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Final Report
of the

COMMISSION TO STUDY THE NEEDS AND OPPORTUNITIES ASSOCIATED WITH THE PRODUCTION OF SALMONID SPORT FISH IN MAINE

November 2002

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Executive Summary and Recommendations

The Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine ("Commission"), established in 1999, was directed by the legislature to assess and evaluate recreational salmonid fish production facilities in the State, set salmonid production goals at state-owned fish production facilities over the next 15 to 20 year planning horizon and ensure that these facilities comply with discharge license standards within three years. The Commission was required to complete its work and report its findings and recommendations to the Joint Standing Committee on Inland Fisheries and Wildlife by October 31, 2002.

To complete its mission the Commission met 15 times between September 1999 and November 2002 and worked extensively with the Department of Inland Fisheries and Wildlife ("Department"), the Department's engineering consultant FishPro Consulting Engineers & Scientists[1] ("FishPro"), and Maine's Department of Environmental Protection ("DEP"). As a result of this work, the Commission issued two interim reports dated December 2000 and December 2001, outlining the Commission progress and continuing work plans that culminated in this report.[2]

Recreational sport fishing is not only an important part of Maine's outdoor heritage, it is an important part of Maine's economic vitality. According to the most recent study by the University of Maine, in 1996 alone, recreational fishing activities in Maine generated $292.7 million in total economic activity that resulted in $13.5 million in sales taxes and supported 5230 full and part time jobs that paid more than $5.7 million in state income taxes that year.[3] Despite the significance recreational fishing activities play in Maine's economy, the Commission found there is increasing evidence that the State's recreational salmonid fisheries no longer meet the expectations of many anglers. In addition, other New England states and Canada are heavily competing for the attention of these anglers and may be drawing anglers away from the State.[4] The Commission found that Maine's fish production facilities form the backbone of the sport fishing industry in Maine and if Maine hopes to successfully compete on a national and international level for angler dollars, these facilities must be upgraded and maintained to produce significantly more salmonid fish. Maine's nine State-owned fish production facilities, in total, have been in

[1] The Department contracted with FishPro on April 13, 2001 to conduct a comprehensive engineering study of the State's fish production facilities including effluent issues and to work with and provide technical support to the Commission.

[2] These reports are available for review at the Maine State Law Library in the State House in Augusta, Maine.

[3] Michael Teisl and Kevin J. Boyle. Economic impact of hunting and inland fishing and wildlife-associated recreation in Maine. Rep #479, Maine Agricultural and Forestry Experiment Station, University of Maine, Orono. November 1998.

[4] See Appendix A for fishing license sales data provided by the Department showing static fishing license sales over the past 8 years.

operation for the equivalent of 500 production years and have an average age of 58 years.[5] Over the past 40 years, these facilities have produced nearly 60 million fish that were stocked in over 700 lakes and 100 streams statewide. In its 2000 interim report, the Commission also found that while some upgrades to these facilities have been implemented since the first facility was constructed in 1857 (Grand Lake Stream), inadequate funding has kept maintenance and enhancement projects well below desirable levels.[6] Because many components of the fish production facilities are reaching the end of their useful service life, nearly all of the State's aging facilities require significant capital improvements just to meet effluent license requirements and maintain current fish production levels. The passage of the November 2002, $7 million bond referendum (Private & Special Law 2001, chapter 35) for renovations and upgrades to the State's fish production facilities, will be a first step towards achieving critical capital improvements and improving Maine's recreational salmonid fisheries.

In its 2001 interim report, the Commission found that opportunities for significantly increasing the stocking of salmonid fish are present throughout the State and proposed that the Department increase salmonid production over the next 15 to 20 years to approximately 865,000 pounds per year, including the development of a trophy fish program to provide anglers with more opportunities for catching trophy size fish. However, based on FishPro's cost estimates for implementing the proposed increase, the Commission has revised that recommendation to exclude the trophy fish program.

In addition to addressing the maintenance and upgrade of Maine's fish production facilities, the Commission worked closely with DEP, the Department and FishPro to identify problem areas regarding effluent discharges at the facilities and to develop recommendations to ensure that these facilities comply with discharge license standards within three years. The Commission concluded that a significant portion of the $7 million bond money should go towards upgrading the effluent treatment systems of fish production facilities identified by DEP as having receiving waters[7] in non-attainment while the remainder of those funds should be used to enhance production at the Embden facility. These upgrades and enhancements will allow fish production facilities to simultaneously address current discharge licenses issues and increase fish production levels.

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[5] Data provided in the Commission's 2000 interim report. Maine's nine fish production facilities are Casco, Dry Mills, Embden, Enfield, Governor Hill, Grand Lake Stream, Palermo, Philips and New Gloucester. A map showing the location of these facilities is attached as Appendix B. A tenth facility located at Deblois was closed in the early 1980's for financial reasons and was subsequently placed under a long-term lease to a private aquaculture firm for the production of Atlantic salmon smolts. That leased will expire in 2004 and the Department, at the recommendation of the Commission, is actively seeking a buyer for this facility.

[6] The Adopt-a-Hatchery Program was established to help alleviate chronic funding shortages facing the State's fish production facilities. While the generous efforts of adoptees under this program have provided much needed funding, this program is not designed to provide the financial resources needed to implement large-scale capital improvements recommended in this report.

[7] For this report, "receiving waters," means water bodies that wastewater is discharged into by fish production facilities.

It is particularly important to note that although recreational fishing activities in Maine generate nearly $300 million in statewide economic benefits, the facilities themselves operate on an annual budget that is directly related to the revenues generated from the sale of resident and nonresident fishing licenses.[8] To the extent that the fish production facilities support such a broad based economic benefits to the State, the Commission feels that it is appropriate to consider broader based revenue sources to fund the needed improvements at those facilities.

The Commission presents the following unanimous and majority findings and recommendations.[9]

Unanimous Finding #1 The Commission unanimously finds, based on data provided by the Department and by FishPro in its 2002 Final Comprehensive Statewide Fish Hatchery System Engineering Study, ("FishPro Study Report"),[10] that the facility resources needed to establish a trophy fish program with production levels recommended by the Commission in its December 2001 interim report are extensive and not economically feasible.

- **Unanimous Recommendation** The Commission unanimously recommends that the Department should not establish a trophy fish program and should continue to use retired brood stock as a source for stocking trophy size fish. The Commission further recommends that a portion of the fish poundage allotted for trophy fish in its December 2001 interim report, be reallocated to increase two-year-old and spring yearling production for brook trout, landlocked salmon and rainbow trout as indicated in Table I attached as Appendix C of this report.

Unanimous Finding #2: The Commission unanimously finds that the Commission's proposed increase in fish production as stated in its 2001 interim report should be

[8] Although the revenues from fishing licenses are not technically "dedicated" for fish production facilities, Article 9, section 22 of the Maine Constitution requires that the Department revenue annual appropriations that are at least equal to the revenues collected by the Department during a fiscal year.

[9] Members present and voting on these findings and recommendations on October 23, 2002 were Senator Woodcock, Senator Martin, Honorable Leo Kieffer, Representative Bryant, Representative Honey, Harold Brown, Ken Elowe (DIFW), Bill Gilzinis (Trout Unlimited), Richard Neal, Gary Picard (private hatchery), Urban Pierce (private hatchery), George Smith (Sportsman Alliance of Maine), Steve Wilson (DIFW). Representative Mathews was present and voted on Findings and Recommendations 8 and 11. Evelyn Sawyer (private hatchery) was present and voted on Findings and Recommendations 1-7, 9 and10. Richard Solman (private hatchery) was not present and did not vote on the Findings and Recommendations.

[10] A copy of this report is available for review at the Maine State Law Library in the State House in Augusta, Maine

modified to incorporate Finding #1 and to incorporate corrected weight estimates for various age classes of fish as indicated in Appendix C, Table 1 of this report.[11]

- **Unanimous Recommendation:** The Commission unanimously recommends that its 2001 proposed increase in total fish production of 865,748 pounds/year be adjusted to as shown in Appendix C, Table 1 to 865,077 pounds/year. The Commission further unanimously recommends that the Department review its present state-wide distribution of stocked fish and adjust fish allocations within the State to better reflect the amount of appropriate coldwater habitat. The Department's fish allocation adjustments should not include stocking fish over wild salmonid populations in waters not previously stocked.

Unanimous Finding #3: The Commission unanimously finds, based on reports from the Department and the results of the 1999 Open Water Survey[12], that brook trout, landlocked salmon and rainbow trout are species most heavily sought after by anglers and are species that have the most potential for expanding stocking opportunities in waters stocked by the Department. The Commission further unanimously finds that splake and whitefish are not heavily sought after by most anglers.

- **Unanimous recommendation:** The Commission unanimously recommends that the species mix for the 865,077 pounds in total fish production include 700,609 pounds of brook trout, 16,457 pounds of landlocked salmon, 60,125 pounds of rainbow trout, 77,622 pounds of brown trout, and 4,664 pounds of lake trout as shown in Table 1 and Figure 2 attached as Appendix C of this report. The Commission also unanimously recommends that brown trout production not be increased from current levels.

- **Majority recommendation:** The Commission unanimously agrees that current splake production should be dramatically reduced, however, a majority of Commission members (9) recommended that existing splake production be reduced from 2000 levels of 9,517 pounds/year to 5,600 pounds/year while a minority of the Commission recommended the complete removal of the splake stocking program.

Unanimous Finding #4: The Commission unanimously finds that a new fish production facility will be needed to meet the Commission's fish production goals.

- **Unanimous Recommendation:** The Commission unanimously recommends that the Department seek funds from the legislature or other sources, to acquire or construct a new fish production facility in the State. The Commission further

[11] Because FishPro's Study Report was not finalized before this report was printed, weight estimates used for this report may vary slightly from those reported in FishPro's published Study Report.
[12] A brief summary of the 1999 open water fishing survey is attached as Appendix D.

recommends that the Department look at the acquisition or construction of a limited-discharge fish production facility.[13]

Unanimous finding #5: The Commission finds based on data provided by the Department and data in the FishPro Study Report, that operating and maintenance costs associated with fish production facilities will increase as a result of implementing the Commission's increased fish production goals and that additional funding to cover these costs is essential to maintaining the facilities production capabilities.

- **Unanimous recommendation:** The Commission recommends that the Department and the joint standing committee of jurisdiction over fish and wildlife matters seek funding sources to support additional operating and maintenance cost associated with the increase in fish production needed to restore Maine's salmonid fisheries.

Unanimous Finding # 6: The Commission finds, based on review of data provided in the FishPro Study Report, that current wastewater discharge permit levels for fish production facilities in Maine mandates excessive compliance costs to these facilities.

- **Unanimous recommendation:** The Commission recommends that the Department and DEP review the wastewater discharge permit levels of fish production facilities located within the State every two years in order to reduce compliance costs by identifying cost reducing alternatives for effluent treatment.

Unanimous Finding #7: The Commission finds that its recommended fish production goals must be implemented as expeditiously as possible to address angler's perception that Maine's recreational salmonid fisheries are in decline. The Commission further finds based on data provided in Figure II-6 (Project Implementation Timeline for $7.0 Million Bond Bill Projects) and Figure II-7 (10-year Full Project Implementation Timeline and Plan) of the FishPro Study Report, that with adequate funding, the implementation of the Commission's fish production goals can be completed within ten years. [14]

- **Unanimous recommendation:** The Commission recommends that upgrades to fish production facilities as provided in Table II-14[15] of the FishPro Study Report be completed prior to November 2005 as shown on Figure II-6. The Commission further recommends that as additional funds become available, the implementation of facility upgrades and the acquisition or construction of a new fish production facility as described in the FishPro Study Report and shown in Table II-14 and Figure II-7, be completed within 10 years in order to expeditiously increase license

[13] A "limited –discharge" facility means a facility that is nearly self contained and discharges low volumes of effluent.
[14] Figure II-6 and Figure II-7 from FishPro's Study Report are attached as Appendix E and F respectively.
[15] Table II-14 from FishPro's Study Report is attached as Appendix G.

sales and boost Maine's sagging economy. While the Commission recommends the Department begin the process of obtaining a new facility after the implementation of upgrades shown on Table II-4, the Department should not supplant efforts to increase fish production through other measures including the continued upgrade of existing facilities.

Unanimous Finding #8: The Commission strongly agrees that it is critical to Maine's recreational salmonid fisheries and to Maine's economy that the Commission's recommendations are attained in the timeframe provided in Figure II-7 of the FishPro Study Report. The Commission finds that a qualified group authorized by the legislature to provide oversight to the Department during the initial implementation of the Commission's recommendations is necessary to address unexpected circumstances and avoid costly delays. The Commission further finds that it is uniquely qualified to provide this oversight function.

- **Unanimous recommendation:** The Commission recommends that the Commission be reestablished for two years and its 2002 membership be reinstated to provide oversight and guidance to the Department during the initial implementation of the Commission's recommendations.

Majority Finding #9: (10 in favor, 3 opposed and 2 abstained) A majority of the Commission finds based on data provided in DEP's September 12, 2002 report ("DEP [16] and data provided in the FishPro Study Report, that the Casco, Embden, Enfield and Palermo facilities will require immediate upgrades to existing effluent treatment systems to help these facilities' conform to the requirements of their current discharge licenses. A majority of the Commission further finds that wastewater improvements and "low-cost" methods, including application of best management practices of effluent treatment as identified by DEP, DIFW and FishPro, are necessary to help those facilities comply with license requirements. Additionally, a majority of the Commission finds that implementing dissolved oxygen improvements at many of the fish production facilities will both improve effluent water quality and allow for some increase in fish production consistent with current discharge license requirements.

- **Majority recommendation:** (10 in favor, 3 opposed and 2 abstained) A majority of the Commission recommends that the Department upgrade the wastewater discharge systems at Casco, Embden, Enfield and Palermo in accordance with the purposes of the effluent improvements provided in the Table II-14 of the FishPro Study Report. Additionally, a majority of the Commission recommends that dissolved oxygen management improvements be implemented at the Casco, Dry Mills, Embden, Enfield, Governor Hill, and Palermo as shown in Table II-14 of the FishPro Study Report.

[16] DEP's September 12, 2002 report is attached as Appendix H.

