RECOMMENDATIONS OF THE SALMON RESEARCH COMMITTEE

1. In determining the present suitability for stocking of rivers now containing salmon runs the Penobscot must be considered separately. The other five rivers in eastern Maine were classified from the standpoint of the chances for salmon to pass obstructions, such as dams and nets, as follows:

   a. The Dennys and Narraguagus rivers are open and were classified as being the most suitable.

   b. The Machias river was classified as being less suitable on account of having three fishways and three unscreened water diversions.

   c. The Pleasant and East Machias rivers were classified as unsuitable. The Pleasant river dam is leaky and presents a difficult fishway problem; also netting is permitted just below the dam on Tuesdays, Wednesdays, and Thursdays of each week. The East Machias river has a bad obstruction due to the large water diversion of the Bangor Hydro-Electric Company which discharges about 800 feet below the dam. The salmon are attracted into the tailrace and remain there during all low water periods. At such times the main river is almost non-existent from the dam to the tailrace.

2. The recommendations for disposal of the Atlantic salmon remaining at Tunk Lake and Craig Brook hatcheries from eggs taken in 1940 are as follows:

Hatchery	Derivation of eggs	Approximate number	Disposal
Tunk Lake	Dennys River	15,000	Dennys River
Do	Penobscot River	10,000	East Branch of Penobscot
Do	Miramichi River	17,500	St. Georges River
Craig Brook	Penobscot River	15,000	East Branch of Penobscot
Do	Miramichi River	15,000	St. Georges River

The Dennys river and St. Georges river plantings are to be made at localities designated by Dr. Cooper and Dr. Rounsefell, respectively.

3. Recommendations concerning the disposal of the sea-run salmon from 1941 eggs now hatching at Craig Brook are as follows:

The Miramichi salmon and the Silver salmon from the Pacific coast will be planted respectively in the St. Georges and Pemaquid rivers at the times and places designated by Dr. Rounsefell.

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Of the 247,000 Atlantic salmon fry from eggs collected from adults taken in the Machias and Penobscot rivers, 120,000 should be planted during 1942 after the first of September, the remainder should be held until 1943.

The 120,000 should be allocated as follows:

Machias River	55,000
Penobscot River	40,000
Narraguagus River	15,000
Dennys River	10,000

If for any reason it becomes necessary to plant over 120,000 during 1942, they should be allocated in the same proportion.

4. Recommendations concerning the obtaining of Atlantic salmon eggs during 1942:

   a. Attempt to obtain 180 to 200 adult salmon.

   b. Hold the adults at Craig Brook and mark fish from each river by clipping part of one fin.

   c. Strip the fish at Craig Brook keeping the eggs from each river separately.

   d. Attempt to trap fish at Bangor dam on the Penobscot, on the Machias river and at least one other river.

   e. Attempt to maintain traps all season in any river from which adults are taken to count the entire run.

   f. Maintain traps at both Bangor and Veazie dams. Mark fish taken at Bangor in excess of those removed for stripping and release them above dam in order to determine the percentage using the Bangor fishway, and to determine whether all fish passing the Bangor dam reach the Veazie fishway.

   g. At any trap take the first ten fish and only every second fish thereafter until enough have been captured.

   h. Attempt to rear all sea salmon at not more than two hatcheries.

5. Recommendations concerning pollution are as follows:

   a. That the laws concerning the dumping of sawdust, shavings, and other wood waste into the Narraguagus and St. Georges rivers be enforced.

b. That an adequate study be made of the pollution on the Penobscot river from East Millinocket to Sandy Point to determine whether present pollution is detrimental to salmon.

6. Recommendations for legislation are that the laws be amended to define an adequate fishway for salmon as having as a minimum requirement, pools six feet by eight feet or at least 48 square feet with a water depth of at least four feet and having not over 18 inches difference in water level between pools.

7. About 100,000 Atlantic salmon eggs from the 1942 egg take be transferred from Craig Brook Station to Tunk Lake Station.

