

## STATE OF MAINE 113TH LEGISLATURE SECOND REGULAR SESSION

## SALMONID SPORTFISH ENHANCEMENT IN ESTUARINE WATERS

A Report by the Commission of Sport Fisheries

November 1988

MEMBERS;

Peter Bourque, Chairman Sen. John L. Tuttle, Jr. Sen. Edgar E. Erwin Rep. James R. Coles Rep. Ernest C. Greenlaw Charles Dibner Lewis N. Flagg Brian Thayer

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## Background

The study dealt with in this report had its origin in LD 1362 "Resolve, to Create the Commission on Sport Fisheries to Study the Possibility of Enhancing and Upgrading Fishing Opportunities in the State" which was introduced in the Senate The bill was sponsored by Senator Tuttle and co-April 28, 1987. sponsored by Reps. Jacques, Duffy and Greenlaw. While the title of the bill indicated that the Commission was to study generally the possibility of enhancing and upgrading fishing opportunities in the State, the body of the bill indicated that the Commission specifically was to study the State's sport fisheries management program and draft recommendations that address the issues of: (1) the feasibility of introducing exotic species into State waters and (2) improving the fisheries with a state-of-the-art hatchery, such as the one on the Salmon River in New York. This bill was replaced by LD 1744 an emergency bill which was enacted into law and became Resolves 1987 chapter 39. It added funding as a subject area for the Commission to study, gave a specific reporting date of February 15, 1988, and allowed no compensation Senate Amendment B. (S-143) directed that expenses for members. for the Study were to come from the Department of Fisheries and Wildlife. As discussed in the method section of this report, the February 15 reporting date was subsequently changed to December 1, 1988.

The interest in Maine in the Salmon River Fishery and Hatchery, an investigation which is an important part of the Commission charge, appears to stem from the creation of an important sport fishery and the resultant economic boost to the rural community of Pulaski, New York.

In order to make its assignment manageable, the Commission used the Salmon River activity to set the general guidelines for its study activities.

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## Method

The Commission was fortunate to have among its members the 2 major resource persons in the State of Maine relative to the subject matter being studied in Peter Bourque, Director, Fisheries and Hatcheries Division, Department of Inland Fisheries and Wildlife and Lewis Flagg, Director, Anadromous Fish Management Division, Department of Marine Resources, as well as two very knowledgeable and experienced fishermen from the private sector in Charles Dibner and Brian Thayer.

Because of these excellent resources the Commission functioned primarily thru a large number of informal presentations and discussions within itself. Five such meetings were held under the provisions of the original bill and 5 under a request for an extension until December 1, 1988 which was submitted as LD 2275 and became Resolves 1988 Chapter 101. All meetings were held in Augusta except for a field trip on the Kennebec and Merrymeeting Bay.

The Study was funded from dedicated revenues of the Department of Inland Fisheries and Wildlife. Initially, no per diem and expenses were paid to legislators under the provisions of the bill which provided for no such payments to members who were not State employees. However, at the time the extension was approved the Legislative Council allowed legislative members expenses retroactively. As of August 15, 1988, the latest status report received, the Commission had spent \$503 of its \$3,000 appropriation.

## Executive Summary

The Commission recommends a 5 year test program of stocking the Kennebec River estuary with rainbow trout and landlocked salmon, with the objective of producing fish of a size attractive to Maine anglers. Funding for the first two years of this project will be included in a bill to be submitted to the upcoming legislative session. Future funding would be in the budget of the Department of Marine Resources. The State does not now have hatchery capacity to support this test. As this is a test, fish for this project would be purchased from non-State sources, rather than additions being made to State hatcheries.

The Commission recommends against a hatchery such as the Salmon River Hatchery and against the introduction of species not now present in the State, particularly the coho and chinook salmon. The Commission was concerned with the incompatibility of these species with native salmonids as well as with the possibility of introducing non-native diseases and parasites.

## Conclusions and Recommendations

## I. The Feasibility of Introducing Exotic Fish

## A. Exotic fish

The Commission interpreted exotic fish as those species which are not established in Maine waters. Fish stocked into the Salmon River in New York but considered exotics in Maine, would consist of chinook salmon, coho salmon and steelhead trout. The Commission recommends against stocking these fish in Maine. These species are considered oceanic migrants, resulting in low returns to the angler and fish being available only seasonally. (See Appendix II) In addition, the two salmon are very competitive with native species and die after spawning.