Majority Finding #10: (10 in favor, 2 opposed and 3 abstaining) A majority of the Commission finds that funding from the November 2002, $7 million bond referendum is sufficient to implement the recommendations under Finding #9 as reflected in Table II-14 of the FishPro Study Report.

- **Majority Recommendation:** (10 in favor, 2 opposed and 3 abstaining) The Commission recommends that funds from the $7 million bond be used to implement the recommendation under Finding #9 as provided in Table II-14 of the FishPro Study Report or should circumstances require, allocate those funds as needed to achieve the purposes reflected in that table.

Majority Finding #11: (14 in favor and 1 opposed) A majority of the Commission finds, based on data presented in the FishPro Study Report and in particular survey results presented in that report, that privatization of fish production could be an important component in meeting the Commission's fish production goals.

- **Majority Recommendation:** (14 in favor and 1 opposed) A majority of the Commission recommends that the Department seek contracts with private fish production facilities to supply egg, fry or fish needed to achieve the Commission's fish production goals that cannot be produced by State-owned facilities.

Establishment and Duties

The Commission was created by Resolves of 1999, chapter 82 and extended by Public Law of 2001, chapter 462.[17] As enacted, Resolves of 1999, chapter 82, created a 13 member Commission to study the salmonid fish culture facilities in Maine. Public Law 2001, chapter 462 increased the Commission's membership to 16.[18] Additionally, Public Law 2001, chapter 462 directed the Commission to set production goals for the number, size and species mix of recreational sport fish to be stocked within the State over the next 15 to 20 year planning horizon. Public Law 2001, chapter 462 also required the Commission to make recommendations on how to meet the State's future sport fish production and management needs in the most cost-effective manner that may include upgrades to existing facilities, closure of non-economic facilities, building new facilities or the purchasing of fish from privately owned fish production facilities. Finally, Public Law 2001, chapter 462 established a non-lapsing fish hatchery maintenance fund, a non-lapsing fund, in the Department to be used by the commissioner to fund engineering designs for the Embden Hatchery and for the maintenance, repair and capital improvements of other fish hatcheries and feeding stations owned by the State.[19]

Study process and prior findings and recommendations

The Commission met 15 times over a four-year period starting September 28, 1999 and ending on October 23, 2002.[20] The Commission held its first six meetings between September 28, 1999 and December 5, 2000. During those meetings the Commission undertook a comprehensive review of the current condition of the fish production facilities and the current levels and type of fish production at those facilities. In conducting that review, the Commission organized itself into three subcommittees focusing on discharge issues, fish management issues and oversight of FishPro. Those subcommittees each held several meetings to discuss topics related to their area of inquiry. During its first six meetings, the Commission and its subcommittees completed the following substantive tasks:

[17] Enacted during the 1st Regular Session of the 119th Legislature with an effective date of June 17, 1999. Resolves of 1999, c. 82, is derived from LD 986, Resolve, Establishing a Commission to Study the Feasibility of Reestablishing a Brook Trout and Landlocked Salmon Hatchery in Northern Maine, sponsored by Senator Kieffer of Aroostook. A copy of the Resolve, chapter 82 and Public Law 462 are attached as Appendix I.

[18] A list of Commission members is attached as Appendix J.

[19] The 119th Legislature appropriated $500,000 to the Department of Inland Fisheries and Wildlife under Part HHH-1 of Public Laws of 1999, chapter 731, and Public Law 462 placed unexpended funds appropriated by the 119th Legislature into the fish hatchery maintenance fund.

[20] In Brewer on 9/28/99, in Skowhegan on 10/15/99, in Augusta on 2/16/00, 3/8/00, 6/19/00,12/5/00, 6/20/01, 7/20/01, 8/1/01, 10/ 6/01, 10/26/01, 1/16/02, 3/27/02, 9/16/02, 10/23/02.

1). Worked with the Department, DEP, private fish hatchery owners and members of the public during the development and final issuance of waste discharge licenses for the nine state-owned fish hatcheries.[21] The Commission worked with those agencies for over a year to obtain those licenses. Prior to the issuance of these licenses in July 2000, the fish production facilities were operating under licenses last issued in 1983;

2). The Commission in conjunction with the Department and FishPro completed a thorough preliminary strategic fish production facility planning and engineering study which characterizes and documents the condition of those facilities and identifies the needs at each facility as well as possible improvements. FishPro also completed a thorough review of the effluent discharge standards contained in the discharge licenses and identified compliance issues and provided guidance to the Commission with respect to what cost effective wastewater treatment options that are available to the State to meet those effluent discharge standards within the three year compliance window; and

3). Began work to determine the future sport fish management needs and to assess how those needs will be met in the most cost effective manner.

In its December 2000 interim report, the Commission made the following findings and recommendations:

Finding 1. That legislative policy guidance to the Department is essential over the next two years to establish long term fish production and distribution goals, ensure a high quality and economically viable recreational sport fishery in the state and provide for reliable, efficient and cost effective fish production systems.

Recommendation. Reauthorize the Commission for an additional two years to complete its assigned tasks and to accomplish the following tasks:

- Continue to work with the Department and FishPro in evaluating the effluent characteristics of fish hatcheries, including private fish hatcheries, with the purpose of ensuring that the State fish hatcheries will be able to comply with licensed effluent discharge standards within three years and to obtain information relevant to discussions of discharge license standards for unlicensed private fish hatcheries;

- Set statewide production goals for the number, size and species mix of recreational sport fish over a 10 to 20 year planning horizon. Although Commission as a whole has not made a recommendation on production goals, some members of the Commission feel that a reasonable goal would be to

[21] Final discharge licenses were issued by DEP on July 25, 2000.

increase annual production by 5 million fish in the next 10 years with an additional 3 million fish in the following 5 years; and

- Determine how to meet those production goals in the most cost effective manner by evaluating all production options, including investing in cost effective upgrades to existing state owned facilities to produce more fish, closing non-economic state owned facilities, purchasing fish from privately owned hatcheries and building new capacity in other locations. The assessment of other locations will include a statewide search for new locations that meet specific requirements.

Finding 2. The 119th Legislature appropriated $500,000 to the Department for engineering analysis and assessment of state owned fish hatcheries in Part HHHH-1 of Public Laws of 1999, chapter 731.

Recommendation. Unexpended balances appropriated to the Department under Part HHH-1 of Public Laws of 1999, chapter 731 should be allowed to carry forward into Fiscal Year 2002.

Public Law 2001, chapter 426, reauthorized the Commission for an additional two years. The Commission held five meetings between June 20, 2001 and October 26, 2001.[22] Over this time period, the Commission undertook a comprehensive review of the Department's current stocking efforts and identified potential needs for new and enhanced stocking of salmonids within the State. In conducting that review, the Commission invited Department regional biologists representing each of the State's seven regions to provide the Commission with detailed information about the region's stocking program and to identify any future stocking opportunities. Reports provided by regional biologists are attached to the Commission's 2001 interim report. As a result of this review, the Department provided the Commission with a report establishing baseline numbers for increased stocking of salmonids in each region.

The Commission, after a thorough review and analysis of the data provided by the Department, directed FishPro to provide the Commission with cost estimates for increasing the State's fish production from its current level of nearly 260,000 pounds of fish per year to nearly 866,000 pounds of fish per year phased in over the next 15 to 20 years.[23] Cost estimates were to include options for the upgrade of existing facilities, acquisition or construction of a new facility and the privatization of fish production in whole or in part. Detailed analysis of increased production options and costs can be found in the FishPro Study Report.

[22] Public Law 462 authorized the Commission to meet a total of four times per year for two years, however, the Commission requested and received permission from the presiding officers to hold a fifth meeting in 2001.

[23] One member of the Commission supported an increase in fish production of approximately 1.1 million pounds of fish per year.

During these five meetings, the Commission completed the following substantive tasks:

1) Established a six member subcommittee to study the possibility of constructing a new fish hatchery to meet fish stocking needs.[24] The subcommittee under the policy supervision of the Commission, worked with the Department and FishPro to identify potential new fish production facility locations.[25] The subcommittee identified 3 localities that met baseline requirements for citing a new fish hatchery and the Department and FishPro have made initial site visits to all three locations.[26]

2) Monitored the progress of the Department, FishPro, and the DEP in finding a long-term solution to effluent issues facing the State's fish hatcheries.

3) Endorsed the Department's and FishPro's recommendation that the Department purchase nine composite water samplers to improve effluent sampling at the State's fish production facilities. The Department currently has the samplers in use.

In its December 2001 interim report, the Commission made the following findings and recommendations:

Finding 1:. That salmonid recreational fishing in Maine is generally not meeting the expectations of Maine anglers and that increased stocking in all regions of the State is needed to meet angler expectations and to maintain Maine's national status as a salmonid-sport-fishing vacation destination.

Recommendation. Pending the completion of the cost estimates, the Department should increase its salmonid production from nearly 260,000 pounds of fish per year to 865,748 pounds of fish per year over the next 10 to 15 years.

Finding 2: Anglers strongly desire the opportunity to fish in waters that contain trophy size fish.

Recommendation. The Department develop a trophy fish stocking program that will allow the Department to include trophy size fish each time it stocks a particular body of water. The Department should strive to ensure that at least 1% of each stocking event is comprised of trophy size fish.

Finding 3: The Deblois Fish Hatchery is not economically viable as a state owned fish hatchery.

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[24] Subcommittee members are Senator Leo Kieffer, Representative Bruce Bryant, Gary Picard, Steve Wilson, Bill Gilzinus and Urban Pierce.
[25] The Commission solicited public input from numerous interested groups and received 4 responses.
[26] A locality near Washburn was visited on October 25, 2001 and localities near the Saco River and Rumford Point in Androscoggin County were visited on October 27, 2001.

Recommendation. The Commission recommends that the Deblois fish production facility be sold with proceeds going into the fish hatchery maintenance fund.

The Commission held its final four meetings between January 30, 2002 and October 23, 2002.[27] During that time frame the Commission continued to work with the Department and FishPro to establish the feasibility and cost implications for the Commission's 2001 recommendations. In FishPro's Draft Final Supplement of August 2002, FishPro stated that increases in production in the range of 25% to 850% of present Department levels are theoretically possible if infrastructure improvements identified by FishPro and presented in the FishPro Study Report in Table II-2 through Table II-12 were implemented. Those improvements included upgrades to all nine facilities, the acquisition or construction of a new facility and limited purchase of fish from commercial producers[28] at an estimated cost of $42 million over the next 22 years.[29]

On October 12, 2002, the Commission met with DEP to review and discuss DEP's September 12, 2002 report on its evaluation of the State's fish production facilities. After a lengthy briefing by DEP followed by an intense discussion among all parties at the meeting, the Commission directed FishPro to modify its cost estimates and timelines to reflect those discussions.[30]

Background on fish production in Maine

Since the late 19th century, Maine has been actively involved in the management of fisheries in its thousands of lakes, ponds, rivers, and streams. These efforts have focused on the protection of native self-sustaining populations, as well as the establishment and maintenance of other non-native species throughout the state. Large and smallmouth bass, for example, were introduced to the waters throughout the southern half of the state and today represent a major self-sustaining sport fishery. Other species, such as landlocked salmon, brook trout, brown trout, lake trout and splake, are currently raised in State-owned hatcheries and stocked in over 700 waters throughout the state. Species such as bass, pickerel, perch and other

[27] Meetings were held in Augusta on 1/30/02, 3/27/02, 9/13/02 and 10/23/02.

[28] FishPro conducted a survey of private aquaculture facilities to determine the interest and capability of those facilities to meet the State's fish production needs. Based on survey responses, FishPro reported that private facilities could contribute 8.9% of the number and 6.5% of the pounds of species currently produced by the Department. A copy of the survey and a more detailed analysis of the privatization option can be found in FishPro's Final Report.

[29] In that report FishPro stated that the proposed trophy fish program would not be feasible because it would require the holding of 3 to 4 concurrent year classes of fish at a trout biomass of over 500,000 pounds per year. To accommodate the proposed trophy program would require a large investment of facility space and resources making the trophy program excessively costly. FishPro also noted that no other state currently produces trophy fish in quantities proposed by the Commission

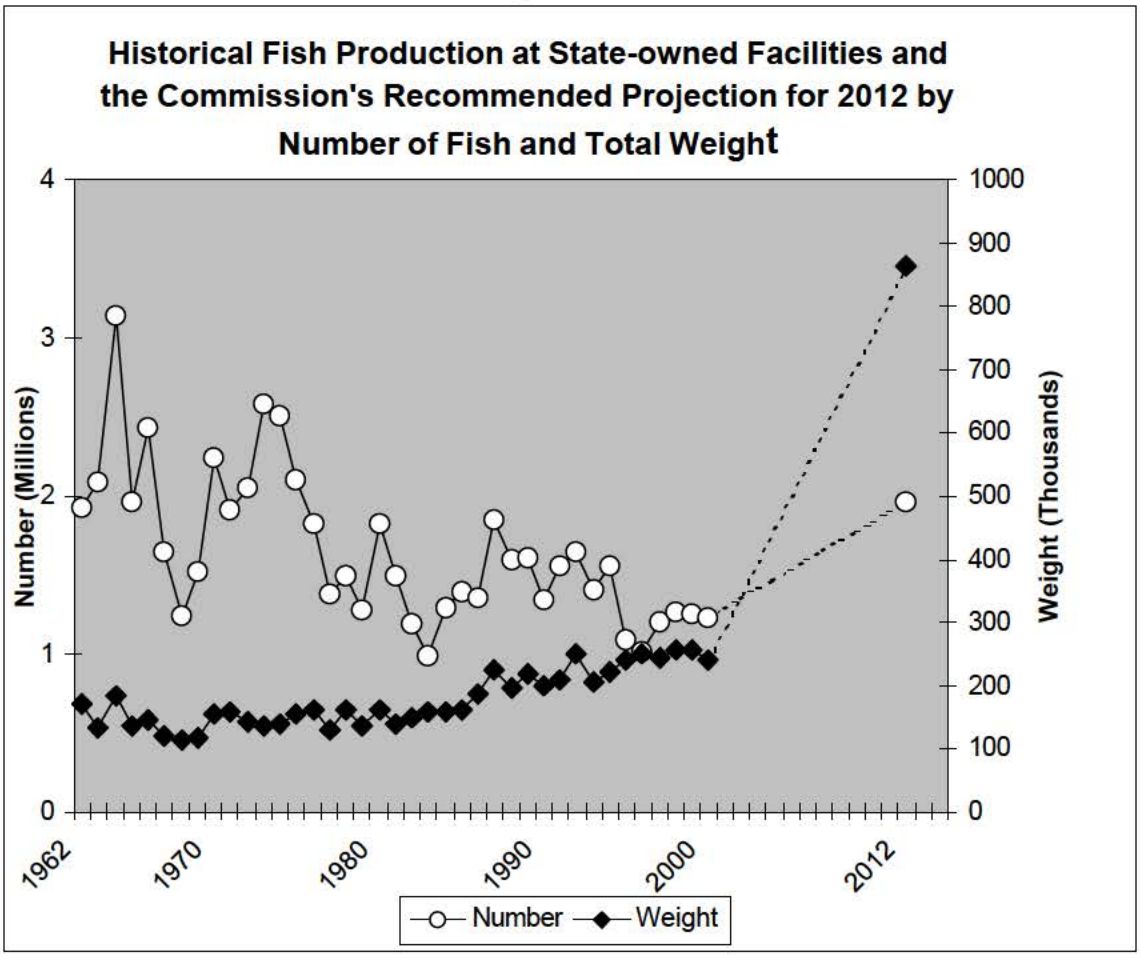
[30] See DEP's September 12, 2002 report, FishPro's Study Report and the section in this report dealing with effluent issues for additional information.