8. Insofar as possible all of the young salmon be carried at the Tunk Lake Station until September 1, 1943.

9. Insofar as possible, 50 percent of the young salmon be carried until the spring of 1944.

10. That the young salmon from the 1940, 1941, and 1942 egg takes now on hand at the Tunk Lake and Craig Brook Fishery Stations be released, insofar as practicable, in accordance with the following tables:

Recommendations for allocation and stocking of sea-salmon during 1943.

Stock	Number	Year spawned	Source of eggs	Where to plant	Number to plant	Percent of plant	Month to plant	Number to hold	Biologist to mark and/or designate exact place of release
Carried over from 1942									
Silver salmon	21,839	1941	Oregon	Pemaquid R.	21,839	100.0	April		Yes
Atlantic salmon	5,872	1940	Miramichi R.	St. Georges R.	5,872	100.0	May		Yes
	12,566	1941	Miramichi R.	St. Georges R.	12,566	100.0	May		Yes
	67,326	1941	Machias R.	Machias R.	30,900	46.0	May		No
				Penobscot R.	22,200	33.3	May		Yes
				Narraguagus R.	8,400	12.5	May		No
				Dennys R.	5,600	8.3	May		Yes
From 1942 eggs 1/									
Silver salmon	44,764	1942	Oregon	Pemaquid R.	Ca. 25,000		Sept.	15,000	Yes
Atlantic salmon Tunk Lake 2/	100,000	1942	Penobscot R.	Three Rivers:	Ca. 40,000		Sept.	50,000	
				Narraguagus R.		50.0			No
				Dennys R.		30.0			Yes
				Machias R.		3/ 20.0			No
Craig Brook	582,513	1942	Penobscot R.		Ca. 125,000			400,000	
				St. Georges R.	20,000		May		Yes
				St. Georges R.	20,000		Sept.		Yes
				Penobscot R.	Ca. 85,000		Sept.		Yes

1/ This is the number of eggs on hand January 15, 1943, so allowance for hatching loss must be made.

2/ Eggs to be transferred from Craig Brook to Tunk Lake Hatchery.

3/ Machias River has a low allotment because the Committee considers its suitability somewhat in doubt due to the presence of three fishways and some question as to their efficiency.

Recommendations, subject to revision at a future meeting, for allocation and stocking during 1944 of sea salmon held over from the 1942 spawning.

Stock	Number held over	Source of eggs	Where to plant	Number	Percent to plant	Month to plant	Number to hold	Biologist to mark and/or designate exact place of release
Tunk Lake Hatchery								
Atlantic salmon	50,000	Penobscot R.	Narraguagus R.		50.0	May		No
			Dennys R.		30.0	May		Yes
			Machias R.		20.0	May		No
Craig Brook Hatchery								
Silver salmon	15,000	Oregon	Pemaquid R.		100.0	April		Yes
Atlantic salmon	400,000	Penobscot R.	St. Georges R.	20,000		May		Yes
			Penobscot R.	Ca.200,000		May		Yes
			St. Georges R.	20,000		Sept.		Yes
			Penobscot R.	Ca.100,000		Sept.		Yes
							50,000	

11. That no bass of any species be introduced into the Pemaquid or Sheepscot river systems until the Committee has decided whether or not these rivers are suitable for the restoration of sea-run salmon. Dr. Cooper (See Fish Survey Report No. 5, Maine Department of Inland Fisheries and Game, 1942) found that some of the lakes in these river systems were suitable for bass but concurs in the opinion of the Committee that they should not be introduced into these river systems unless, at a future date, experiments should prove these rivers to be unsuitable for salmon.

12. That an attempt be made to obtain about 180 to 200 adult salmon to hold at Craig Brook for spawning.

13. That the salmon-counting trap in the fishway at Veazie Dam, which was successfully operated by the Department of Inland Fisheries and Game during 1943, be operated annually as a permanent feature of the Penobscot River management program.

14. That a concrete wall be constructed below the foot of the fishway on the east bank of the Penobscot River at Bangor Dam to facilitate the passage of fish up through the fishway during summer low water periods.