## B. Large Fish

It was the Commission's observation that the appeal of the Salmon River fishery was a result of the large average size of the fish creeled and not the exotic species being caught. With this in mind the Commission explored in detail the possibility of providing anglers with larger, non-exotic species than are currently available in Maine. It became obvious that Maine does not possess a body of fresh water of the size and with the productivity of Lake Ontario. Although nowhere near the magnitude of Lake Ontario, some of Maine's estuarine waters would more closely approximate the higher productivity of Lake Ontario and its tributary, the Salmon River.

The three species of salmonids currently present in Maine that seemed worthy of consideration were: brown trout, rainbow trout and landlocked salmon. The first two species are producing fisheries for large fish in the Salmon River in New York. The landlocked salmon, although not utilized in the Salmon River, would seem to offer the capability of producing larger fish here in Maine.

C. Recommendation for Test Program

While it was the Commission's judgment that there is a good possibility of producing large fish thru an estuarian stocking program, they recommended such a program proceed on a 5 year test basis. The reasons for the recommendation to test are:

- 1. The lack of experience with an estuarine salmonid stocking program using the species recommended.
- Concerns about the environmental impact of such a program on existing fish populations. (Competition with native estuarine fish)

3. The cost of expanding Maine's hatchery capacity to sustain such a program. Preliminary estimates are \$2,500,000 to \$3,000,000.

The Commission believes that if the test program results in a minimum catch of 0.2 fish per angler per day averaging 3 pounds in weight and that there are no significant adverse ecological effects, a long term stocking program and the commensurate capital investment would be justified.

- D. Details of Test Program
- 1. Estuarine Study Area

While this is a test program, the Commission elected to select an estuary where they would expect a reasonable chance of success. The estuary selected is the Kennebec/Androscoggin because of its large size, productivity and angler availability.

Stocking of the Kennebec/Androscoggin estuary would likely be a major boon to sportsmen during the test period regardless of whether the program was extended to other estuaries in the future.

- 2. Fish
  - a) The Commission decided to use rainbow trout and landlocked salmon as test species. The rainbow has been highly successful in the Salmon River Program in New York and landlocked salmon now provide some of Maine's finest sport fishing. According to biological testimony received by the Commission these species will not naturally reproduce to any degree and therefore the program will be controllable if there are adverse environmental impacts.
  - b) Number and Size of Fish

The Commission recommended that one fish per acre of each of the two species be stocked into the estuary. While this is a fairly heavy stocking compared to the Inland Fisheries and Wildlife's fresh water practices, it is considered conservative relative to what is estimated to be more productive habitat in the estuary.

The fish stocked will be yearlings. Currently Maine Inland Fisheries and Wildlife stocks 7-10 inch spring yearlings in their inland program. If available, the fish used in this test should be a minimum of 10 inches in length to help reduce predation from birds and larger fish. c) Stocking Needs and Source of Fish

At the stocking rate of 2 fish per acre it would require 17,000 fish to stock the 8,500 acres of Merrymeeting Bay. Currently, Inland Fisheries and Wildlife does not have the hatchery capacity necessary to raise these additional fish without reducing current programs. The Commission was faced with the altenatives of Department funding or a bond issue for capital construction or of purchasing the fish from private sources. Given the test nature of the project, the usual tight departmental budgets, and the fact that the required additional hatchery capacity is preliminary estimated at \$2,500,000 -\$3,000,000, the Commission recommended the purchase of fish.

d) Objective of Test

The objective of the test will be to determine whether stocking will provide a minimum catch of 0.2 fish per angler per day (higher than the current state average for landlocked salmon) averaging at least three pounds each without significant adverse impact on existing species and the ecology of the estuary.

e) Expansion to other Estuaries

It is expected to take up to 5 years before the test program can be evaluated and recommendations made relative to expansion into additional estuaries. A list of estuaries suitable for expansion of the program has been included in Appendix III. However, given the duration of this test and the need for evaluating the results, the Commission has not attempted to prioritize this list or develop associated costs. Under current plans, the program would not be instituted in estuaries where there are active management programs for Atlantic salmon.

f) Licensing and Catch Limits

As is traditional no sport fishing licenses are required in coastal waters. The Department of Marine Resource will develop regulations on harvest methods and the numbers and sizes of fish to be kept. These regulations will be formulated within the overall objective of the study which is to provide the opportunity to catch large fish.

