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# SYSTEMS MODELING OF SOCKEYE SALMON IN THE WOOD RIVER LAKES

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(Annual Report for the Period July 1, 1974 through June 30, 1975)

## INTRODUCTION

The production of sockeye salmon in the Wood River lakes has declined significantly since the beginning of commercial fishing in the late 1800's. The causes of this decline and methods of increasing the present production have been the major objectives of a research program by the Fisheries Research Institute since its inception in 1946. The results of this research point to three components which limit or control the production of sockeye salmon in the biological system in which they occur at present in the Wood River lakes. These components are: (1) the amount of spawning area available, (2) the food-producing capacity of the lakes, and (3) predation, especially by Arctic char and humans. These biological components could be modified by man; however, the biological system is affected by largely uncontrollable and usually unpredictable climatological conditions. An understanding of the effects and the interactions of effects of the factors which control the abundance of the Wood River sockeye is needed to provide a rational basis for management of the system.

In the first year of this project, we examined the relationships between the abundance of spawners (escapement) and their returning adult progeny because the spawner-return relationship has formed the basis for past management of the Wood River stock.[1] Regulation of fishing mortality to obtain "optimum escapements" to the lake system is unlikely to result in increased abundance of the stock. The relationship between abundance of spawners and abundance of adult progeny, although highly variable, appears to have shifted downwards during the history of the fishery. Small to medium escapements produce fewer adults now than they did before, whereas large escapements still only produce average numbers of adults. The abundance of spawning populations (races) within each lake in the system tends to be correlated but there is frequent lack of correlation in the runs to the lakes. The nursery areas for fry (the lakes) are thus indicated as a major limiting factor to the production of adults.

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[1] Systems Modeling of Sockeye Salmon in the Wood River Lakes. Annual Progress Report - Anadromous Fish Project. FRI-UW-7406. June 1974.

The declines in the Wood River runs were probably caused by one or more of the following: (1) occasional large escapements which exceeded the spawning and rearing capacity of the system, (2) increased mortality on juveniles as a direct result of increased abundance of Arctic char and an indirect result of a decreased growth rate, (3) decreased productivity of the lakes (food producing capacity), and (4) the selective mortality imposed by the commercial gillnet fishery. The best means of increasing production in the Wood River stock is through management of the freshwater environment of the juvenile fish. The techniques for this management should follow from an understanding of the mechanisms which influence or regulate their growth and survival. The objectives of this report are to examine the interrelationships among growth, survival, and effects of the physical environment.

## METHODS

The annual abundance of spawners in each of the Wood River lakes has been estimated each year since 1951 according to the method of Gilbert (1968). The number in each lake is estimated from tower counts in Wood River and aerial surveys of the spawning grounds. Potential egg deposition was estimated from the sex ratio and mean length in the Wood River escapement and the ocean age composition of females on the spawning grounds in each lake. Two regressions were used to estimate the average number of eggs from the average lengths of 2-ocean and 3-ocean fish in each year's escapement.

The abundance of juveniles in the lakes has been estimated during late August to early September each year since 1958. Population estimates of pelagic fish are made from townet sampling and echosounding (Rogers, 1967). A major assumption in these estimates of fry production is that the fry are completely available (occupy the pelagic region) to the tow net and/or echosounder. This assumption was probably invalid in 1971 and 1972 when the fish were still concentrated inshore during late summer.

The annual growth or the size of the fry in late summer (September 1) has been calculated from mean lengths in townet samples and growth rates in Lake Aleknagik that are estimated from periodic beach seine sampling during June-August (Rogers, 1973). Mean weights of juveniles on September 1 were calculated from mean lengths and a weight-length regression.

Each of the major lakes and lake basins (Nerka) are divided into three sampling areas (Fig. 1). Dimensions of these areas are given in Table 1. Estimates of abundance and size are made by sampling area and an estimate for a lake is either the sum or the weighted mean of

the area estimates. Although the main objectives of this report are concerned with parameters of lake and lake system populations, I have included statistics by area as well because both growth and abundance vary within some of the lakes in a consistent manner. These statistics are given in Tables 2-10. Although the boundaries of the sampling areas are somewhat arbitrary with respect to the distribution of fish, fry are usually most abundant in the area with the most spawning area and growth is usually poorest in the same area.

Statistics on abundance and growth were examined for each lake, for combinations of adjacent lakes, and for the lake system by regression methods. Data were first plotted (scatter diagrams) and an appropriate regression model (e.g., linear or polynomial) was determined from these plots.

## RESULTS

The population estimates (number and weight) are given by lake in Table 11. The average biomass of pelagic fish was greatest in Lake Aleknagik primarily because of the greater abundance of threespine stickleback in the lake (Table 12). The density of pelagic fish was greatest in Little Togiak Lake even though the absolute abundance is small in this lake because of its small size relative to the other lakes.

The annual statistics on sockeye salmon abundance (adults and juveniles) and size are given by brood year and lake in Table 13. The survival rates for potential eggs to fry (about September 1) and for fry to returning adults are given in Table 14. The returns from the 1969 brood year are preliminary and estimates of the return of six-year old fish in 1975 were included in calculating the survival from fry to adults for this brood year.

### Relationship Between Eggs and Fry

The relationship between the number of fry produced (late summer) and the number of eggs in the parent escapement was approximately linear for each of the lakes in the system. The data from Lakes Beverley and Kulik were combined because of the significant correlation in annual escapements and fry abundance in these lakes. A linear model ($Y = bX$) is shown in Fig. 2, (polynomial regressions were not statistically significant). Survival from eggs to fry was greater in Aleknagik than in the other lakes; however, this higher survival may be partly the result of a higher availability of fry to the tow-net sampling in Lake Aleknagik as compared to the other lakes. The relationship in Lakes Beverley, Kulik, and Nerka might better be modeled by some logistic type of curve, e.g., curving upwards at low numbers of eggs and downwards at high numbers of eggs.

The growth of fry during the summer is partly density dependent. As the density of eggs and fry increases the size of the fry by September 1 decreases (Fig. 3). The relationship between growth and abundance is probably asymptotic at the extremes of density; however, in the range of 2 to 10 million eggs per square kilometer of lake area, the size of the fry decreases approximately linear with increasing density of eggs. At low densities of eggs, the fry tend to be smaller in the upper lakes (Beverley and Kulik) whereas at high densities the fry tend to be larger in these lakes than in Lakes Aleknagik and Nerka. The upper lakes have a shorter ice-free period and probably produce less food for sockeye fry; however, the populations of threespine sticklebach (main competitors with sockeye fry) are not as dense in these lakes as in Lake Aleknagik.

As a result of the density-dependent growth the relationships between the weight (biomass) of fry produced and the number of parent eggs were curvilinear (Fig. 4). The relationships were similar among the lakes with the exception of Lake Aleknagik where the maximum biomass was produced at an intermediate abundance of eggs.

The factors which control the survival from eggs to fry were sought by multiple regression (partial correlations with the fry-egg regressions) and correlation analysis between measurements of the physical environment and estimated survivals. The only significant correlation found was that between survival and the average air temperature during the winter following spawning and this was statistically significant only for data from Lakes Beverley and Kulik. Spawning in these lakes occurs primarily along the beaches. Very cold winters probably result in poorer survival because of the freezing of eggs. This would most likely occur when the density of spawners was relatively high and much of the spawning would take place in shallow water, i.e., higher on the beach and more exposed to freezing at the lower winter water levels. The relationship between survival from eggs to fry and the average air temperature in December-January (measured at Dillingham) is shown in Fig. 5. Observations from years of low escapements (every fourth year) were excluded because no correlation was evident for these years.

## Relationship Between Fry and Adult Return

The relationships between the number of adults produced and the number of fry were similar to those for the number of adults and biomass of fry (Figs. 6 and 7). The relationships appeared nearly linear for the upper lakes of the system and curvilinear for the other lakes. The maximum adult return occurred near the maximum abundance of fry that has been observed in each of the lakes. Thus, since 1958, the fry populations in the lakes in late summer have usually been within

the carrying capacity of the lakes (egg to fry relationships) and at the highest abundance of fry there has been only a slight decrease in the production of adults.

There were statistically significant correlations between the survival from fry to adults and the mean weight of fry for all lakes except Lake Aleknagik (Fig. 8). Although the correlations were small (.14, .59, .73) there was evidence that the growth of the fry had some effect on their ability to survive. The importance of the fry's size to its ability to avoid predation (primarily by Arctic char) would be greatest for those populations farthest from the outlet of the lake system, because in migrating out as smolts they would be more subjected to predation than smolts migrating from Lake Aleknagik (Rogers, Gilbertson, and Eggers, 1972).

The growth of the fry or their size at the end of their first summer also affects their age at smoltification. The sockeye salmon in the Wood River system migrate to sea predominantly as yearlings; however, when fry populations are large and hence growth is poorer than average, some of the fry will holdover another year and migrate as two-year-olds. The advantage in survival that two-year-old smolts would have from their larger size is apparently lost because of the added mortality during their extra year in the lakes. The relationship between the number of adults produced (ages 2.2 and 2.3) and the number of yearlings in the lakes appears curvilinear (curving upwards with increasing abundance of yearlings) in Fig. 9.

## SUMMARY

Mathematical models were used to approximate the relationships between the abundance of sockeye salmon at various stages in their life history. Simple models, e.g., linear and second degree polynomical, were used because the amount of data (13 years) did not seem to justify more complex models. There was considerable variation around the lines or curves that were used to describe the statistical relationships between abundances. Much of this variation is likely associated with sampling error in estimating the abundance of fish. Nevertheless some apparently significant differences were evident between lakes in the Wood River system. These differences in production at various freshwater stages in the sockeye life history can be used in choosing alternative methods of management in the lakes, e.g., predator control, fertilization, and incubation systems.

The statistics for the lake system are primarily determined by those for the largest lake (Nerka). The relationships shown in Fig. 10 are thus similar to those for Lake Nerka; however, the number of fry produced in the lake system was not linear with the number of parent eggs as was the case for individual lakes. The number of fry produced

decreased slightly at high abundance of parent eggs. Growth decreased with an increase in abundance, therefore the biomass of fry produced decreased sharply when the abundance of eggs exceeded the average for recent years.

The number of adults produced was proportional to the number of fry in the lake system when the number of fry was less than average, but there was no increase in the number of adults produced when fry abundance was high. The number of adults was more closely correlated with the biomass of fry than with the number of fry and the returns declined at a lesser rate with a high biomass of fry than they did with a high number of fry.

The production of adult sockeye salmon in the Wood River lakes is presently limited by (1) the amount of spawning ground, e.g., mainly Lake Aleknagik where there is a high proportion of creek spawning, (2) predation during lake residence and seaward migration, and (3) growth conditions in the lakes which affect the age and size at seaward migration and thus the early marine survival. Historically the escapements were no larger than at present and it is unlikely that the amount of spawning area has decreased; therefore, the decline in the abundance of adults in the Wood River system is probably the result of a decrease in growth conditions (primary and secondary productivity) and an increase in freshwater mortality that most likely was caused by an increase in the abundance of Arctic char. Studies of the food production (insects and zooplankton) and the predators (mainly char) in the lakes are needed to provide a basis for management to increase the Wood River sockeye runs.

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Table 1. Physical data by sampling area for the Wood River lake system

| Lake | Area | Surface area ($km^2$) | Volume 0-20 m ($km^3$) | Total volume ($km^3$) | Mean depth (m) |
|---|---|---|---|---|---|
| Aleknagik | A | 22.8 | 0.3691 | 1.1900 | 52.19 |
| | B | 32.6 | 0.5183 | 1.8098 | 55.52 |
| | C | 27.6 | 0.3536 | 0.6196 | 22.45 |
| South Nerka | A | 20.2 | 0.3283 | 0.9741 | 48.02 |
| | B | 20.1 | 0.3094 | 0.6697 | 33.32 |
| | C | 23.0 | 0.3364 | 0.6581 | 28.61 |
| Central Nerka | A | 9.4 | 0.1674 | 0.8086 | 86.02 |
| | B | 22.1 | 0.4007 | 1.4498 | 65.60 |
| | C | 19.8 | 0.3379 | 0.7876 | 39.78 |
| North Nerka | A | 32.3 | 0.5214 | 1.2615 | 39.06 |
| | B | 31.1 | 0.4880 | 0.8818 | 28.35 |
| | C | 23.0 | 0.2724 | 0.3426 | 14.90 |
| Little Togiak | A | 1.7 | 0.0242 | 0.0298 | 17.53 |
| | B | 1.8 | 0.0272 | 0.0575 | 31.94 |
| | C | 2.5 | 0.0369 | 0.0886 | 35.44 |
| Beverley | A | 25.8 | 0.4640 | 2.0176 | 78.20 |
| | B | 26.4 | 0.4661 | 1.5723 | 59.56 |
| | C | 37.8 | 0.5392 | 1.3487 | 35.68 |
| Kulik | A | 13.1 | 0.2290 | 0.9201 | 70.24 |
| | B | 17.4 | 0.3172 | 1.6378 | 94.13 |
| | C | 14.5 | 0.2426 | 0.8996 | 62.04 |

Table 2. Mean lengths (live equivalent in mm on September 1) of juvenile sockeye salmon (age 0) in the Wood River lake system by area and year, 1958-1974. Numbers in parentheses are estimates of missing observations

| | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | | | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C |
| 1958 | 60.8 | 60.8 | 65.3 | 61.3 | 62.2 | 62.3 | 59.9 | 63.2 | 59.5 | 61.7 | (59.9) | 59.2 | 59.0 | 61.2 | 60.9 | 60.9 | 61.9 | (63.9) | 61.7 | 61.7 | 61.9 |
| 1959 | 59.3 | 64.6 | 62.7 | 65.0 | 69.1 | 62.9 | 59.3 | 60.5 | 62.2 | 61.3 | (61.9) | 61.1 | 62.8 | 61.7 | 65.6 | 52.2 | 59.1 | 63.1 | 63.4 | 62.3 | 60.6 |
| 1960 | 54.8 | 55.4 | 55.9 | 56.2 | 59.6 | 63.4 | 52.5 | 54.1 | 56.4 | 51.1 | 51.6 | 50.7 | 57.1 | 52.7 | 53.0 | 43.2 | 45.9 | 47.8 | 51.9 | 53.1 | 53.9 |
| 1961 | 53.6 | 59.0 | 59.0 | 58.3 | 59.3 | 60.4 | 55.0 | 55.8 | 56.4 | 55.3 | 54.0 | 53.8 | 52.7 | 55.2 | 57.5 | 52.8 | 53.8 | 60.5 | 53.3 | 54.4 | 56.8 |
| 1962 | 49.7 | 56.0 | 56.8 | 62.4 | 64.1 | 64.4 | 55.9 | 59.7 | 58.6 | 59.1 | 60.1 | 56.8 | 57.8 | 56.7 | 57.5 | 60.3 | 60.9 | 69.4 | 59.4 | 61.3 | 62.0 |
| 1963 | 60.6 | 63.9 | 64.5 | 61.4 | 61.9 | 64.2 | 57.8 | 63.5 | 59.7 | 58.1 | 64.4 | 63.3 | 60.7 | 60.2 | 63.0 | 51.7 | 59.4 | 59.2 | 53.3 | 54.0 | 58.7 |
| 1964 | 56.6 | 61.4 | 60.8 | 56.9 | 56.8 | 64.2 | 52.4 | 56.3 | 54.7 | 59.0 | 65.0 | 64.0 | 48.7 | 54.4 | 56.5 | 48.3 | 48.0 | 56.6 | 49.6 | 46.0 | 51.3 |
| 1965 | 47.2 | 52.4 | 58.1 | 54.5 | 57.3 | 60.2 | 47.1 | 53.7 | 54.4 | 53.6 | 53.7 | 55.8 | 48.3 | 52.8 | 53.0 | 50.0 | 45.3 | 55.8 | 53.0 | 47.4 | 48.8 |
| 1966 | 46.7 | 50.0 | 47.9 | 54.3 | 56.4 | 58.9 | 56.2 | 54.8 | 53.2 | 55.4 | 54.8 | 52.7 | 43.7 | 45.4 | 48.9 | 54.5 | 56.1 | 58.7 | 54.2 | 55.9 | 58.1 |
| 1967 | 41.5 | 44.0 | 44.2 | 63.1 | 64.3 | 63.5 | 55.7 | 58.3 | 57.5 | 57.3 | 62.2 | 58.8 | 51.1 | 54.2 | 55.0 | 53.1 | 58.1 | 64.3 | 62.0 | 59.6 | 63.2 |
| 1968 | 57.4 | 58.0 | 58.6 | 65.3 | 72.4 | 70.7 | 59.6 | 66.6 | 61.6 | 64.3 | 69.0 | 62.7 | 59.9 | 54.0 | 58.5 | 61.1 | 65.7 | 69.0 | 68.8 | 71.7 | 66.3 |
| 1969 | 60.7 | 61.8 | 61.4 | 63.1 | 64.5 | 68.3 | (57.3) | 61.7 | 60.3 | 63.8 | 57.4 | 59.6 | 43.6 | 52.6 | 56.3 | 57.7 | 57.4 | 60.2 | 63.8 | 62.8 | 63.3 |
| 1970 | 55.1 | 59.6 | 62.5 | 62.8 | 65.9 | 63.5 | 67.8 | 65.2 | 64.0 | 59.2 | 63.2 | 63.4 | 53.6 | 60.7 | 59.2 | 61.2 | 54.4 | (64.4) | 63.7 | 62.4 | (64.7) |
| 1971 | 50.0 | 55.7 | 56.2 | 52.6 | 51.2 | 57.0 | 42.1 | 53.4 | 51.9 | 53.7 | 58.5 | 50.7 | 47.1 | 48.4 | (49.9) | 48.9 | 56.9 | 57.3 | 54.1 | 52.2 | 55.1 |
| 1972 | 51.7 | 55.0 | 55.5 | 57.9 | 56.0 | (59.2) | 42.7 | 57.3 | 55.3 | 53.2 | 58.3 | 56.5 | 51.2 | 46.7 | 49.1 | 50.0 | 48.9 | 62.5 | 50.7 | 54.4 | 58.9 |
| 1973 | 61.8 | 58.8 | 69.2 | 61.0 | 60.7 | (62.2) | 64.5 | 60.7 | (59.5) | 57.4 | 63.1 | 67.3 | 56.4 | 55.7 | 57.0 | (59.0) | (61.0) | 66.8 | 53.8 | 56.7 | 59.3 |
| 1974 | 59.0 | 63.4 | 62.5 | 66.7 | 67.0 | 75.1 | 70.3 | 63.6 | 62.6 | 64.8 | 62.9 | 64.7 | 51.2 | 54.7 | 54.0 | (59.2) | (58.3) | (64.1) | (59.8) | (60.3) | (61.7) |
| Means | 54.5 | 57.6 | 58.9 | 60.2 | 61.7 | 63.6 | 55.7 | 59.3 | 58.7 | 58.1 | 60.0 | 58.9 | 53.2 | 54.5 | 56.2 | 54.4 | 55.9 | 61.4 | 58.0 | 57.4 | 59.1 |

