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BRIEF STATEMENT OF PRESENT STATUS AND FUTURE PLANS FOR THE PINK SALMON INVESTIGATION IN BRITISH COLUMBIA

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Brief Statement of Present Status and Future Plans for the Pink Salmon Investigation in British Columbia.

by

A. L. Pritchard.

Three phases of the pink salmon investigation carried out under the author's direction at McClinton creek, Masset inlet, have been productive of noteworthy results. These phases are: the study of migration as shown by marking experiments, the study of propagation as indicated by the counts of the adults and fry, and the study of transplantation in an effort to build a run in the "off" year.

Migration

During the fry migration each year with the exception of 1937 a number were marked by the removal of certain fins to ensure later identification. A scar would thus form where the fins were removed and be distinctive in the adult fish when it was captured. The following is a summary of the experiment.

Year	1931	1933	1935
No. marked	185,000	108,000	85,634
Fins removed	Adipose	Both vent.	Adipose and both ventrals
No. returning to McClinton	95	2,950	35
No. returning to other areas on the Queen Charlotte Is.	38	328	--
No. returning to outside areas	50	7	
Year of return	1932	1934	1936

Since all the recoveries were made in the second year after the fish were marked when the adults were on their spawning migration, the conclusion is evident that all the pink salmon in McClinton MATURE AND RETURN TO SPAWN

IN THEIR SECOND YEAR.

For reasons beyond the control of the author the experiments of 1931 and 1935 produced so few returns that little reliance can be placed on their interpretation. From the programme of 1933 comes the definite indication of the behaviour of the fish. In that year 2,950 out of a total of 3,285 were recovered at McClinton creek. Three hundred and twenty-four were taken from the canneries on the inlet and elsewhere, from catches made in Masset inlet itself. Four were taken in other localities on the island, three from the west coast and one from the north. Only seven were taken in regions outside the Queen Charlotte islands where one could reasonably suppose that they would not reach their parent stream. IN 1934 THEREFORE THE NUMBER OF WANDERERS FROM MCCLINTON CREEK WAS INSIGNIFICANT FROM THE ECONOMIC VIEWPOINT.

Propagation

The following is a summary of the counts made at McClinton creek:

Year	1930	1932	1934	1936
No. of males	32,955	8,003	77,467	24,221
No. of females	33,196	7,597	77,716	28,091
Total run	66,151	15,600	155,183	52,312
No. of eggs per female	1,535+12	1,758+15	1,799+11	1,899+12
Possible egg deposition	50,950,000	13,360,000	139,000,000	53,345,000
No. fry migrants	5,384,000	2,230,000	12,608,000	3,675,000
Per cent hatch	10.6	16.7	9.1	6.9
Per cent return (Basis of fry migrants)	.30	7.3	.4	
Per cent return (Basis of egg deposition	.03	1.16	.04	

The actual loss in all parts of the life history figured on the basis of egg deposition is 98.84 to 99.97 per cent. The greatest portion of this occurs during incubation and the migration of the fry to sea and amounts to

83.3 to 93.1 per cent.

Each year with the exception of 1932 the percentage hatch was of the same order of magnitude, from 6.9 to 10.6. Thus if there was a large number of adults there was a correspondingly large number of fry migrants. In spite of this after a large egg deposition and a large fry migration, a relatively small return in adults resulted two years later. The reason for this anomaly must lie somewhere in the sea life. It might be due to wandering from the parent stream in years of large runs or to a differential mortalith which was heavier in years of large fry migrations.

The year 1932 is peculiar in the large percentage hatch of fry as well as in the large return of fry migrants which resulted two years later. No other run of the same size occurred so that it could not be ascertained whether the exceptionally high return was due to the peculiar conditions which occurred during that cycle or whether the phenomenon is the result of better conditions due to the small size of the run.

Transplantation in the "off" year.

Since no pink salmon could be found in Masset inlet in the odd-numbered years, a series of experiments was carried out in an effort to establish a run. The eggs were obtained in the Tlell river on the east coast of Graham island and immediately transferred to an eyeing station on McClinton creek. The table below presents a resume of the programmes:

Year	1931	1933	1935
No. of eggs taken	1,131,666	757,659	757,837
Planted as ---	fry	eyed eggs	fry
No. fry migrants	877,634	5	505,874
No. marked	124,002		108,200
Mark used	Adipose + left ventral	- - -	Adipose + right ventral
No. unmarked	753,632		397,674
Return to Tlell river	None		
Return to McClinton	One		
Return to other areas	Fraser river (40)		

In 1931 only one pink returned to McClinton. Since it was unmarked it could not definitely be assigned to the above experiment. None returned to the Tlell but forty marked fish were picked up in the Fraser river area.

Heavy freshets following the planting of the eggs in 1933 apparently had a very adverse effect with the result that only five fry reached the fence the following spring. Thus the experiment was ended prematurely.

The recoveries from the 1935 experiments are due this autumn. None have been reported to the present.

Future Plans.

The indications from the counts are that following a large run of adults at McClinton creek, in spite of the fact that a correspondingly large fry migration goes to sea, a small return in mature fish results two years later. This may be due to wandering to other localities when the fry migration is large or to a differential mortality. The importance of fixing the cause is evident. If it should be the former, little reliance could be placed on the assumption that Pink salmon would return consistently from cycle to cycle to a given area. If the latter were the reason, the idea which is now prevalent that the increase in the number of migrants from fresh water means a greater return of adult salmon, would have to be adjusted. Comprehensive marking

experiments over a number of cycles are the solution in that they would give data on wandering as well as on the mortality in the sea. Such a programme would mean some assurance of continuity since there is little use spending the time or the money in marking the fry if two years later no facilities are available for the collection of returns.

The question of a thorough oceanographic programme in the inlets and along Dixon Entrance has often been introduced with the suggestion that it might provide some reason for fluctuations in the numbers in the runs. Such a programme might produce information of a very fundamental nature in this connection but it is doubtful if the data would have any economic application. If initiated, however, the programme should be prosecuted over a period of five consecutive years. At the same time definite checks could be made of certain rivers to see if any differences were evident there.

As a result of the queries which are now coming in from the industry it is now realized that the time has come to enlarge the work on the Pink salmon outside the limits of one inlet. Certainly it is not to be hoped that the same detailed examination can be carried through in every stream but a general survey of the spawning areas should be made and all the information as to the present condition of the fishery should be drawn together. This will then set up a basis for comparison in future years.

It should be pointed out that this investigation started as the Pink and Chum salmon inquiry. Of necessity it has been limited to the Pink salmon. The other species should be considered. The first step might be the same general survey as is recommended for the Pink. After this is completed there may be some demand and opportunity for specific programmes of the same nature as that which has been conducted in Masset inlet.