"warm water" species are perpetuated by natural reproduction, so no stocking program for these species is considered necessary.

The production of fish from State-owned facilities play a vital role in the maintenance of the salmonid angling opportunities that are highly valued by Maine anglers and thousands of others who visit our State to enjoy its outdoor heritage. According to the Department, over 60 percent of the state's landlocked salmon waters have inadequate spawning habitat and are maintained by stocking. For example, only about four natural populations of landlocked salmon existed historically within the state. Now there are over 200 lake salmon fisheries statewide.

In recent years, greater reliance has been placed on size, health, and genetic makeup of the Department's fish stock to maximize survival in the wild. Although the number of fish stocked has been declining over the years, the size of fish stocked has been steadily increasing. As shown in Figure 1, the overall average weight of fish raised in Maine's fish production facilities has increased approximately 41% since 1962 and is currently at the greatest average weight ever produced by the State. With the implementation of the Commission's recommendations, the weight of fish produced by the Department will increase 409% from 1962 levels by 2012. Interestingly, the number of fish produced over this same period of time will increase only by 2%.

Figure 1



Dotted line represents increase in fish production over the next 10 years expected to result from the implementation of the Commission's recommendations.

Aging fish production infrastructure

The nine facilities currently operated by the State were initially constructed between 1857 (Grand Lake Stream) and 1958 (Enfield). In total, these nine hatcheries have been operation for the overall equivalent of 500 production years and have an average age of 58 years. According to the Department's consultant, many components of those facilities are reaching the end of their useful service life.

In 1987, the Department assessed the status of these facilities in a comprehensive manner, and updated a plan to address a variety of maintenance needs. Although some of these needs have been addressed since that time, inadequate funds have kept maintenance and enhancement projects at less then desired levels. Raceway renovations were completed at several facilities (Grand Lake Stream, Palermo, Governor Hill, and Dry Mills), and production increased at

Dry Mills by increasing water supplies and reclaiming previously unused raceways. Recent renovations to the water supply dam, construction of a new hatchery facility, and development of underground well water supplies have greatly enhanced the operation of the New Gloucester facility. At Governor Hill, new sources of well water have been located that will allow a significant expansion in both brood rearing and fry production, while also allowing for a modest increase in fish for stocking. In addition, voluntary assistance from some or the larger paper companies, through an "Adopt-A-Hatchery" program, is providing technical support and assistance needed to address many ongoing maintenance needs at each facility. All of the nine facilities have been adopted and will be benefiting from significant corporate/employee contributions resulting in major improvements. The Department is also committing significant resources (up to $250,000 annually over the next few years) to support this effort.

During the 1990's, considerable effort was spent on two initiatives to fund improvements at state hatcheries. The first attempt was in 1994 when the Legislature approved a $10 million bond referendum that, if passed by the voters, would have funded improvements and expansions of state fish hatcheries.[31] That referendum failed to receive a majority vote in the general election of November 1994.[32] A second fish hatchery bond issue for $5 million was contemplated two years later in 1996. At that time, the Department's proposal was to use funds from a bond issue to incorporate new fish rearing technology into the existing facilities, expand and protect their water supplies and upgrade effluent treatment facilities to meet new discharge requirements associated with expanded production. That proposal was withdrawn before going before the voters; however, because of the lack of a detailed long-range plan upon which the use of such funds could be based.

In November 2002, voters passed a $24.1million bond package referendum that included $7 million to make renovations and enhance wastewater treatment at the Department's fish production facilities. That bond money will be provided to the department in periodic allotments, as needed to carryout the purposes of the bond.

Effluent issues at fish production facilities

The primary sources of waste matter in discharge waters from fish production facilities are unconsumed feed and the by-products or wastes produced by fish. The amount of waste produced by a fish depends on the mass of the fish and the amount of food utilized by the fish. Therefore, the water quality impacts are in direct proportion to the amount of fish food introduced into the system. Detailed analysis of fish production effluents are presented in the Fish Hatchery Effluent Study, FishPro, November 2000,[33] and in the FishPro Study Report.

[31] Private and Special 993, chapter 90 (LD 1756).
[32] That referendum was supported by 238,092 voters (48.9%) and rejected by 249,142 voters (51.1%).
[33] A copy of this report is available for review at the Maine State Law Library in the State House in Augusta, Maine

Maine has had a water classification system since the 1950's. This classification system establishes water quality goals for the State and is used to direct the State in the management of its surface waters, protect the quality of those waters for their intended management purposes, and where standards are not achieved, direct the State to enhance the quality to achieve those purposes. The classification standards establish designated uses, related characteristics of those uses, and criteria necessary to protect the uses, and specific conditions for certain activities such as the discharge of wastewater.

All surface waters in Maine have been classified by the legislature and once a classification assignment is made, and the uses and criteria are achieved, that achievement is protected by the antidegradation provisions of the water quality statute (36 MRSA § 464(4)(F)). Thus, the law provides a mechanism for the State to continually move forward in the improvement and protection of water quality. While downgrades to classification have been made, it is infrequent and is limited to situations where existing conditions do not afford the possibility to achieve the higher class.

The State has four classes for freshwater rivers, three classes for marine and estuarine waters, and one class for lakes and ponds. DEP views the classification systems as more representative of a hierarchy of risk rather than an indicator of water use or quality. The risk to the water body is the possibility of a breakdown of the ecosystem and loss of use due to either natural or human-caused events. Classes AA, GPA and SA involve little risk since activities such as waste discharge and impoundment are prohibited in these waters. Class A waters allow impoundments and very restricted discharges, so the risk of degradation while quite small, does increase since there is some small human intervention in the maintenance of the ecosystem. Classes B and SB have fewer restrictions on activities but still maintain high water quality criteria. Finally, Classes C and SC have the least restrictions on use and lower water quality criteria. Classes C and SC waters are still good quality, but the margin for error before significant degradation might occur in these waters in the event of an additional stress being introduced (such as a spill or a drought) is the least.

The reclassification of waters of the State is governed by 38 MRSA §§ 464(2), 464(2-A) and 464(3). This statute requires DEP to conduct water quality studies, and the Board of Environmental Protection to hold hearings and propose changes to the water classification system to the Legislature for final approval. This is to be conducted from time to time, but at least every three years. The last reclassification resulted in changes enacted in 1999 and a classification review may be done in 2003.

Three of the state-owned fish production facilities' receiving waters are Class A waters and six are Class B waters. DEP is mandated with ensuring that facility discharges do not cause non-attainment of these receiving waters classification. In assessing the attainment status of receiving waters, DEP conducts monitoring and observations to determine the condition of those criteria.

On July 25, 2000, DEP issued 5-year waste discharge licenses to the nine state-owned fish production facilities. The licenses established technology based and receiving water quality based discharge limits and monitoring requirements for biological oxygen demands, total suspended sediment and total phosphorous. Those licenses impose monthly and yearly effluent limits on phosphorus, suspended solids and dissolved oxygen, although each of the licenses includes a provision allowing the facilities three years to comply with the effluent limits. At the request of the Commission, the Department contracted with FishPro to conduct an effluent study of those fish production facilities to determine how the discharge characteristics compared to the effluent limits in the discharge licenses, whether or not compliance was achievable within the 3 year compliance window and, if compliance could not be guaranteed, what effluent treatment options were available to the hatcheries that would allow them to meet their discharge limits when those limits take effect in 2003. That analysis was completed in December 2000 and presented to the Commission on December 5, 2000. [34]

FishPro's analysis indicated that five of the fish production facilities were in compliance with all their numeric effluent limits in the discharge licenses. Those facilities are Casco, Embden, Grand Lake Stream and New Gloucester. Effluent from three other hatcheries, Dry Mills, Governor Hill and Phillips, may not have met the license limits for phosphorus and dissolved oxygen at the time of the FishPro's analysis, and were potentially at risk of being in noncompliance with their discharge license in 2003 unless some steps were taken to further treat the effluent from those facilities. It was unclear if the Palermo facility was meeting its phosphorus limits at the time FishPro conducted its analysis because of technical concerns about how the phosphorus license limit was initially calculated for this facility.

As a result of this analysis, the Commission endorsed recommendations by FishPro, and the Department to meet with the DEP to discuss the discharge license to address the Palermo phosphorus limit and the limits applicable to rearing unit cleaning. The Commission also encouraged the Department to undertake immediate measures to implement improved solids recovery and management of existing treatment basins at the three fish production facilities that may have been operating above limits established in their discharge permits. Additionally, the Commission encouraged the Department to give a high priority to improvements of solids collection and disposal systems at facilities with solids recovery systems and to evaluate the costs of constructing effluent treatment systems at those fish production facilities without solids recovery systems. Furthermore, the Commission recommended that the Department purchase nine composite water samplers to monitor effluent levels at the State's nine fish production facilities. As of the date of this report, the Department in conjunction with FishPro and DEP has implemented or begun to implement these recommendations.

In 2002, DEP analyzed the condition of the receiving waters for the nine-state-owned fish production facilities and discharge data collected by the Department for these facilities to reevaluate the 2000 license limits. DEP conducted monitoring for aquatic macro-invertebrates

[34] A copy this report is available for review at the Maine State Law Library in the State House in Augusta, Maine.

in fish production facilities' receiving waters and made specific observations of conditions impacting class attainment such as the presence of certain types of fungus and algae[35].

In its 2002 report, DEP maintains that the effluent limits for biological oxygen demand, total suspended solids and phosphorous as set in 2000 for the State's fish production facilities permits are appropriate, except DEP agreed that the phosphorous limit for Palermo should be revised to make it less restrictive. DEP found that the receiving waters for Dry Mills, New Gloucester, Governor Hill and Phillips fish production facilities are currently meeting or exceeding their assigned classes for micro-invertebrates. DEP tentatively identified the receiving waters for Enfield and Grand Lake Stream fish production facilities as not meeting their assigned classifications for macro-invertebrates but stated that this may be due to adjacent lake effects on rock baskets used to sample aquatic insect faunas, and that the receiving water for these facilities may actually attain their classifications. DEP identified the receiving waters for Casco, Embden and Palermo as not meeting the classification for micro-invertebrates.

In its report to the Commission, DEP stressed that receiving waters currently in non-attainment of classification standards must be brought into attainment and that any facility expansion must produce better quality effluent than current effluent for any receiving water currently in non-attainment. In addition to compliance with current license limits, facility upgrades must address receiving water class attainment issues such as discharges into Class A waters,[36] dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts. DEP also recommended the Department exhaust any low cost options including best management practices, elimination of non-treated effluent discharges and regular cleaning of sediment basins to see how receiving waters respond before implementing larger scale upgrades to treatment systems.

As a result of DEP's report, the Commission directed FishPro to design wastewater effluent treatment recommendations that include best management practices to ensure the State's fish production facilities comply with discharge license requirements. As indicated in Table II-14 of the FishPro Study Report, Casco, Embden, Enfield and Palermo fish production facilities should be fitted with Tier I and Tier II wastewater treatment system improvements. Additionally, dissolved oxygen management should be implemented at all but three facilities which will help maintain dissolved oxygen levels and increase the ability of fish to metabolize feed more efficiently. Because discharge license compliance also includes factors such as

[35] DEP uses macro-invertebrates as indicators because changes to macro-invertebrate communities are typically caused by factors that are likely to affect the entire receiving water ecosystem. Excessive algae or fungus can also indicate elevated levels of certain pollutants.

[36] In order to protect Maine's Class A waters, 38 MRSA 465.2(C) states that new or expanded discharges into Class A waters are permitted only if, in addition to satisfying all the requirements of the article, the discharged effluent will be equal to or better than the existing water quality of the receiving water. This includes demonstrating that the proposed expansion is necessary and that there are no reasonable alternatives available.

insect community health, fungus and algae conditions, future effluent analysis by DEP may require additional upgrades to effluent treatment systems in order to attain class assignments.

