tech.	(1) Bio. II (1) Bio. I (3) Cons. Aide (1) Fish + Game Tech.	(1) Bio. II (1) Bio. I (3) Cons. Aide (1) Fish + Game Tech.	(1) Bio. II (1) Bio. I (3) Cons. Aide (1) Fish + Game Tech	(1) Bio. II (1) Bio. I (3) Cons. Aide (1) Fish + Game Tech
Personnel Costs*	-	-	\$62,000	\$114,000	\$191,000	\$191,000	\$191,000	\$191,000	\$191,000
Annual Operations & Maintenance	-	-	\$10,000	\$30,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Office Space and Equipment	-	-	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000
Fish Rearing Expense	-	-	-	-	-	-	-	-	-
Total Expense	-	-	\$83,000	\$155,000	\$252,000	\$252,000	\$252,000	\$252,000	\$252,000

* This does not include any positions for the Conservation Plan. (see page 46)

Central Zone Stocking Programs

4a. Penobscot River Stocking Program

Fiscal Year	Fry Stocked	Hatchery	Egg Source	Smolt Stocked	Hatchery	Egg Source
1997	1,200,000	CB	CB	575,000	GL	GL
1998	1,200,000	CB	CB	575,000	GL	GL
1999	1,200,000	CB	CB	575,000	GL	GL
2000	1,500,000	CB	CB	575,000	GL	GL
2001	2,000,000	CB	CB	575,000	GL	GL
2002	2,500,000	CB	CB	575,000	GL	GL
2003	3,000,000	CB	CB	575,000	GL	GL
2004	3,000,000	CB	CB	575,000	GL	GL
2005	3,000,000	CB	CB	575,000	GL	GL
2006	3,000,000	CB	CB	575,000	GL	GL

Assumes expansion at the Federal hatcheries at Green Lake and/or Craig Brook will allow for more egg production. Fry hatchery may be assisted by a proposed fry hatchery on the Penobscot River.

4b. St. Croix River Stocking Plan

As Maine shares the St. Croix River with Canada, the ASA will need to work out a shared stocking program with Canadian authorities. At present, broodstock for the St. Croix program are held at DFO's Mactaquac Hatchery and juveniles are hatched and reared at DFO's Saint John Hatchery. The planned stocking program will require the holding and rearing of additional numbers of salmon with the participation of hatchery facilities in Maine. The ASA's target would be to provide 500,000 fry annually to supplement current natural reproduction and stocking from Canadian sources.

An existing cost would be the annual provision for \$35,000 for the work currently being accomplished by the St. Croix Waterway Commission.

4c. Dennys, E. Machias, Machias, Pleasant, Narraguagus, Ducktrap, and
Sheepscot Rivers Stocking Plan

This plan is still being put together by the Governor's Task Force on Atlantic salmon, but it is assumed that there is or will be adequate space at Craig Brook or other federal hatcheries to handle the river-specific fry stocking requirements for these rivers.

It is still unclear, at this time, how the personnel requirements will be managed and funded. The ASA assumes that the biologists presently funded by federal grants will continue their work as part of the Conservation Plan (annual cost is approximately \$350,000).

It may be necessary to add two additional full-time biologists and 2 part-time conservation aides depending on how much work is absorbed by the federal agencies. Approximate annual costs for these personnel would be \$150,000.

4d. Union River Stocking Plan

The Union Rivers does not have natural run of wild salmon although recent sporadic releases of excess fry and parr have produced a small number of returnees. The ASA will continue to stock excess fry and parr as available until the year 2001, when a formal restocking program will be initiated. In the interim, the Authority will be working with other stakeholders to resolve the existing lack of a permanent fish passage plan for the Union River Drainage.