Table 3. Mean lengths (live equivalent in mm on September 1) of juvenile sockeye salmon (age I) in the Wood River lake system by area and year, 1958-1974. Numbers in parentheses are estimates of missing observations

| | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | | | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C |
| 1958 | 87 | 91 | 85 | 105 | (99) | 97 | 109 | 107 | 112 | 100 | (100) | (104) | 102 | 96 | 93 | 104 | (100) | (104) | 105 | (102) | 100 |
| 1959 | 96 | 112 | 114 | (114) | (113) | (115) | 115 | 110 | 114 | 104 | (96) | 93 | 107 | 105 | 104 | 97 | (93) | (96) | (97) | 87 | (89) |
| 1960 | 98 | 85 | 95 | 98 | 97 | 93 | 95 | 9[illegible] | 92 | 101 | (95) | 94 | 95 | 100 | 99 | 84 | 81 | 78 | 92 | 90 | 93 |
| 1961 | 86 | 88 | 92 | 88 | 94 | 103 | 93 | 94 | 90 | 93 | 86 | 92 | 86 | 90 | 87 | 87 | 85 | 87 | 85 | 85 | 89 |
| 1962 | 89 | 87 | 93 | 93 | 10[illegible] | 105 | 105 | 94 | 102 | 100 | 91 | (99) | 90 | 92 | 87 | 96 | 94 | (96) | 85 | 89 | 89 |
| 1963 | 87 | 93 | 102 | 98 | 101 | 104 | 110 | 107 | 104 | 102 | 114 | 105 | 105 | 100 | 102 | 96 | 82 | 94 | 93 | 94 | 95 |
| 1964 | 108 | 102 | 98 | 100 | 98 | 102 | 92 | 96 | 98 | 93 | 94 | 98 | 97 | 96 | 94 | 75 | 77 | 81 | 84 | 83 | 80 |
| 1965 | (93) | 92 | 103 | 98 | 94 | 95 | 98 | 94 | 99 | 89 | 89 | 91 | 86 | 85 | 88 | 83 | 83 | 87 | 81 | 82 | 84 |
| 1966 | 79 | 82 | 82 | 92 | 96 | 99 | 103 | 92 | 92 | 89 | 85 | 94 | 80 | 92 | 88 | 89 | 88 | 89 | 82 | 87 | 85 |
| 1967 | 70 | 70 | 69 | 98 | 92 | 98 | (91) | 85 | 92 | 92 | (89) | 90 | 86 | 96 | 91 | 102 | 98 | 98 | (95) | 97 | 95 |
| 1968 | 78 | 81 | (82) | 110 | (105) | 103 | 113 | 91 | 96 | (94) | (94) | 98 | 87 | 90 | 90 | (93) | 93 | 88 | 95 | 99 | 106 |
| 1969 | (83) | (86) | 87 | 108 | 94 | 93 | (109) | (105) | 108 | 115 | (115) | (119) | 99 | 105 | 95 | 92 | 87 | (91) | (90) | 90 | (92) |
| 1970 | 92 | 96 | 92 | 111 | - | - | - | - | 112 | 103 | - | - | 91 | - | - | - | 112 | - | - | - | - |
| 1971 | 84 | 105 | 92 | 95 | 98 | 86 | 91 | 100 | (96) | 88 | 83 | 92 | 87 | 91 | (88) | (87) | 83 | (86) | (92) | 98 | 88 |
| 1972 | 90 | 95 | 107 | 96 | 95 | 106 | 77 | 86 | 92 | 90 | 94 | 99 | 76 | 79 | 77 | 95 | 99 | (99) | 97 | 87 | 92 |
| 1973 | 78 | (86) | 93 | 106 | 110 | 107 | 97 | 96 | 107 | 85 | (83) | (86) | 82 | 85 | 86 | (87) | (85) | 87 | 88 | 92 | 89 |
| 1974 | - | 88 | - | - | 112 | - | - | - | - | - | - | - | 85 | 87 | 82 | - | - | - | - | - | - |
| Means[1] | 87 | 90 | 93 | 100 | 99 | 100 | 99 | 97 | 100 | 96 | 94 | 97 | 91 | 93 | 91 | 91 | 89 | 91 | 90 | 91 | 91 |

[1]Excluding 1970 and 1974.

Table 4. Mean lengths (live equivalent in mm on September 1) of age I threespine stickleback in the Wood River lake system by area and year 1958-1974. Numbers in parentheses are estimates of missing observations

| | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | | | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C |
| 1958 | 43.0 | 44.8 | 45.3 | 46.2 | 41.9 | 44.5 | 40.9 | 44.3 | 43.6 | 43.6 | (42.8) | 43.4 | 40.2 | 39.9 | 39.2 | 43.7 | (44.5) | 44.8 | (42.4) | 43.6 | 41.8 |
| 1959 | 43.4 | 44.5 | 48.4 | 45.9 | 46.9 | (47.7) | 42.9 | 42.4 | 42.3 | 41.5 | (41.3) | 42.4 | 44.6 | 45.1 | 46.6 | 39.4 | 40.9 | 39.3 | 39.0 | 41.9 | 43.4 |
| 1960 | 42.3 | 43.4 | 44.2 | 44.3 | 45.1 | 42.1 | 42.3 | 41.3 | 42.6 | 42.2 | 41.5 | 43.2 | 40.6 | 45.0 | 44.5 | 38.2 | 39.4 | 38.9 | 42.8 | 42.8 | 42.6 |
| 1961 | 41.1 | 44.1 | 42.0 | 44.7 | 42.1 | (45.2) | 45.5 | 42.7 | 42.7 | 40.5 | 39.9 | 40.9 | 40.7 | 42.6 | 44.2 | 40.6 | 40.5 | 41.8 | 41.1 | 43.6 | 40.8 |
| 1962 | 42.6 | 43.1 | 45.1 | 47.6 | 47.2 | 49.0 | 46.1 | 45.1 | 46.8 | 44.8 | 41.7 | 46.3 | 44.8 | 44.2 | 42.9 | 47.0 | (47.2) | (46.9) | 42.1 | 43.4 | 44.1 |
| 1963 | 44.9 | 47.1 | 47.2 | 47.3 | 48.2 | 47.6 | 49.1 | 47.9 | 46.5 | 46.8 | 50.7 | 50.4 | 45.0 | 48.1 | 49.1 | 46.2 | 48.2 | 46.7 | 44.8 | 43.4 | 43.4 |
| 1964 | 42.0 | 43.1 | 43.5 | 43.8 | 43.5 | 47.0 | (47.2) | 45.9 | 44.6 | 43.1 | 44.1 | 45.5 | 40.1 | 42.6 | 43.2 | 40.6 | 40.9 | 42.9 | 43.0 | 42.4 | 42.4 |
| 1965 | 39.0 | 41.3 | 42.2 | 43.2 | 38.8 | 45.9 | 46.5 | 38.4 | 40.6 | 40.9 | 39.7 | 40.4 | 41.7 | 43.0 | 42.9 | 41.3 | 35.4 | 39.4 | (40.1) | 43.0 | 37.8 |
| 1966 | 39.0 | 40.0 | 40.3 | (42.0) | 42.8 | 41.8 | (44.6) | 44.6 | 41.0 | 42.6 | 43.5 | 44.3 | 41.1 | 40.1 | 41.2 | 45.6 | 46.0 | 44.2 | 38.6 | 39.6 | 46.5 |
| 1967 | 40.2 | 41.2 | 42.6 | 48.2 | 47.8 | 47.7 | 47.4 | 45.6 | 46.7 | 45.2 | 47.8 | 46.1 | 40.3 | 40.6 | 42.9 | 46.2 | 49.1 | 46.3 | 46.9 | 47.4 | 47.2 |
| 1968 | 43.0 | 43.3 | 44.5 | 48.7 | 51.2 | 53.4 | 51.7 | 48.3 | 47.9 | 44.8 | 46.9 | 47.2 | 44.5 | 42.8 | 43.8 | 47.9 | 48.3 | 48.0 | 48.1 | 48.0 | 48.3 |
| 1969 | 42.8 | 45.3 | 45.7 | 46.9 | 48.0 | 48.8 | (48.4) | 45.7 | 47.2 | 47.9 | 44.1 | 46.2 | 43.1 | 44.6 | 45.8 | 45.1 | 45.8 | 44.6 | 52.0 | 46.9 | 46.8 |
| 1970 | 41.2 | 44.8 | 47.1 | (44.6) | 43.8 | 45.9 | 46.6 | 42.4 | 42.9 | 41.0 | 37.3 | 43.4 | 44.1 | 47.6 | 43.6 | 42.4 | 42.5 | 43.5 | 44.1 | 45.7 | 42.6 |
| 1971 | 41.8 | 40.7 | 43.9 | (43.0) | (42.0) | (44.0) | (43.5) | 41.5 | (42.0) | 43.7 | 45.3 | 42.1 | 36.7 | 39.8 | (39.2) | 44.1 | 40.0 | 39.9 | (46.3) | 49.1 | 44.2 |
| 1972 | 41.2 | 43.5 | 45.6 | 44.9 | 42.3 | (44.9) | (46.1) | 41.8 | 46.6 | 44.9 | (45.8) | 48.0 | 39.0 | 42.5 | 41.6 | 45.6 | 47.9 | 45.5 | 43.5 | 40.4 | (42.3) |
| 1973 | 46.7 | 51.5 | 50.2 | - | - | - | (46.7) | 44.7 | (45.1) | 44.4 | 47.7 | (49.0) | 39.2 | 36.4 | (36.7) | (46.4) | 49.5 | 43.4 | 49.8 | 46.8 | 42.9 |
| 1974 | 49.5 | 48.6 | 50.7 | 52.7 | 53.0 | 53.7 | 49.6 | 48.7 | 48.4 | 49.8 | 51.3 | 52.2 | 48.4 | 48.0 | 48.7 | - | - | - | - | - | - |
| Means 1958-1974 | 41.8 | 43.3 | 44.5 | 45.4 | 44.8 | 46.4 | 45.9 | 43.9 | 44.3 | 43.6 | 43.5 | 44.7 | 41.8 | 43.2 | 43.6 | 43.6 | 43.8 | 43.5 | 43.7 | 44.1 | 43.6 |

Table 5. Geometric mean townet catches of juvenile sockeye salmon in the Wood River lake system by area and year, 1958-1974

| Year | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | | | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C |
| | | | | | | | | | | Age 0 | | | | | | | | | | | |
| 1958 | 25.7 | 9.7 | 9.9 | 5.1 | 1.7 | 5.6 | 2.4 | 1.5 | 7.0 | 18.8 | 7.9 | 2.1 | 64.9 | 40.3 | 18.3 | 2.1 | 2.5 | 0.0 | 1.0 | 2.5 | 4.4 |
| 1959 | 10.5 | 11.1 | 16.8 | 43.5 | 8.7 | 1.7 | 11.6 | 3.9 | 13.7 | 2.5 | 4.5 | 6.8 | 549.7 | 109.8 | 93.4 | 76.2 | 86.1 | 5.7 | 11.6 | 13.6 | 48.5 |
| 1960 | 48.5 | 137.3 | 131.0 | 79.7 | 101.3 | 12.3 | 9.2 | 42.3 | 57.3 | 48.1 | 59.2 | 8.7 | 278.0 | 60.1 | 99.3 | 28.2 | 19.2 | 67.8 | 30.3 | 42.2 | 123.6 |
| 1961 | 43.6 | 78.4 | 179.7 | 259.6 | 74.1 | 5.2 | 36.8 | 62.2 | 59.9 | 45.9 | 49.4 | 108.4 | 266.2 | 159.7 | 145.3 | 32.0 | 15.2 | 22.4 | 52.8 | 35.4 | 30.4 |
| 1962 | 52.0 | 45.8 | 65.0 | 2.7 | 2.1 | 1.0 | 2.2 | 5.3 | 11.1 | 9.4 | 39.8 | 28.9 | 19.1 | 33.0 | 14.7 | 5.1 | 1.0 | 0.6 | 7.9 | 4.2 | 18.6 |
| 1963 | 51.4 | 16.2 | 11.3 | 87.7 | 76.2 | 15.4 | 7.6 | 14.6 | 26.9 | 60.9 | 42.5 | 63.8 | 37.7 | 303.5 | 43.5 | 162.6 | 116.8 | 37.5 | 91.6 | 24.5 | 75.3 |
| 1964 | 12.3 | 33.3 | 21.6 | 3.1 | 4.9 | 0.9 | 1.8 | 8.1 | 9.1 | 27.3 | 81.3 | 15.9 | 14.1 | 89.9 | 11.2 | 66.2 | 17.9 | 10.5 | 36.8 | 3.6 | 129.6 |
| 1965 | 52.2 | 113.7 | 131.3 | 4.9 | 40.5 | 2.4 | 1.6 | 14.2 | 3.4 | 67.9 | 166.9 | 28.7 | 130.3 | 56.7 | 141.8 | 31.8 | 2.0 | 5.5 | 17.7 | 5.8 | 59.0 |
| 1966 | 377.2 | 72.7 | 261.0 | 2.2 | 4.3 | 5.2 | 1.0 | 8.7 | 6.8 | 69.4 | 85.2 | 51.4 | 32.0 | 10.6 | 7.0 | 3.0 | 2.8 | 2.4 | 3.0 | 0.6 | 2.7 |
| 1967 | 49.3 | 46.5 | 50.8 | 3.2 | 13.4 | 8.6 | 0.1 | 34.1 | 8.1 | 31.4 | 23.6 | 139.7 | 101.6 | 98.5 | 8.3 | 46.7 | 7.2 | 6.1 | 7.0 | 5.1 | 31.3 |
| 1968 | 15.7 | 9.7 | 5.8 | 6.8 | 2.7 | 3.7 | 9.1 | 9.1 | 13.6 | 16.4 | 3.9 | 2.2 | 127.5 | 48.5 | 35.8 | 25.0 | 18.4 | 7.5 | 9.7 | 39.7 | 0.2 |
| 1969 | 35.0 | 26.6 | 173.4 | 5.5 | 28.1 | 11.1 | 0.0 | 4.8 | 5.1 | 14.4 | 34.8 | 34.7 | 2.8 | 2.7 | 3.3 | 11.3 | 5.2 | 5.6 | 1.7 | 17.3 | 13.2 |
| 1970 | 38.4 | 59.9 | 27.3 | 0.3 | 1.0 | 3.7 | 0.2 | 6.8 | 4.5 | 9.2 | 33.0 | 22.5 | 353.2 | 57.1 | 6.0 | 4.5 | 2.5 | 0.0 | 3.4 | 0.2 | 0.0 |
| 1971 | 9.8 | 6.5 | 35.0 | 2.9 | 4.7 | 2.8 | 3.8 | 10.9 | 9.8 | 16.0 | 490.5 | 52.3 | 18.3 | 9.2 | 5.2 | 2.3 | 1.0 | 1.4 | 0.5 | 6.5 | 21.0 |
| 1972 | 1.4 | 20.6 | 5.4 | 3.5 | 3.0 | 0.2 | 1.8 | 6.0 | 21.4 | 10.8 | 3.1 | 9.4 | 0.4 | 7.3 | 44.2 | 2.9 | 1.0 | 2.4 | 27.4 | 17.0 | 3.2 |
| 1973 | 2.0 | 0.6 | 5.4 | 1.6 | 1.6 | 0.1 | 0.1 | 5.8 | 0.1 | 13.3 | 14.9 | 3.3 | 4.3 | 9.8 | 4.7 | 0.4 | 0.1 | 0.7 | 2.5 | 2.6 | 68.3 |
| 1974 | 16.3 | 44.4 | 66.1 | 10.4 | 1.5 | 3.5 | 3.0 | 1.5 | 6.2 | 17.4 | 14.2 | 82.5 | 46.6 | 49.4 | 29.5 | - | - | - | - | - | - |
| Means 1958-1974 | 25.1 | 25.9 | 34.9 | 8.0 | 9.1 | 3.5 | 2.7 | 9.9 | 10.2 | 21.2 | 31.4 | 19.7 | 44.6 | 37.9 | 21.5 | 13.3 | 6.4 | 4.6 | 9.3 | 7.8 | 17.3 |

Table 5. Geometric mean townet catches of juvenile sockeye salmon in the Wood River lake system by area and year, 1958-1974 - continued

| Year | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | | | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C |
| | | | | | | | | | | Age I | | | | | | | | | | | |
| 1958 | 1.0 | 0.8 | 1.7 | 4.8 | 0.0 | 0.6 | 1.6 | 0.2 | 1.1 | 0.4 | 0.0 | 0.2 | 1.7 | 0.3 | 1.2 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 | 1.3 |
| 1959 | 0.3 | 0.2 | 0.4 | 0.0 | 0.0 | 0.0 | 0.4 | 0.1 | 0.3 | 0.1 | 0.0 | 0.4 | 3.0 | 0.8 | 0.8 | 0.4 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 |
| 1960 | 0.1 | 0.2 | 0.3 | 1.3 | 2.4 | 0.7 | 0.4 | 1.1 | 1.0 | 0.2 | 0.0 | 0.8 | 8.3 | 0.7 | 0.4 | 6.5 | 9.1 | 5.9 | 1.7 | 2.0 | 1.6 |
| 1961 | 12.0 | 13.4 | 15.9 | 14.5 | 12.1 | 5.2 | 6.8 | 2.3 | 3.4 | 2.5 | 0.7 | 1.9 | 12.7 | 17.0 | 26.0 | 5.4 | 2.7 | 6.6 | 8.2 | 28.2 | 24.0 |
| 1962 | 1.7 | 3.8 | 0.7 | 1.5 | 3.6 | 1.2 | 2.6 | 1.1 | 1.1 | 2.0 | 0.8 | 0.0 | 13.5 | 10.5 | 2.9 | 2.4 | 1.1 | 0.7 | 2.3 | 4.2 | 5.0 |
| 1963 | 0.7 | 0.4 | 0.3 | 0.4 | 0.5 | 0.4 | 0.6 | 0.9 | 0.5 | 0.1 | 0.5 | 0.6 | 0.0 | 4.6 | 0.7 | 0.1 | 0.1 | 0.1 | 0.8 | 0.3 | 0.6 |
| 1964 | 0.7 | 0.8 | 0.6 | 1.7 | 0.9 | 1.2 | 0.9 | 2.7 | 1.3 | 2.5 | 0.7 | 0.8 | 8.3 | 3.5 | 0.2 | 8.6 | 10.7 | 3.7 | 1.6 | 0.6 | 6.1 |
| 1965 | 0.0 | 0.3 | 0.3 | 5.2 | 2.7 | 0.5 | 0.6 | 9.2 | 1.5 | 3.4 | 1.6 | 1.2 | 9.9 | 4.2 | 8.1 | 10.5 | 0.9 | 1.0 | 51.8 | 2.1 | 30.6 |
| 1966 | 42.1 | 43.4 | 31.0 | 10.5 | 2.3 | 2.9 | 3.5 | 13.3 | 5.7 | 4.2 | 1.7 | 2.2 | 11.3 | 7.4 | 3.5 | 3.1 | 6.1 | 0.8 | 1.7 | 1.8 | 0.8 |
| 1967 | 9.3 | 5.8 | 4.4 | 1.2 | 0.9 | 0.7 | 0.0 | 1.7 | 1.2 | 0.2 | 0.0 | 1.5 | 4.4 | 9.0 | 1.2 | 0.1 | 1.8 | 0.0 | 0.0 | 0.1 | 0.2 |
| 1968 | 1.2 | 0.5 | 0.0 | 0.0 | 0.0 | 0.4 | 1.1 | 0.3 | 0.1 | 0.0 | 0.0 | 0.1 | 15.1 | 0.9 | 0.7 | 0.0 | 0.3 | 0.0 | 0.2 | 0.6 | 0.0 |
| 1969 | 0.0 | 0.0 | 0.2 | 0.2 | 0.2 | 0.5 | 0.0 | 0.0 | 0.4 | 0.3 | 0.0 | 0.0 | 2.3 | 0.3 | 1.0 | 0.4 | 0.2 | 0.0 | 0.0 | 0.2 | 0.0 |
| 1970 | 0.3 | 0.2 | 0.1 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 3.3 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1971 | 0.6 | 0.1 | 0.5 | 0.0 | 0.6 | 0.2 | 0.1 | 0.8 | 0.0 | 0.2 | 0.5 | 0.6 | 4.0 | 1.9 | 1.7 | 0.0 | 0.1 | 0.0 | 0.0 | 0.2 | 0.1 |
| 1972 | 0.7 | 1.0 | 2.3 | 3.2 | 4.7 | 3.7 | 0.6 | 1.8 | 8.5 | 0.4 | 1.1 | 0.4 | 7.0 | 52.6 | 102.1 | 1.0 | 0.8 | 0.0 | 0.3 | 1.0 | 1.6 |
| 1973 | 0.2 | 0.4 | 2.2 | 3.9 | 3.3 | 0.5 | 0.2 | 3.0 | 1.5 | 2.1 | 0.0 | 0.0 | 2.4 | 14.7 | 5.3 | 0.3 | 0.1 | 0.4 | 0.5 | 2.6 | 22.0 |
| 1974 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.2 | 0.5 | - | - | - | - | - | - |
| Means 1958-1974 | 1.4 | 1.4 | 1.4 | 1.7 | 1.3 | 0.9 | 0.8 | 1.4 | 1.2 | 0.8 | 0.4 | 0.5 | 5.1 | 3.7 | 2.6 | 1.3 | 1.1 | 0.6 | 1.1 | 1.2 | 2.0 |