APPENDIX A

Calendar Year Summary and Projections of Hunting and Fishing Licenses

	1992	1993	1994	1995	1996	1997	1998	1999	2000	*Actual* 2001
RESIDENT										
Fishing	117,188	115,146	107,673	106,207	107,895	108,511	111,452	112,929	111,809	108,242
Comb. Arch. & Fish.	288	387	471	505	499	544	554	558	537	532
Comb. Hunt. & Fish.	80,722	82,538	79,156	77,423	75,316	72,771	75,569	76,472	77,902	77,082
Serviceman Comb.	965	849	620	531	539	504	511	499	373	327
Serviceman Fish									172	203
Serviceman Hunt									160	172
Archery	10,488	11,668	13,508	11,731	11,128	10,689	10,029	9,976	9,792	9,541
Expanded Archery						1,399	2,495	4,909	5,249	5,185
Hunting	72,865	69,672	68,809	68,450	66,245	68,452	65,706	64,561	61,848	60,317
Junior Hunting	15,979	15,842	15,235	15,156	14,883	15,081	15,413	15,834	16,097	16,325
Small Game	833	901	807	960	892	878	864	898	828	857
Total Fishing	199,164	198,920	187,920	186,868	184,349	180,330	188,086	190,458	190,621	186,386
Total Hunting	182,141	181,855	178,708	174,758	171,502	170,318	171,141	173,707	172,628	170,338
NONRESIDENT										
Season Fishing	13,598	13,573	13,188	12,928	12,724	12,785	13,137	13,979	14,412	14,621
1-Day Fishing 3)	35,185	37,179	29,131	25,283	18,576	17,821	17,240	16,908	15,716	14,321
3-Day Fishing 3)	25,234	24,610	24,815	24,507	23,299	22,763	22,675	22,697	22,882	22,110
7-Day Fishing 5)	17,343	16,856	16,171	15,982	15,499	15,324	15,894	16,516	16,971	16,884
15-Day Fishing 5)	4,853	4,793	4,871	4,325	4,607	4,702	4,808	4,467	4,443	4,371
Junior Fishing	5,203	5,147	5,113	5,327	5,293	5,230	5,358	5,456	5,350	5,160
Comb. Hunt. & Fish.	2,949	2,698	2,814	2,778	2,624	2,652	2,741	3,026	3,341	3,545
Archery	1,016	1,134	1,122	1,124	1,199	1,139	1,044	997	1,099	1,115
Expanded Archery						44	61	135	151	159
Big Game	32,875	31,881	30,846	29,654	29,871	29,775	30,089	30,686	31,398	30,579
Small Game	2,515	2,724	2,578	2,078	1,870	1,845	1,602	1,775	1,895	2,051
3-Day Small Game	0	0	0	734	1,242	1,485	1,628	1,678	1,715	1,862
Junior Hunt	116	128	118	120	354	542	635	729	773	768
Total Fishing	104,365	105,054	98,103	91,118	82,622	81,257	81,849	83,048	83,117	81,012
Total Hunting	39,471	38,783	37,478	36,488	37,160	37,282	37,780	39,005	40,372	40,079
ALIEN										
Fishing	174	150	160	148	154	127	120	134	112	106
Comb. Hunt. & Fish.	51	40	43	43	33	39	29	33	30	19
Archery	58	49	52	30	17	18	8	15	12	11
Big Game	2,570	2,472	1,946	1,709	1,392	1,289	976	927	665	556
Small Game	98	123	94	103	79	75	58	65	79	52
Total Fishing	225	190	203	191	187	166	149	167	142	125
Total Hunting	2,775	2,684	2,135	1,895	1,521	1,421	1,071	1,040	988	838
NONRESIDENT & ALIEN SUBTOTAL										
Total Fishing	104,590	105,244	98,306	91,309	82,809	81,423	81,998	83,215	83,259	81,137
Total Hunting	42,246	41,467	39,613	38,373	38,681	38,703	38,851	40,045	41,358	40,717
GRAND TOTAL										
Total Fishing	303,754	304,164	284,226	277,975	267,158	261,753	270,084	273,673	273,880	267,523
Total Hunting	224,387	223,302	218,319	213,128	210,183	209,021	209,992	213,752	213,984	211,055

Exchanges added to category of final license and deleted from license returned

Calendar Year Summary and Projections of Hunting and Fishing Licenses

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
COMPLIMENTARY										
Over 70 (comb.) 1)	5,411	6,789	5,944	1,705	1,824	1,645	1,648	1,587	1,644	1,494
Over 70 (fish) 1)	2,868	3,369	3,124	1,448	1,319	1,247	1,244	1,211	1,273	1,254
Over 70 (hunt) 1)	25	18	20	21	22	17	17	30	17	28
Over 70 (hunt,fish,& arch.) 1)	0	302	277	48	39	52	54	62	81	65
Paraplegic (comb.) 2)	68	127	82	77	121	80	81	114	93	24
Paraplegic (fish) 2)	26	17	26	29	19	28	28	22	22	5
Paraplegic (hunt) 2)	0	3	3	1	3	4	3	2	4	1
Disabled Vet.(comb.) 2)	222	350	257	308	403	314	314	409	378	164
Disabled Vet. (fish) 2)	57	59	54	80	81	99	98	132	143	78
Blind (fish)	22	13	19	18	9	23	23	14	15	10
Mental Disability (fish) 2)	75	67	71	94	125	182	182	209	210	212
Indian (comb.)	1,998	1,995	2,001	1,934	1,973	1,920	1,902	1,724	1,903	1,750
Total Fishing	10,747	13,088	11,855	5,739	5,913	5,590	5,574	5,484	5,762	5,054
Total Hunting	7,724	9,584	8,584	4,092	4,385	4,032	4,019	3,928	4,120	3,526

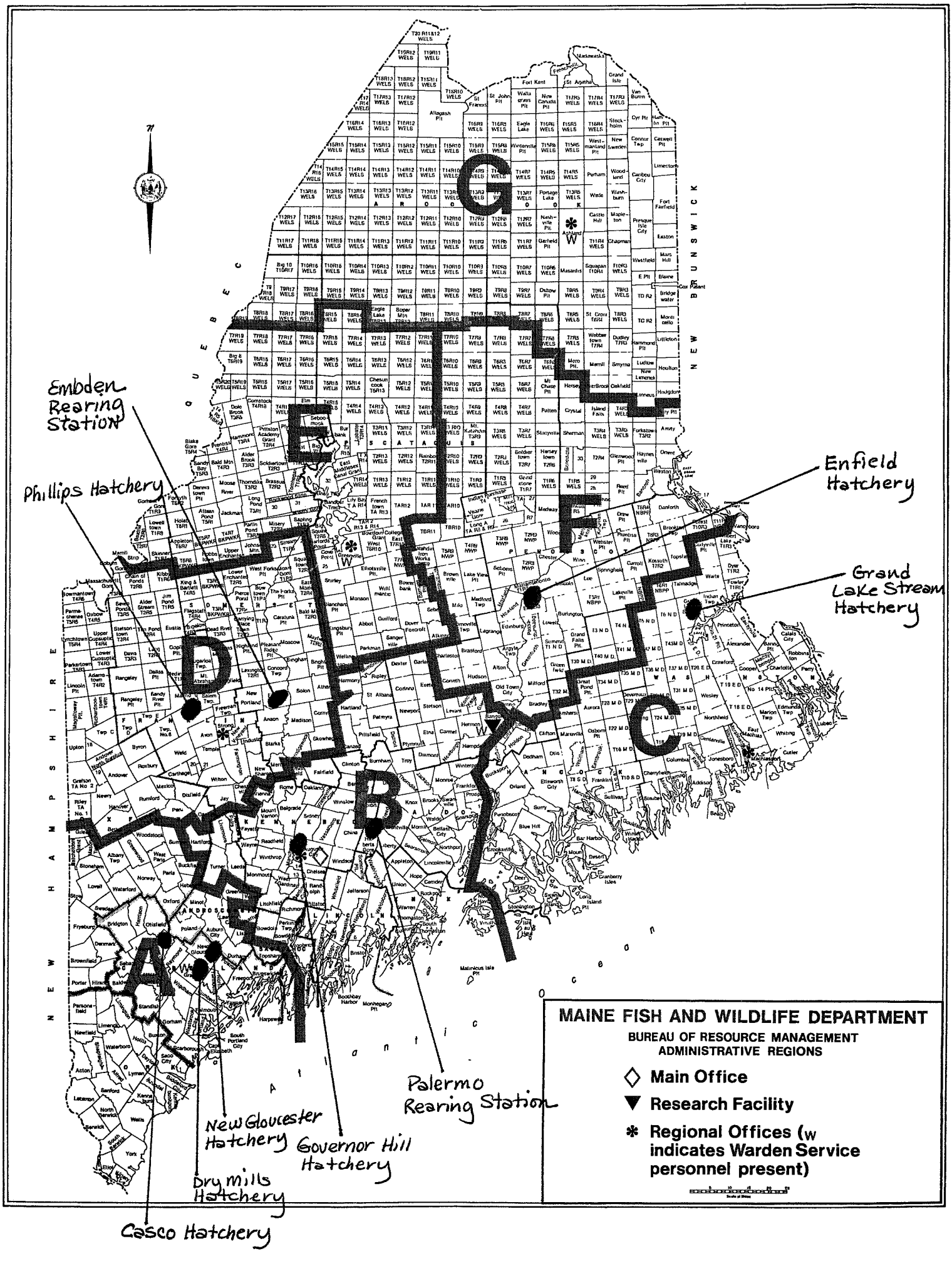
GRAND TOTAL (without complimentary) 6)										
Fishing	303,754	304,164	284,226	277,975	267,158	261,753	270,084	273,673	273,880	267,523
Hunting	224,387	223,302	218,319	213,129	210,183	209,021	209,992	213,752	213,984	211,055

GRAND TOTAL (with all compilmentary licenses issued in calendar year) 8)										
Fishing	314,501	317,252	296,081	283,714	273,071	267,343	275,658	279,157	279,642	272,577
Hunting	232,111	232,886	226,903	217,221	214,568	213,053	214,011	217,680	218,104	214,581

1) Good for 3 years through 1991, lifetime after
2) Good for 1 year through 1982, good for 3 years thereafter
3) May be purchased by resident, nonresident, and alien
4) Beginning in 1989, guide license does not allow hunting or fishing
5) May be purchased by nonresident and alien
6) Does not include any complimentary types - best annual trend of sales
7) Does not include the following complimentary types issued for more than one year :
   over 70, paraplegic, disabled vet., mental disability - best annual trend of users)
8) Includes all licenses issued in a year, even those for good for more than one year, including lifetime

Exchanges added to category of final license and deleted from license returned

APPENDIX B


Embden Rearing Station
Phillips Hatchery
Enfield Hatchery
Grand Lake Stream Hatchery
Palermo Rearing Station
New Gloucester Hatchery
Governor Hill Hatchery
Dry Mills Hatchery
Casco Hatchery
MAINE FISH AND WILDLIFE DEPARTMENT
BUREAU OF RESOURCE MANAGEMENT
ADMINISTRATIVE REGIONS
Main Office
Research Facility
Regional Offices (w indicates Warden Service personnel present)

APPENDIX C

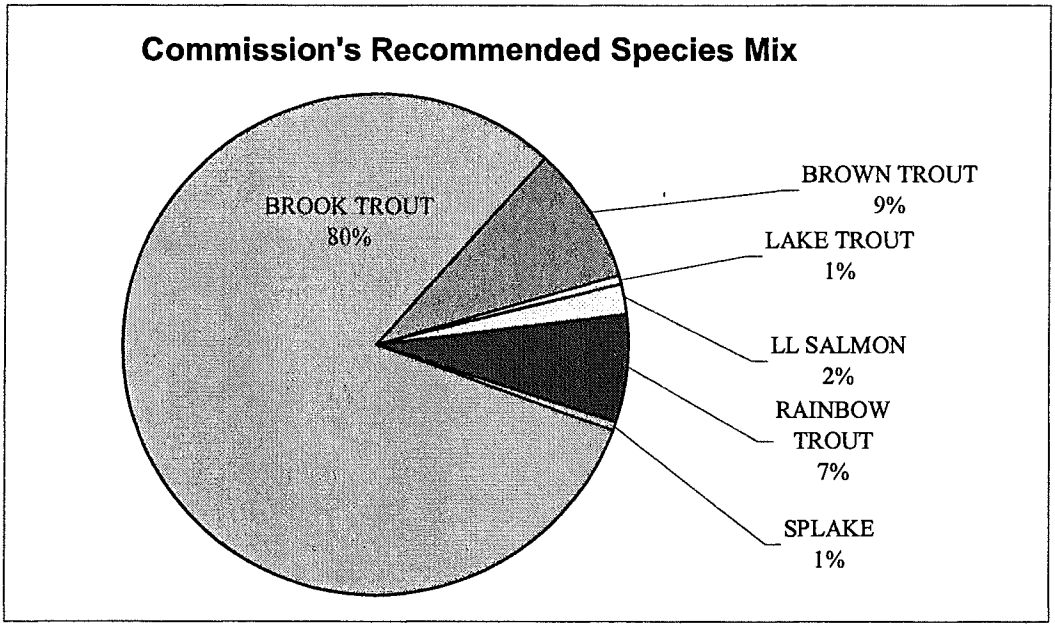
Table 1

Commission's Recommended Fish Production Goals by 2012

SPECIES	Number of Fish	Pounds of Fish
BROOK-FF	35,342	2,561
BROOK-FY	422,118	383,744
BROOK-SY	784,173	245,054
BROOK-SY2	2,000	4,000
BROOK-SY from Brook Trophy*	208,800	65,250
BROOK-Totals	**1,452,433**	**700,609**
BROWN	239,735	77,622
BROWN-Totals	**239,735**	**77,622**
LAKE TROUT	37,232	4,664
LAKE-Totals	**37,232**	**4,664**
LL SALMON-FY	10,041	7,172
LL SALMON-SY	15,694	2,660
LL SALMON-SY2	2,000	4,000
LL SALMON-SY from SPL Trophy*	15,488	2,625
LL SALMON-Totals	**43,222**	**16,457**
RAINBOW-SY	90,000	30,000
RAINBOW-FY	27,600	23,000
RAINBOW-SY from Brown Trophy	21,375	7,125
RAINBOW-Totals	**138,975**	**60,125**
SPLAKE	46,466	5,600
SPLAKE-Totals	**46,466**	**5,600**
TOTAL BY REGION	**1,958,063**	**865,077**

*Trophy listing allocates poundage for 2001 proposed trophy program to spring yearlings

Figure 2



APPENDIX D

BULLETS FROM THE 1999 OPEN WATER FISHING SURVEY

Survey Description

1) **Sample:** A random sample of 5,971 names was drawn from 217,999 license holders on September 16, 1999. Surveys were successfully delivered to 5,504 license holders. Three thousand four hundred sixty surveys were returned for a response rate of 63 percent.
   a) **Questionnaire:** Four different surveys were distributed. Each version shared the following sections: (1) a section on fishing activity, fishing success and satisfaction, (2) a table for reporting open water effort catch and harvest on up to 13 different waters, and (3) a concluding section containing socioeconomic questions.
   b) Additionally, anglers were queried about their opinions on access issues, regulations, fishery management practices and consumption advisories in one or the other of the four versions of the survey