## g) Evaluation

A significant portion of the evaluation of this test will be done thru the reaction of anglers, both sports and commercial, to the availability of the new fishing resource and to any impact that it might have on the existing fish population.

These attitudes and opinions will be backed up by objective measures of catch and studies on the impacts on existing fish populations and fisheries as approved by the Commissioner of the Department of Marine Resources. Prestocking evaluations will consist of a creel survey of the winter estuarine smelt anglers and analysis of several years of existing catch data from summer seine haul sampling in Merrymeeting Bay and the Kennebec and Androscoggin Rivers. The summer seine haul survey and smelt creel survey will be continued during the salmonid stocking evaluation. The creel survey of the salmonid sport fishery will be conducted from FY-92 through FY-95.

h) Test Costs

The costs of this test are estimated as follows:

		stocking Years	Initia <u>Stocki</u>		<u>Test Eval</u>	uation Y	ears
	FY89	9 FY90	FY91	FY92	FY93	FY94	FY95
Purchase of Fish	None	\$60,000	60,000	65,000	70,000	75,000	80,000
Rainbow trout	,	(30,000	30,000	32,500	35,000	37,500	40,000)
Landloc salmon	ked	(30,000	30,000	32,500	35,000	37,500	40,000)
Evaluation	L	15,000		97,000	75,000	75,000	75,000
TOTAL		75,000	60,000	162,000	145,000	150,000	155,000

## i) Justification of Test Cost

The Commission did not involve itself in justifying the costs of this test nor is an economic analysis to be part of the evaluation program. The reasons are: (1) it was not seen as part of the Commission's charge, and (2) economic issues are being dealt with by the Commission to Study the Impact of Game and Non-Game Species on Maine's economy (Private Laws 1987 Chapter 349).

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## II. State-of-the-Art Hatchery

The Commission devoted little time to the overall question of whether the fisheries, in general, could be improved with a state-of-the-art hatchery. To properly answer such a question would go far beyond what appeared to be the overall intent of those setting up the Commission. A further reason for the limited focus on hatcheries was the Commission's decision not to obtain fish for its proposed pilot test from the State's hatchery system.

However, while pursuing what it perceived to be its major charge of developing a fishery for larger fish, the Commission was not presented with any evidence of the inadequacy of Maine's current hatchery program except as it concerns the issue of the need to stock more legal-sized brook trout particularly in the urban areas. The Commission, however, did become aware that Maine hatcheries are at their capacity and that in the near future the demands generated by increased tourism will have to be dealt with thru increased hatchery capacity. The Commission felt at that time plans for a state-of-the-art hatchery would be assessed.

## III. Alternative Funding Sources

Because these recommendations do not include hatchery needs, (expansion) the Commission did not devote a great deal of a attention to alternative funding sources. The Commission did determine that private funding could be solicited by the Commissioners of Inland Fisheries and Marine Resources under current law but did not feel such funding was appropriate for the type of non-capital administrative and evaluative expenditures required by the recommended test project.

## IV. Related Subjects Considered by the Commission

Although not considered a direct charge to the Commission the following areas were discussed and need continued focus:

Other habitats - lakes vs rivers vs estuaries Angler use & regulation (harvest vs non-harvest) Identify & resolve predation problems Fish species selectivity Environmental impacts of introductions Need for advertising specific sport fisheries

APPENDICES

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Appendix I

#### FIRST REGULAR SESSION

#### ONE HUNDRED AND THIRTEENTH LEGISLATURE

Legislative Document

No. 1362

S.P. 448

In Senate, April 28, 1987

Reference to the Committee on Fisheries and Wildlife suggested and ordered printed.

JOY J. O'BRIEN, Secretary of the Senate Presented by Senator TUTTLE of York. Cosponsored by Representative JACQUES of Waterville,

Representative DUFFY of Bangor, Representative GREENLAW of Standish.

STATE OF MAINE

IN THE YEAR OF OUR LORD NINETEEN HUNDRED AND EIGHTY-SEVEN

Resolve, to Create the Commission on Sport Fisheries to Study the Possibility of Enhancing and Upgrading Fishing Opportunities in the State.