Table 6. Geometric mean townet catches of threespine stickleback in the Wood River lake system by area and year, 1958-1974

| | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | | | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C |
| 1958 | 13.6 | 71.2 | 13.2 | 13.7 | 9.7 | 9.8 | 0.6 | 4.1 | 4.6 | 29.1 | 52.5 | 78.7 | 125.8 | 47.6 | 77.1 | 67.7 | 57.2 | 41.1 | 107.0 | 26.2 | 108.4 |
| 1959 | 59.0 | 139.7 | 195.6 | 67.2 | 94.7 | 4.9 | 63.8 | 14.5 | 13.0 | 50.6 | 21.0 | 12.7 | 38.6 | 61.2 | 67.5 | 19.0 | 81.5 | 24.5 | 15.0 | 26.7 | 10.1 |
| 1960 | 43.9 | 26.5 | 92.2 | 10.6 | 7.9 | 3.9 | 3.0 | 4.5 | 9.2 | 12.3 | 25.7 | 16.2 | 18.6 | 7.1 | 25.4 | 41.2 | 22.3 | 28.6 | 12.0 | 5.5 | 8.9 |
| 1961 | 12.4 | 11.8 | 90.8 | 6.0 | 2.9 | 0.2 | 0.6 | 10.4 | 4.6 | 4.1 | 10.2 | 26.5 | 26.5 | 39.7 | 47.1 | 14.3 | 7.5 | 4.1 | 19.9 | 5.0 | 7.1 |
| 1962 | 113.1 | 128.8 | 172.4 | 3.6 | 9.3 | 6.2 | 2.7 | 3.9 | 13.7 | 2.7 | 2.8 | 12.3 | 41.5 | 63.3 | 23.5 | 4.6 | 1.0 | 0.9 | 1.4 | 1.9 | 8.1 |
| 1963 | 62.0 | 46.0 | 33.1 | 3.8 | 6.0 | 5.1 | 0.0 | 1.1 | 2.0 | 18.3 | 11.8 | 19.0 | 26.8 | 97.8 | 43.3 | 39.9 | 68.9 | 6.9 | 31.1 | 1.6 | 2.2 |
| 1964 | 78.8 | 502.3 | 160.4 | 2.5 | 0.6 | 2.1 | 0.2 | 13.3 | 15.5 | 1.5 | 8.0 | 29.0 | 13.3 | 90.8 | 112.0 | 8.1 | 5.0 | 8.9 | 30.6 | 0.1 | 6.3 |
| 1965 | 264.0 | 159.1 | 143.4 | 0.8 | 10.6 | 1.0 | 0.1 | 2.1 | 2.9 | 9.2 | 28.3 | 7.9 | 7.1 | 52.9 | 83.5 | 15.4 | 1.4 | 5.4 | 1.3 | 1.4 | 4.0 |
| 1966 | 161.2 | 144.4 | 147.9 | 0.2 | 1.0 | 0.6 | 0.0 | 4.5 | 0.9 | 8.6 | 14.3 | 13.8 | 18.9 | 151.6 | 9.6 | 2.0 | 0.8 | 18.2 | 0.0 | 0.0 | 0.9 |
| 1967 | 46.3 | 80.7 | 50.2 | 0.2 | 3.8 | 0.9 | 0.4 | 24.0 | 15.1 | 24.6 | 3.6 | 17.9 | 116.9 | 66.3 | 12.2 | 41.7 | 1.9 | 2.3 | 7.3 | 1.8 | 1.9 |
| 1968 | 376.8 | 347.4 | 84.7 | 13.6 | 15.1 | 15.6 | 9.6 | 71.8 | 69.6 | 10.3 | 10.0 | 15.1 | 39.9 | 171.5 | 234.8 | 21.4 | 7.5 | 9.1 | 37.0 | 62.7 | 0.9 |
| 1969 | 87.1 | 71.5 | 86.6 | 2.3 | 8.0 | 2.4 | 0.0 | 0.8 | 2.0 | 5.7 | 31.4 | 61.9 | 3.7 | 25.2 | 35.9 | 41.8 | 5.7 | 45.9 | 4.7 | 19.4 | 17.3 |
| 1970 | 49.1 | 55.8 | 155.5 | 0.6 | 1.9 | 5.9 | 1.6 | 0.6 | 2.6 | 5.3 | 0.6 | 23.9 | 48.9 | 113.0 | 36.1 | 3.7 | 4.8 | 4.2 | 5.2 | 4.1 | 0.5 |
| 1971 | 1.6 | 0.8 | 6.5 | 0.2 | 0.7 | 0.0 | 0.0 | 0.3 | 0.0 | 0.4 | 2.2 | 27.8 | 2.4 | 10.2 | 5.4 | 1.2 | 0.3 | 1.6 | 0.7 | 2.1 | 10.3 |
| 1972 | 1.9 | 12.0 | 18.6 | 0.6 | 2.7 | 1.3 | 0.0 | 3.0 | 25.5 | 26.3 | 0.0 | 3.1 | 3.5 | 172.2 | 246.8 | 11.1 | 1.1 | 12.9 | 10.0 | 14.1 | 8.4 |
| 1973 | 7.0 | 1.3 | 17.5 | 1.1 | 0.0 | 0.1 | 0.0 | 3.6 | 0.1 | 13.8 | 4.3 | 1.7 | 3.4 | 3.7 | 1.6 | 0.4 | 0.9 | 1.0 | 3.1 | 8.3 | 31.5 |
| 1974 | 109.5 | 111.3 | 137.0 | 28.4 | 21.4 | 10.6 | 20.1 | 125.0 | 278.5 | 242.8 | 112.3 | 44.8 | 89.3 | 49.0 | 71.6 | - | - | - | - | - | - |
| Mean 1958-1974 | 40 | 49 | 63 | 3 | 5 | 2 | 1 | 5 | 5 | 9 | 8 | 16 | 19 | 49 | 36 | 12 | 6 | 8 | 8 | 5 | 6 |

Table 7. F-ratios from analysis of variance of geometric mean catch by area and year ($y = \log_{10}\bar{C}+1$), 1958-1972

| Lake | Sockeye salmon, age 0 | | Sockeye salmon, age I | | Threespine stickleback | |
|---|---|---|---|---|---|---|
| | Areas[1] | Years[2] | Areas | Years | Areas | Years |
| Aleknagik | 0.8 | 6.8** | 0.2 | 55.5** | 1.6 | 10.0** |
| South Nerka | 4.2* | 4.9** | 2.9 | 9.3** | 3.4* | 6.5** |
| Central Nerka | 17.7** | 5.0** | 0.9 | 4.5** | 11.7** | 5.4** |
| North Nerka | 1.2 | 4.1** | 2.1 | 5.5** | 3.3 | 1.7 |
| Little Togiak | 2.5 | 4.4** | 2.7 | 4.3** | 4.7* | 1.9 |
| Beverley | 11.1** | 11.8** | 3.9* | 12.3** | 3.3 | 4.9** |
| Kulik | 1.4 | 3.4** | 0.9 | 10.2** | 1.0 | 3.1** |

[1]d.f. = 2,28.
[2]d.f. = 14,28.
*Significant at 5%.
**Significant at 1%.

Table 8. Estimates of sockeye salmon population (millions) in the Wood River lake system 1958 through 1974 by sampling area and age group

| Year | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C | A | B | C | | A | B | C | A | B | C |
| | | | | | | | | | | Age 0 | | | | | | | | | |
| 1958 | 3.44 | 1.83 | 1.06 | 1.44 | 0.14 | 1.26 | 0.23 | 0.15 | 0.74 | 2.15 | 0.71 | 0.12 | 0.80 | 0.28 | 0.28 | 0.02 | 0.09 | 0.30 | 0.78 |
| 1959 | 1.15 | 2.23 | 1.26 | 5.87 | 1.02 | 0.31 | 0.82 | 0.37 | 0.97 | 0.52 | 0.65 | 0.51 | 3.69 | 10.58 | 10.12 | 1.20 | 1.49 | 1.50 | 21.02 |
| 1960 | 3.02 | 16.12 | 10.35 | 8.82 | 7.65 | 2.14 | 0.61 | 4.06 | 4.65 | 5.50 | 7.07 | 0.48 | 2.05 | 4.56 | 2.17 | 14.94 | 2.52 | 5.71 | 16.36 |
| 1961 | 2.88 | 8.39 | 13.39 | 31.99 | 7.26 | 0.76 | 2.36 | 5.78 | 4.98 | 5.22 | 6.24 | 7.38 | 3.74 | 3.95 | 2.30 | 4.05 | 3.99 | 3.88 | 4.87 |
| 1962 | 3.17 | 4.65 | 4.54 | 0.62 | 0.27 | 0.21 | 0.13 | 0.82 | 1.61 | 2.03 | 6.06 | 4.77 | 0.93 | 0.81 | 0.12 | 0.22 | 0.67 | 0.61 | 2.35 |
| 1963 | 2.76 | 2.69 | 1.33 | 5.43 | 4.50 | 6.18 | 0.30 | 1.14 | 3.71 | 9.43 | 3.91 | 3.04 | 2.36 | 13.74 | 10.26 | 4.36 | 6.92 | 3.30 | 4.83 |
| 1964 | 0.88 | 4.27 | 1.44 | 0.61 | 0.66 | 0.11 | 0.17 | 0.67 | 0.56 | 2.99 | 4.74 | 0.88 | 0.35 | 9.80 | 2.21 | 2.44 | 4.24 | 0.67 | 20.30 |
| 1965 | 4.02 | 8.94 | 7.33 | 1.38 | 3.35 | 0.54 | 0.10 | 1.48 | 0.26 | 6.59 | 13.23 | 1.61 | 2.14 | 2.75 | 0.22 | 0.69 | 1.01 | 0.49 | 4.89 |
| 1966 | 20.09 | 6.57 | 16.80 | 0.33 | 0.35 | 0.52 | 0.05 | 0.66 | 0.60 | 8.11 | 8.65 | 3.38 | 0.24 | 0.52 | 0.34 | 0.52 | 0.18 | 0.05 | 0.68 |
| 1967 | 3.25 | 5.14 | 4.89 | 0.75 | 1.38 | 2.35 | 0.01 | 3.89 | 0.37 | 4.46 | 3.06 | 6.65 | 2.58 | 5.80 | 0.86 | 1.62 | 0.63 | 0.88 | 4.28 |
| 1968 | 0.90 | 0.98 | 0.53 | 0.45 | 0.34 | 0.31 | 0.25 | 3.27 | 0.97 | 3.03 | 0.48 | 0.12 | 1.24 | 4.31 | 2.19 | 1.97 | 0.57 | 2.70 | 0.02 |
| 1969 | 2.67 | 3.94 | 12.55 | 0.33 | 1.98 | 0.67 | 0.00 | 0.32 | 1.15 | 2.07 | 3.30 | 2.13 | 0.15 | 1.43 | 1.34 | 1.38 | 0.14 | 1.25 | 0.89 |
| 1970 | 2.14 | 6.80 | 1.62 | 0.04 | 0.14 | 0.33 | 0.02 | 1.06 | 0.48 | 1.20 | 6.32 | 2.41 | 1.11 | 0.79 | 0.45 | 0.00 | 0.53 | 0.02 | 0.00 |
| 1971 | 0.87 | 0.92 | 1.65 | 0.34 | 1.25 | 0.21 | 0.21 | 0.92 | 0.60 | 1.53 | 37.35 | 4.07 | 0.25 | 0.24 | 0.08 | 0.24 | 0.04 | 0.46 | 1.36 |
| 1972 | 0.11 | 1.72 | 0.34 | 0.36 | 0.19 | 0.03 | 0.12 | 0.80 | 1.89 | 1.06 | 0.24 | 0.60 | 0.24 | 0.28 | 0.13 | 0.44 | 1.60 | 2.40 | 0.26 |
| 1973 | 0.11 | 0.06 | 0.54 | 0.22 | 0.24 | 0.01 | 0.00 | 1.29 | 0.01 | 2.08 | 2.08 | 0.45 | 0.21 | 0.05 | 0.01 | 0.17 | 0.20 | 0.23 | 4.94 |
| 1974 | 0.79 | 6.94 | 3.17 | 2.43 | 0.14 | 0.59 | 0.13 | 0.25 | 0.78 | 2.21 | 1.42 | 5.47 | 1.58 | - | - | - | - | - | - |

Table 8. Estimates of sockeye salmon population (millions) in the Wood River lake system 1958 through 1974 by sampling area and age group - continued

| Year | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C | A | B | C | | A | B | C | A | B | C |
| | | | | | | | | | Age I | | | | | | | | | | |
| 1958 | 0.07 | 0.12 | 0.13 | 0.61 | 0.00 | 0.09 | 0.11 | 0.03 | 0.08 | 0.07 | 0.01 | 0.02 | 0.03 | 0.01 | 0.03 | 0.05 | 0.00 | 0.00 | 0.18 |
| 1959 | 0.02 | 0.03 | 0.03 | 0.00 | 0.00 | 0.00 | 0.04 | 0.01 | 0.01 | 0.01 | 0.00 | 0.04 | 0.36 | 0.04 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 |
| 1960 | 0.00 | 0.02 | 0.03 | 0.14 | 0.20 | 0.17 | 0.03 | 0.11 | 0.06 | 0.02 | 0.00 | 0.05 | 0.02 | 1.03 | 1.06 | 1.18 | 0.14 | 0.23 | 0.21 |
| 1961 | 0.87 | 1.48 | 1.24 | 1.66 | 1.26 | 0.78 | 0.44 | 0.21 | 0.27 | 0.31 | 0.06 | 0.11 | 0.37 | 0.67 | 0.29 | 1.20 | 0.58 | 3.13 | 3.01 |
| 1962 | 0.15 | 0.37 | 0.04 | 0.43 | 0.33 | 0.27 | 0.26 | 0.17 | 0.20 | 0.38 | 0.11 | 0.00 | 0.31 | 0.33 | 0.12 | 0.32 | 0.18 | 0.60 | 0.66 |
| 1963 | 0.05 | 0.08 | 0.03 | 0.02 | 0.03 | 0.11 | 0.02 | 0.06 | 0.04 | 0.02 | 0.06 | 0.03 | 0.05 | 0.01 | 0.01 | 0.01 | 0.08 | 0.03 | 0.03 |
| 1964 | 0.06 | 0.08 | 0.04 | 0.37 | 0.10 | 0.12 | 0.11 | 0.23 | 0.07 | 0.26 | 0.04 | 0.04 | 0.03 | 1.48 | 1.06 | 0.86 | 0.29 | 0.10 | 1.05 |
| 1965 | 0.00 | 0.02 | 0.02 | 0.66 | 0.16 | 0.08 | 0.05 | 1.04 | 0.11 | 0.34 | 0.12 | 0.10 | 0.12 | 0.92 | 0.09 | 0.13 | 2.46 | 0.19 | 2.43 |
| 1966 | 2.16 | 3.74 | 2.03 | 1.47 | 0.18 | 0.28 | 0.20 | 0.97 | 0.65 | 0.46 | 0.19 | 0.17 | 0.15 | 0.57 | 0.86 | 0.17 | 0.09 | 0.14 | 0.12 |
| 1967 | 1.00 | 0.64 | 0.42 | 0.14 | 0.12 | 0.19 | 0.00 | 0.33 | 0.06 | 0.03 | 0.00 | 0.07 | 0.40 | 0.02 | 0.15 | 0.01 | 0.00 | 0.01 | 0.01 |
| 1968 | 0.07 | 0.04 | 0.00 | 0.00 | 0.00 | 0.03 | 0.04 | 0.04 | 0.02 | 0.00 | 0.00 | 0.01 | 0.06 | 0.00 | 0.03 | 0.01 | 0.01 | 0.04 | 0.01 |
| 1969 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.03 | 0.00 | 0.00 | 0.05 | 0.04 | 0.00 | 0.00 | 0.04 | 0.05 | 0.05 | 0.00 | 0.00 | 0.01 | 0.00 |
| 1970 | 0.03 | 0.02 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1971 | 0.10 | 0.51 | 0.02 | 0.00 | 0.08 | 0.01 | 0.01 | 0.07 | 0.00 | 0.02 | 0.05 | 0.04 | 0.09 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 |
| 1972 | 0.05 | 0.09 | 0.14 | 0.33 | 0.30 | 0.64 | 0.04 | 0.24 | 0.76 | 0.04 | 0.08 | 0.02 | 1.18 | 0.10 | 0.10 | 0.00 | 0.02 | 0.09 | 0.13 |
| 1973 | 0.01 | 0.04 | 0.29 | 0.33 | 0.31 | 0.06 | 0.01 | 0.55 | 0.18 | 0.28 | 0.00 | 0.00 | 0.22 | 0.03 | 0.01 | 0.11 | 0.03 | 0.23 | 1.59 |
| 1974 | 0.00 | 0.05 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | - | - | - | - | - | - |

Table 9. Estimates of threespine stickleback population (millions) in the Wood River lake system 1958 through 1974, by sampling area and age group

| Year | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C | A | B | C | | A | B | C | A | B | C |
| | | | | | | | | | | Age 0 | | | | | | | | | |
| 1958 | 0.02 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.06 | 0.20 | 0.00 | 0.00 | 0.00 |
| 1959 | 0.13 | 0.81 | 2.72 | 0.06 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 2.33 | 0.66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.04 | 0.01 |
| 1960 | 0.09 | 0.04 | 0.18 | 0.01 | 0.01 | 0.00 | 0.01 | 0.02 | 0.01 | 0.05 | 0.34 | 0.01 | 0.02 | 0.01 | 0.01 | 0.21 | 0.00 | 0.00 | 0.00 |
| 1961 | 0.04 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.04 | 0.02 | 0.01 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 |
| 1962 | 0.40 | 0.16 | 0.31 | 0.07 | 0.00 | 0.12 | 0.00 | 0.01 | 0.00 | 0.09 | 0.05 | 0.02 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1963 | 0.15 | 0.01 | 0.19 | 0.01 | 0.04 | 0.05 | 0.00 | 0.00 | 0.00 | 0.24 | 0.12 | 0.06 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 |
| 1964 | 0.04 | 0.17 | 0.08 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1965 | 0.13 | 0.05 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 |
| 1966 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1967 | 0.19 | 0.05 | 0.92 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 1.24 | 0.06 | 0.21 | 0.02 | 0.04 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 |
| 1968 | 25.59 | 18.04 | 2.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.37 | 0.20 | 0.01 | 0.09 | 0.06 | 0.11 | 0.20 | 0.00 | 0.01 | 0.00 |
| 1969 | 0.01 | 0.02 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 |
| 1970 | 0.06 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| 1971 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1972 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1973 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 1974 | 2.54 | 6.56 | 3.58 | 0.08 | 0.57 | 0.46 | 0.04 | 1.81 | 2.20 | 8.67 | 1.18 | 0.03 | 0.06 | - | - | - | - | - | - |