Survey Results

1) **Effort and Harvest:** A total of 217,815 license holders fished during the 1999 open-water fishing season. These anglers kept 2.8 million of the 12.6 million fish they caught for an overall release rate of 78 percent. Relative to the 1994 survey, the 1999 figures represent an *11 percent decrease in anglers*, a *four percent increase in angler days*, a *31 percent increase in catch* and a *28 percent increase in harvest.* More than 50% of those surveyed were aware that many Maine waters are open to fishing in October and November. Twenty-seven percent of respondents fished in October of 1998 (an average of five days) and nine percent fished in November (an average of two days). Similar percentages of anglers indicated that they intended to fish in those months in 1999.
2) **Rating of Fishing Quality:** Fishing quality ratings in 1999 were at or approached "good" (a rating of "3") in each of the DIFW's seven fishery management regions, *a substantial increase relative to 1994.* The improvement in fishing quality is large enough to indicate a significant change in this statistic.
3) **Range Extensions & Exotic Species:** The spread of exotic (nonnative species) *into* the state and range extensions of native species *within* the state were regarded as a threat by approximately 70 percent and 50 percent of respondents, respectively.
4) **Resident Junior Licenses:** Over 50 Percent of respondents felt those resident youths *< 16 years old should not be required to possess a Junior License.* Of those that supported a Junior License, 80 percent felt that a fee should be charged.
5) **Angler Assessment of Current and Future Inland Fishery Resources:**
   a) Anglers were most concerned about *habitat degradation and declines in fishing quality over the next ten years.*
   b) Residents were more concerned about *public access* than were nonresidents.
   c) The three most important gamefish were, in order of importance: *brook trout, landlocked salmon and rainbow trout.*

BULLETS FROM THE 1999 OPEN WATER FISHING SURVEY

d) Among fishing "methods" *boat fishing* was regarded as the most important.
e) Anglers felt that fishing a *remote water, open water fishing, fishing a wild fish population and brook fishing* were the most important aspects of an enjoyable fishing trip.

6) **Access:**
   a) Nearly 30 percent of resident anglers indicated they always based their selection of waters based on ease of access.
   b) Twenty-two percent of survey respondents indicated they encountered some type of access problem during the 1999 open water season, a slight decrease in the incidence of access problems relative to the 1994 survey. Most of these problems were resolved.

7) **Black Bass Angling:**
   a) When queried directly, twenty-nine percent of resident license holders surveyed indicated they had fished purposely for black bass during the 1999 open water season. Almost all of these anglers caught a black bass and about one-quarter kept their catch for a release rate of 75 percent. These figures indicate *an increase in fishing effort for black bass relative to the 1994 survey.*
   b) Nevertheless, *the number of 1999 survey participants who consider black bass an important game fish species declined relative to the 1994 survey* (47% vs. 65%, respectively).
   c) Curiously, *bass ranked third among Maine gamefish targeted* by anglers!

8) **Fish Consumption Advisories:**
   a) Over *80 percent of resident license holders surveyed were aware* of the statewide fish consumption advisory for mercury, a slight increase of awareness since the 1994 survey.
   b) Twenty-four percent of women under 40 and thirteen percent of children under eight, had consumed freshwater game fish during 1999.
   c) Brook trout and white perch were the species most frequently consumed by these groups.

9) **Regulations:**
   a) Regulations book: Over *90 percent of respondents rely upon the regulations booklet* to find out about open water fishing regulations. *Thirty-five percent of respondents felt that Maine's regulations are either somewhat or very easy to understand* with some variation depending on the age and education of the respondent. Over *40 percent indicated that the regulations are very or somewhat difficult to understand.*
   b) Regulation "strictness and adequacy": Over *50 % of respondents* thought the number of open water regulations was "about right". Nearly *75% of survey participants felt that Maine's regulations were adequate or more than adequate* to protect our sport fishery resources. Just 10 percent of those surveyed felt Maine's open water regulations were not strict enough, 20 percent thought regulations to be too strict and *60 percent felt open water regulations were about right.*

BULLETS FROM THE 1999 OPEN WATER FISHING SURVEY

c) Harvest regulations: Resident, *regular license holders favored low bag limits and limits on numbers of lines* as regulatory methods to prevent over-harvest. Reducing the season length was the least favorite option.

d) Terminal tackle regulations: Anglers were asked to rate (separately) each of the following methods for reducing hooking mortalities: barbless hooks only, fly-fishing only, and artificial lures only. *None of the three methods received a favorable rating by 50 percent or more participating anglers.* Artificial lures only and barbless hooks only each were strongly favored or somewhat favored by 40 percent of survey respondents while fly fishing only was strongly or somewhat favored by 35 percent of survey respondents. *Over 50 percent of respondents were opposed to fly fishing only regulations.* Of the three options, *a barbless hooks only regulation was "least" opposed.*

e) Slot limits: Approximately 75 percent of those surveyed had fished a water having a slot limit regulation in 1999. *Between 74 and 91 percent felt that slot limits were easy to understand.*

f) Catch and release: Twenty-one percent of surveyed anglers had fished a designated "catch and release" water in 1999 and fourteen percent of those that did so said that they always fish "catch and release" waters. Nearly 90 percent of respondents released some, most or all of the fish they caught when it was not required by law. *Over sixty percent of respondents indicated they would support a catch and release regulation on their favorite water if scientific data compiled by DIFW indicated this regulation was the best way to improve fishing quality.*

10) Fishery Management Practices:

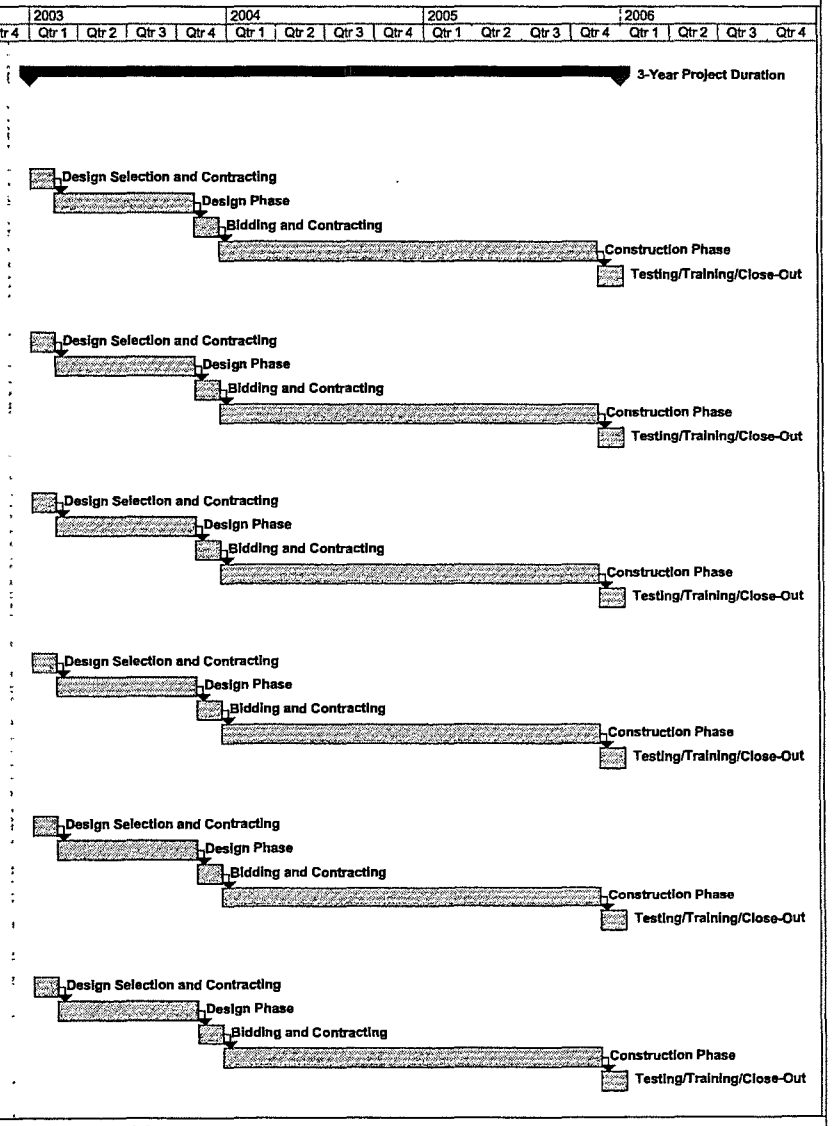
a) *Habitat protection, improving fishing quality, habitat improvement and coldwater fishery management scored highest* of the 17 fishery management practices anglers were asked to rate regarding their importance over the next ten years.

b) Reduction in enforcement effort, liberalization of regulations, stocking exotic (non-native) species and more restrictive regulations scored lowest of the 17 practices.

APPENDIX E

Figure II-6 -- Potential Project Implementation Timeline for $7.0 Million Bond Bill Projects

ID	Task Name
1	
2	**3-Year Project Duration**
3	**Casco SFH (Dissolved Oxygen Management, Tier I & II Wastewater Improvements)**
4	Design Selection and Contracting
5	Design Phase
6	Bidding and Contracting
7	Construction Phase
8	Testing/Training/Close-Out
9	**Dry Mills SFH (Dissolved Oxygen Management)**
10	Design Selection and Contracting
11	Design Phase
12	Bidding and Contracting
13	Construction Phase
14	Testing/Training/Close-Out
15	**Embden SFH (Dissolved Oxygen Management, Tier I & II Wastewater Improvements, and New Circular Tank Farm)**
16	Design Selection and Contracting
17	Design Phase
18	Bidding and Contracting
19	Construction Phase
20	Testing/Training/Close-Out
21	**Enfield SFH (Dissolved Oxygen Management, Tier I & II Wastewater Improvements)**
22	Design Selection and Contracting
23	Design Phase
24	Bidding and Contracting
25	Construction Phase
26	Testing/Training/Close-Out
27	**Governor Hill SFH (Dissolved Oxygen Management)**
28	Design Selection and Contracting
29	Design Phase
30	Bidding and Contracting
31	Construction Phase
32	Testing/Training/Close-Out
33	**Palermo SFH (Dissolved Oxygen Management, Tier I & II Wastewater Improvements)**
34	Design Selection and Contracting
35	Design Phase
36	Bidding and Contracting
37	Construction Phase
38	Testing/Training/Close-Out
39	

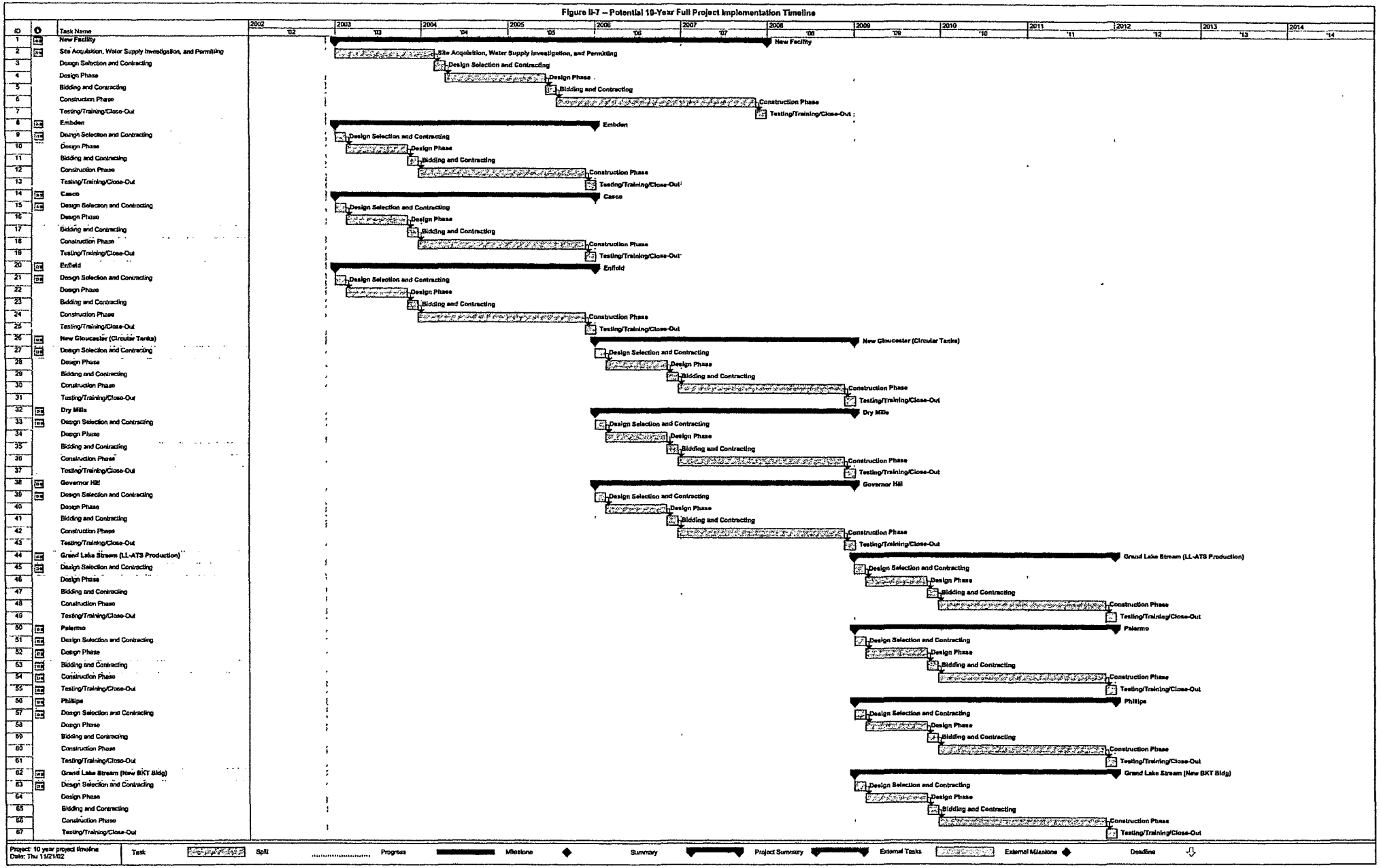


Project: 7.0 mil bond bill project timelir
Date: Thu 11/21/02

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

APPENDIX F

Figure II-7 -- Potential 10-Year Full Project Implementation Timeline



APPENDIX G

Table II-14. -- Potential Appropriation of $7.0 Million Bond Bill Based on Approved September 13, 2002 Commission Meeting Recommendations