<u>Fiscal Year</u>	<u>Fry Stocked</u>	<u>Fry Hatchery</u>	<u>Egg Source</u>
2001	80,000	GL	GL
2002	160,000	GL	GL
2003	200,000	GL	GL
2004	200,000	GL	GL
2005	200,000	GL	GL
2006	200,000	GL	GL

Southern Zone Stocking Programs

5a. Saco River Stocking Program

Fiscal Year	Fry Stocked*	Fry Hatchery	Egg Source	Smolt Stocked	Hatchery	Egg Source	Additional Cost Using PBF**
1997	80,000	SRSC	GL/CB	20,000	Green Lake	GL	-
1998	400,000	SRSC	GL/CB	20,000	Green Lake	GL	-
1999	400,000	SRSC	GL/CB	20,000	Green Lake	GL	-
2000	400,000	SRSC	GL/CB	20,000	Green Lake	GL	-
2001	600,000	SRSC	GL/PBF	20,000	Green Lake	GL	\$17,500
2002	800,000	SRSC	GL/PBF	20,000	Green Lake	GL	\$35,000
2003	800,000	SRSC	GL/PBF	20,000	Green Lake	GL	\$35,000
2004	600,000	SRSC	GL/PBF	20,000	Green Lake	GL	\$17,500
2005	400,000	SRSC	GL/PBF	20,000	Green Lake	GL	-
2006	400,000	SRSC	GL/PBF	20,000	Green Lake	GL	-

It is assumed that the Saco River's limited target of 1.2 million fry would begin to be partially satisfied by returning adults around the year 2004. As a result, stocked fry numbers begin to lower, allowing hatchery capacity to be focused on the Kennebec and Androscoggin rivers. Additionally, fry could also be available for stocking in the New Hampshire portions of the Saco River Drainage.

5b. Androscoggin River Stocking Program

Because of the many dams on the Androscoggin River this program should be delayed until 2002 when habitat studies below Lewiston Falls begin. In 2003 broodstock should be collected for the PBF hatchery.

Fiscal Year	Fry Stocked*	Hatchery	Egg Source	Additional Costs From Using PBF**
2004	150,000	SRSC	PBF	\$18,000
2005	250,000	SRSC	PBF	\$30,000
2006***	250,000	SRSC	PBF	\$30,000

* Assumes 80% survival from eggs to fry stocked.

** Assumes PBF would charge .07/egg
 Saco would charge .05/egg to raise to fry
 .12 total

*** After 2006 focus on new fishways and/or trap and truck should allow the program to expand upriver beyond Lewiston Falls.

5c. Kennebec River Stocking Program

Because of the Edwards Dam the focus of this program will be on the available Atlantic salmon habitat in the lower river. Assuming that the Edwards Dam is eliminated by the year 2002, a restoration program should be started by capturing broodstock for Pbf in the year 2003.

Fiscal Year	Fry Stocked***	Hatchery	Egg Source	Additional Cost From Using PBF
2004	100,000	SRSC	PBF	\$12,000
2005	250,000	SRSC	PBF	\$30,000
2006	250,000	SRSC	PBF	\$30,000

*** Assumes 80% survival from eggs to fry stocked.

As a result of the Edwards Dam, the Kennebec River salmon population has been reduced to a very low level. The program should be started by capturing broodstock for Pbf in the year 2003. This program should be started by capturing broodstock for Pbf in the year 2003.

The program should be started by capturing broodstock for Pbf in the year 2003. This program should be started by capturing broodstock for Pbf in the year 2003.

Fiscal Year	Fry Stocked	Hatchery	Egg Source	Additional Cost
2004	100,000	SRSC	PBF	\$12,000
2005	250,000	SRSC	PBF	\$30,000
2006	250,000	SRSC	PBF	\$30,000

The program should be started by capturing broodstock for Pbf in the year 2003. This program should be started by capturing broodstock for Pbf in the year 2003.

VIII - 6. Summary: Estimated Costs for Statewide Plan by Year (in 1997 dollars).