Table 9. Estimates of threespine stickleback population (millions) in the Wood River lake system 1958 through 1974, by sampling area and age group - continued

| Year | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C | A | B | C | | A | B | C | A | B | C |
| | | | | | | | | | | Age I | | | | | | | | | |
| 1958 | 0.64 | 4.84 | 0.36 | 0.51 | 0.46 | 0.46 | 0.01 | 0.23 | 0.16 | 1.33 | 0.99 | 0.75 | 0.20 | 4.07 | 3.83 | 5.22 | 0.24 | 0.36 | 0.28 |
| 1959 | 0.89 | 5.24 | 8.39 | 0.57 | 0.74 | 0.07 | 0.61 | 0.19 | 0.09 | 1.14 | 0.32 | 0.18 | 0.09 | 0.91 | 1.00 | 0.62 | 0.23 | 0.27 | 0.09 |
| 1960 | 2.77 | 1.84 | 4.79 | 0.73 | 0.08 | 0.10 | 0.10 | 0.22 | 0.38 | 0.43 | 1.15 | 0.39 | 0.10 | 4.94 | 1.06 | 3.11 | 0.29 | 0.53 | 0.14 |
| 1961 | 0.47 | 0.20 | 2.48 | 0.22 | 0.11 | 0.00 | 0.01 | 0.33 | 0.12 | 0.19 | 0.70 | 1.97 | 0.43 | 0.52 | 0.32 | 0.23 | 0.20 | 0.09 | 0.22 |
| 1962 | 3.80 | 6.64 | 5.15 | 0.37 | 0.23 | 0.34 | 0.22 | 0.22 | 0.64 | 0.13 | 0.04 | 0.38 | 0.32 | 0.20 | 0.06 | 0.01 | 0.03 | 0.05 | 0.26 |
| 1963 | 3.02 | 6.06 | 5.51 | 0.24 | 0.22 | 1.22 | 0.00 | 0.06 | 0.07 | 1.93 | 0.80 | 0.85 | 0.71 | 2.22 | 5.35 | 0.49 | 0.54 | 0.13 | 0.05 |
| 1964 | 3.26 | 25.44 | 3.97 | 0.34 | 0.03 | 0.07 | 0.00 | 0.81 | 0.46 | 0.16 | 0.29 | 0.82 | 0.32 | 1.08 | 0.21 | 0.44 | 0.76 | 0.01 | 0.60 |
| 1965 | 11.48 | 2.18 | 0.70 | 0.01 | 0.27 | 0.01 | 0.01 | 0.01 | 0.08 | 0.31 | 2.03 | 0.11 | 0.06 | 0.25 | 0.04 | 0.13 | 0.00 | 0.02 | 0.01 |
| 1966 | 8.52 | 4.03 | 0.85 | 0.00 | 0.01 | 0.01 | 0.00 | 0.16 | 0.02 | 0.46 | 1.16 | 1.10 | 0.05 | 0.04 | 0.03 | 0.63 | 0.00 | 0.00 | 0.00 |
| 1967 | 2.39 | 6.45 | 2.28 | 0.01 | 0.12 | 0.06 | 0.03 | 1.15 | 0.55 | 2.04 | 0.47 | 0.91 | 0.43 | 4.22 | 0.16 | 0.36 | 0.11 | 0.15 | 0.14 |
| 1968 | 3.51 | 16.82 | 3.74 | 0.76 | 0.85 | 0.61 | 0.17 | 4.93 | 6.98 | 0.82 | 0.38 | 0.56 | 1.26 | 1.84 | 0.74 | 1.58 | 0.39 | 5.14 | 0.06 |
| 1969 | 6.20 | 1.75 | 2.81 | 0.08 | 0.80 | 0.09 | 0.00 | 0.02 | 0.12 | 0.32 | 2.24 | 3.44 | 0.09 | 2.46 | 0.48 | 5.56 | 0.04 | 0.32 | 0.39 |
| 1970 | 0.93 | 1.41 | 0.87 | 0.00 | 0.02 | 0.00 | 0.04 | 0.01 | 0.03 | 0.14 | 0.02 | 0.49 | 0.06 | 0.07 | 0.38 | 0.12 | 0.19 | 0.03 | 0.01 |
| 1971 | 0.02 | 0.02 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.03 | 0.05 | 0.80 | 0.03 | 0.01 | 0.01 | 0.01 | 0.00 | 0.02 | 0.05 |
| 1972 | 0.05 | 0.05 | 0.16 | 0.02 | 0.02 | 0.00 | 0.00 | 0.07 | 0.41 | 1.51 | 0.00 | 0.06 | 0.06 | 0.08 | 0.04 | 0.15 | 0.09 | 0.02 | 0.00 |
| 1973 | 0.34 | 0.09 | 1.10 | 0.07 | 0.00 | 0.00 | 0.00 | 0.55 | 0.00 | 1.24 | 0.22 | 0.00 | 0.02 | 0.03 | 0.10 | 0.08 | 0.04 | 0.06 | 0.41 |
| 1974 | 1.05 | 1.08 | 3.31 | 1.16 | 0.34 | 0.12 | 0.68 | 3.69 | 6.54 | 11.94 | 11.93 | 3.26 | 0.57 | - | - | - | - | - | - |

Table 9. Estimates of threespine stickleback population (millions) in the Wood River lake system 1958 through 1974, by sampling area and age group - continued

| Year | Aleknagik | | | South Nerka | | | Central Nerka | | | North Nerka | | | Little Togiak | Beverley | | | Kulik | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | A | B | C | A | B | C | A | B | C | | A | B | C | A | B | C |
| | | | | | | | | | | Age II+ | | | | | | | | | |
| 1958 | 0.38 | 2.71 | 0.91 | 1.00 | 0.33 | 1.58 | 0.03 | 0.13 | 0.13 | 2.01 | 3.67 | 3.66 | 1.52 | 9.07 | 3.47 | 7.13 | 2.79 | 3.70 | 13.80 |
| 1959 | 2.66 | 13.44 | 14.37 | 6.40 | 8.59 | 0.88 | 3.57 | 1.11 | 0.72 | 2.83 | 1.10 | 0.64 | 1.16 | 1.64 | 7.93 | 4.10 | 0.93 | 2.71 | 1.36 |
| 1960 | 0.78 | 0.94 | 2.51 | 0.77 | 0.49 | 0.65 | 0.18 | 0.18 | 0.23 | 0.99 | 1.09 | 0.55 | 0.20 | 0.72 | 1.40 | 2.02 | 0.05 | 0.41 | 1.28 |
| 1961 | 0.32 | 1.16 | 4.64 | 0.92 | 0.23 | 0.03 | 0.03 | 0.73 | 0.18 | 0.21 | 0.69 | 0.91 | 0.30 | 1.23 | 0.66 | 0.51 | 0.43 | 0.51 | 1.19 |
| 1962 | 2.39 | 6.34 | 6.08 | 0.48 | 0.80 | 0.89 | 0.22 | 0.30 | 0.91 | 0.22 | 0.27 | 0.82 | 0.60 | 0.47 | 0.09 | 0.23 | 0.02 | 0.22 | 0.74 |
| 1963 | 0.66 | 5.64 | 2.79 | 0.05 | 0.06 | 0.24 | 0.00 | 0.02 | 0.02 | 0.65 | 0.16 | 0.23 | 0.95 | 1.15 | 0.95 | 0.26 | 0.29 | 0.04 | 0.07 |
| 1964 | 2.48 | 25.10 | 6.42 | 0.22 | 0.06 | 0.18 | 0.02 | 0.44 | 0.32 | 0.07 | 0.11 | 0.43 | 0.74 | 0.64 | 0.31 | 1.55 | 0.88 | 0.00 | 1.29 |
| 1965 | 6.29 | 9.47 | 5.88 | 0.10 | 1.14 | 0.16 | 0.00 | 0.30 | 0.26 | 0.67 | 2.16 | 1.19 | 0.53 | 1.05 | 0.12 | 0.51 | 0.04 | 0.10 | 0.41 |
| 1966 | 4.87 | 8.11 | 7.12 | 0.03 | 0.08 | 0.06 | 0.00 | 0.18 | 0.08 | 0.45 | 0.25 | 0.93 | 0.79 | 0.30 | 0.06 | 3.18 | 0.00 | 0.00 | 0.22 |
| 1967 | 0.71 | 1.84 | 1.66 | 0.01 | 0.15 | 0.15 | 0.00 | 0.62 | 0.19 | 0.41 | 0.26 | 0.20 | 1.46 | 1.04 | 0.12 | 0.27 | 0.04 | 0.07 | 0.07 |
| 1968 | 1.37 | 1.69 | 0.71 | 0.55 | 0.47 | 0.40 | 0.10 | 2.61 | 2.72 | 0.50 | 0.48 | 0.22 | 0.20 | 1.37 | 0.30 | 0.96 | 0.22 | 3.25 | 0.02 |
| 1969 | 8.08 | 4.30 | 5.94 | 0.10 | 0.30 | 0.06 | 0.00 | 0.02 | 0.05 | 0.33 | 0.52 | 3.52 | 0.35 | 4.41 | 1.38 | 8.61 | 0.15 | 1.31 | 1.03 |
| 1970 | 3.76 | 3.41 | 10.36 | 0.11 | 0.21 | 0.52 | 0.07 | 0.04 | 0.31 | 0.66 | 0.05 | 1.01 | 0.89 | 0.66 | 0.49 | 0.58 | 0.50 | 0.37 | 0.03 |
| 1971 | 0.14 | 0.08 | 0.59 | 0.02 | 0.08 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.12 | 1.13 | 0.03 | 0.11 | 0.01 | 0.29 | 0.04 | 0.15 | 0.59 |
| 1972 | 0.10 | 0.94 | 1.00 | 0.04 | 0.16 | 0.17 | 0.00 | 0.33 | 1.84 | 1.06 | 0.00 | 0.13 | 2.33 | 1.01 | 0.11 | 2.20 | 0.39 | 2.00 | 0.68 |
| 1973 | 0.04 | 0.05 | 0.50 | 0.07 | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 | 0.39 | 0.37 | 0.18 | 0.08 | 0.02 | 0.00 | 0.08 | 0.24 | 0.68 | 1.84 |
| 1974 | 0.16 | 0.06 | 0.76 | 0.44 | 0.11 | 0.17 | 0.19 | 0.22 | 0.50 | 1.46 | 2.39 | 0.32 | 0.33 | - | - | - | - | - | - |

Table 10. Geometric means of population estimates (millions) by lake area, 1958-1972

| Lake | Area | Sockeye salmon | | Threespine stickleback | | |
|---|---|---|---|---|---|---|
| | | Age 0 | Age I | Age 0 | Age I | Age II+ |
| Aleknagik | A | 2.39 | 0.23 | 0.34 | 2.20 | 1.65 |
| | B | 3.99 | 0.32 | 0.31 | 3.23 | 3.65 |
| | C | 3.37 | 0.20 | 0.30 | 2.09 | 3.55 |
| South Nerka | A | 1.62 | 0.32 | 0.01 | 0.23 | 0.43 |
| | B | 1.33 | 0.16 | 0.01 | 0.23 | 0.48 |
| | C | 0.75 | 0.17 | 0.01 | 0.17 | 0.35 |
| Central Nerka | A | 0.28 | 0.08 | 0.00 | 0.07 | 0.15 |
| | B | 1.31 | 0.20 | 0.00 | 0.35 | 0.38 |
| | C | 1.20 | 0.14 | 0.01 | 0.37 | 0.41 |
| North Nerka | A | 3.05 | 0.12 | 0.20 | 0.62 | 0.62 |
| | B | 4.09 | 0.05 | 0.11 | 0.59 | 0.55 |
| | C | 1.88 | 0.05 | 0.02 | 0.72 | 0.84 |
| Beverley | A | 2.53 | 0.28 | 0.01 | 1.07 | 1.20 |
| | B | 1.29 | 0.21 | 0.01 | 0.58 | 0.71 |
| | C | 1.34 | 0.21 | 0.05 | 0.79 | 1.46 |
| Kulik | A | 1.15 | 0.18 | 0.00 | 0.19 | 0.35 |
| | B | 1.22 | 0.20 | 0.00 | 0.27 | 0.69 |
| | C | 2.80 | 0.35 | 0.00 | 0.14 | 0.82 |
| Little Togiak | | 1.19 | 0.19 | 0.01 | 0.22 | 0.66 |

Table 11. Estimated populations, mean weights, and biomasses of pelagic fish populations in the Wood River lake system by lake and age group, 1958 through 1974

| | | Population estimates (millions) | | | | | Mean weight (grams) | | | | | Biomass (metric tons) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | |
| Lake | Year | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Total |
| Aleknagik | 1958 | 6.33 | 0.32 | 0.04 | 5.85 | 4.00 | 2.15 | 5.29 | 0.12 | 0.66 | 1.61 | 13.61 | 1.70 | 0.01 | 3.86 | 6.44 | 25.62 |
| | 1959 | 4.64 | 0.08 | 3.66 | 14.51 | 30.47 | 2.22 | 10.45 | 0.19 | 0.76 | 1.87 | 10.29 | 0.84 | 0.69 | 11.03 | 56.97 | 79.82 |
| | 1960 | 29.48 | 0.05 | 0.30 | 9.39 | 4.22 | 1.54 | 6.06 | 0.12 | 0.61 | 1.78 | 45.41 | 0.30 | 0.04 | 5.73 | 7.52 | 59.00 |
| | 1961 | 24.66 | 3.59 | 0.09 | 3.15 | 6.11 | 1.79 | 5.68 | 0.11 | 0.56 | 1.45 | 44.14 | 20.39 | 0.01 | 1.76 | 8.86 | 75.16 |
| | 1962 | 12.37 | 0.57 | 0.87 | 15.59 | 14.81 | 1.43 | 5.64 | 0.12 | 0.62 | 1.30 | 17.69 | 3.19 | 0.10 | 9.66 | 19.25 | 49.89 |
| | 1963 | 6.78 | 0.15 | 0.35 | 14.58 | 9.09 | 2.15 | 6.25 | 0.12 | 0.75 | 1.69 | 14.57 | 0.96 | 0.04 | 10.94 | 15.36 | 41.87 |
| | 1964 | 6.58 | 0.17 | 0.29 | 32.67 | 34.00 | 1.98 | 8.57 | 0.12 | 0.60 | 1.69 | 13.03 | 1.47 | 0.03 | 19.60 | 57.46 | 91.59 |
| | 1965 | 20.29 | 0.04 | 0.20 | 14.37 | 21.64 | 1.39 | 7.45 | 0.12 | 0.46 | 1.53 | 28.20 | 0.28 | 0.02 | 6.61 | 33.10 | 68.21 |
| | 1966 | 43.43 | 7.93 | 0.00 | 13.40 | 20.11 | 0.97 | 4.31 | 0.08 | 0.46 | 1.23 | 42.15 | 34.19 | 0.00 | 6.16 | 24.73 | 107.23 |
| | 1967 | 13.29 | 2.06 | 1.16 | 11.12 | 4.22 | 0.74 | 2.69 | 0.11 | 0.53 | 1.45 | 9.83 | 5.55 | 0.13 | 5.90 | 6.12 | 27.53 |
| | 1968 | 2.41 | 0.10 | 42.65 | 24.08 | 3.77 | 1.75 | 3.99 | 0.17 | 0.61 | 1.78 | 4.21 | 0.41 | 7.25 | 14.69 | 6.71 | 33.27 |
| | 1969 | 19.16 | 0.01 | 0.12 | 10.76 | 18.32 | 2.09 | 5.31 | 0.11 | 0.65 | 1.53 | 40.04 | 0.05 | 0.01 | 7.00 | 28.03 | 75.13 |
| | 1970 | 10.56 | 0.05 | 0.11 | 3.22 | 17.53 | 1.85 | 6.58 | 0.15 | 0.67 | 1.61 | 19.56 | 0.36 | 0.02 | 2.16 | 28.22 | 50.32 |
| | 1971 | 3.44 | 0.09 | 0.00 | 0.11 | 0.82 | 1.46 | 5.72 | ---- | 0.61 | 2.16 | 5.03 | 0.51 | 0.00 | 0.07 | 1.76 | 7.37 |
| | 1972 | 2.16 | 0.28 | 0.02 | 0.25 | 2.04 | 1.48 | 8.05 | 0.07 | 0.66 | 2.26 | 3.20 | 2.25 | 0.00 | 0.17 | 4.60 | 10.22 |
| | 1973 | 0.67 | 0.34 | 0.01 | 1.53 | 0.59 | 2.72 | 5.60 | 0.10 | 0.95 | 2.51 | 1.82 | 1.90 | 0.00 | 1.45 | 1.48 | 6.65 |
| | 1974 | 10.91 | 0.05 | 12.67 | 5.43 | 0.98 | 2.23 | 5.38 | 0.17 | 0.94 | 1.98 | 24.33 | 0.27 | 2.15 | 5.10 | 1.94 | 33.79 |