State Fish Hatcheries	Column A (1) Tier I Wastewater	Column B (2) Tier II Wastewater	Column C (3) Dissolved Oxygen Management	Column D (F - E) (4) Circular Tank Farm at Embden	Column E (A + B + C) (4) Subtotal	Column F (A + B + C + D) (4) Total
Casco	$552,908	$240,133	$196,213	NA	**$989,253**	**$989,253**
Dry Mills	NA	NA	$175,588	NA	**$175,588**	**$175,588**
Embden	$304,686	$237,946	$223,713	**$2,936,377**	**$766,344**	**$3,702,722**
Enfield	$590,652	$240,133	$213,400	NA	**$1,044,184**	**$1,044,184**
Governor Hill	NA	NA	$103,400	NA	**$103,400**	**$103,400**
Grand Lake Stream	NA	NA	NA	NA	**$0**	**$0**
New Gloucester	NA	NA	NA	NA	**$0**	**$0**
Palermo	$541,633	$240,133	$203,088	NA	**$984,853**	**$984,853**
Phillips	NA	NA	NA	NA	**$0**	**$0**
Total	**$1,989,879**	**$958,343**	**$1,115,400**	**$2,936,377**	**$4,063,623**	**$7,000,000**

(1) Tier I Wastewater Improvements -- Improve Quiescent Zones, Install New or Improve Existing Clarifiers, Sludge Storage, Effluent Measurement, and Related Effluent Site Work

(2) Tier II Wastewater Improvements -- Effluent Microscreening System

(3) Dissolved Oxygen Management Improvements -- Bulk Liquid Oxygen Tank, Vaporizer, Filling System, Fencing, Concrete Pad, Buried Copper Conduit, Low Head Oxygen Contacting Units, and Oxygen Flow Meters

(4) All Costs include Estimating (10%), State Construction (10%), Design Phase (8%), and Construction Phase (7%) Contingencies

APPENDIX H

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.
GOVERNOR

MARTHA KIRKPATRICK
COMMISSIONER

September 12, 2002

Honorable Bruce Bryant
Maine House of Representatives
2 State House Station
Augusta, ME 04333

RE: Expansion of State Fish Hatcheries

Dear Representative Bryant:

As we discussed at the meeting held September 9, 2002 with you, Fishpro, the Department of Inland Fish and Wildlife, and the Department of Environmental Protection, attached is a report from DEP outlining water quality concerns and effects from state fish hatcheries. This report summarizes the issues we discussed at our meeting.

I request that the Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine consider this information in their deliberations on the best course of action for the state fish hatcheries.

I will attend the Commission meeting on September 13, 2002 with my staff to answer any questions the Commission may have.

Please feel free to call me at 287-7849, with any comments or questions.

Sincerely,

DAVID VAN WIE
Director, Bureau of Land and Water Quality

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MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER QUALITY CONCERNS AND EFFECTS
FROM STATE FISH HATCHERY DISCHARGES
September 12, 2002

The purpose of this report is to provide information on impacts and concerns to state waters receiving effluent from state fish hatcheries so that this information can be considered in facility and production expansion planning. On September 9, 2002, Maine DEP Bureau of Land and Water Quality staff met with personnel from Inland Fisheries and Wildlife, Fishpro consultants, and Representative Bruce Bryant to discuss issues related to the *Draft Final Supplement, Comprehensive Statewide Fish Hatchery System Engineering Study* (August 2002), which was received by the Department on September 3, 2002. The Department would like to thank IF&W, Fishpro, and Representative Bryant for meeting, as it provided a forum to discuss existing water quality and habitat impacts in the streams, rivers, and lakes receiving hatchery effluent as well as concerns related to proposed production increases at some facilities. It also provided a natural extension of the ongoing interagency efforts to resolve and address permitting, compliance, and environmental impact problems with the hatchery facilities demonstrated through DEP's spring 2002 site investigations at all nine IF&W hatcheries, meetings with hatchery personnel, DEP's May 16, 2002 follow up guidance, and ongoing communication efforts. This report summarizes specific DEP concerns with facility receiving waters and proposed expansions discussed during the September 9 meeting and is intended to compliment the efforts of IF&W and the Commission to Study the Needs and Opportunities Associated with Production of Salmonid Sport Fish in Maine.

After reviewing applicable data and information, the DEP views the following as critical needs:

1. Receiving waters that are currently in non-attainment of classification standards must be brought into attainment as expeditiously as possible;

2. Given the existing receiving water conditions and hatchery contributions, the quality of hatchery effluent after facility expansions must be of better quality than the current effluent for any water currently impaired, in order to begin to correct the conditions;

3. Facility wastewater treatment upgrades and demonstrated improvements in effluent quality and receiving water conditions need to precede increases in production. In addition to compliance with current license limits, facility upgrades must be designed to address receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts.

4. Comparatively low cost methods of waste water treatment and improvements in operational practices, such as elimination of non-treated effluent discharges, regular cleaning of sediment basins, and other steps identified during the spring 2002 site investigations, should be pursued to determine how the receiving waters will respond prior to large scale expenditures.

Information contained in this report elaborates on these identified needs.

REGULATORY BACKGROUND

The Maine Department of Environmental Protection administers the Maine Pollutant Discharge Elimination System (MEPDES) program to regulate the discharge of pollutants to waters of the State. The purpose of the MEPDES program is to ensure that state and federal water quality laws are met and that designated water classifications of Maine surface waters are maintained. All surface waters in Maine are classified and DEP is mandated with ensuring that facility effluent discharges do not cause non-attainment of those classifications. This is accomplished through establishment of site and industry specific effluent limitations and monitoring requirements. Classifications are based on numerical and narrative standards for dissolved oxygen, water quality, habitat values for fish and other aquatic life, and existing recreational and navigational uses.

The DEP issued waste discharge licenses for all nine MDIFW fish hatcheries in July 2000. The July 2000 discharge licenses established technology based and receiving water quality based discharge limits and monitoring requirements for BOD, TSS, and total phosphorous. In 2002, the Department analyzed discharge data from the MDIFW hatcheries as well as current conditions in the receiving waters to reevaluate the 2000 limits. Discussions of these analyses are included in this report.

CURRENT STATUS OF RECEIVING WATERS

As stated above, surface water classifications contain both numerical and narrative standards for a variety of criteria. In determining attainment statuses of receiving waters, the DEP conducts monitoring and observations to determine the conditions of those criteria. The Department conducted monitoring for aquatic macro-invertebrates (bio-monitoring) in specific locations in the hatchery receiving waters as an indicator of the overall health of the receiving water and to determine the actual conditions attributable to the associated hatcheries. Macro-invertebrates are used as indicators, as changes in their communities are typically caused by factors that effect the entire receiving water ecosystem. Results from historical in-stream dissolved oxygen monitoring as well as monitoring required pursuant to licenses issued in 2000 were analyzed. Further, specific observations of conditions impacting class attainment, such as the presence of sphaerotilus fungus and algae, have been noted. Biochemical oxygen demand, total suspended solids, and phosphorous are common pollutants discharged from fish hatcheries that can have real and detrimental effects on Maine's waters. A detailed description of these pollutants is attached as Appendix B. The amounts of these pollutants in hatchery wastewater and their resulting effects on the receiving waters can be significantly reduced with proper wastewater treatment and management. A summary of current impacts to the receiving waters is shown in the following table. Detailed discussions of impacts and concerns at each of the hatcheries is included in Appendix A of this report.

Hatchery	Receiving Water	Effluent Dilution in Rec. Water	Receiving Water Class Assigned	Class Meeting (Bio-monitoring)	Additional Concerns
Cobb State – Enfield	Cold Stream	2.3:1	A	B*	Class A water, D.O. non-attainment, sphaerotilus fungus
Dry Mills – Gray	Hatchery Stream	1.3:1	B	B	Marginal attainment
Embden	Mill Stream	1:1	B	C	historic excess algae
Gov. Hill – Augusta	Spring Brook	1:1	B	A	historic D.O. non-attainment
Grand Lake Stream	Grand Lake Stream (Big Lake)	23.4:1	A	B*	Class A water leading to lake
New Gloucester	Eddy Brook	1:1	B	B	
Palermo	Sheepscot River (Long Pond)	3:1	B	C	effects on lake
Phillips	Meadow Brook	1:1	A	A	Class A water
Wade State – Casco	Mile Stream (Sebago Lake)	1:1	B	C	effects on lake

*Indications are that this may be representative of adjacent lake effects on the rock baskets and that the receiving water may actually attain applicable standards for this criteria.

REGULATORY CONSIDERATIONS FOR EXPANSIONS

The data in the above table and Appendix A, which was updated in September 2002, indicates, for the receiving waters that are not meeting their assigned classes, that the designated MDIFW hatcheries are causing or contributing to these conditions. Maine law (38 MRSA, Section 464.4(F)(3)) states that the Department may only issue "a discharge license or approve water quality certification for a project affecting a waterbody in which the standards of classification are not met if the project does not cause or contribute to the failure of the waterbody to meet the standards of classification". There are obvious and serious implications to this statute for any facility whose receiving water is currently not attaining class and where increases in production and resulting effluent discharges are desired.

The final draft report projects effluent pollutant removal efficiencies of 30% for phosphorous, 40% for BOD, and 50% for TSS after treatment upgrades. Considering the existing conditions in the receiving waters and the limited pollutant removal projections, the DEP is concerned with large scale production increases at some facilities and the resulting increases in pollutant discharges. Given the existing conditions and hatchery contributions to them, IF&W essentially will have to generate a better quality effluent after facility expansions than is currently discharged. As stated above, in order for the hatchery discharge to be permitted or modified, it can not cause or contribute to non-attainment conditions in the receiving water.

As a result of the DEP's on-going analysis of receiving water monitoring data and conditions as well as review of past license limits, the Department has determined that future re-issued or modified permits will contain water quality based or previously established license limits for phosphorous, but that phosphorous limits based on industry best practical treatment (BPT) standards will not be established at this time. The DEP needs to inform IF&W, however, that the

USEPA is in the process of developing new nutrient water quality based standards that may be more stringent than the current parameters DEP uses for setting water quality based limits.

To provide IF&W with operational flexibility at those hatcheries whose effluent discharges immediately to rivers and streams but eventually to lakes, the DEP intends to apply the less restrictive river/stream phosphorous concentration limit and the lake based mass limit. However, IF&W needs to realize that active effluent management will be required with this flexibility as discharging at the full river/stream concentration on a regular basis will result in non-compliance with a yearly lake based mass limit.

One of the primary efforts in the DEP's spring 2002 site investigations was to encourage greater consistency in hatchery effluent sampling and reporting to allow for more accurate assessments of actual discharge conditions and comparisons with receiving water conditions. Although this has been realized at some facilities, DEP remains concerned that reported effluent data do not appear to correlate with receiving water conditions for some facilities. DEP is encouraged that facility upgrades can be expected to improve both wastewater treatment and effluent monitoring practices. In the interim, DEP considers additional receiving water condition data as necessary and will continue its bio-monitoring program at the facilities in non-attainment for this criteria, Embden, Palermo, and Casco. The DEP also considers further in-stream dissolved oxygen monitoring necessary. In-stream D.O. monitoring will be the responsibility of IF&W, but DEP will offer any guidance necessary.

DEP RECOMMENDATIONS

The DEP recommends that facility expansions and upgrades proceed in phases, with incremental production increases following upgrades in wastewater treatment and demonstrated improvements in effluent quality and receiving water conditions. Of particular concern are the facilities whose receiving waters are currently not attaining their assigned classes and those facilities discharging to Class A waters. The receiving waters must be brought into attainment with their designated classifications at existing production levels as expeditiously as possible.

As is often the case, the non-attainment situations at many of the facilities are due to a combination of multiple pollutants in the effluent and specific sensitive conditions in the receiving waters, such as extremely low dilutions. Due to the variability in the facilities' existing physical plants, treatment methods, operation and maintenance practices, and effluent sampling and reporting practices, the cause of non-attainment can not be narrowed to a single parameter. Therefore, DEP cautions that improvements in these conditions will be necessary before more accurate predictions can be made on the extent that production can be increased without causing or contributing to violations of water quality standards in the receiving waters. DEP recommends addressing comparatively low cost methods of waste water treatment and improvements in operational practices, such as elimination of non-treated effluent discharges, regular cleaning of sediment basins, and other steps identified during the spring 2002 site investigations, to determine how the receiving waters will respond prior to large scale expenditures. The DEP encourages this cautious approach because of concerns with existing and on-going effects in receiving waters with extremely low dilutions and the ability to accept wastewater flows with high pollutant loads. The DEP does not wish to see IF&W and the

Commission expend resources to expand production at a facility only to subsequently discover that the facility discharge is not permittable or is only permittable with additional expensive advanced forms of wastewater treatment.

RESPONSES TO QUESTIONS RAISED IN FISHPRO'S DRAFT FINAL REPORT AND THE SEPTEMBER 9, 2002 MEETING

In the final draft report, Fishpro questioned the appropriateness of establishing concentration limits for discharged pollutants. DEP recognizes that the actual mass of a pollutant is often the primary concern to the receiving water. However, as stated at the September 9 meeting, DEP's consistent position with the vast majority of permits issued, as supported by Department Rule, Chapter 523, Section 6(f)(2), is that establishing and adhering to concentration limits ensures that best practicable treatment will be provided at the facility when discharging below full licensed flows. The DEP maintains that concentration limits are appropriate.