15. That the Rules and Regulations of the Department of Sea and Shore Fisheries 130, Resolves, 1941, c. 84, and the Commissioner's Ruling of March 26, 1942, amending it, be further amended. The present Ruling reads:

> "No fish shall be taken, except by hook and line, from the waters of Pemaquid River, above a line drawn from the most southerly end of Cardy's Point to the most southwesterly end of Old Fort Point, EXCEPT, that during the months of May and June fishermen shall be permitted to seine ALEWIVES from the waters of Pemaquid river with seine of not less than two inch mesh and Alewife nets of not more than three inch mesh. March 26, 1942"

The Committee feels that the present restriction will not provide the necessary protection either for the young silver salmon migrating downstream in April and May or for the adult salmon migrating upstream in the autumn. Therefore the Committee recommends that the last Ruling be amended to read:

> "No fish shall be taken from the waters of Pemaquid River, above a line drawn from the most southwesterly tip of Thurston Point to the most southwesterly tip of Fish Point, EXCEPT, that during the months of May and June, ALEWIVES may be dipped at Pemaquid Falls in the manner determined by the fish committee of the Town of Bristol, with due regard for the downstream passage of young salmon."

16. That the Ducktrap River be henceforth considered suitable for salmon.

17. That the law prohibiting the taking of salmon after July 15 each year be more strictly enforced for the commercial gear in Penobscot Bay.

18. That accurate statistics of both sport and commercial catches of salmon be obtained for each river in the following manner:

    a. Statistics will be compiled of individual rivers and shall show number of fish (also weight when obtainable), type of gear used in making the catch, whether sport or commercial, and dates fish were taken as accurately as possible.

    b. All statistics will be compiled by the fisheries statistician of the Department of Sea and Shore Fisheries.

    c. Reports will be collected each year immediately after the close of the salmon fishing season in each locality.

    d. The statistics shall not include kelts (spawned out salmon, thin and emaciated, sometimes taken by so-called sport fishermen).

    e. The Inland Fisheries wardens will gather all records of salmon caught in fresh water by sport gear or other means (including known cases of fish taken illegally), and of salmon taken while dipping alewives.

    f. The Sea and Shore wardens will gather the statistics on the remainder of the catch, including the commercial.

    g. The Sea and Shore Fisheries statistician will make the detailed arrangements with the wardens of both fisheries departments in order to avoid duplication and to insure final centralized compilation.

19. That the collection of adult salmon for spawning purposes be carried out in conformity with the Committee's previous recomendation (4g) made on April 30, 1942.

20. That in carrying out the recommendations of the Committee in collecting adult salmon for hatchery use, the personnel do not select the fish, but take every second fish regardless of injuries, or other factors.

21. That certain vital statistics of hatchery operations, which are essential to the success of the salmon restoration program, be kept as follows:

    a. Methods of enumeration or estimation of the numbers of eggs or fish will be approved and the counting or estimating supervised by the biologists conducting the salmon research program.

    b. The number of adults taken by the hatcheries.

    c. The number of adults of each sex spawned.

    d. The number of eggs stripped.

    e. The number of fry hatched.

    f. The number of feeding fry placed in each pond and the date.

    g. Records of mortality by individual ponds.

    h. Records of disease or preventative treatment by pond, showing diagnosis, who made the diagnosis, treatment recommended, date and type of treatments actually used, including exact name of chemical, concentration, and time of exposure, and date and results of reinspection.

    i. Weight and either an actual count or approved estimate of each planting.

    j. An approved enumeration or accurate estimation of the total numbers of each lot of salmon held in the hatcheries at the time any stocking is done. This approved estimate to be obtained for all lots, regardless of whether any are planted, at least twice annually, preferably in May and October.

22. That controlled experiments to determine the effects on mortality and growth of crowding, cannibalism resulting when fish are not sorted into size categories, and of differences in the composition, amount and frequency of feeding, be carried out in an attempt to bolster the survival of young salmon in artificial propagation.