Table 11. Estimated populations, mean weights, and biomasses of pelagic fish populations in the Wood River lake system by lake and age group, 1958 through 1974 - continued

| Lake | Year | Population estimates (millions) | | | | | Mean weight (grams) | | | | | Biomass (metric tons) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | |
| | | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Total |
| South Nerka | | | | | | | | | | | | | | | | | |
| | 1958 | 2.84 | 0.70 | 0.00 | 1.43 | 2.91 | 2.12 | 8.94 | ---- | 0.64 | 1.69 | 6.03 | 6.25 | 0.00 | 0.92 | 4.92 | 18.12 |
| | 1959 | 7.20 | 0.00 | 0.06 | 1.38 | 15.37 | 2.55 | ---- | 0.14 | 0.74 | 1.69 | 18.36 | 0.00 | 0.01 | 1.02 | 26.82 | 46.21 |
| | 1960 | 18.61 | 0.51 | 0.02 | 0.92 | 1.91 | 1.79 | 7.16 | 0.12 | 0.65 | 1.78 | 33.32 | 3.64 | 0.00 | 0.60 | 3.40 | 40.96 |
| | 1961 | 40.01 | 3.71 | 0.00 | 0.33 | 1.17 | 1.81 | 6.47 | ---- | 0.63 | 1.30 | 72.41 | 23.98 | 0.00 | 0.21 | 1.53 | 98.13 |
| | 1962 | 1.11 | 1.03 | 0.18 | 0.94 | 2.18 | 2.32 | 7.93 | 0.15 | 0.82 | 1.53 | 2.56 | 8.16 | 0.03 | 0.77 | 3.33 | 14.85 |
| | 1963 | 16.11 | 0.16 | 0.09 | 1.67 | 0.36 | 2.14 | 8.21 | 0.10 | 0.81 | 2.06 | 34.48 | 1.35 | 0.01 | 1.35 | 0.73 | 37.92 |
| | 1964 | 1.39 | 0.60 | 0.02 | 0.43 | 0.46 | 1.70 | 8.03 | 0.11 | 0.66 | 1.61 | 2.36 | 4.81 | 0.00 | 0.29 | 0.75 | 8.21 |
| | 1965 | 5.27 | 0.90 | 0.01 | 0.29 | 1.39 | 1.66 | 7.19 | 0.10 | 0.45 | 1.45 | 8.75 | 6.45 | 0.00 | 0.13 | 2.02 | 17.35 |
| | 1966 | 1.20 | 1.93 | 0.00 | 0.02 | 0.16 | 1.70 | 6.60 | ---- | 0.57 | 1.30 | 2.04 | 12.73 | 0.00 | 0.01 | 0.21 | 14.99 |
| | 1967 | 4.48 | 0.45 | 0.11 | 0.19 | 0.31 | 2.32 | 7.40 | 0.14 | 0.82 | 1.78 | 10.38 | 3.35 | 0.02 | 0.16 | 0.55 | 14.46 |
| | 1968 | 1.10 | 0.03 | 0.00 | 2.23 | 1.42 | 2.89 | 8.86 | 0.07 | 0.99 | 1.87 | 3.16 | 0.30 | 0.00 | 2.20 | 2.66 | 8.32 |
| | 1969 | 2.98 | 0.05 | 0.00 | 0.97 | 0.45 | 2.49 | 7.57 | ---- | 0.83 | 1.87 | 7.42 | 0.35 | 0.00 | 0.80 | 0.84 | 9.41 |
| | 1970 | 0.51 | 0.07 | 0.00 | 0.02 | 0.84 | 1.85 | 10.90 | ---- | 0.67 | 1.69 | 0.94 | 0.76 | 0.00 | 0.01 | 1.42 | 3.13 |
| | 1971 | 1.80 | 0.09 | 0.00 | 0.00 | 0.10 | 1.42 | 6.48 | ---- | ---- | 1.96 | 2.56 | 0.56 | 0.00 | 0.00 | 0.19 | 3.31 |
| | 1972 | 0.58 | 1.27 | 0.00 | 0.04 | 0.37 | 1.68 | 7.26 | ---- | 0.63 | 1.45 | 0.98 | 9.22 | 0.00 | 0.02 | 0.54 | 10.76 |
| | 1973 | 0.46 | 0.70 | 0.00 | 0.07 | 0.07 | 2.02 | 10.05 | ---- | 0.67 | 1.23 | 0.93 | 7.04 | 0.00 | 0.05 | 0.09 | 8.11 |
| | 1974 | 3.16 | 0.03 | 1.11 | 1.63 | 0.72 | 2.92 | 11.36 | 0.18 | 1.10 | 1.92 | 9.23 | 0.34 | 0.20 | 1.79 | 1.38 | 12.94 |

Table 11. Estimated populations, mean weights, and biomasses of pelagic fish populations in the Wood River lake system by lake and age group, 1958 through 1974 - continued

| Lake | Year | Population estimates (millions) | | | | | Mean weight (grams) | | | | | Biomass (metric tons) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | |
| | | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Total |
| Central Nerka | | | | | | | | | | | | | | | | | |
| | 1958 | 1.12 | 0.21 | 0.00 | 0.40 | 0.29 | 1.95 | 10.75 | ---- | 0.64 | 1.69 | 2.18 | 2.28 | 0.00 | 0.25 | 0.49 | 5.20 |
| | 1959 | 2.15 | 0.07 | 0.01 | 0.90 | 5.39 | 2.06 | 11.72 | 0.15 | 0.58 | 1.45 | 4.44 | 0.77 | 0.00 | 0.52 | 7.81 | 13.54 |
| | 1960 | 9.32 | 0.19 | 0.03 | 0.70 | 0.58 | 1.52 | 6.19 | 0.11 | 0.56 | 1.78 | 14.16 | 1.17 | 0.00 | 0.39 | 1.03 | 16.75 |
| | 1961 | 13.13 | 0.92 | 0.00 | 0.46 | 0.94 | 1.57 | 6.25 | 0.15 | 0.59 | 1.30 | 20.61 | 5.78 | 0.00 | 0.27 | 1.22 | 27.88 |
| | 1962 | 2.56 | 0.63 | 0.01 | 1.08 | 1.44 | 1.85 | 7.83 | 0.11 | 0.75 | 1.23 | 4.73 | 4.93 | 0.00 | 0.81 | 1.77 | 12.24 |
| | 1963 | 4.15 | 0.13 | 0.00 | 0.14 | 0.04 | 1.97 | 9.75 | 0.17 | 0.79 | 0.98 | 8.18 | 1.27 | 0.00 | 0.11 | 0.04 | 9.60 |
| | 1964 | 1.40 | 0.41 | 0.00 | 1.28 | 0.78 | 1.53 | 7.14 | ---- | 0.70 | 1.38 | 2.14 | 2.92 | 0.00 | 0.89 | 1.07 | 7.02 |
| | 1965 | 1.84 | 1.20 | 0.00 | 0.10 | 0.55 | 1.39 | 6.66 | ---- | 0.51 | 1.30 | 2.55 | 7.98 | 0.00 | 0.05 | 0.72 | 11.30 |
| | 1966 | 1.31 | 1.81 | 0.00 | 0.18 | 0.25 | 1.39 | 6.34 | ---- | 0.64 | 1.38 | 1.82 | 11.48 | 0.00 | 0.11 | 0.35 | 13.76 |
| | 1967 | 4.27 | 0.39 | 0.00 | 1.72 | 0.80 | 1.76 | 5.38 | ---- | 0.73 | 1.38 | 7.51 | 2.09 | 0.00 | 1.26 | 1.11 | 11.97 |
| | 1968 | 4.49 | 0.10 | 0.08 | 12.08 | 5.42 | 2.37 | 8.78 | 0.19 | 0.84 | 1.45 | 10.64 | 0.85 | 0.02 | 10.14 | 7.86 | 29.51 |
| | 1969 | 1.46 | 0.05 | 0.00 | 0.15 | 0.06 | 2.03 | 9.98 | ---- | 0.77 | 1.61 | 2.97 | 0.51 | 0.00 | 0.11 | 0.10 | 3.69 |
| | 1970 | 1.55 | 0.00 | 0.00 | 0.08 | 0.41 | 2.44 | 11.21 | ---- | 0.65 | 1.53 | 3.78 | 0.03 | 0.00 | 0.05 | 0.63 | 4.49 |
| | 1971 | 1.73 | 0.08 | 0.00 | 0.01 | 0.01 | 1.24 | 7.83 | ---- | 0.54 | 1.69 | 2.14 | 0.59 | 0.00 | 0.01 | 0.02 | 2.76 |
| | 1972 | 2.81 | 1.03 | 0.00 | 0.48 | 2.17 | 1.53 | 5.91 | ---- | 0.73 | 1.38 | 4.30 | 6.07 | 0.00 | 0.35 | 3.00 | 13.72 |
| | 1973 | 1.29 | 0.75 | 0.00 | 0.56 | 0.19 | 2.01 | 7.74 | ---- | 0.67 | 1.30 | 2.59 | 5.80 | 0.00 | 0.38 | 0.25 | 9.02 |
| | 1974 | 1.15 | 0.00 | 4.05 | 10.91 | 0.90 | 2.32 | ---- | 0.26 | 0.86 | 1.56 | 2.67 | 0.00 | 1.05 | 9.38 | 1.40 | 14.50 |

Table 11. Estimated populations, mean weights, and biomasses of pelagic fish populations in the Wood River lake system by lake and age group, 1958 through 1974 - continued

| Lake | Year | Population estimates (millions) | | | | | Mean weight (grams) | | | | | Biomass (metric tons) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | |
| | | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Total |
| North Nerka | | | | | | | | | | | | | | | | | |
| | 1958 | 2.97 | 0.09 | 0.00 | 3.08 | 9.34 | 2.09 | 8.11 | ---- | 0.62 | 1.69 | 6.21 | 0.75 | 0.00 | 1.91 | 15.78 | 24.65 |
| | 1959 | 1.68 | 0.05 | 3.00 | 1.64 | 4.57 | 2.07 | 7.12 | 0.14 | 0.54 | 1.45 | 3.47 | 0.33 | 0.42 | 0.89 | 6.62 | 11.73 |
| | 1960 | 13.05 | 0.07 | 0.40 | 1.97 | 2.63 | 1.22 | 6.96 | 0.15 | 0.56 | 1.53 | 15.92 | 0.49 | 0.06 | 1.10 | 4.03 | 21.60 |
| | 1961 | 18.83 | 0.48 | 0.12 | 2.86 | 1.81 | 1.44 | 6.19 | 0.12 | 0.51 | 1.17 | 27.12 | 2.99 | 0.01 | 1.46 | 2.12 | 33.70 |
| | 1962 | 12.86 | 0.50 | 0.16 | 0.55 | 1.32 | 1.85 | 7.33 | 0.14 | 0.70 | 1.23 | 23.78 | 3.66 | 0.02 | 0.38 | 1.62 | 29.46 |
| | 1963 | 16.38 | 0.10 | 0.42 | 3.59 | 1.04 | 2.11 | 10.24 | 0.15 | 0.87 | 1.69 | 34.56 | 1.02 | 0.06 | 3.12 | 1.76 | 40.52 |
| | 1964 | 8.61 | 0.34 | 0.05 | 1.27 | 0.61 | 2.31 | 6.69 | 0.15 | 0.68 | 1.45 | 19.83 | 2.26 | 0.01 | 0.86 | 0.88 | 23.84 |
| | 1965 | 21.43 | 0.56 | 0.46 | 2.45 | 4.03 | 1.40 | 5.66 | 0.12 | 0.48 | 1.30 | 30.00 | 3.15 | 0.05 | 1.18 | 5.24 | 39.62 |
| | 1966 | 20.14 | 0.82 | 0.00 | 2.72 | 1.64 | 1.44 | 5.76 | 0.14 | 0.63 | 1.23 | 29.00 | 4.69 | 0.00 | 1.71 | 2.01 | 37.41 |
| | 1967 | 14.17 | 0.10 | 1.51 | 3.42 | 0.87 | 1.85 | 5.94 | 0.21 | 0.72 | 1.38 | 26.22 | 0.59 | 0.32 | 2.47 | 1.20 | 30.80 |
| | 1968 | 3.62 | 0.01 | 0.59 | 1.76 | 1.21 | 2.47 | 7.52 | 0.15 | 0.75 | 1.38 | 8.94 | 0.08 | 0.09 | 1.32 | 1.66 | 12.09 |
| | 1969 | 7.50 | 0.04 | 0.01 | 5.99 | 4.37 | 1.89 | 12.18 | 0.15 | 0.71 | 1.61 | 14.18 | 0.49 | 0.00 | 4.25 | 7.03 | 25.95 |
| | 1970 | 9.93 | 0.00 | 0.01 | 0.65 | 1.72 | 2.22 | 8.68 | 0.11 | 0.59 | 1.45 | 22.04 | 0.00 | 0.00 | 0.38 | 2.49 | 24.91 |
| | 1971 | 42.95 | 0.11 | 0.00 | 0.87 | 1.25 | 1.74 | 5.34 | ---- | 0.57 | 1.30 | 74.73 | 0.58 | 0.00 | 0.50 | 1.63 | 77.44 |
| | 1972 | 1.89 | 0.15 | 0.00 | 1.57 | 1.19 | 1.48 | 6.60 | ---- | 0.68 | 1.30 | 2.80 | 0.97 | 0.00 | 1.07 | 1.54 | 6.38 |
| | 1973 | 4.61 | 0.28 | 0.46 | 1.46 | 0.94 | 2.03 | 4.93 | 0.15 | 0.68 | 1.38 | 9.36 | 1.38 | 0.07 | 0.99 | 1.30 | 13.10 |
| | 1974 | 9.11 | 0.00 | 9.88 | 27.13 | 4.16 | 2.40 | ---- | 0.20 | 0.97 | 1.68 | 21.86 | 0.00 | 1.98 | 26.32 | 6.99 | 57.15 |

Table 11. Estimated populations, mean weights, and biomasses of pelagic fish populations in the Wood River lake system by lake and age group, 1958 through 1973 - continued

| Lake | Year | Population estimates (millions) | | | | | Mean weight (grams) | | | | | Biomass (metric tons) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | |
| | | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Total |
| Beverley | 1958 | 0.58 | 0.08 | 0.27 | 13.12 | 19.67 | 2.09 | 9.05 | 0.15 | 0.65 | 2.58 | 1.20 | 0.73 | 0.04 | 8.53 | 50.74 | 61.24 |
| | 1959 | 21.90 | 0.04 | 0.02 | 2.54 | 13.66 | 1.60 | 7.23 | 0.17 | 0.48 | 1.30 | 35.04 | 0.32 | 0.00 | 1.22 | 17.76 | 54.34 |
| | 1960 | 21.67 | 3.26 | 0.23 | 9.11 | 4.14 | 0.92 | 4.21 | 0.11 | 0.43 | 1.78 | 19.94 | 13.73 | 0.03 | 3.92 | 7.38 | 45.00 |
| | 1961 | 10.30 | 2.16 | 0.04 | 1.07 | 2.40 | 1.57 | 5.21 | 0.15 | 0.51 | 1.61 | 16.17 | 11.27 | 0.01 | 0.54 | 3.87 | 31.86 |
| | 1962 | 1.14 | 0.77 | 0.00 | 0.27 | 0.80 | 2.12 | 6.89 | ---- | 0.78 | 1.45 | 2.42 | 5.29 | 0.00 | 0.21 | 1.16 | 9.08 |
| | 1963 | 28.36 | 0.03 | 0.05 | 8.06 | 2.36 | 1.53 | 6.06 | 0.10 | 0.80 | 1.69 | 43.40 | 0.19 | 0.00 | 6.45 | 3.99 | 54.03 |
| | 1964 | 14.45 | 3.40 | 0.00 | 1.73 | 2.50 | 1.08 | 3.64 | ---- | 0.52 | 1.30 | 15.61 | 12.39 | 0.00 | 0.90 | 3.24 | 32.14 |
| | 1965 | 3.66 | 1.15 | 0.06 | 0.41 | 1.67 | 1.17 | 4.65 | 0.12 | 0.49 | 1.17 | 4.28 | 5.35 | 0.01 | 0.20 | 1.96 | 11.80 |
| | 1966 | 1.37 | 1.60 | 0.00 | 0.71 | 3.54 | 1.62 | 5.46 | ---- | 0.65 | 1.38 | 2.22 | 8.71 | 0.00 | 0.46 | 4.88 | 16.27 |
| | 1967 | 8.29 | 0.18 | 0.04 | 4.74 | 1.43 | 1.52 | 8.06 | 0.17 | 0.74 | 1.53 | 12.59 | 1.41 | 0.01 | 3.51 | 2.18 | 19.70 |
| | 1968 | 8.47 | 0.04 | 0.37 | 4.16 | 2.63 | 2.37 | 6.27 | 0.15 | 0.83 | 1.78 | 20.08 | 0.23 | 0.06 | 3.45 | 4.68 | 28.50 |
| | 1969 | 4.15 | 0.10 | 0.02 | 8.50 | 14.40 | 1.80 | 5.94 | 0.12 | 0.68 | 1.53 | 7.47 | 0.61 | 0.00 | 5.78 | 22.03 | 35.89 |
| | 1970 | 1.24 | 0.01 | 0.01 | 0.58 | 1.72 | 1.82 | 11.28 | 0.15 | 0.59 | 1.45 | 2.26 | 0.07 | 0.00 | 0.34 | 2.50 | 5.17 |
| | 1971 | 0.56 | 0.01 | 0.00 | 0.03 | 0.41 | 1.33 | 4.61 | ---- | 0.54 | 1.53 | 0.75 | 0.04 | 0.00 | 0.02 | 0.63 | 1.44 |
| | 1972 | 0.85 | 0.20 | 0.00 | 0.27 | 3.31 | 1.61 | 7.39 | ---- | 0.73 | 1.53 | 1.38 | 1.50 | 0.00 | 0.19 | 5.07 | 8.14 |
| | 1973 | 0.22 | 0.15 | 0.00 | 0.21 | 0.10 | 2.63 | 5.32 | ---- | 0.77 | 2.50 | 0.59 | 0.80 | 0.00 | 0.16 | 0.25 | 1.80 |

Table 11. Estimated populations, mean weights, and biomasses of pelagic fish populations in the Wood River lake system by lake and age group, 1958 through 1973 - continued

| Lake | Year | Population estimates (millions) | | | | | Mean weight (grams) | | | | | Biomass (metric tons) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | |
| | | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Total |
| Kulik | 1958 | 1.16 | 0.18 | 0.00 | 0.88 | 20.29 | 2.12 | 8.01 | ---- | 0.60 | 2.93 | 2.46 | 1.46 | 0.00 | 0.53 | 59.46 | 63.91 |
| | 1959 | 24.02 | 0.09 | 0.05 | 0.59 | 5.00 | 2.05 | 5.27 | 0.12 | 0.51 | 3.72 | 49.23 | 0.49 | 0.01 | 0.30 | 18.60 | 68.63 |
| | 1960 | 24.59 | 0.59 | 0.00 | 0.96 | 1.74 | 1.37 | 6.04 | ---- | 0.59 | 2.69 | 33.69 | 3.54 | 0.00 | 0.56 | 4.68 | 42.47 |
| | 1961 | 12.74 | 6.72 | 0.00 | 0.51 | 2.14 | 1.48 | 5.19 | ---- | 0.53 | 1.38 | 18.86 | 34.89 | 0.00 | 0.27 | 2.95 | 56.97 |
| | 1962 | 3.64 | 1.44 | 0.00 | 0.34 | 0.98 | 2.06 | 5.44 | ---- | 0.62 | 1.30 | 7.49 | 7.83 | 0.00 | 0.21 | 1.28 | 16.81 |
| | 1963 | 15.06 | 0.14 | 0.00 | 0.73 | 0.41 | 1.52 | 6.60 | ---- | 0.66 | 1.23 | 22.89 | 0.92 | 0.00 | 0.48 | 0.50 | 24.79 |
| | 1964 | 25.21 | 1.44 | 0.00 | 1.38 | 2.17 | 1.20 | 4.30 | ---- | 0.59 | 1.23 | 30.25 | 6.18 | 0.00 | 0.81 | 2.67 | 39.91 |
| | 1965 | 6.38 | 5.08 | 0.00 | 0.03 | 0.55 | 1.06 | 4.48 | ---- | 0.51 | 1.17 | 6.76 | 22.75 | 0.00 | 0.01 | 0.64 | 30.16 |
| | 1966 | 0.91 | 0.35 | 0.00 | 0.00 | 0.22 | 1.55 | 4.90 | ---- | 0.54 | 1.30 | 1.40 | 1.71 | 0.00 | 0.00 | 0.28 | 3.39 |
| | 1967 | 5.78 | 0.02 | 0.00 | 0.40 | 0.18 | 2.21 | 7.00 | 0.12 | 0.78 | 1.61 | 12.78 | 0.13 | 0.00 | 0.31 | 0.29 | 13.51 |
| | 1968 | 3.29 | 0.05 | 0.01 | 5.58 | 3.48 | 3.23 | 7.69 | ---- | 0.83 | 1.30 | 10.62 | 0.39 | 0.00 | 4.63 | 4.52 | 20.16 |
| | 1969 | 2.29 | 0.01 | 0.00 | 0.75 | 2.49 | 2.25 | 5.86 | ---- | 0.78 | 1.87 | 5.15 | 0.06 | 0.00 | 0.58 | 4.66 | 10.45 |
| | 1970 | 0.55 | 0.00 | 0.00 | 0.23 | 0.90 | 2.32 | ---- | ---- | 0.65 | 1.87 | 1.27 | 0.00 | 0.00 | 0.15 | 1.68 | 3.10 |
| | 1971 | 1.86 | 0.02 | 0.00 | 0.07 | 0.78 | 1.39 | 6.64 | ---- | 0.73 | 1.96 | 2.58 | 0.14 | 0.00 | 0.05 | 1.52 | 4.29 |
| | 1972 | 4.26 | 0.25 | 0.00 | 0.11 | 3.07 | 1.36 | 5.93 | ---- | 0.60 | 2.46 | 5.79 | 1.46 | 0.00 | 0.07 | 7.54 | 14.86 |
| | 1973 | 5.37 | 1.86 | 0.03 | 0.51 | 2.76 | 1.85 | 5.66 | 0.11 | 0.63 | 2.62 | 9.93 | 10.53 | 0.00 | 0.32 | 7.23 | 28.01 |