Commission established. Resolved: That the Commission on Sport Fisheries is established. The commission shall consist of the following 8 members, appointed in the following manner: Two members from the Joint Standing Committee on Fisheries and Wildlife and 2 members from the Joint Standing Committee on Marine Resources, to be appointed by the chairman of each committee; 2 members from the public, reprementing organizations with an interest in sport fishing, to be appointed by the Governor; and one member from the Department of Inland Fisheries and Wildlife and one member from the Department of Marine Re-

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Commission on Safety in the Bureau of Insurance can absorg with the Joint Select Commisof Providing Benefits and comorkers' Compensation Act with ing resources.

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STATEMENT OF FACT

ment establishes the Joint Selthe Costs of Providing Benefitnder the Workers' Compensation mpensation system has been and lic debate and scrutiny ject of this study is to deten charged, the costs of bensation coverage states igher than other states id to be higher, the committee reasons for the increased cost iven a broad mandate to invery increased costs and is prom all agencies and department well as staff assistance for il.

form of, the workers' compensawithout reliable, objective the problems within int can be made to find a soluthe exact area of the problethe purpose of this study is any problems in the worker if they exist, and to suggest address the precise areas of

Senator Dutremble for the constant of the cons

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sources, both members being fisheries' management l FIF biologists, to be appointed by the Governor; and be 2 3 it further ONE HUNDRED 4 Study. Resolved: That the commission shall study the State's sport fisheries' management program 5 6 and subsequently draft a report that specifically ad-Legislative Documer 7 dresses the feasibility of introducing exotic species and improving the fisheries with a state-of-the-art 8 hatchery, such as the one on the Salmon River in New g H.P. 1010 York; and be it further 10 Approved for intro Legislative Council pur 11 Report submitted. Resolved: That the commission Reference to the ( 12 shall submit its report and any necessary legislation ordered printed. to the Second Regular Session of the 113th Legisla-13 14 ture; and be it further Presented by Represent. Cosponsored by Sei Expenses. Resolved: That the commission members 15 Representatives MacBRII shall receive compensation for their expenses only; 16 Isle. and be it further 17 18 Appropriation. Resolved: That there is appropri-19 ated from the General Fund \$5,000 to carry out the 20 purposes of this resolve. IN T NINETEEN 21 STATEMENT OF FACT AN ACT Relati This resolve creates the Commission on Sport Fisheries to study the State's sport fisheries' man-22 23 24 agement program. Be it enacted by th follows: 25 0723041487 36 MRSA \$1760, 6 705, Pt. K, is fur 41. Certain er. 8 foreign commerce. T 9 raitroad--rotting-s is placed in use by ity of interstate o after that sale not less than 80% o 6] A an instrumentality 15 The State Tax Asses Page Page 2-LR0723

Appendix I

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JUN 19'87 39 BY GOVERNOR RESOLVES

## STATE OF MAINE

## IN THE YEAR OF OUR LORD NINETEEN HUNDRED AND EIGHTY-SEVEN

S.P. 591 - L.D. 1744

Resolve, to Create the Commission on Sport Fisheries to Study the Possibility of Enhancing and Upgrading Fishing Opportunities in the State.

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 State's fisheries support a substantial tourism industry; and

Whereas, maintaining and enhancing these fisheries is vital to the economic well-being of the State; and

Whereas, to conduct a thorough study, the commission must begin work immediately; 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

Commission established. Resolved: That the Commission on Sport Fisheries is established. The commission shall consist of the following 8 members, appointed in the following manner: Two members from the Joint Standing Committee on Fisheries and Wildlife and 2 members from the Joint Standing Committee on Marine Resources, to be appointed jointly by the

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President of the Senate and the Speaker of the House; 2 members from the public, representing organizations with an interest in sport fishing, to be appointed by the Governor; and one member from the Department of Inland Fisheries and Wildlife and one member from the Department of Marine Resources, both members being fisheries' management biologists, to be appointed by the Governor. The commission shall select a chairman from within their membership. The first meeting of the commission shall be convened by the chairman of the Legislative Council. All appointments shall be made no later than 10 days following the effective date of this resolve. The Executive Director of the Legislative Council shall be notified by all appointing authorities once their selections have been finalized; and be it further