23. That all previous recommendations concerning planting of salmon of the 1942 brood year held at Craig Brook and Tunk Lake fishery stations are hereby revised, and planting shall, insofar as practicable, be in accordance with the following table

Recommendations for Allocation and Stocking of Sea-salmon Held Over from 1943 during 1944

Station	Egg Source	Year	Species	Number estimated on hand by hatchery Oct. 1, 1943	Number estimated will be on hand by committee May 1944	Where to plant	Per-cent	Month to plant	Per-cent to hold	Biologist to mark and/or designate exact place of release
Craig Brook	Penobscot	1942	Atlantic	224,135	125,000	Penobscot	25	May		Yes
						St. George	15	"		Yes
						Penobscot	25	Sept.		Yes
						St. George	15	"		Yes
									20	
" "	Oregon	1942	Silver	1/ 12,217	10,000	Pemaquid	all	May		Yes
Tunk Lake	Penobscot	1942	Atlantic	72,000	30,000	Penobscot	50	"		Yes
						Narraguagus	25	"		No
						Denny s	15	"		Yes
						Machias	10	"		No

1/ Actual count by biologists

SALMON RESEARCH COMMITTEE
Gerald P. Cooper
Lester A. Stubbs
George A. Rounsefell

24. That no weirs, pound nets, traps, or other fixed gear be permitted within a radius of three-quarters of a mile from the point where U. S. Highway 1 crosses the Ducktrap River.

25. That the planting of salmon of the 1943 brood year held at Craig Brook Station, be in accordance with the attached table:

Recommendations for Allocation and Stocking of Sea-salmon of 1943 Brood Year during 1944 and 1945

Station	Egg Source	Year	Species	Number estimated on hand by hatchery 4/1/44	Where to plant	Per-cent	Month to plant	Per-cent to hold	Biologist to mark and/or designate exact place of release
Craig Brook	Penobscot R.	1943	Atlantic	143,919	Penobscot	50	May 1945		Yes
					Do	50	Sep 1945		Yes
								rem.	
Craig Brook	Miramichi R.	1943	Atlantic	49,376	St. George	50	May 1945		Yes
					Do	rem.	Sep 1945		Yes
Craig Brook	Washington	1943	Silver	95,789	Ducktrap	20	May 1944		Yes)
					Do	20	Aug 1944		Yes) Lot A 50%
					Do	20	Nov 1944		Yes) of eggs
					do	rem.	May 1945		Yes)
					Pemaquid	60	Sep 1944		Yes) Lot B 50%
					Do	rem.	May 1945		Yes) of eggs

NOTE: rem. = remainder

Wed a.m.

Dear Bill

I wonder if you would care to give an opinion on the age and periods in salt and fresh water represented by these salmon scale photographs. They are from the Humber River in Newfoundland. A friend of mine is writing a sporting magazine article on Humber River and would like some description when the salmon leaves the sea and how he has more than passing knowledge of salmon himself.

Will you call me back on Chase when you have worked at them.

Yours

Salmon A Female 25½#

2 or 3 or 4 winters in fresh water 2 or 3 fresh

1 or 2 " " salt water 2+ in salt

Salmon B Female 28½#

2 winters in fresh water 2+

3 winters in salt water 3+

Salmon B - Hunter River 28½# Female

Salmon A - Hunter River 25½#

Salmon B - 28½# Female, Hunter R.

SALMON RESEARCH COMMITTEE

The sixth meeting of the Salmon Research Committee was called at 2.45 PM. on May 7, 1945 at the U. S. Fisheries Station, Craig Brook, Maine. The members present were Mr. Lester Stubbs, representing the Maine Department of Sea and Shore Fisheries; Mr. Gerry Wade, representing the Maine Department of Inland Fisheries and Game; and Mr. Louis D. Stringer, representing the Fish and Wildlife Service, U. S. Department of the Interior. Mr. Wade has been appointed to fill the vacancy caused by Dr. G. Cooper's resignation and Mr. Stringer to the vacancy caused by Dr. G. Rounsefell's transfer to Washington.