Table 11. Estimated populations, mean weights, and biomasses of pelagic fish populations in the Wood River lake system by lake and age group, 1958 through 1974 - continued

| Lake | Year | Population estimates (millions) | | | | | Mean weight (grams) | | | | | Biomass (metric tons) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | |
| | | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Total |
| Little Togiak | | | | | | | | | | | | | | | | | |
| | 1958 | 0.80 | 0.03 | 0.00 | 0.20 | 1.52 | 1.97 | 7.12 | ---- | 0.48 | 1.69 | 1.57 | 0.23 | 0.00 | 0.10 | 2.56 | 4.46 |
| | 1959 | 3.69 | 0.03 | 0.00 | 0.09 | 1.16 | 2.26 | 9.66 | ---- | 0.71 | 1.87 | 8.34 | 0.32 | 0.00 | 0.06 | 2.17 | 10.89 |
| | 1960 | 2.05 | 0.02 | 0.02 | 0.10 | 0.20 | 1.53 | 6.93 | 0.17 | 0.64 | 2.15 | 3.14 | 0.17 | 0.00 | 0.06 | 0.43 | 3.80 |
| | 1961 | 3.74 | 0.37 | 0.02 | 0.43 | 0.31 | 1.51 | 5.33 | 0.21 | 0.59 | 1.53 | 5.64 | 1.96 | 0.00 | 0.25 | 0.47 | 8.32 |
| | 1962 | 0.93 | 0.31 | 0.05 | 0.32 | 0.60 | 1.70 | 5.92 | 0.17 | 0.62 | 1.53 | 1.59 | 1.83 | 0.01 | 0.20 | 0.92 | 4.55 |
| | 1963 | 2.36 | 0.05 | 0.00 | 0.71 | 0.95 | 2.01 | 8.03 | 0.07 | 0.80 | 2.06 | 4.74 | 0.37 | 0.00 | 0.57 | 1.96 | 7.64 |
| | 1964 | 0.35 | 0.03 | 0.00 | 0.32 | 0.74 | 1.42 | 7.16 | ---- | 0.59 | 1.69 | 0.50 | 0.22 | 0.00 | 0.19 | 1.24 | 2.15 |
| | 1965 | 2.14 | 0.12 | 0.00 | 0.06 | 0.53 | 1.20 | 5.19 | 0.14 | 0.59 | 1.45 | 2.57 | 0.65 | 0.00 | 0.04 | 0.76 | 4.02 |
| | 1966 | 0.24 | 0.15 | 0.00 | 0.05 | 0.79 | 0.90 | 4.72 | ---- | 0.54 | 1.78 | 0.22 | 0.69 | 0.00 | 0.03 | 1.41 | 2.35 |
| | 1967 | 2.58 | 0.40 | 0.02 | 0.43 | 1.46 | 1.34 | 5.68 | 0.07 | 0.51 | 1.61 | 3.46 | 2.25 | 0.00 | 0.22 | 2.35 | 8.28 |
| | 1968 | 1.24 | 0.06 | 0.09 | 1.26 | 0.20 | 1.61 | 5.38 | 0.15 | 0.61 | 1.61 | 2.00 | 0.31 | 0.01 | 0.77 | 0.32 | 3.41 |
| | 1969 | 0.15 | 0.04 | 0.00 | 0.09 | 0.35 | 1.17 | 7.74 | ---- | 0.69 | 1.45 | 0.18 | 0.30 | 0.00 | 0.06 | 0.50 | 1.04 |
| | 1970 | 1.10 | 0.01 | 0.00 | 0.06 | 0.89 | 1.44 | 6.00 | ---- | 0.68 | 1.78 | 1.60 | 0.05 | 0.00 | 0.04 | 1.58 | 3.27 |
| | 1971 | 0.25 | 0.09 | 0.00 | 0.03 | 0.03 | 0.95 | 5.60 | ---- | 0.45 | 1.96 | 0.24 | 0.49 | 0.00 | 0.01 | 0.06 | 0.80 |
| | 1972 | 0.24 | 1.18 | 0.00 | 0.06 | 2.33 | 1.05 | 3.80 | ---- | 0.56 | 1.37 | 0.25 | 4.49 | 0.00 | 0.03 | 3.19 | 7.96 |
| | 1973 | 0.21 | 0.22 | 0.00 | 0.02 | 0.08 | 1.60 | 4.93 | ---- | 0.39 | 1.90 | 0.34 | 1.08 | 0.00 | 0.01 | 0.15 | 1.58 |
| | 1974 | 1.58 | 0.02 | 0.06 | 0.57 | 0.33 | 1.41 | 4.74 | 0.25 | 0.85 | 1.74 | 2.23 | 0.09 | 0.02 | 0.48 | 0.57 | 3.39 |

Table 11. Estimated populations, mean weights, and biomasses of pelagic fish populations in the Wood River lake system by lake and age group, 1958 through 1974 - continued

| Lake | Year | Population estimates (millions) | | | | | Mean weight (grams) | | | | | Biomass (metric tons) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | |
| | | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Total |
| Nerka | 1958 | 6.93 | 1.00 | 0.00 | 4.91 | 12.54 | 2.08 | 9.25 | ---- | 0.63 | 1.69 | 14.41 | 9.25 | 0.00 | 3.09 | 21.19 | 47.94 |
| | 1959 | 11.03 | 0.12 | 3.07 | 3.92 | 25.83 | 2.38 | 9.80 | 0.14 | 0.62 | 1.60 | 26.25 | 1.18 | 0.43 | 2.43 | 41.33 | 71.62 |
| | 1960 | 40.98 | 0.77 | 0.73 | 12.06 | 5.12 | 1.55 | 6.90 | 0.14 | 0.60 | 1.65 | 63.52 | 5.31 | 0.10 | 7.24 | 8.45 | 84.62 |
| | 1961 | 71.97 | 5.11 | 0.12 | 3.65 | 2.92 | 1.67 | 6.40 | 0.12 | 0.53 | 1.22 | 120.19 | 32.70 | 0.01 | 1.93 | 3.56 | 158.39 |
| | 1962 | 16.53 | 2.16 | 0.35 | 2.57 | 4.94 | 1.88 | 7.76 | 0.14 | 0.76 | 1.36 | 31.08 | 16.76 | 0.05 | 1.95 | 6.72 | 56.56 |
| | 1963 | 36.64 | 0.39 | 0.51 | 5.40 | 1.44 | 2.11 | 9.24 | 0.14 | 0.85 | 1.76 | 77.31 | 3.60 | 0.07 | 4.59 | 2.53 | 88.10 |
| | 1964 | 11.40 | 1.35 | 0.07 | 2.98 | 1.85 | 2.14 | 7.42 | 0.14 | 0.69 | 1.46 | 24.40 | 10.02 | 0.01 | 2.06 | 2.70 | 39.19 |
| | 1965 | 28.54 | 2.66 | 0.47 | 2.84 | 5.97 | 1.45 | 6.63 | 0.12 | 0.48 | 1.33 | 41.38 | 17.64 | 0.06 | 1.36 | 7.94 | 68.38 |
| | 1966 | 22.65 | 4.56 | 0.00 | 2.92 | 2.05 | 1.45 | 6.35 | ---- | 0.63 | 1.25 | 32.84 | 28.96 | 0.00 | 1.84 | 2.56 | 66.20 |
| | 1967 | 22.92 | 0.94 | 1.62 | 5.33 | 1.98 | 1.93 | 6.41 | 0.21 | 0.73 | 1.44 | 44.24 | 6.03 | 0.34 | 3.89 | 2.85 | 57.34 |
| | 1968 | 9.21 | 0.14 | 0.67 | 16.07 | 8.05 | 2.47 | 8.70 | 0.14 | 0.85 | 1.51 | 22.75 | 1.22 | 0.09 | 13.66 | 9.82 | 47.54 |
| | 1969 | 11.94 | 0.14 | 0.01 | 7.11 | 4.88 | 2.06 | 9.75 | 0.15 | 0.73 | 1.63 | 24.60 | 1.37 | 0.00 | 5.19 | 7.95 | 39.11 |
| | 1970 | 11.99 | 0.07 | 0.01 | 0.75 | 2.97 | 2.23 | 10.90 | 0.11 | 0.60 | 1.53 | 26.74 | 0.76 | 0.00 | 0.45 | 4.54 | 32.49 |
| | 1971 | 46.48 | 0.28 | 0.00 | 0.88 | 1.36 | 1.71 | 6.42 | ---- | 0.57 | 1.35 | 79.48 | 1.80 | 0.00 | 0.50 | 1.84 | 83.62 |
| | 1972 | 5.28 | 2.45 | 0.00 | 2.09 | 3.73 | 1.53 | 6.65 | ---- | 0.69 | 1.36 | 8.08 | 16.29 | 0.00 | 1.44 | 5.07 | 30.88 |
| | 1973 | 6.36 | 1.73 | 0.46 | 2.09 | 1.20 | 2.02 | 8.22 | 0.15 | 0.68 | 1.36 | 12.88 | 14.22 | 0.07 | 1.42 | 1.64 | 30.23 |
| | 1974 | 13.42 | 0.03 | 15.04 | 39.66 | 5.79 | 2.52 | 11.36 | 0.21 | 0.94 | 1.69 | 33.82 | 0.34 | 3.16 | 37.28 | 9.79 | 84.39 |

Table 11. Estimated populations, mean weights, and biomasses of pelagic fish populations in the Wood River lake system by lake and age group, 1958 through 1974 - continued

| Lake | Year | Population estimates (millions) | | | | | Mean weight (grams) | | | | | Biomass (metric tons) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | Sockeye salmon | | Threespine stickleback | | | |
| | | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Age 0 | Age I | Age 0 | Age I | Age II+ | Total |
| Wood River lake system | | | | | | | | | | | | | | | | | |
| | 1958 | 15.8 | 1.6 | 0.3 | 25.0 | 58.0 | 2.11 | 8.27 | 0.15 | 0.65 | 2.42 | 33.3 | 13.2 | 0.1 | 16.2 | 140.4 | 203.2 |
| | 1959 | 65.3 | 0.4 | 6.8 | 21.6 | 76.1 | 1.98 | 8.51 | 0.17 | 0.69 | 1.80 | 129.3 | 3.4 | 1.2 | 14.9 | 137.0 | 285.8 |
| | 1960 | 118.8 | 4.7 | 1.3 | 31.6 | 15.4 | 1.39 | 4.91 | 0.13 | 0.55 | 1.84 | 165.1 | 23.1 | 0.2 | 17.4 | 28.3 | 234.1 |
| | 1961 | 123.4 | 18.0 | 0.3 | 8.8 | 13.9 | 1.66 | 5.64 | 0.13 | 0.54 | 1.42 | 204.8 | 101.5 | 0.0 | 4.8 | 19.7 | 330.8 |
| | 1962 | 34.6 | 5.2 | 1.3 | 19.1 | 22.1 | 1.74 | 6.66 | 0.13 | 0.64 | 1.33 | 60.2 | 34.6 | 0.2 | 12.2 | 29.4 | 136.6 |
| | 1963 | 89.2 | 0.8 | 0.9 | 29.5 | 14.2 | 1.83 | 7.96 | 0.13 | 0.78 | 1.71 | 163.2 | 6.4 | 0.1 | 23.0 | 24.3 | 217.0 |
| | 1964 | 58.0 | 6.4 | 0.4 | 39.1 | 41.3 | 1.44 | 4.74 | 0.12 | 0.60 | 1.63 | 83.5 | 30.3 | 0.0 | 23.5 | 67.3 | 204.6 |
| | 1965 | 61.0 | 9.0 | 0.7 | 17.7 | 30.4 | 1.36 | 5.16 | 0.12 | 0.46 | 1.46 | 83.0 | 46.4 | 0.1 | 8.1 | 44.4 | 182.0 |
| | 1966 | 68.6 | 14.6 | 0.0 | 17.1 | 26.7 | 1.15 | 5.09 | 0.08 | 0.50 | 1.27 | 78.9 | 74.3 | 0.0 | 8.6 | 33.9 | 195.7 |
| | 1967 | 52.9 | 3.6 | 2.8 | 22.0 | 9.3 | 1.57 | 3.17 | 0.17 | 0.63 | 1.49 | 83.1 | 11.4 | 0.5 | 13.9 | 13.9 | 122.8 |
| | 1968 | 24.6 | 0.4 | 43.8 | 51.2 | 18.1 | 2.42 | 6.60 | 0.17 | 0.73 | 1.57 | 59.5 | 2.6 | 7.4 | 37.4 | 28.4 | 143.6 |
| | 1969 | 37.7 | 0.3 | 0.2 | 27.2 | 40.4 | 2.05 | 7.93 | 0.11 | 0.68 | 1.56 | 77.3 | 2.4 | 0.0 | 18.5 | 63.0 | 161.2 |
| | 1970 | 25.4 | 0.1 | 0.1 | 4.8 | 24.0 | 2.02 | 9.03 | 0.15 | 0.65 | 1.60 | 51.3 | 0.9 | 0.0 | 3.1 | 38.4 | 93.7 |
| | 1971 | 52.6 | 0.5 | 0.0 | 1.1 | 3.4 | 1.67 | 6.11 | ---- | 0.58 | 1.53 | 87.8 | 3.1 | 0.0 | 0.6 | 5.2 | 96.7 |
| | 1972 | 12.8 | 4.4 | 0.0 | 2.8 | 14.5 | 1.46 | 5.96 | 0.07 | 0.68 | 1.76 | 18.7 | 26.2 | 0.0 | 1.9 | 25.5 | 72.3 |
| | 1973 | 12.8 | 4.3 | 0.5 | 4.4 | 4.7 | 1.99 | 6.64 | 0.15 | 0.77 | 2.27 | 25.6 | 28.5 | 0.1 | 3.4 | 10.7 | 68.3 |
| | 1974 | 28.6 | 0.2 | 28.2 | 49.9 | 10.3 | 2.33 | 7.08 | 0.19 | 0.94 | 1.71 | 66.6 | 1.4 | 5.4 | 46.9 | 17.6 | 137.9 |

Table 12. Average biomass (metric tons) of pelagic fish in the Wood River Lakes, 1958 through 1972

| Lake | Sockeye salmon | | | Threespine stickleback | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Age 0 | Age I | Sum | Age 0 | Age I | Age II+ | Sum | |
| | Geometric mean biomass | | | | | | | |
| Aleknagik | 15.3 | 1.2 | 16.5 | 0.1 | 3.8 | 13.5 | 17.4 | 33.9 |
| South Nerka | 6.1 | 2.0 | 8.1 | 0.0 | 0.2 | 1.4 | 1.6 | 9.7 |
| Central Nerka | 4.6 | 1.7 | 6.3 | 0.0 | 0.3 | 0.7 | 1.0 | 7.3 |
| North Nerka | 16.6 | 0.7 | 17.3 | 0.0 | 1.2 | 2.6 | 3.8 | 21.1 |
| Beverley | 6.3 | 1.2 | 7.5 | 0.0 | 0.9 | 4.5 | 5.4 | 12.9 |
| Kulik | 8.2 | 1.0 | 9.2 | 0.0 | 0.2 | 2.4 | 2.6 | 11.8 |
| Little Togiak | 1.3 | 0.5 | 1.8 | 0.0 | 0.1 | 0.9 | 1.0 | 2.8 |
| | Relative biomass (metric tons per $km^2$ of surface area x 100) | | | | | | | |
| Aleknagik | 18.4 | 1.5 | 19.9 | 0.1 | 4.6 | 16.3 | 21.0 | 40.9 |
| South Nerka | 9.6 | 3.2 | 12.8 | 0.0 | 0.3 | 2.2 | 2.5 | 15.3 |
| Central Nerka | 9.0 | 3.3 | 12.3 | 0.0 | 0.6 | 1.4 | 2.0 | 14.2 |
| North Nerka | 19.2 | 0.8 | 20.0 | 0.0 | 1.4 | 3.0 | 4.4 | 24.4 |
| Beverley | 7.0 | 1.3 | 8.3 | 0.0 | 1.0 | 5.0 | 6.0 | 14.3 |
| Kulik | 18.2 | 2.2 | 20.4 | 0.0 | 0.4 | 5.3 | 5.8 | 26.2 |
| Little Togiak | 21.7 | 8.3 | 30.0 | 0.0 | 1.7 | 15.0 | 16.7 | 46.7 |

Table 13. Annual sockeye salmon escapements, abundance and size of juveniles, and the adult returns in the Wood River lakes, 1956 through 1973, by lake and age group

| Lake | Brood year | Escapement (thousands) | Potential eggs (millions) | Number of juveniles (millions) | | Mean weight of juveniles (grams) | | Adult returns (thousands) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Age 0 (year n+1) | Age I (year n+2) | Age 0 (year n+1) | Age I (year n+2) | Age 1.2 (year n+4) | Age 1.3 (year n+5) | Age 2.2 (year n+5) | Age 2.3 (year n+6) | Total |
| Lehmagik | 1956 | 252 | 474 | - | 0.32 | - | 5.29 | 27 | 192 | 1 | 0 | 220 |
| | 1957 | 88 | 198 | 6.33 | 0.08 | 2.15 | 10.45 | 3 | 61 | 0 | 0 | 64 |
| | 1958 | 63 | 130 | 4.64 | 0.05 | 2.22 | 6.06 | 80 | 35 | 0 | 1 | 116 |
| | 1959 | 205 | 445 | 29.48 | 3.59 | 1.54 | 5.68 | 26 | 136 | 18 | 11 | 191 |
| | 1960 | 85 | 212 | 24.66 | 0.57 | 1.79 | 5.64 | 176 | 321 | 18 | 33 | 548 |
| | 1961 | 153 | 394 | 12.37 | 0.15 | 1.43 | 6.25 | 36 | 434 | 3 | 24 | 497 |
| | 1962 | 48 | 108 | 6.78 | 0.17 | 2.15 | 8.57 | 83 | 119 | 0 | 1 | 202 |
| | 1963 | 31 | 69 | 6.58 | 0.04 | 1.98 | 7.45 | 57 | 252 | 2 | 1 | 312 |
| | 1964 | 155 | 355 | 20.29 | 7.93 | 1.39 | 4.31 | 45 | 82 | 145 | 57 | 329 |
| | 1965 | 220 | 545 | 43.43 | 2.06 | 0.97 | 2.69 | 58 | 395 | 31 | 117 | 601 |
| | 1966 | 287 | 681 | 13.29 | 0.10 | 0.74 | 3.99 | 38 | 216 | 8 | 35 | 297 |
| | 1967 | 92 | 213 | 2.41 | 0.01 | 1.75 | 5.31 | 14 | 40 | 2 | 0 | 56 |
| | 1968 | 177 | 386 | 19.16 | 0.05 | 2.09 | 6.58 | 70 | 198 | 1 | 1 | 270 |
| | 1969 | 160 | 345 | 10.56 | 0.09 | 1.85 | 5.72 | 3 | 108 | 77 | - | - |
| | 1970 | 302 | 619 | 3.44 | 0.28 | 1.46 | 8.05 | 103 | - | - | - | - |
| | 1971 | 182 | 412 | 2.16 | 0.34 | 1.48 | 5.60 | - | - | - | - | - |
| | 1972 | 97 | 191 | 0.67 | 0.05 | 2.72 | 5.38 | - | - | - | - | - |
| | 1973 | 162 | 358 | 10.91 | - | 2.23 | - | - | - | - | - | - |