Fiscal Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Current Staff	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000
	<i>Northern Zone (see page 42)</i>									
Personnel, etc.	-	\$63,500	\$63,500	\$118,000	\$134,000	\$134,000	\$134,000	\$134,000	\$134,000	\$134,000
Fish Rearing	-	-	-	\$35,000	\$35,000	\$70,000	\$105,000	\$105,000	\$105,000	\$105,000
Subtotal	-	\$63,500	\$63,500	\$153,000	\$169,000	\$204,000	\$239,000	\$239,000	\$239,000	\$239,000
	<i>Central Zone (see page 44)</i>									
Personnel, etc.	-	-	-	\$83,000	\$155,000	\$252,000	\$252,000	\$252,000	\$252,000	\$252,000
Cons. Plan**	-	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000
St. Croix WW Com.	-	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Subtotal	-	\$185,000	\$185,000	\$268,000	\$340,000	\$437,000	\$437,000	\$437,000	\$437,000	\$437,000
	<i>Southern Zone (see page 47)</i>									
Personnel, etc.	-	\$63,500	\$63,500	\$118,000	\$134,000	\$134,000	\$134,000	\$134,000	\$134,000	\$134,000
Fish Rearing	-	-	-	-	\$17,500	\$35,000	\$35,000	\$47,000	\$60,000	\$60,000
Subtotal	-	\$63,500	\$63,500	\$118,000	\$151,500	\$169,000	\$169,000	\$181,000	\$194,000	\$194,000
	<i>Statewide Program</i>									
Hatchery Develop.	-	-	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	-	-	-
Ex. Director***	-	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000
Subtotal	-	\$80,000	\$180,000	\$180,000	\$180,000	\$180,000	\$180,000	\$80,000	\$80,000	\$80,000
Grand Total	\$110,000	\$502,000	\$602,000	\$829,000	\$950,500	\$1,100,000	\$1,135,000	\$913,000	\$1,060,000	\$1,060,000

* Does not include existing federally-funded positions.

** Financial impact of the Conservation Plan for Seven Rivers unknown at this time (see page 46).

*** Could also serve as Coordinator for the Conservation Plan for Seven Rivers during FY 1998 - FY 2001, unless provided from some other department of state government.

Appendix I. Atlantic Salmon in the Economic Future of Maine

Prepared by:

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January 1997

When the subject of Atlantic Salmon is raised all over our state at meetings in board rooms, government offices, and at social gatherings, all the issues seem to boil in the pot. Positions generally are taken as follows:

Industry:

Like Atlantic Salmon, but are frightened that over zealous supporters will upstage their business activity resulting in higher operational expense and a less viable bottom line.

Environmental and Salmon Organizations:

Are intimidated by what some view as the corporate rush for profits at the expense of the environment and the follow on threat to Atlantic Salmon.

Government:

Is fearful that polarized positions of both business and industry and the environmental or salmon groups will damage sound economic development for the state and result in the loss of present jobs or the prevention of potential job creation.

At Social Gatherings (a mix of all the above):

Lively chatter takes place of the above disciplines that results in the worst possible conclusion - fear and distrust of each other.

We as a people should step back and ponder for one moment Franklin D. Roosevelt admonition to the American people early on during the Depression. He said "The only thing we have to fear is fear itself." He further used ideas to urge people and industry to not be afraid, work together, and succeed towards the common goal that he offered - to win. Government, business, industry, environmental groups, salmon enthusiasts, and the everyday citizen in Maine need that type of leadership today. The common goal must be business, industry, environment, salmon and citizen cooperation, at the minimum expense to all disciplines.

The final result must be an expanded Maine economy.

The initial leadership to start to accomplish this task is in place.

- a) The Governor and his office of the State of Maine
- b) The association of manufacturers of Maine
- c) The Maine Atlantic Salmon Authority

The three disciplines form a small fighting ship that can get the job done because of maneuverability.

To spur all to action, all must understand the economic value of Atlantic Salmon. The aquiculture business in Maine, as of 1995, contributed 1184.5 million dollars to the State economy and 450 jobs. Millions and jobs that were not there in 1976 and proof that you can start with little and receive large returns. Salmon aquiculture provides in addition to these results continuing economic growth.

Let us now ponder what in fact sport fishing for the king of fish might do for the economy of the State of Maine if it had the same opportunity in the next twenty years that salmon aquiculture system has had in the last twenty years.

An honest effort to project economic for supporting Atlantic Salmon forward in a very conservative way has not been accomplished heretofore in the State of Maine. It is believed that the projection method should be as follows:

- 1) Select rivers most liable to be able to support a sport fishery in the next 10 years.
- 2) Estimate the numbers of commercial sporting camps that would operate on those rivers.

¹Source - Maine Aquaculture Association

- 3) Estimate the number of rod days that would actually be sold per year.
- 4) Estimate the local sportsman rod days per year.
- 5) Calculate the value of a) non-resident over b) resident rod days. Resulting in
- 6) Dollar value of sport fishing Atlantic Salmon on the selected rivers and value of Atlantic Salmon fishing in total to state economy of those values.