That the commission Study. Resolved: shall study the State's sport fisheries' management program and subsequently draft recommendations that specifically address the following issues; the feasibility of introducing exotic species into state waters; improving the fisheries with a state-of-the-art hatchery, such as the one on the Salmon River in New York; and alternative sources of funding for these projects; and be it further

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

Report submitted. Resolved: That the commission shall submit its report and any necessary legislation to the Second Regular Session of the 113th Legislature by February 15, 1988; and be it further

Expenses. Resolved: That the commission members who are not state employees shall not receive per diem or compensation for their expenses; and be it further

Allocation. Resolved: That the following funds are allocated from dedicated revenue of the Department of Inland Fisheries and Wildlife to carry out the purposes of this resolve.

1987-88

# LEGISLATURE

Commission on Sports Fisheries

All Other

\$2,000

Provides funds for the anticipated costs of the commission.

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

## L.D. 1744

(Filing No. S-143)

#### STATE OF MAINE SENATE 113TH LEGISLATURE FIRST REGULAR SESSION

SENATE AMENDMENT " $_{\rm B}$ " to S.P. 591, L.D. 1744, "Resolve, to Create the Commission on Sport Fisheries to Study the Possibility of Enhancing and Upgrading Fishing Opportunities in the State."

Amend the resolve in the 6th paragraph after the title in the 7th and 8th lines (page 2, lines 15 and 16 in L.D.) by striking out the following: "by the chairman of each committee" and inserting in its place the following: 'jointly by the President of the Senate and the Speaker of the House'

Further amend the resolve in the 11th paragraph after the title by striking out all of the first 3 lines (page 3, lines 9 to 11 in L.D.) and inserting in their place the following: 18 19 20

'Allocation. Resolved: That the following funds are allocated from dedicated revenue of the Depart-21 22 ment of Inland Fisheries and Wildlife to carry out 23 • the purposes of this resolve.' 24

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SENATE AMENDMENT "B" to S.P. 591, L.D. 1744

#### STATEMENT OF FACT

The purpose of this amendment is to change the appointing authority for legislative members to the President of the Senate and the Speaker of the House, as has been the practice in the past. It also changes the appropriation to an allocation.

3293060587 7 (Sen. Usher) 8 ls on SPONSORED BY: 9 COUNTY: Cumberland 10

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Reproduced and Distributed Pursuant to Senate Rule 12. (6/5/87) (Filing No. S-143)

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#### (EMERGENCY) SECOND REGULAR SESSION

Legislative	Document	NO.	2275
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 H.P. 1663 House of Representatives, February 16, 1988 Reported by Representative GREENLAW for the Commission on Sport Fisheries pursuant to Resolves of 1987, Chapter 39. Reference to the Joint Standing Committee on Fisheries and Wildlife suggested and printing ordered under Joint Rule 18.

EDWIN H. PERT, Clerk

STATE OF MAINE

IN THE YEAR OF OUR LORD NINETEEN HUNDRED AND EIGHTY-EIGHT

RESOLVE, to Change the Reporting Date of the Commission on Sport Fisheries.

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

Whereas, Resolves 1987, chapter 39 established Commission on Sport Fisheries to study the State's

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8 .9 sport fisheries management program and to report its
 findings to the Legislature by February 15, 1988; and

3 Whereas, the commission's assignment is a very 4 extensive and time consuming one involving, among 5 other issues, the question of the capacity of Maine's 6 waters, angler desires, current hatchery capabilities, 7 state-of-the-art hatcheries and innovative funding; and

8 Whereas, the commission has determined that 9 specialized advice will be required to assist it in 10 its endeavors and time is required to identify the 11 resource personnel, to determine methods of funding 12 their participation and to obtain time on their 13 schedules; and

Whereas, the Commission to Study the Impact of Game and Nongame Species on Maine's Economy is dealing with material of value to the commission and will have quarterly reports during 1988 and a formal interim report December 1, 1988; and

19 Whereas, because of these reasons, the commission 20 requires additional time to complete its study; 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

27 **Report of commission.** Resolved: That, 28 notwithstanding Resolves 1987, chapter 39, the 29 Commission on Sport Fisheries shall continue its study 30 and report its findings, together with any necessary 31 legislation, to the Legislature no later than December 32 1, 1988; and be it further

33 Nonlapsing funds. Resolved: That the funds 34 appropriated by Resolves 1987, chapter 39, shall not 35 lapse on February 15, 1988, but shall carry forward

Page 2-LR4751

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1 until the purposes of this study have been completed.

