Summary of Egg Sampling at the Williams Creek Fence in 1949.

Introduction

The only way in which any idea of the number of eggs deposited by a given population can be gained is by taking a sample of that stock to calculate the average.

During the summer of 1949 a fence count was made at Williams creek, which provides spawning accommodation for approximately 94% of the sockeye spawning in streams tributary to Lakelse lake. Egg samples were taken in association with the fence count.

Methods

Ovaries were obtained from 7 females which had died in the pens or in the fence and from 18 females which were dipped randomly from one of the pens. Upon removal the ovaries were wrapped in cheesecloth or put in stomach bags and were preserved in 10% formalin in kegs. The length, weight, scale sample and the manner in which the fish was obtained were recorded separately to correspond with a numbered tag wrapped with each pair of ovaries.

The number of eggs were calculated volumetrically rather than by an absolute count. The volume of 500 eggs was determined and the ratio obtained was then applied to the volume of the remainder of the eggs. The following formula was used:

$$\frac{\text{Volume of remainder} \times 500}{\text{Volume of sample}} + 500 = \text{Total number of eggs.}$$

The eggs were separated and cleaned prior to measurement. Actual counts were made in four cases. These are compared with the calculated counts in the table attached to figures 1 and 2.

Results

The average counts, certain characteristics of the sample after graphical and statistical analysis (figures 1 and 2), and the potential egg deposition are given in Table I. For comparison similar data for 1939 as done by Pritchard and Cameron (figures 3 and 4) are also given in Table I.

TABLE I. Characteristics of the sockeye salmon run and potential egg deposition in Williams creek in 1949 as compared to similar data for 1939.

	1939	1949
Number in sample	24	25
Average egg content	3888±116	3737±114
Range of egg content	2145-4911	2600-4780
Average length of females (cm.)	59.6±0.61	57.8±0.49
Range of length (cm.)	51.0-65.5	52.0-62.5
Relation of number of eggs (E) to length (L)	E = 127.6L-3717	E = 178.1L-6556
Average increase of eggs per cm.	127.6	178.1
Correlation coefficient (Lt. vs eggs)	0.673±0.11	0.763±0.08
Average weight of females (lb.)	5.0±0.16	4.9±0.11
Range of weight (lb.)	3.2-6.4	3.25-6.25
Relation of number of eggs (E) to weight (W)	E = 529.6W+1240	E = 663.4+486
Average increase of eggs per lb.	529.6	663.4
Correlation coefficient (Wt. vs eggs)	0.727±0.10	0.846±0.06
Number of spawning females	11,735	3,000
Potential egg deposition	45,625,680	11,211,000

Comparison of the data in Table I for 1939 and 1949 shows variation in the number of eggs per units of increased length and weight between the two years. The average egg content does not show a great variation between the years though differences between individuals may be as much as 2,600 eggs.

The table attached to figures 1 and 2 shows a difference of + 32 between actual and calculated counts. As this figure was obtained from counts on only 4 individuals it cannot be considered accurate enough to apply.

Conclusions

1. The average egg content of female sockeye in Williams creek does not show much variation between 1939 and 1949.
2. Variation between the number of eggs in individuals may be as much as 2600 eggs.
3. The average increase in number of eggs per increased unit length and per increased unit weight was greater in 1949 than in 1939.
4. The average lengths of females sampled in 1949 was almost 2 centimetres less than the average lengths of females sampled in 1939.
5. The correlations between length and number of eggs and between weight and number of eggs were found to be highly significant at the 0.01 probability level. Hence, the correlations could occur less than once in a hundred by chance.

Suggestions

1. Egg counts should be carried on in future years at Williams creek if the potential egg deposition is desired.

2. The volumetric method of calculating the number of eggs should be checked further.

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