Table 13. Annual sockeye salmon escapements, abundance and size of juveniles, and the adult returns in the Wood River lakes, 1956 through 1973, by lake and age group - continued

| Lake | Brood year | Escapement (thousands) | Potential eggs (millions) | Number of juveniles (millions) | | Mean weight of juveniles (grams) | | Adult returns (thousands) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Age 0 (year n+1) | Age I (year n+2) | Age 0 (year n+1) | Age I (year n+2) | Age 1.2 (year n+4) | Age 1.3 (year n+5) | Age 2.2 (year n+5) | Age 2.3 (year n+6) | Total |
| South Nerka | 1956 | 205 | 355 | - | 0.70 | - | 8.94 | 139 | 27 | 4 | 0 | 170 |
| | 1957 | 73 | 145 | 2.84 | 0.00 | 2.12 | - | 28 | 19 | 4 | 0 | 51 |
| | 1958 | 163 | 315 | 7.20 | 0.51 | 2.55 | 7.16 | 218 | 27 | 0 | 4 | 250 |
| | 1959 | 564 | 1,119 | 18.61 | 3.71 | 1.79 | 6.47 | 72 | 14 | 1 | 1 | 88 |
| | 1960 | 231 | 530 | 40.01 | 1.03 | 1.81 | 7.93 | 188 | 54 | 6 | 9 | 256 |
| | 1961 | 49 | 120 | 1.11 | 0.16 | 2.32 | 8.21 | 35 | 34 | 1 | 0 | 70 |
| | 1962 | 97 | 207 | 16.11 | 0.60 | 2.14 | 8.03 | 173 | 28 | 0 | 0 | 201 |
| | 1963 | 56 | 120 | 1.39 | 0.90 | 1.70 | 7.19 | 57 | 15 | 1 | 1 | 74 |
| | 1964 | 110 | 238 | 5.27 | 1.93 | 1.66 | 6.60 | 54 | 11 | 7 | 1 | 73 |
| | 1965 | 60 | 140 | 1.20 | 0.45 | 1.70 | 7.40 | 59 | 62 | 1 | 0 | 122 |
| | 1966 | 149 | 309 | 4.48 | 0.03 | 2.32 | 8.86 | 134 | 42 | 3 | 0 | 179 |
| | 1967 | 44 | 96 | 1.10 | 0.05 | 2.89 | 7.57 | 63 | 5 | 0 | - | 71 |
| | 1968 | 46 | 88 | 2.98 | 0.07 | 2.49 | 10.90 | 41 | 8 | 0 | 1 | 50 |
| | 1969 | 51 | 104 | 0.51 | 0.09 | 1.85 | 6.48 | 16 | 104 | 4 | - | - |
| | 1970 | 141 | 257 | 1.80 | 1.27 | 1.42 | 7.26 | 172 | - | - | - | - |
| | 1971 | 68 | 140 | 0.58 | 0.70 | 1.68 | 10.05 | - | - | - | - | - |
| | 1972 | 37 | 68 | 0.46 | 0.03 | 2.02 | 11.36 | - | - | - | - | - |
| | 1973 | 19 | 39 | 3.16 | - | 2.92 | - | - | - | - | - | - |

Table 13. Annual sockeye salmon escapements, abundance and size of juveniles, and the adult returns in the Wood river lakes, 1956 through 1973, by lake and age group - continued

| | Brood year | Escapement (thousands) | Potential eggs (millions) | Number of juveniles (millions) | | Mean weight of juveniles (grams) | | Adult returns (thousands) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Age 0 (year n+1) | Age I (year n+2) | Age 0 (year n+1) | Age I (year n+2) | Age 1.2 (year n+4) | Age 1.3 (year n+5) | Age 2.2 (year n+5) | Age 2.3 (year n+6) | Total |
| trail Nerka | 1956 | 73 | 126 | - | 0.21 | - | 10.75 | 137 | 50 | 2 | 0 | 189 |
| | 1957 | 57 | 113 | 1.12 | 0.07 | 1.95 | 11.72 | 15 | 34 | 0 | 0 | 49 |
| | 1958 | 58 | 117 | 2.15 | 0.19 | 2.06 | 6.19 | 154 | 39 | 1 | 0 | 194 |
| | 1959 | 332 | 662 | 9.32 | 0.92 | 1.52 | 6.25 | 78 | 65 | 19 | 3 | 165 |
| | 1960 | 137 | 312 | 13.13 | 0.63 | 1.57 | 7.83 | 228 | 64 | 15 | 5 | 312 |
| | 1961 | 50 | 127 | 2.56 | 0.13 | 1.85 | 9.75 | 43 | 100 | 2 | 1 | 146 |
| | 1962 | 73 | 159 | 4.15 | 0.41 | 1.97 | 7.14 | 120 | 35 | 1 | 2 | 158 |
| | 1963 | 65 | 142 | 1.40 | 1.20 | 1.53 | 6.66 | 85 | 80 | 6 | 5 | 176 |
| | 1964 | 159 | 353 | 1.84 | 1.81 | 1.39 | 6.34 | 78 | 15 | 10 | 2 | 105 |
| | 1965 | 77 | 180 | 1.31 | 0.39 | 1.39 | 5.38 | 60 | 43 | 4 | 1 | 108 |
| | 1966 | 141 | 308 | 4.27 | 0.10 | 1.76 | 8.78 | 138 | 72 | 1 | 0 | 211 |
| | 1967 | 64 | 138 | 4.49 | 0.05 | 2.37 | 9.98 | 50 | 14 | 6 | 0 | 70 |
| | 1968 | 103 | 209 | 1.46 | 0.00 | 2.03 | 11.21 | 86 | 28 | 0 | 0 | 114 |
| | 1969 | 56 | 117 | 1.55 | 0.07 | 2.44 | 7.83 | 0 | 89 | 13 | - | - |
| | 1970 | 132 | 240 | 1.73 | 1.03 | 1.24 | 5.91 | 106 | - | - | - | - |
| | 1971 | 73 | 155 | 2.81 | 0.75 | 1.53 | 7.74 | - | - | - | - | - |
| | 1972 | 82 | 150 | 1.29 | 0.00 | 2.01 | - | - | - | - | - | - |
| | 1973 | 29 | 63 | 1.15 | - | 2.32 | - | | - | - | - | - |

Table 13. Annual sockeye salmon escapements, abundance and size of juveniles, and the adult returns in the Wood River lakes, 1956 through 1973, by lake and age group - continued

| Lake | Brood year | Escapement (thousands) | Potential eggs (millions) | Number of juveniles (millions) | | Mean weight of juveniles (grams) | | Adult returns (thousands) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Age 0 (year n+1) | Age I (year n+2) | Age 0 (year n+1) | Age I (year n+2) | Age 1.2 (year n+4) | Age 1.3 (year n+5) | Age 2.2 (year n+5) | Age 2.3 (year n+6) | Total |
| North Nerka | 1956 | 135 | 237 | - | 0.09 | - | 8.11 | 152 | 127 | 5 | 0 | 284 |
| | 1957 | 52 | 110 | 2.97 | 0.05 | 2.09 | 7.12 | 25 | 88 | 12 | 0 | 125 |
| | 1958 | 188 | 376 | 1.68 | 0.07 | 2.07 | 6.96 | 244 | 103 | 3 | 5 | 355 |
| | 1959 | 395 | 795 | 13.05 | 0.48 | 1.22 | 6.19 | 106 | 81 | 33 | 13 | 233 |
| | 1960 | 214 | 490 | 18.83 | 0.50 | 1.44 | 7.33 | 209 | 222 | 25 | 23 | 479 |
| | 1961 | 143 | 363 | 12.86 | 0.10 | 1.85 | 10.24 | 60 | 231 | 5 | [illegible] | 300 |
| | 1962 | 126 | 279 | 16.38 | 0.34 | 2.11 | 6.69 | 164 | 85 | 3 | 6 | 258 |
| | 1963 | 110 | 246 | 8.61 | 0.56 | 2.31 | 5.66 | 135 | 180 | 4 | 9 | 328 |
| | 1964 | 161 | 360 | 21.43 | 0.82 | 1.40 | 5.76 | 63 | 82 | 55 | 3 | 203 |
| | 1965 | 184 | 450 | 20.14 | 0.10 | 1.44 | 5.94 | 273 | 206 | 6 | 11 | 496 |
| | 1966 | 246 | 550 | 14.17 | 0.01 | 1.85 | 7.52 | 145 | 244 | 1 | 1 | 392 |
| | 1967 | 114 | 251 | 3.62 | 0.04 | 2.47 | 12.18 | 71 | 52 | 0 | 0 | 123 |
| | 1968 | 150 | 322 | 7.50 | 0.00 | 1.89 | 8.68 | 86 | 95 | 0 | 0 | 181 |
| | 1969 | 266 | 558 | 9.93 | 0.11 | 2.22 | 5.34 | 6 | 118 | 43 | - | - |
| | 1970 | 229 | 445 | 42.95 | 0.15 | 1.74 | 6.60 | 127 | - | - | - | - |
| | 1971 | 178 | 392 | 1.89 | 0.28 | 1.48 | 4.93 | - | - | - | - | - |
| | 1972 | 109 | 207 | 4.61 | 0.00 | 2.03 | - | - | - | - | - | - |
| | 1973 | 83 | 181 | 9.11 | - | 2.40 | - | - | - | - | - | - |

Table 13. Annual sockeye salmon escapements, abundance and size of juveniles, and the adult returns in the Wood River lakes, 1956 through 1973, by lake and age group - continued

| ke | Brood year | Escapement (thousands) | Potential eggs (millions) | Number of juveniles (millions) | | Mean weight of juveniles (grams) | | Adult returns (thousands) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Age 0 (year n+1) | Age I (year n+2) | Age 0 (year n+1) | Age I (year n+2) | Age 1.2 (year n+4) | Age 1.3 (year n+5) | Age 2.2 (year n+5) | Age 2.3 (year n+6) | Total |
| verley | 1956 | 56 | 102 | - | 0.08 | - | 9.05 | 83 | 19 | 1 | 0 | 103 |
| | 1957 | 6 | 12 | 0.58 | 0.04 | 2.09 | 7.23 | 20 | 10 | 19 | 3 | 52 |
| | 1958 | 354 | 671 | 21.90 | 3.26 | 1.60 | 4.21 | 947 | 74 | 80 | 11 | 1,116 |
| | 1959 | 414 | 825 | 21.67 | 2.15 | 0.92 | 5.21 | 311 | 44 | 190 | 5 | 552 |
| | 1960 | 211 | 457 | 10.30 | 0.77 | 1.57 | 6.89 | 389 | 46 | 8 | 0 | 444 |
| | 1961 | 32 | 78 | 1.14 | 0.03 | 2.12 | 6.06 | 46 | 21 | 4 | 1 | 72 |
| | 1962 | 411 | 870 | 28.36 | 3.40 | 1.53 | 3.64 | 352 | 63 | 73 | 9 | 497 |
| | 1963 | 281 | 598 | 14.45 | 1.15 | 1.08 | 4.65 | 102 | 90 | 20 | 0 | 212 |
| | 1964 | 324 | 702 | 3.66 | 1.60 | 1.17 | 5.46 | 67 | 12 | 11 | 1 | 89 |
| | 1965 | 67 | 155 | 1.37 | 0.18 | 1.62 | 8.06 | 19 | 3 | 1 | 1 | 24 |
| | 1966 | 276 | 556 | 8.29 | 0.04 | 1.52 | 6.27 | 307 | 56 | 1 | 0 | 367 |
| | 1967 | 117 | 253 | 8.47 | 0.10 | 2.37 | 5.94 | 298 | 10 | 10 | 0 | 318 |
| | 1968 | 112 | 228 | 4.15 | 0.01 | 1.80 | 11.28 | 54 | 5 | 0 | 0 | 59 |
| | 1969 | 27 | 57 | 1.24 | 0.01 | 1.82 | 4.61 | 8 | 32 | 16 | - | - |
| | 1970 | 238 | 414 | 0.56 | 0.20 | 1.33 | 7.39 | 449 | - | - | - | - |
| | 1971 | 245 | 491 | 0.85 | 0.15 | 1.61 | 5.32 | - | - | - | - | - |
| | 1972 | 53 | 96 | 0.22 | - | 2.63 | - | - | - | - | - | - |
| | 1973 | 12 | 24 | - | - | - | - | - | - | - | - | - |

Table 13. Annual sockeye salmon escapements, abundance and size of juveniles, and the adult returns in the Wood River lakes, 1956 through 1973, by lake and age group - continued

| Lake | Brood year | Escapement (thousands) | Potential eggs (millions) | Number of juveniles (millions) | | Mean weight of juveniles (grams) | | Adult returns (thousands) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Age 0 (year n+1) | Age I (year n+2) | Age 0 (year n+1) | Age I (year n+2) | Age 1.2 (year n+4) | Age 1.3 (year n+5) | Age 2.2 (year n+5) | Age 2.3 (year n+6) | Total |
| Kulik | 1956 | 30 | 54 | - | 0.18 | - | 8.01 | 62 | 17 | 3 | 0 | 82 |
| | 1957 | 5 | 10 | 1.16 | 0.09 | 2.12 | 5.27 | 8 | 10 | 2 | 0 | 20 |
| | 1958 | 100 | 192 | 24.02 | 0.59 | 2.05 | 6.04 | 190 | 15 | 5 | 0 | 210 |
| | 1959 | 283 | 472 | 24.59 | 6.72 | 1.37 | 5.19 | 214 | 35 | 103 | 1 | 354 |
| | 1960 | 105 | 228 | 12.74 | 1.44 | 1.48 | 5.44 | 132 | 16 | 10 | 2 | 160 |
| | 1961 | 19 | 48 | 3.64 | 0.14 | 2.06 | 6.60 | 18 | 19 | 2 | 0 | 39 |
| | 1962 | 83 | 176 | 15.06 | 1.44 | 1.52 | 4.30 | 83 | 25 | 22 | 0 | 130 |
| | 1963 | 144 | 301 | 25.12 | 5.08 | 1.20 | 4.48 | 75 | 14 | 29 | 3 | 121 |
| | 1964 | 135 | 295 | 6.38 | 0.35 | 1.06 | 4.90 | 8 | 3 | 11 | 0 | 22 |
| | 1965 | 28 | 64 | 0.91 | 0.02 | 1.55 | 7.00 | 13 | 0 | 1 | 0 | 14 |
| | 1966 | 73 | 150 | 5.78 | 0.05 | 2.21 | 7.69 | 71 | 21 | 0 | 0 | 93 |
| | 1967 | 61 | 131 | 3.29 | 0.01 | 3.23 | 5.86 | 76 | 8 | 6 | 0 | 90 |
| | 1968 | 31 | 61 | 2.29 | 0.00 | 2.25 | - | 32 | 2 | 0 | 0 | 34 |
| | 1969 | 17 | 35 | 0.55 | 0.02 | 2.32 | 6.64 | 8 | 20 | 21 | - | - |
| | 1970 | 55 | 95 | 1.86 | 0.25 | 1.39 | 5.93 | 368 | - | - | - | - |
| | 1971 | 66 | 132 | 4.26 | 1.86 | 1.36 | 5.66 | - | - | - | - | - |
| | 1972 | 33 | 61 | 5.37 | - | 1.85 | - | - | - | - | - | - |
| | 1973 | 10 | 19 | - | - | - | - | - | - | - | - | - |

Table 13. Annual sockeye salmon escapements, abundance and size of juveniles, and the adult returns in the Wood River lakes, 1956 through 1973, by lake and age group - continued

| Lake | Brood year | Escapement (thousands) | Potential eggs (millions) | Number of juveniles (millions) | | Mean weight of juveniles (grams) | | Adult returns (thousands) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Age 0 (year n+1) | Age I (year n+2) | Age 0 (year n+1) | Age I (year n+2) | Age 1.2 (year n+4) | Age 1.3 (year n+5) | Age 2.2 (year n+5) | Age 2.3 (year n+6) | Total |
| Little Togiak | 1956 | 20 | 35 | - | 0.03 | - | 7.12 | 9 | 11 | 1 | 0 | 21 |
| | 1957 | 6 | 12 | 0.80 | 0.03 | 1.97 | 9.66 | 3 | 5 | 1 | 0 | 8 |
| | 1958 | 16 | 34 | 3.69 | 0.02 | 2.26 | 6.93 | 20 | 12 | 2 | 1 | 35 |
| | 1959 | 40 | 80 | 2.05 | 0.37 | 1.53 | 5.33 | 24 | 5 | 7 | 0 | 36 |
| | 1960 | 17 | 38 | 3.74 | 0.31 | 1.51 | 5.92 | 18 | 8 | 16 | 3 | 45 |
| | 1961 | 11 | 28 | 0.93 | 0.05 | 1.70 | 8.03 | 18 | 15 | 1 | 0 | 34 |
| | 1962 | 10 | 22 | 2.36 | 0.03 | 2.01 | 7.16 | 18 | 9 | 0 | 0 | 27 |
| | 1963 | 21 | 46 | 0.35 | 0.12 | 1.42 | 5.19 | 11 | 21 | 2 | 0 | 34 |
| | 1964 | 15 | 33 | 2.14 | 0.15 | 1.20 | 4.72 | 10 | 5 | 3 | 2 | 20 |
| | 1965 | 26 | 58 | 0.24 | 0.40 | 0.90 | 5.68 | 23 | 15 | 15 | 1 | 54 |
| | 1966 | 22 | 48 | 2.58 | 0.06 | 1.34 | 5.38 | 45 | 28 | 2 | 1 | 76 |
| | 1967 | 10 | 22 | 1.24 | 0.04 | 1.61 | 7.74 | 11 | 8 | 2 | 1 | 22 |
| | 1968 | 20 | 42 | 0.15 | 0.01 | 1.17 | 6.00 | 9 | 15 | 0 | 0 | 24 |
| | 1969 | 20 | 42 | 1.10 | 0.09 | 1.44 | 5.60 | 2 | 18 | 15 | - | - |
| | 1970 | 55 | 99 | 0.25 | 1.18 | 0.95 | 3.80 | 25 | - | - | - | - |
| | 1971 | 24 | 51 | 0.24 | 0.22 | 1.05 | 4.93 | - | - | - | - | - |
| | 1972 | 14 | 27 | 0.21 | 0.02 | 1.60 | 4.74 | - | - | - | - | - |
| | 1973 | 14 | 31 | 1.58 | - | 1.41 | - | - | - | - | - | - |

