

Informational Leaflet 13

FORECAST OF CHIGNIK BAY RED SALMON RUN IN 1962

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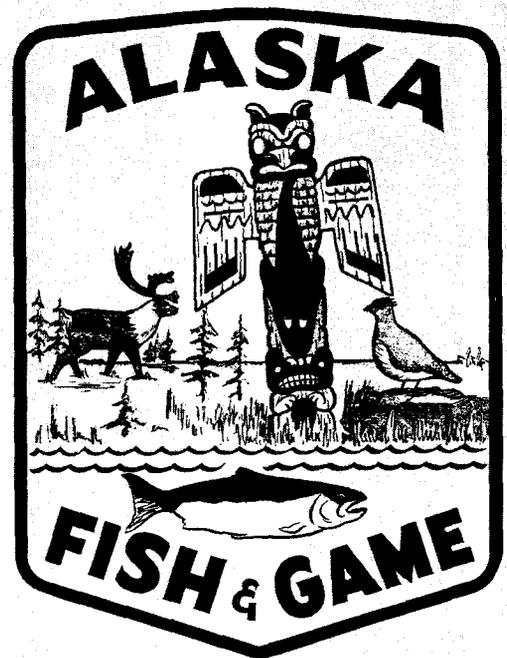
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Fisheries Research Institute

April 15, 1962

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Compiled jointly by the

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INTRODUCTION

Forecasts of the Chignik red salmon runs have been issued by the Fisheries Research Institute as research made forecasts possible. A method was developed based on ocean age composition of the adult run. In 1961 the Alaska Department of Fish and Game assumed the responsibility of collecting data on the age composition of the adult run. This forecast is issued jointly by the two agencies and is based on the age composition found in 1961 and the historical age and return relationships since 1955.

BACKGROUND

The size of the Chignik red salmon runs during the last ten years has ranged between 410,000 and 1,420,000 and averaged slightly over 800,000. Analysis of an extensive series of data suggests there is no suitable correlation between escapement and return to use as basis of prediction.

A smolt enumeration study was conducted by the Fisheries Research Institute from 1955 to 1959 and continued by the Department in 1960. The sampling site was established at the outlet of Chignik Lake and smolt abundance indices were compiled for a period of five years. No relationship was evident between the counts of migration smolts and subsequent adult return. The project was discontinued by the Department in 1961.

The relationship of the return after two years in the ocean to the following year's return after three years in the ocean has been reasonably consistent and provides the basis for forecasts which have been issued since 1958 as indicated in Table 1.

Table 1. F.R.I. Chignik forecasts, 1958-61.

Year	Predicted run	Actual return	% Error
1958	621,000	646,000	4.0
1959	834,000	827,000	-0.8
1960	1,900,000	1,285,000	-32.4
1961	795,000	721,000	-9.3

Limited tagging experiments conducted by the Department in the Stepovak Bay area in 1961 indicated that a small portion of the Chignik run is caught there. These catches have not been included in the actual returns as the data for predictions used in Table 1.

PREDICTION

The Chignik prediction is based on the ocean age composition of the returning adult red salmon. These runs consist mainly of fish which have spent three winters in the ocean (.3). Fish having spent two winters at sea (.2) make up only a minor portion of the runs. The ratio between .2 fish of one year and .3 fish of the following year has been fairly consistent. The geometric mean of these ratios for the past six years is 1:11.63 (Table 2).

The known return of 74,000 .2 fish in 1961 was applied to the mean ratio to predict the .3 fish return in 1962 of 860,000. The average .2 fish return over the past seven years is 80,000. Thus, the 1962 Chignik forecast is 940,000 red salmon.

Sources of error in the forecast method used at Chignik include variations in ocean survival, sampling error, and error in escapement enumerate. Any one of these could cause sizable deviation from the predicted 1962 return.

Table 2. Summary of prediction method for the 1962 Chignik red salmon run.

Return of .2 fish (two winters in ocean)	Return of .3 fish (three winters in ocean)	Ratio
92,000 (1955)	1,241,000 (1956)	1:13.49
42,000 (1956)	733,000 (1957)	1:17.45
47,000 (1957)	571,000 (1958)	1:12.15
63,000 (1958)	640,000 (1959)	1:10.16
152,000 (1959)	1,217,000 (1960)	1: 8.01
60,000 (1960)	642,000 (1961)	1:10.70
74,000 (1961)	--- (1962)	1:11.63 (Geometric mean)

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