The previous recommendations of the Committee were discussed. Mr. Wade asked what was planned in the way of operating counting traps on the Penobscot River and suggested that they be maintained in all fishways, in addition to Bangor and Veazie. He questioned whether the Fish and Wildlife Service would contribute to the paying of salary and expenses for a man to watch these traps. Mr. Stringer offered to look into this possibility. After some discussion, it was decided, because of the labor scarcity, not to expand these operations but to continue this year only at Bangor and Veazie. Mr. Stubbs asked if anything had been done about the previous recommendation of the Committee (No. 14) to construct a concrete wall below the fishway in the Bangor Dam. Mr. Stringer stated that Commissioner Stobie had given him to understand that nothing could be done until labor and materials were available. Mr. Stringer asked Mr. Wade if he would look further into this situation and see whether anything could be done this year. Mr. Wade agreed.

The possibility of obtaining salmon for spawning at the Narraguagus River was discussed. Mr. Wade stated he thought the Department of Inland Fisheries and Game might be willing to install some kind of trap, but he suggested that due to the scarcity of labor and materials it would be better to postpone this work. Mr. Stubbs agreed and the Committee let this matter drop.

During the past several years a question frequently has arisen respecting the relative effectiveness of hatchery rearing methods used in the State and Federal hatcheries. In order to obtain more specific information on these points so that the best methods could be determined and adopted, Mr. Stringer proposed an experiment designed to test the merits of the respective methods. This would require that one-half of the salmon to be planted in the Penobscot from the 1944 egg take, be transferred to the Tunk Lake hatchery. The experiment would require an accurate count of the number of fish retained at Craig Brook, the number transferred to Tunk Lake, and the number on hand at each hatchery when planted. A record of all other hatchery methods would be maintained. The fish would be marked differently and planted at approximately the same time and place. The number of returns from these fish, with the other data, would give some indication of the relative hatchery efficiencies. Mr. Wade stated he did not believe a comparison of Tunk Lake, a one man station, with Craig Brook, a five man station, a valid one. Mr. Stringer asked the availability of some other State hatchery of equal plant and manpower. Mr. Wade said there were none available. Mr. Wade also said that with the difficulty in obtaining foods, etc., he could not agree to hold fish until such times as the Committee recommended planting and that he would plant whenever he felt the shortage of food was critical. The Committee agreed under these conditions that the experiment should be postponed.

Mr. Stringer then submitted a table showing the proposed stocking of 1944 Atlantic and Silver salmon now held at Craig Brook. These plantings are part of experiments run on the Penobscot, St. George, Pemaquid, and Ducktrap Rivers to study the effect of different stocking procedures, to compare natural spawning with artificial propagation, and to develop a stocking policy for other rivers. Fish are obtained at some river having a natural run, spawned, the eggs hatched, and the resulting fish reared to various sizes, ages, and times of the year when they are planted. Eggs have been obtained from the Penobscot, Dennys, Machias, and Miramichi (Canada) Rivers. The policy was started last year (1944) of taking only every other fish caught for this spawn-taking, the others are allowed to spawn naturally. One-half of the fish resulting from artificial propoagation are always returned to the river from which the eggs were obtained. Mr. Stubbs objected to the continuation of plantings in the St. George River of fish resulting from eggs taken only from the Penobscot River. His opinion was that this was depleting the Penobscot and as long as this river was furnishing all the fish for spawning and it was not possible to obtain spawning fish from other rivers, that all fish resulting from Penobscot eggs should be planted back in the Penobscot. Mr. Stringer pointed out that of the 62,594 fish, from three age groups, planted to date in the St. George; only 30,870 had been Penobscot fish. These of the 1943 age group, to be planted in the St. George this Spring and Fall, were fish obtained by the Fish and Wildlife Service from the Miramichi River in Canada. It was further shown that the Penobscot had received 34,198 fish from the Machias River. Mr. Wade agreed with Mr. Stubbs that until eggs could be obtained from some other source that the Penobscot eggs should be returned to that river. After much discussion, Mr. Stringer asked for a vote and the Committee voted two to one to plant all fish resulting from Penobscot River eggs back in the Penobscot.