During our September 9 meeting, Fishpro questioned the appropriateness of applying natural stream classification standards to discharge waters that have been historically and substantially increased by the presence of the hatchery. The DEP recognizes that conditions of the receiving water would be significantly different without the hatchery and its discharge. However, Department biologists indicate that although the flow regime would most definitely be altered under those conditions, so would the pollutant load to the receiving water. Further, their research indicates that under such conditions, even isolated pools of water typically meet higher classification standards.

IF&W and Fishpro have expressed the concern that the effluent limits established in the 2000 waste discharge licenses may be excessively stringent. However, DEP's analyses of the actual impacts in hatchery receiving waters illustrated in the table above, the level of waste water treatment currently being performed at the hatcheries, and the level of treatment attainable, indicate that the BOD, TSS, and all but one of the total phosphorous limits contained in the 2000 licenses are both valid and necessary. As mentioned earlier, a Department lake biologist recalculated Palermo's lake based phosphorous mass limit. Although most of the established limits have been validated, many of the receiving waters are not attaining their designated classes due to ongoing inadequate wastewater treatment at the facilities and effluent discharges often above these limits. The Department believes that these conditions can be greatly improved or corrected through incorporation of proper wastewater treatment practices and methodologies and their proper operation and maintenance. The Draft Final Supplement references (page III-28) that overall effluent treatment requirements and costs may be reduced with efforts to improve food conversion, feed efficiency and reduce feed waste. In our meeting on September 9, Fishpro stated that phosphorous discharges can be reduced by 25% with conversion to low phosphorous food. The DEP strongly encourages these operational steps at reducing pollutant loads to the receiving waters and commends IF&W and Fishpro for recognizing that improvements in wastewater management should and will be a high priority.

SUMMARY

The DEP is encouraged by the efforts underway and wishes to offer any assistance that it can provide. The DEP agrees that upgrades to the hatcheries are long overdue and is optimistic that well planned improvements in wastewater treatment, operation and maintenance have the potential to correct the non-attainment statuses in many of the receiving waters. The DEP recognizes that all interested parties need to work together to ensure that these facilities can perform their intended functions while eliminating the impacts they have on the rivers, streams, and lakes to which they discharge their effluent.

The DEP views the following as critical needs:

1. Receiving waters that are currently in non-attainment of classification standards must be brought into attainment as expeditiously as possible;

2. Given the existing receiving water conditions and hatchery contributions, the quality of hatchery effluent after facility expansions must be of better quality than the current effluent for any water currently impaired, in order to begin to correct the conditions;

3. Facility wastewater treatment upgrades and demonstrated improvements in effluent quality and receiving water conditions need to precede increases in production. In addition to compliance with current license limits, facility upgrades must be designed to address receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts.

4. Comparatively low cost methods of waste water treatment and improvements in operational practices, such as elimination of non-treated effluent discharges, regular cleaning of sediment basins, and other steps identified during the spring 2002 site investigations, should be pursued to determine how the receiving waters will respond prior to large scale expenditures.

APPENDIX A
FACILITY SPECIFIC COMMENTS

To further elaborate on existing conditions and concerns, the following facility specific comments are provided.

Cobb State – Enfield: Cold Stream (Enfield), Grand Lake Stream, and Meadow Brook (Phillips) are all classified as Class A waters. State law (38 MRSA, 465.2(C)) states that new or expanded discharges to Class A waters after January 1, 1986, are permitted only if, in addition to satisfying all the requirements of the article, the discharged effluent will be equal to or better than the existing water quality of the receiving waters. This includes clear demonstrations that the proposed expansion is necessary and that there are no other reasonable alternatives available. This is a very restrictive requirement designed to protect Maine's Class A waters. Department Rule, Chapter 586, *Rules Pertaining to Discharges to Class A Waters*, establishes the criteria for meeting this requirement. The DEP believes that significant wastewater treatment technology and practices would be required to expand a discharge to a Class A water and attain Class A standards, and therefore strongly recommends that IF&W and the Commission consider this information in facility expansion planning. This appears to be the predominate issue for Enfield when considering expansion. Although bio-monitoring data appears to indicate that Cold Stream only attains Class B macro-invertebrate standards, a Department aquatic biologist indicates that this may actually be representative of the effects of the upstream lake, Cold Stream Pond, and that Cold Stream may be attaining the applicable class standard. Historical in-stream dissolved oxygen data from July 1998 and more recent but limited data collected pursuant to the 2000 discharge license indicate that Cold Stream is not attaining Class A D.O. criteria. Further, sphaerotilus fungus was observed in the receiving water downstream from the facility in 2001. The presence of sphaerotilus, a discharge related fungi, is evidence that Class A criteria are not being attained. At current licensed levels, hatchery effluent will only receive a 2.3:1 dilution in the receiving water under low flow conditions. The amount of effluent dilution in a receiving water is a significant issue. The lower the dilution ratio, the greater the effect of pollutants on the receiving water. For comparative purposes, commercial hatchery discharges to the Kennebec River receive dilutions of approximately 50:1.. Increases in production are anticipated to further reduce effluent dilution and potentially increase receiving water impacts. Using the data in Tables III-13 and III-14 of the Draft Final Supplement, it appears that production increases of 100% may be possible without violations of BOD, TSS, and total phosphorous discharge limits. However, the report recommends a production increase of 300%. It should be noted that the data in these tables is used by Fishpro to predict compliance with current license limits, but that it does not consider efforts that may be necessary to address other receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts.

Dry Mills – Gray: The table above indicates that the macro-invertebrates in Hatchery Stream are attaining Class B standards. A Department aquatic biologist clarifies that although it attains Class B, attainment is only marginal and caution should be exercised when increasing production at this facility. Reportedly, Dry Mills realized an improvement in previous macro-invertebrate conditions following maintenance of the settling basin. At current licensed levels, hatchery effluent will only receive a 1.3:1 dilution in the receiving water under low flow conditions.

Increases in production are anticipated to further reduce effluent dilution and potentially increase receiving water impacts. Using the data in Tables III-13 and III-14 of the Draft Final Supplement, it appears that production increases of 25% may be possible without violations of BOD, TSS, and total phosphorous discharge limits. The report recommends a production increase of this amount. It should be noted that the data in these tables is used by Fishpro to predict compliance with current license limits, but that it does not consider efforts that may be necessary to address other receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts.

Embden: As indicated in the table above, Mill Stream is only attaining Class C standards for macro-invertebrates and is therefore not in attainment. However, a Department aquatic biologist believes that Mill Stream may be able to achieve Class B standards with improvements in effluent quality and that this improvement may be expected to occur over a one to two year period. Observations of excess algae in the receiving water are based on historical data. A recent attempt to determine if this condition is still present was hindered by high water levels. Current observations are needed. Excess algae is indicative of enriched conditions in the receiving water, as is Mill Stream's bio-monitoring results. At current licensed levels, hatchery effluent will only receive a 1:1 dilution in the receiving water under low flow conditions. Increases in production are anticipated to further reduce effluent dilution and potentially increase receiving water impacts. Using the data in Tables III-13 and III-14 of the Draft Final Supplement, it appears that production increases of 100% may be possible without violations of BOD, TSS, and total phosphorous discharge limits. However, the report recommends a production increase of 400%. It should be noted that the data in these tables is used by Fishpro to predict compliance with current license limits, but that it does not consider efforts that may be necessary to address other receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts.

Governor Hill – Augusta: As indicated in the table above, Spring Brook is exceeding Class B standards for macro-invertebrates. Historical in-stream dissolved oxygen data from 1998 indicated that Spring Brook was not attaining Class B D.O. standards at the time. Preliminary review of more recent data appears to indicate that this situation may have been corrected. Reportedly, Governor Hill realized an improvement in previous macro-invertebrate conditions following maintenance of the settling basin. At current licensed levels, hatchery effluent will only receive a 1:1 dilution in the receiving water under low flow conditions. Increases in production are anticipated to further reduce effluent dilution and potentially increase receiving water impacts. Using the data in Tables III-13 and III-14 of the Draft Final Supplement, it appears that no production increase would be possible without violations of BOD, TSS, and total phosphorous discharge limits. However, the report recommends a production increase of 25%. It should be noted that the data in these tables is used by Fishpro to predict compliance with current license limits, but that it does not consider efforts that may be necessary to address other receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts.

Grand Lake Stream. Grand Lake Stream is classified as a Class A water and thus has a requirement that any new or expanded discharge must be equal to or of better quality than the receiving water itself. This appears to be the predominate issue for Grand Lake Stream when considering expansion. Please refer to additional information under Enfield, above. Although bio-monitoring data appears to indicate that Grand Lake Stream only attains Class B macro-invertebrate standards, a Department aquatic biologist indicates that this is actually representative of the effects of the upstream lake, West Grand Lake, and that Grand Lake Stream is attaining the applicable class standard. Because effluent from Grand Lake Stream reaches Big Lake, a lake based mass limit is required to address the phosphorous in Grand Lake Stream's effluent. At current licensed levels, hatchery effluent will receive a 23.4:1 dilution in the receiving water under low flow conditions. Increases in production are anticipated to further reduce effluent dilution and potentially increase receiving water impacts. Using the data in Tables III-13 and III-14 of the Draft Final Supplement, it appears that production increases of 400% may be possible without violations of BOD, TSS, and total phosphorous discharge limits. However, the report recommends a production increase of 850%. It should be noted that the data in these tables is used by Fishpro to predict compliance with current license limits, but that it does not consider efforts that may be necessary to address other receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts.

New Gloucester: At current licensed levels, hatchery effluent will only receive a 1:1 dilution in the receiving water under low flow conditions. Increases in production are anticipated to further reduce effluent dilution and potentially increase receiving water impacts. Using the data in Tables III-13 and III-14 of the Draft Final Supplement, it appears that no production increase would be possible based on concentration and an increase of 50% based on mass may be possible without violations of BOD, TSS, and total phosphorous discharge limits. However, the report recommends a production increase of 25%. It should be noted that the data in these tables is used by Fishpro to predict compliance with current license limits, but that it does not consider efforts that may be necessary to address other receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts.

Palermo: As indicated in the table above, the Sheepscot River is only attaining Class C standards for macro-invertebrates and is therefore not in attainment. According to a Department aquatic biologist, observed conditions indicate a highly enriched and unbalanced macro-invertebrate community. Enrichment can occur as direct organic enrichment or as indirect enrichment. Direct enrichment is introduced through BOD and/or TSS pollutant loads that are directly consumed by the macro-invertebrates. Indirect enrichment occurs through nutrient loads, such as phosphorous, that cause excessive growth of algae that provides a food source for macro-invertebrates. This is an indication of the overall health of the receiving water as large numbers of less sensitive macro-invertebrates representative of a lower water class replace the more sensitive macro-invertebrates indicative of the assigned water class. Because effluent from Palermo reaches Long Pond, a lake based mass limit is required to address the phosphorous in Palermo's effluent. Upon further review of existing data and conditions, the Department determined that a revised phosphorous discharge limit would be more appropriate for this receiving water and communicated the revised limit to IF&W at the September 9 meeting. This

revised limit for Palermo is significantly less restrictive than the anticipated limit communicated to IF&W in a memo in November 2001. Effects on the Sheepscot River and Long Pond are of significant concern to the Department and current data indicates that phosphorous levels in the effluent exceed even the revised limit. Current effluent and receiving water data do not permit a definitive determination of which form of enrichment is the cause of the macro-invertebrate community conditions noted. However, a Department lake biologist believes that efforts to reduce phosphorous in the effluent through effective waste water treatment can be expected to reduce other pollutant loads and vice versa resulting in some level of improvement in the macro-invertebrate community. The DEP is unable to determine at this time what level of change can be expected and whether it could result in class attainment for this criteria. At current licensed levels, hatchery effluent will only receive a 3:1 dilution in the receiving water under low flow conditions. Increases in production are anticipated to further reduce effluent dilution and potentially increase receiving water impacts. Using the data in Tables III-13 and III-14 of the Draft Final Supplement, it appears that no production increase would be possible without violations of BOD, TSS, and total phosphorous discharge limits. The report recommends no production increase. It should be noted that the data in these tables is used by Fishpro to predict compliance with current license limits, but that it does not consider efforts that may be necessary to address other receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts. Figure II-6, *Project Implementation Timeline*, of the Draft Final report indicates that wastewater treatment upgrades for this facility are not scheduled for completion until 2021. Since this facility is currently preventing the Sheepscot River from attaining Class B standards for macro-invertebrates, the Department will require IF&W to correct this situation as expeditiously as possible.

Phillips: Meadow Brook is classified as a Class A water and thus has a requirement that any new or expanded discharge must be equal to or of better quality than the receiving water itself. This appears to be the predominate issue for Phillips when considering expansion. Please refer to additional information under Enfield, above. Bio-monitoring indicates that Meadow Brook is attaining Class A standards for macro-invertebrates. At current licensed levels, hatchery effluent will only receive a 1:1 dilution in the receiving water under low flow conditions. Increases in production are anticipated to further reduce effluent dilution and potentially increase receiving water impacts. Using the data in Tables III-13 and III-14 of the Draft Final Supplement, it appears that no production increase would be possible without violations of BOD, TSS, and total phosphorous discharge limits. The report recommends no production increase. It should be noted that the data in these tables is used by Fishpro to predict compliance with current license limits, but that it does not consider efforts that may be necessary to address other receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts.

Wade State – Casco. As indicated in the table above, Mile Stream is only attaining Class C standards for macro-invertebrates and is therefore not in attainment. According to a Department aquatic biologist, observed conditions indicate an enriched and unbalanced macro-invertebrate community. Please refer to additional information under Palermo, above. At current licensed levels, hatchery effluent will only receive a 1:1 dilution in the receiving water under low flow conditions. Increases in production are anticipated to further reduce effluent dilution and

potentially increase receiving water impacts. Because effluent from Casco reaches Sebago Lake, a lake based mass limit is required to address the phosphorous in Casco's effluent. A Department lake biologist reviewed the proposed production expansion scenarios prepared by Fishpro for Casco and commented that it appears that phosphorous limits could be met with a 200% production increase and that it would be possible at the 300% production increase scenario with additional treatment beyond what has been proposed by Fishpro and active effluent management. However, it appears that phosphorous limits would be extremely difficult to meet with a 400% production increase and therefore this scenario is a significant concern in this water. Using the data in Tables III-13 and III-14 of the Draft Final Supplement, it appears that production increases of 300% may be possible without violations of BOD and TSS discharge limits. However, the report recommends a production increase of 400%. It should be noted that the data in these tables is used by Fishpro to predict compliance with current license limits, but that it does not consider efforts that may be necessary to address other receiving water class attainment issues such as discharges to Class A waters, dissolved oxygen, the presence of fungus and excess algae, and macro-invertebrate impacts.