To accomplish the above, we must use as reference, recent New Brunswick economic information for it is fresh and factual¹.

²Which rivers over the next ten years are most able to support sport fishing of Atlantic Salmon?

1. Penobscot
2. St. Croix
3. Pleasant
4. Narraguagus
5. Denneys
6. East Machias
7. Machias
8. Sheepscott
9. Aroostook

Three Examples:

Penobscot River: Estimate a high of 6 and low of 3 private sporting camps over the next ten years. The river would offer 120 day Atlantic Salmon season.

¹Bill Hooper, New Brunswick Dept. of Natural Resources

²Ed Baum, MASA

At the rate of an average of 6 non-resident anglers at each camp per day with the low of 3 camps in operation, it would mean 18 people would pay \$250.00 per day for 2,160 days per year, yielding income of \$540,000.

With history as our yardstick, it is estimated that an average of 150 residents would fish per day. 150×120 days equals 18,000 rod days per year. We estimated they will spend in addition to their normal daily living expense, which we do not count, another \$25.00 per day because they are salmon fishing. So $\$25.00 \times 18,000 = \$450,000$ per year. Grand total for the river is \$990,000 per year before applying the economic multiplier and running at one half the economic possibility.

Six rivers Downeast (St. Croix, Machias, East Machias, Denneys, Pleasant and Narraguagus) estimate a high of 8 and low of 4 sporting camps over the next ten years.

The river would offer a 105 day open Atlantic Salmon season. At the rate of 6 non-resident anglers at each camp at the low estimate of 4 camps in operation, it would mean that 24 people would pay \$250.00 per day for 105 days, yielding income of \$630,000 per year.

It is estimated that 10 Maine resident anglers per day would fish each of the six rivers or 60 Maine resident anglers per day at the \$25.00 per day economic value, this would yield another \$157,500. Grand total of the 6 rivers per year would be \$787,500 per year before the economic multiplier is brought to bare.

Aroostook: Estimate that a high of 6 and a low of 3 private sporting camps over the next ten years. The river would offer a 75 day Atlantic Salmon season.

At the rate of an average of six non-resident anglers at each camp per day with the low of 3 camps in operation it would mean 18 people would pay \$250.00 per day for 1,350 days or \$337,500 per year.

An estimated 60 Maine resident anglers would fish per day or 3,600 angling days per year at the \$25.00 per day expense yielding another \$112,500. Grand total for the

river of \$450,000 basic yield before the economic multiplier is brought to bare.

Thus the three river examples would yield before the economic multiplier is applied:

1. Penobscot	\$990,000
2. Six Down East Rivers	\$787,500
3. Aroostook	<u>\$450,000</u>
	\$2,227,500

(Two Million, Two Hundred Twenty Seven Thousand Five Hundred Dollars.)

Estimated daily fee source (as adjusted downward):

1. W. Hooper, New Brunswick Dept. Natural Resource
2. Dr. Alex Bielack, Atlantic Salmon Federation
3. Cornell University, Study series #87-6 D. Kay, L. Brown and D. Allee.

Multiplier:

Using the same economic model multiplier as developed by the University of Maine¹ results in direct economic impact of \$6,682,500 per year if we were to achieve 50% of the estimate and \$13,336,500 per year if we were to achieve 100% of estimate. Remember that at the start of the calculation to be conservative, we started at 50% of what we thought could be done. Therefore, it is conceptually correct that if success where to blossom, the above basic numbers could happen. Do not forget the other rivers not included in these estimates, they also are able to add to these numbers.

Is this reasonable approach to economic growth tempered with concern for present business and industry misplaced in the halls of our government? We say no it is not! It is rather a call to kindly working together with reason friendship and respect. An even handedness seldom witnessed in these days of "beat the other guy up to get your profit or your way".

¹Ed Baum, MASA - Multiplier of x 3 to base money spent

The leadership for success is in place to table the issues, demand the reasonability of action, and pave the pathway to success. Until there is commitment, there is hesitancy. The Maine Atlantic Salmon Authority is committed.

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10. Qualitative and Economic Evaluations of Atlantic Salmon Fishing on the Penobscot River - University of Maine, 1992
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11. The Reason Why Potential for Economic Returns by Developing the Sport Fishing in Atlantic Canada, 1995
B.T. Patterson and Association, New Brunswick, Canada