Mr. Stringer asked the Committee if they approved of the planting schedule for the 1944 Silver salmon and the Committee voted unanimously recommending the stocking of 1944 Silver and Atlantic salmon as outlined in the following table:

Stocking Table - 1944 Brood Year

Station	Egg Source	Year	Species	Number on hand 8/1/45	Where to plant	Percent to plant	Month to plant	Percent to hold	Biologist to mark and/or designate exact place of release	
Craig Brook	Oregon	1944	Silver	50,000	Pemaquid	60	Sept. 1945	40	Yes	)Lot A
					"	Remainder	May 1946	0	"	)50% of
										)eggs
				50,000	Ducktrap	30	Aug. 1945	70	"	)Lot B
					"	30	Nov. 45	40	"	)50% of
					"	Remainder	May 1946	0	"	)eggs
Craig Brook	Penobscot	1944	Atlantic	140,000	Penobscot	50	May 1946	50	"	
					"	Remainder	Sept. 1946	0	"	

The meeting was concluded at 4:45 P.M.

Salmon Research Committee

Lester A. Stubbs
Gerry Wade
Louis D. Stringer

August 21, 1945.

REPORT OF WORK ACCOMPLISHED ON RECOMMENDATIONS OF THE
SALMON RESEARCH COMMITTEE
1945

Since the sixth meeting of the Salmon Research Committee on May 7, 1945, the following work has been done on recommendations made at this meeting.

As the maintenance of traps on all Penobscot River dams was dropped for the present, only those maintained for the last three years at Bangor and Veazie were continued this year. The trap at Bangor, used to obtain adult salmon for spawn-taking and census of spawning escapement, was installed on June 4, 1945, by members of the Craig Brook Fisheries Station staff and wardens of the Maine Department of Inland Fisheries and Game. A warden from this department was assigned to full time duty at Bangor and Veazie. The trap was removed on September 10,1945. During the time it operated, 168 fish were taken, all being caught by the 21st of July. The hatchery crew took 109 to Craig Brook for spawn-taking and the remaining 59 were freed and allowed to proceed upstream. Of this number only 4 were retaken at the counting trap at Veazie, the next dam above Bangor.

The stocking of the 1944 silver salmon recommended by the Committee was carried out as follows: The Pemaquid river received 19,976 in October, and the Ducktrap, 19,995, also in October. The August planting of silver salmon recommended for the Ducktrap was omitted because the fish were too small to mark.

The recommendation of the Committee to plant all of the 1944 Atlantic salmon from Penobscot eggs back in the Penobscot will work considerable hardship on the experimental marking and planting in

the St.George river. Of the two experimental rivers (Penobscot and St.George) now being planted with Atlantic salmon, the St. George does not have a natural run. At present, four age groups of salmon have been planted in the St. George. Of the 87,775 fish planted to date only 35.2 percent were fish from the Penobscot. The remainder were from eggs obtained by the Fish and Wildlife Service from the Miramichi River in Canada. No 1944 eggs were obtained from the Miramichi; consequently, if fish from the Penobscot cannot be used, a gap of at least one year class will occur in the St. George plantings. Returns are expected on the St. George in 1946. This experiment represents our preliminary efforts to establish a run of salmon in a stream from which these fish have been completely destroyed. It will also enable studies to determine the best size and age, the best season, and the best location in the river system for planting. It is a fairly small river, has no natural run of salmon, has sufficient summer flow, and only two small dams. It is a simpler problem to attack than the Penobscot, because of its small size, lack of heavy pollution, water diversions, and high dams. On the whole it represents a river which might be worked with a small staff, rather than requiring the large outlay that would be necessary on the Penobscot. If runs can be established on the St. George, they will provide positive proof that salmon can be restored to streams from which they have been exterminated provided pollution and dams can be brought under control, and they will also provide an added supply of eggs to the hatchery. A break of one or more years will result in a break in the run, if such is established, and also a break in the experimental data.

Louis D. Stringer

Louis D. Stringer
Acting in Charge, Salmon Investigation.

12/20/45