2 Emergency clause. In view of the emergency 3 cited in the preamble, this resolve shall take effect 4 when approved.

#### STATEMENT OF FACT

6 This resolve extends the reporting date of the 7 Commission on Sport Fisheries from February 15, 1988 8 to December 1, 1988. It continues the \$2,000 9 appropriation of the original resolve, about \$1,000 of 10 which is earmarked for report production. It 11 continues the provision that Legislators and public 12 members do not receive per diem or expenses.

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## Appendix I

#### L.D. 2275

## (Filing No. H-486)

#### STATE OF MAINE HOUSE OF REPRESENTATIVES 113TH LEGISLATURE SECOND REGULAR SESSION

HOUSE AMENDMENT "A " to H.P. 1663, L.D. 2275, "RESOLVE, to Change the Reporting Date of the Commission on Sport Fisheries."

Amend the resolve in the last paragraph before the emergency clause in the last line (page 3, line 1 in L.D.) by striking out the following: "completed." and inserting in its place the following: 'completed; and be if further'

Further amend the resolve by inserting before the emergency clause the following:

17 'Allocation. Resolved: That the following 18 funds are allocated from dedicated revenue of the 19 Department of Inland Fisheries and Wildlife to carry 20 out the purposes of this resolve.

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23 Commission on Sports Fisheries

24 All Other

LEGISLATURE

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\$1,000

1988-89

Provides funds for the remaining anticipated costs of the

#### Page 1-LR5058

HOUSE AMENDMENT "Â" to H.P. 1663, L.D. 2275 1 commission.' 2 STATEMENT OF FACT 3 The purpose of this amendment is to include and 4 allocation section to this resolve. 5 - 5058031688 Filed by Rep. Jacques of Waterville Reproduced and distributed under the direction of the Clerk of the House 3/16/88 (Filing No. H-486)

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Page 2-LR5058

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Species	Stock Attributes	Pros	Cons	Remarks
Brook trout	Migration Current status Angler availability Expected return to anglers Size range	In shore Native Year round High		l-4 lbs.
Brown trout	Migration Current Status Angler availability Expected return to anglers Size range	In shore Established pops. Year round High		1-9 lbs (most 2-4 lbs)
Rainbow trout	Migration Current status Angler availability Expected return to anglers Size range	In shore Established pops. Year round High	· ·	1-9 lbs (most 2-4 lbs)
Steelhead trout	Migration Current status Angler availability Expected return to anglers Size range		Off shore Exotic Seasonal Low	5-20 lbs
Landlocked salmon	Migration Current status Angler availability Expected return to anglers Size range	In shore Native Year round High		1-10 lbs
Coho salmon (Silver)	Migration Current status Angler availability Expected return to anglers Size range		Off shore Exotic Seasonal Low	Die after spawning Competition with native species Fall fishery 6-8 lbs
Chincok salmon (King)	Migration Current status Angler availability Expected return to anglers Size range		Off shore Exotic Seasonal Low	Die after spawning Competition with native species 8-15 lbs

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Species	Stock Attribtutes	Pros	Cons	Remarks
Atlantic salmon	Migration Current status Angler availability Expected return to anglers Size range	Native	Off shore Seasonal Low	5-20 lbs
Striped bass	Migration Current status Angler availability Expected return to anglers Size range	In shore * Native Year round High		2-70 lbs (most 3-5 lbs)
American Shad	Migration Current status Angler availability Expected return to anglers Size range	In shore* Native High	Seasonal	2-9 lbs

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\*Subject to intercept fisheries along the Maine coast

# CANDIDATE ESTUARIES FOR DMR/IF&W SALMONID PROGRAMS

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River	Drainage Area(Mi <sup>2</sup> )
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Kennebec-Androscoggin/Merrymeeting Bay	9,610
Salmon Falls	329
York	32
Mousam	125
Ogunquit	20.7
Kennebunk	38
Presumpscot	615
Royal	142
Damariscotta	57
Pemaquid	36
Medomak	74
St. George	225

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