APPENDIX B.
DETAILED DESCRIPTIONS OF COMMON POLLUTANTS AND EFFECTS.

BOD. Biochemical Oxygen Demand is an indication of the amount of oxygen that will be consumed by bacteria while decomposing organic matter in wastewater. The amount of BOD is higher with higher amounts of organic matter. The discharge of high BOD wastewaters to a receiving water causes the lowering of oxygen levels in the receiving water as bacteria consume the organic matter. Lowering oxygen levels in a receiving water impacts the aquatic life in that water, making it unfit for some forms of life.

TSS. Total Suspended Solids is a measure of the amount of particulate organic matter in wastewater. TSS can be indicative of a contribution of nutrients resulting in enrichment conditions and a lowering of oxygen levels in a receiving water. TSS can also result in displacement of the interstitial spaces in the bottom sediments that are used by aquatic organisms through physical deposition. These situations can impact the aquatic life in that water, making it unfit for some forms of life.

Phosphorous is a nutrient that encourages the growth of plants such as bottom-attached algae and macrophytes in waters. Oxygen levels in the water are reduced in the early morning hours due to extended nighttime respiration of algae. The decomposition of excess plant material further reduces the amount of available oxygen in the water through biochemical oxygen demand. Lowering oxygen levels in a receiving water impacts the aquatic life in that water, making it unfit for some forms of life. Further, enrichment from excess nutrients, such as phosphorous, can result in reductions in aquatic macro-invertebrate species diversity, an indicator of the overall health of a receiving water. Excess phosphorous can also result in undesirable aesthetic conditions in a receiving water, impacting that water's ability to meet standards for maintaining recreational use.

APPENDIX I

CHAPTER 82

S.P. 332 - L.D. 986

Resolve, Establishing a Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine

Emergency preamble. Whereas, Acts and resolves of the Legislature do not become effective until 90 days after adjournment unless enacted as emergencies; and

Whereas, the salmonid sport fishery in Maine is important to the economy of the State; and

Whereas, the continuation of a healthy salmonid sport fishery requires careful management; and

Whereas, several critical factors necessary for effective management of that fishery must be studied; and

Whereas, in the judgment of the Legislature, these facts create an emergency within the meaning of the Constitution of Maine and require the following legislation as immediately necessary for the preservation of the public peace, health and safety; now, therefore, be it

Sec. 1. Commission established. Resolved: That the Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine, referred to in this resolve as the "commission," is established; and be it further

Sec. 2. Commission membership. Resolved: That the commission consists of the following 13 members:

1. One member of the Joint Standing Committee on Inland Fisheries and Wildlife appointed by the President of the Senate;

2. Two members of the Joint Standing Committee on Inland Fisheries and Wildlife appointed by the Speaker of the House;

3. The Commissioner of Inland Fisheries and Wildlife or the commissioner's designee;

4. The Superintendent of Fish Culture, Department of Inland Fisheries and Wildlife;

5. One member of Trout Unlimited nominated by the president of that organization and appointed by the Governor;

6. Two members of the Inland Fisheries and Wildlife Advisory Council appointed by the Governor;

7. Three individuals representing owners or operators of a private fish hatchery in the State appointed by the Governor;

8. One member of the Sportsman's Alliance of Maine nominated by the president of that organization and appointed by the Governor; and

9. One individual who owns or operates a private aquaculture facility in the State and who is appointed by the Governor; and be it further

Sec. 3. Appointments; meetings. Resolved: That all appointments must be made no later than 30 days following the effective date of this resolve. The appointing authorities must notify

the Executive Director of the Legislative Council upon making their appointments. When the appointment of all members is complete, the chairs of the commission shall call and convene the first meeting of the commission no later than August 1, 1999. The first named Senate member is the Senate chair and the first named House member is the House chair; and be it further

Sec. 4. Duties. Resolved: That the commission shall assess and evaluate salmonid fish culture facilities in Maine and associated production and distribution capabilities, opportunities and needs, including waste discharge licensing issues. In addition, the commission shall develop recommendations designed to provide for the production and distribution of fish needed to meet future sport fish management program needs in the most cost effective manner; and be it further

Sec. 5. Staff assistance. Resolved: That the commission shall request staffing assistance from the Legislative Council; and be it further

Sec. 6. Compensation. Resolved: That legislative members are entitled to receive the legislative per diem and reimbursement of necessary expenses for their attendance at authorized meetings of the commission. Public members not otherwise compensated by their employers or other entities whom they represent are entitled to receive reimbursement of necessary expenses for their attendance at authorized meetings of the commission; and be it further

Sec. 7. Report. Resolved: That the commission shall submit its report, together with any necessary implementing legislation, to the Joint Standing Committee on Inland Fisheries and Wildlife no later than September 29, 2000. If the commission requires an extension, it may apply to the Legislative Council, which may grant the extension; and be it further

Sec. 8. Appropriation. Resolved: That the following funds are appropriated from the General Fund to carry out the purposes of this resolve.

	1999-00	2000-01
LEGISLATURE		
Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine		
Personal Services	$660	$495
All Other	2,700	2,150

Provides funds for the per diem and expenses of legislative members and expenses for other eligible members of the Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine and to print the required report.

LEGISLATURE		
TOTAL	$3,360	$2,645

Emergency clause. In view of the emergency cited in the preamble, this resolve takes effect when approved.

Effective June 17, 1999.

CHAPTER 462
S.P. 568 - L.D. 1732

An Act to Establish for an Additional Two Years the Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine

Emergency preamble. Whereas, Acts of the Legislature do not become effective until 90 days after adjournment unless enacted as emergencies; and

Whereas, the 119th Legislature originally established the Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine in Resolve 1999, chapter 82; and

Whereas, the 119th Legislature appropriated $500,000 to be spent over the current biennium for engineering design for the Embden Hatchery and a statewide assessment of all other hatchery facilities; and

Whereas, authorization of this commission for an additional 2-year period is essential to complete the original duties assigned to the commission and to provide ongoing legislative policy guidance on the expenditures of those funds appropriated for engineering design for the Embden Hatchery and a statewide assessment of all other hatchery facilities; and

Whereas, in the judgment of the Legislature, these facts create an emergency within the meaning of the Constitution of Maine and require the following legislation as immediately necessary for the preservation of the public peace, health and safety; now, therefore,
Be it enacted by the People of the State of Maine as follows:

Sec. A-1. 12 MRSA §7671-A is enacted to read:

§7671-A. Fish hatchery maintenance fund

The fish hatchery maintenance fund, referred to in this section as the "fund," is established in the department as a nonlapsing fund to be used by the commissioner to fund or assist in funding engineering designs for the Embden Hatchery, a statewide assessment of all other hatchery facilities and maintenance, repair and capital improvements at fish hatcheries and feeding stations owned by the State and the per diem and related expenses of 4 meetings of the Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Fish in Maine in fiscal year 2001-02 and 4 meetings of the commission in fiscal year 2002-03. The fund may not be used to fund personnel services costs or general operating costs of a fish hatchery. The commissioner may accept and deposit into the fund any monetary gifts, donations or other contributions from public or private sources and must use that money for the purposes specified in this section.

Sec. A-2. Report. The Commissioner of Inland Fisheries and Wildlife shall report to the Joint Standing Committee on Inland Fisheries and Wildlife no later than January 15, 2002 with recommendations on sources of revenues for the fish hatchery maintenance fund established under the Maine Revised Statutes, Title 12, section 7671-A to be used to fund maintenance, repair and capital improvements at fish hatcheries and feeding stations. Those recommendations must include draft proposals for any statutory enactments necessary to implement the commissioner's recommendations.

Sec. B-1. Commission established. The Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine, referred to in this Part as the "commission," is established.

Sec. B-2. Commission membership; appointed ad hoc and ex officio members; meetings. The commission consists of appointed members as follows:

1. Except as otherwise provided in this section, all members appointed pursuant to Resolve 1999, chapter 82, including legislative members, whether or not members of the 120th Legislature, are members of this commission;

2. The President of the Senate shall appoint 2 members of the Senate to the commission. The first Senator appointed pursuant to this subsection is the Senate chair of the commission. When making these appointments, the President of the Senate shall give preference to a Senate member of the Joint Standing Committee on Inland Fisheries and Wildlife and a Senate member of the Joint Standing Committee on Natural Resources;

3. The Speaker of the House shall appoint a member of the House to the commission who is the House chair. When making this appointment, the Speaker of the House shall give preference to a House member of the Joint Standing Committee on Inland Fisheries and Wildlife; and

4. The Governor shall appoint one person to replace one of the persons appointed by the Governor under Resolve 1999, chapter 82, section 2, subsection 6 and one person to replace the person appointed by the Governor under Resolve 1999, chapter 82, section 2, subsection 9.

Upon completion of all appointments, the chairs shall call and convene the first meeting of the commission, which must be held no later than August 15, 2001.

Sec. B-3. Duties. The commission shall complete all duties prescribed in Resolve 1999, chapter 82 and shall provide oversight and policy guidance to the Department of Inland Fisheries and Wildlife with respect to the expenditure of funds appropriated by the 119th Legislature in Public Law 1999, chapter 731, Part A, section 1 and Part HHHH, section 1, for engineering design for the Embden Hatchery and a statewide assessment of all other hatchery facilities. In addition, the commission shall:

1. Continue to work with the Department of Inland Fisheries and Wildlife and the department's consultant to continue the work of evaluating the effluent characteristics of fish hatcheries, including private fish hatcheries, with the purpose of ensuring that the state fish hatcheries will be able to comply with licensed effluent discharge standards within 3 years and to obtain information relevant to discussions of discharge license standards for unlicensed private fish hatcheries;

2. Set statewide production goals for the number, size and species mix of recreational sport fish over a 15- to 20-year planning horizon;

3. Determine how to meet those production goals in the most cost-effective manner by evaluating all production options, including options for investing in cost-effective upgrades to existing state-owned facilities to produce more fish, closing noneconomic state-owned facilities and building new capacity in other locations in the State and purchasing fish from privately owned hatcheries; and

4. Within existing budgeted resources, undertake any studies or other activities as are necessary to complete the tasks outlined in this section and is authorized to hold 4 meetings annually.

Sec. B-4. Staff assistance. The commission shall request staffing assistance from the Legislative Council.

Sec. B-5. Compensation. Members who are Legislators are entitled to the legislative per diem, as defined in the Maine Revised Statutes, Title 3, section 2, and reimbursement for necessary expenses incurred for their attendance at authorized meetings of the commission that occur on days the Legislature is not in session. Other members of the commission who are not otherwise compensated by their employers or other entities that they represent are entitled to receive reimbursement of necessary expenses incurred for their attendance at authorized meetings. The Commissioner of Inland Fisheries and Wildlife shall use funds in the fish hatchery maintenance fund established in the Maine Revised Statutes, Title 12, section 7671-A to reimburse the Legislature in fiscal years 2001-02 and 2002-03 for all costs incurred to pay the per diem and expenses of members of the commission who are Legislators and members who are not otherwise compensated by their employers or other entities that they represent and the costs to print the commission report.

Sec. B-6. Report. The commission shall submit an interim report to the Joint Standing Committee on Inland Fisheries and Wildlife no later than December 1, 2001 and a final report to that same committee no later than October 31, 2002.

Sec. B-7. Unexpended balances transferred; balances carried forward. Unexpended funds appropriated by Public Law 1999, chapter 731, Part A, section 1 and Part HHHH, section

1, to the Department of Inland Fisheries and Wildlife, Fisheries and Hatcheries Operations, are appropriated to the fish hatchery maintenance fund established in the Maine Revised Statutes, Title 12, section 7671-A to be used by the Commissioner of Inland Fisheries and Wildlife pursuant to Title 12, section 7671-A. Those funds may not be encumbered for any other purpose without prior consultation with the commission. Unexpended balances in the fund do not lapse but are carried forward to subsequent years.

Sec. B-8. Allocation. The following funds are allocated from Other Special Revenue funds to carry out the purposes of this Act.

	2001-02	2002-03
INLAND FISHERIES AND WILDLIFE, DEPARTMENT OF		
Fisheries and Hatcheries Operations		
All Other	$500	$500
Provides initial allocations for the Fish Hatchery Maintenance Fund.		
DEPARTMENT OF INLAND FISHERIES AND WILDLIFE		
TOTAL	$500	$500
LEGISLATURE		
Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine		
Personal Services	$1,320	$1,320
All Other	3,600	3,600
Provides funds for the per diem and expenses of legislative members and expenses of other eligible members of the Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine.		
LEGISLATURE		
TOTAL	$4,920	$4,920
TOTAL		
ALLOCATION	$5,420	$5,420

Emergency clause. In view of the emergency cited in the preamble, this Act takes effect when approved.

Effective June 28, 2001.

APPENDIX J

Membership List

Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport fish in Maine

Sen. Chandler E. Woodcock
259 Middle Street
Farmington, ME 04938

Sen. John Martin
P.O. Box 250
Eagle Lake, ME 04739

Sen. Leo R. Kieffer
12 Harvest Road
Caribou, ME 04736

Rep. Bruce S. Bryant
2470 Canton Point Road
Dixfield, ME 04224

Rep. Kenneth A. Honey
P. O. Box 6
Boothbay, ME 04537

Rep. Zachary Matthews
43 Smiley Avenue
Winslow, ME 4901

Harold Brown
33 17th Street
Bangor, ME 04401

Ken Elowe
Department of IFW
41 State House Station

Bill Gilzinis
132 Arno Road
Dexter, ME 04930

Richard Neal
650 Milton Mills Road
Acton, ME 04001

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Hollis Center, ME 04042-3306

Evellyn Sawyer
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Arundel, ME 04046

George Smith
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Richard D. Solman
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41 State House Station
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