Table 13. Annual sockeye salmon escapements, abundance and size of juveniles, and the adult returns in the Wood River lakes, 1956 through 1973, by lake and age group - continued

| Lake | Brood year | Escapement (thousands) | Potential eggs (millions) | Number of juveniles (millions) | | Mean weight of juveniles (grams) | | Adult returns (thousands) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Age 0 (year n+1) | Age I (year n+2) | Age 0 (year n+1) | Age I (year n+2) | Age 1.2 (year n+4) | Age 1.3 (year n+5) | Age 2.2 (year n+5) | Age 2.3 (year n+6) | Total |
| Nerka | 1956 | 413 | 718 | - | 1.00 | - | 9.25 | 428 | 204 | 11 | 0 | 643 |
| | 1957 | 183 | 369 | 6.93 | 0.12 | 2.08 | 9.80 | 68 | 141 | 16 | 0 | 225 |
| | 1958 | 409 | 809 | 11.03 | 0.77 | 2.38 | 6.90 | 616 | 169 | 4 | 9 | 798 |
| | 1959 | 1,291 | 2,576 | 40.98 | 5.11 | 1.55 | 6.40 | 256 | 160 | 53 | 17 | 486 |
| | 1960 | 582 | 1,332 | 71.97 | 2.16 | 1.67 | 7.76 | 625 | 340 | 46 | 37 | 1,048 |
| | 1961 | 242 | 609 | 16.53 | 0.39 | 1.88 | 9.24 | 138 | 365 | 8 | 5 | 516 |
| | 1962 | 297 | 645 | 36.64 | 1.35 | 2.11 | 7.42 | 457 | 148 | 4 | 8 | 617 |
| | 1963 | 230 | 508 | 11.40 | 2.66 | 2.14 | 6.63 | 277 | 274 | 11 | 16 | 578 |
| | 1964 | 430 | 951 | 28.54 | 4.56 | 1.45 | 6.35 | 194 | 108 | 72 | 6 | 380 |
| | 1965 | 321 | 770 | 22.65 | 0.94 | 1.45 | 6.41 | 393 | 312 | 11 | 11 | 727 |
| | 1966 | 536 | 1,167 | 22.92 | 0.14 | 1.93 | 8.70 | 416 | 358 | 4 | 1 | 779 |
| | 1967 | 222 | 485 | 9.21 | 0.14 | 2.47 | 9.75 | 184 | 71 | 6 | 0 | 261 |
| | 1968 | 299 | 618 | 11.94 | 0.07 | 2.06 | 10.90 | 213 | 131 | 1 | 1 | 346 |
| | 1969 | 373 | 779 | 11.99 | 0.28 | 2.23 | 6.42 | 26 | 271 | 60 | - | - |
| | 1970 | 502 | 943 | 46.48 | 2.45 | 1.71 | 6.65 | 405 | - | - | - | - |
| | 1971 | 319 | 687 | 5.28 | 1.73 | 1.53 | 8.22 | - | - | - | - | - |
| | 1972 | 228 | 426 | 6.36 | 0.03 | 2.02 | 11.36 | - | - | - | - | - |
| | 1973 | 130 | 283 | 13.42 | - | 2.52 | - | - | - | - | - | - |

Table 13. Annual sockeye salmon escapements, abundance and size of juveniles, and the adult returns in the Wood River lakes, 1956 through 1973, by lake and age group - continued

| Lake | Brood year | Escapement (thousands) | Potential eggs (millions) | Number of juveniles (millions) | | Mean weight of juveniles (grams) | | Adult returns (thousands) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Age 0 (year n+1) | Age I (year n+2) | Age 0 (year n+1) | Age I (year n+2) | Age 1.2 (year n+4) | Age 1.3 (year n+5) | Age 2.2 (year n+5) | Age 2.3 (year n+6) | Total |
| Wood River lake system | 1956 | 773 | 1,387 | - | 1.6 | - | 8.27 | 614 | 445 | 18 | 1 | 78 |
| | 1957 | 289 | 602 | 15.8 | 0.4 | 2.11 | 8.51 | 103 | 229 | 39 | 4 | 375 |
| | 1958 | 960 | 1,869 | 65.3 | 4.7 | 1.98 | 4.91 | 1,910 | 306 | 97 | 23 | 2,336 |
| | 1959 | 2,209 | 4,442 | 118.8 | 18.0 | 1.39 | 5.64 | 844 | 386 | 380 | 34 | 1,644 |
| | 1960 | 1,016 | 2,299 | 123.4 | 5.2 | 1.66 | 6.66 | 1,362 | 738 | 100 | 76 | 2,276 |
| | 1961 | 461 | 1,165 | 34.6 | 0.8 | 1.74 | 7.96 | 266 | 859 | 16 | 31 | 1,172 |
| | 1962 | 874 | 1,874 | 89.2 | 6.4 | 1.83 | 4.74 | 1,009 | 371 | 108 | 24 | 1,512 |
| | 1963 | 721 | 1,554 | 58.0 | 9.0 | 1.44 | 5.16 | 533 | 661 | 66 | 21 | 1,281 |
| | 1964 | 1,076 | 2,374 | 61.0 | 14.6 | 1.36 | 5.09 | 329 | 244 | 282 | 76 | 931 |
| | 1965 | 675 | 1,622 | 68.6 | 3.6 | 1.15 | 3.17 | 481 | 731 | 67 | 131 | 1,410 |
| | 1966 | 1,209 | 2,632 | 52.9 | 0.4 | 1.57 | 6.60 | 867 | 686 | 16 | 36 | 1,605 |
| | 1967 | 516 | 1,132 | 24.6 | 0.3 | 2.42 | 7.93 | 605 | 138 | 29 | 2 | 816 |
| | 1968 | 649 | 1,358 | 37.7 | 0.1 | 2.05 | 9.03 | 383 | 348 | 3 | 17 | 751 |
| | 1969 | 604 | 1,272 | 25.4 | 0.5 | 2.02 | 6.11 | 49 | 389 | 188 | (50) | (676) |
| | 1970 | 1,162 | 2,187 | 52.6 | 4.4 | 1.67 | 5.96 | 1,467 | - | - | - | - |
| | 1971 | 851 | 1,805 | 12.8 | 4.3 | 1.46 | 6.64 | - | - | - | - | - |
| | 1972 | 431 | 811 | 12.8 | 0.2 | 1.99 | 7.08 | - | - | - | - | - |
| | 1973 | 330 | 719 | 28.6 | - | 2.33 | - | - | - | - | - | - |

Table 14. Survival rates (in percent) from (A) potential eggs to fry and (B) fry to adult returns

| | Lake | Brood year | | | | | | | | | | | | | | | | Geometric Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | |
| (A) | Aleknagik | 3.2 | 3.6 | 6.6 | 11.6 | 3.1 | 6.3 | 9.5 | 5.7 | 8.0 | 2.0 | 1.1 | 5.0 | 3.1 | 0.6 | 0.5 | 0.4 | 3.0 | 2.9 |
| | South Nerka | 2.0 | 2.3 | 1.7 | 7.5 | 0.9 | 7.8 | 1.2 | 2.2 | 0.9 | 1.4 | 1.1 | 3.4 | 0.5 | 0.7 | 0.4 | 0.7 | 8.1 | 1.6 |
| | Central Nerka | 1.0 | 1.8 | 1.4 | 4.2 | 2.0 | 2.6 | 1.0 | 0.5 | 0.7 | 1.4 | 3.3 | 0.7 | 1.3 | 0.7 | 1.8 | 0.9 | 1.8 | 1.4 |
| | North Nerka | 2.7 | 0.4 | 1.6 | 3.8 | 3.5 | 5.9 | 3.5 | 6.0 | 4.5 | 2.6 | 1.4 | 2.3 | 1.8 | 9.7 | 0.5 | 2.2 | 5.0 | 2.6 |
| | Beverley | 4.8 | 3.3 | 2.6 | 2.3 | 1.5 | 3.3 | 2.4 | 0.5 | 0.9 | 1.5 | 3.3 | 1.8 | 2.2 | 0.1 | 0.2 | 0.2 | - | 1.3 |
| | Kulik | 11.6 | 12.5 | 5.2 | 5.6 | 7.6 | 8.6 | 8.3 | 2.2 | 1.4 | 3.9 | 2.5 | 3.8 | 1.6 | 2.0 | 3.2 | 8.8 | - | 4.4 |
| | Little Togiak | 6.7 | 10.9 | 2.6 | 9.8 | 3.3 | 10.7 | 0.8 | 6.5 | 0.4 | 5.4 | 5.6 | 0.4 | 2.6 | 0.3 | 0.5 | 0.8 | 5.1 | 2.4 |
| | Nerka | 1.9 | 1.4 | 1.6 | 5.4 | 2.7 | 5.7 | 2.2 | 3.0 | 2.9 | 2.0 | 1.9 | 1.9 | 1.5 | 4.9 | 0.8 | 1.5 | 4.7 | 2.3 |
| | Beverley and Kulik | 7.2 | 5.1 | 3.4 | 3.2 | 3.6 | 4.0 | 4.3 | 1.0 | 0.9 | 1.9 | 2.9 | 2.1 | 1.7 | 0.5 | 0.8 | 3.3 | - | 2.3 |
| | Wood River | 2.6 | 3.5 | 2.7 | 5.4 | 3.0 | 4.8 | 3.7 | 2.6 | 4.2 | 2.0 | 2.2 | 2.8 | 2.0 | 2.4 | 0.7 | 1.6 | 4.0 | 2.7 |
| (B) | Aleknagik | 1.0 | 2.5 | 0.6 | 2.2 | 4.0 | 3.0 | 4.7 | 1.6 | 1.4 | 2.2 | 2.3 | 1.4 | (2.7) | | | | | 1.9 |
| | South Nerka | 1.8 | 3.5 | 0.5 | 0.6 | 6.3 | 1.2 | 5.3 | 1.4 | 10.2 | 4.0 | 6.5 | 1.6 | (24.5) | | | | | 2.4 |
| | Central Nerka | 4.4 | 9.0 | 1.8 | 2.4 | 5.7 | 3.8 | 12.6 | 5.7 | 8.2 | 4.9 | 1.6 | 7.8 | (4.5) | | | | | 4.8 |
| | North Nerka | 4.2 | 21.1 | 1.8 | 2.5 | 2.3 | 1.6 | 3.8 | 0.9 | 2.5 | 2.8 | 3.4 | 2.4 | (1.8) | | | | | 2.8 |
| | Beverley | 9.0 | 5.1 | 2.5 | 4.3 | 6.3 | 1.8 | 1.5 | 2.4 | 1.8 | 4.4 | 3.8 | 1.4 | (4.6) | | | | | 3.1 |
| | Kulik | 1.7 | 0.9 | 1.4 | 1.3 | 1.1 | 0.9 | 0.5 | 0.3 | 1.5 | 1.6 | 2.7 | 1.5 | (9.1) | | | | | 1.1 |
| | Little Togiak | 1.0 | 0.9 | 1.8 | 1.2 | 3.7 | 1.1 | 9.7 | 0.9 | 22.5 | 2.9 | 1.8 | 16.0 | (3.2) | | | | | 2.7 |
| | Nerka | 3.2 | 7.2 | 1.2 | 1.5 | 3.1 | 1.7 | 5.1 | 1.3 | 3.2 | 3.4 | 2.8 | 2.9 | (3.0) | | | | | 2.7 |
| | Beverley and Kulik | 4.4 | 3.0 | 2.0 | 2.7 | 2.7 | 1.5 | 0.9 | 1.2 | 2.0 | 3.3 | 3.5 | 1.6 | (5.9) | | | | | 2.2 |
| | Wood River | 2.4 | 3.6 | 1.4 | 1.8 | 3.4 | 1.7 | 2.2 | 1.5 | 2.1 | 3.0 | 3.3 | 2.0 | (2.7) | | | | | 2.3 |

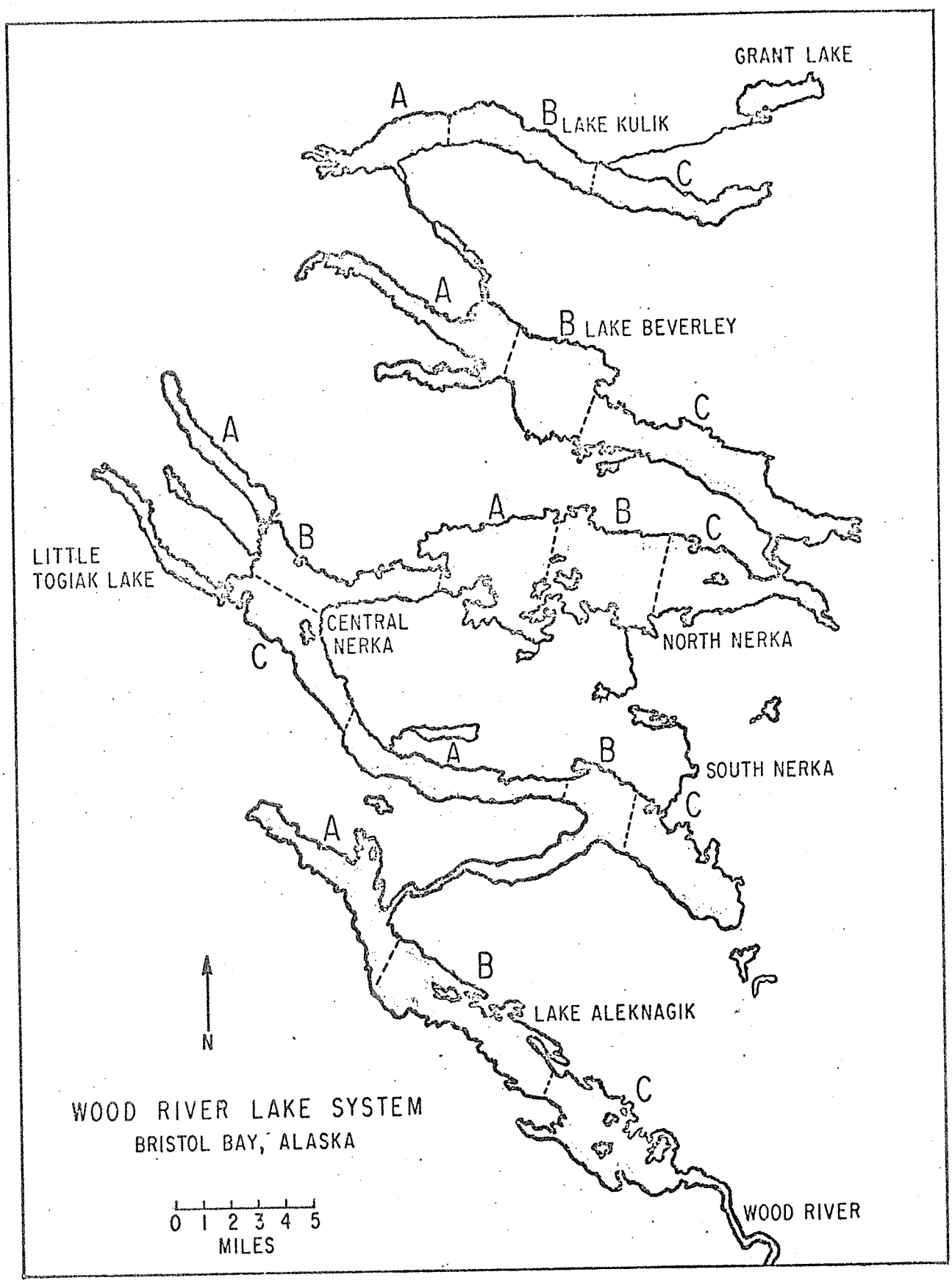


Fig. 1. Map of the Wood River lake system, showing sampling areas (A,B,C).

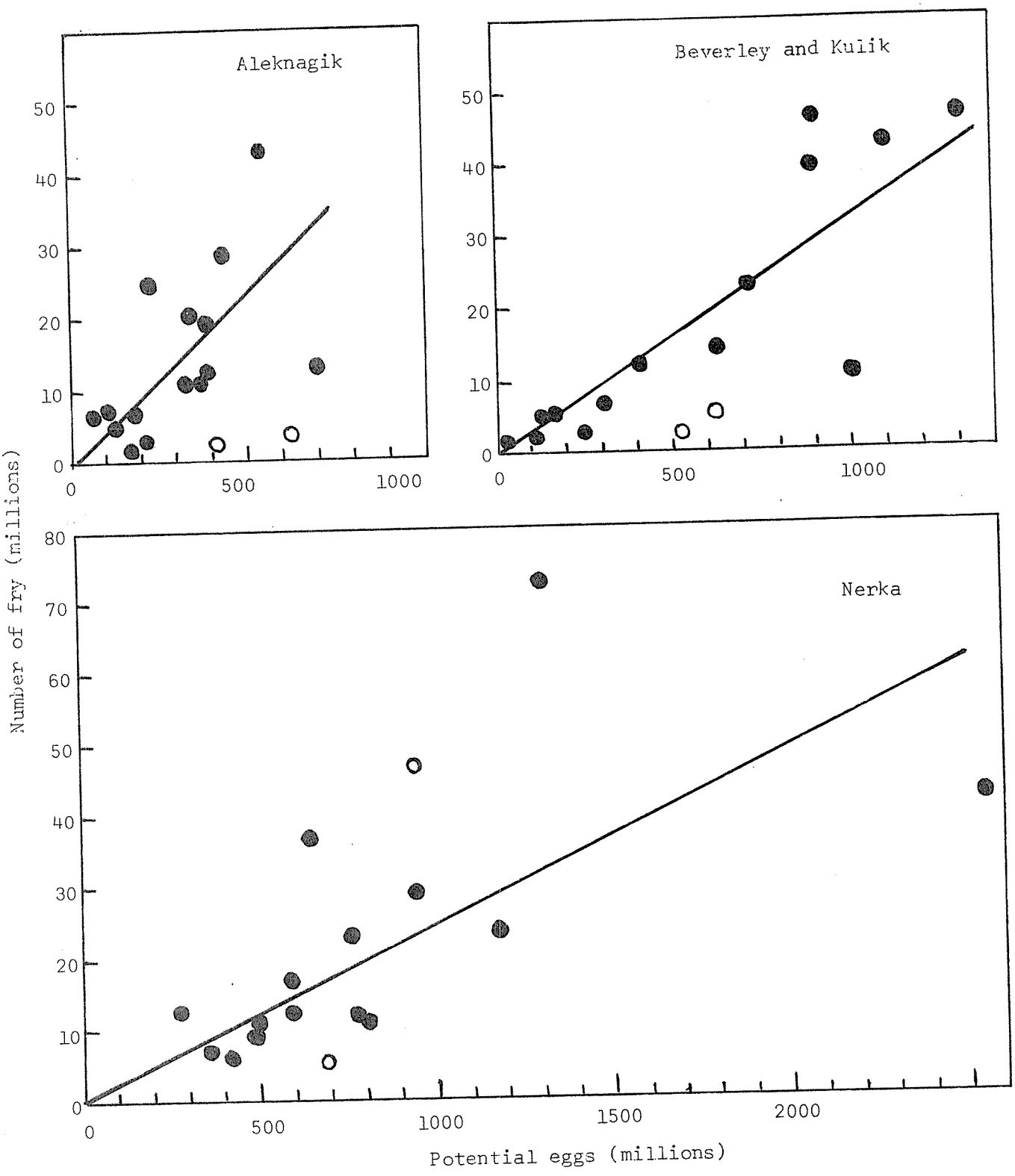


Fig. 2. Linear relationships between the number of fry and potential eggs, Y = bx. Open circles for the 1970-1971 brood years.

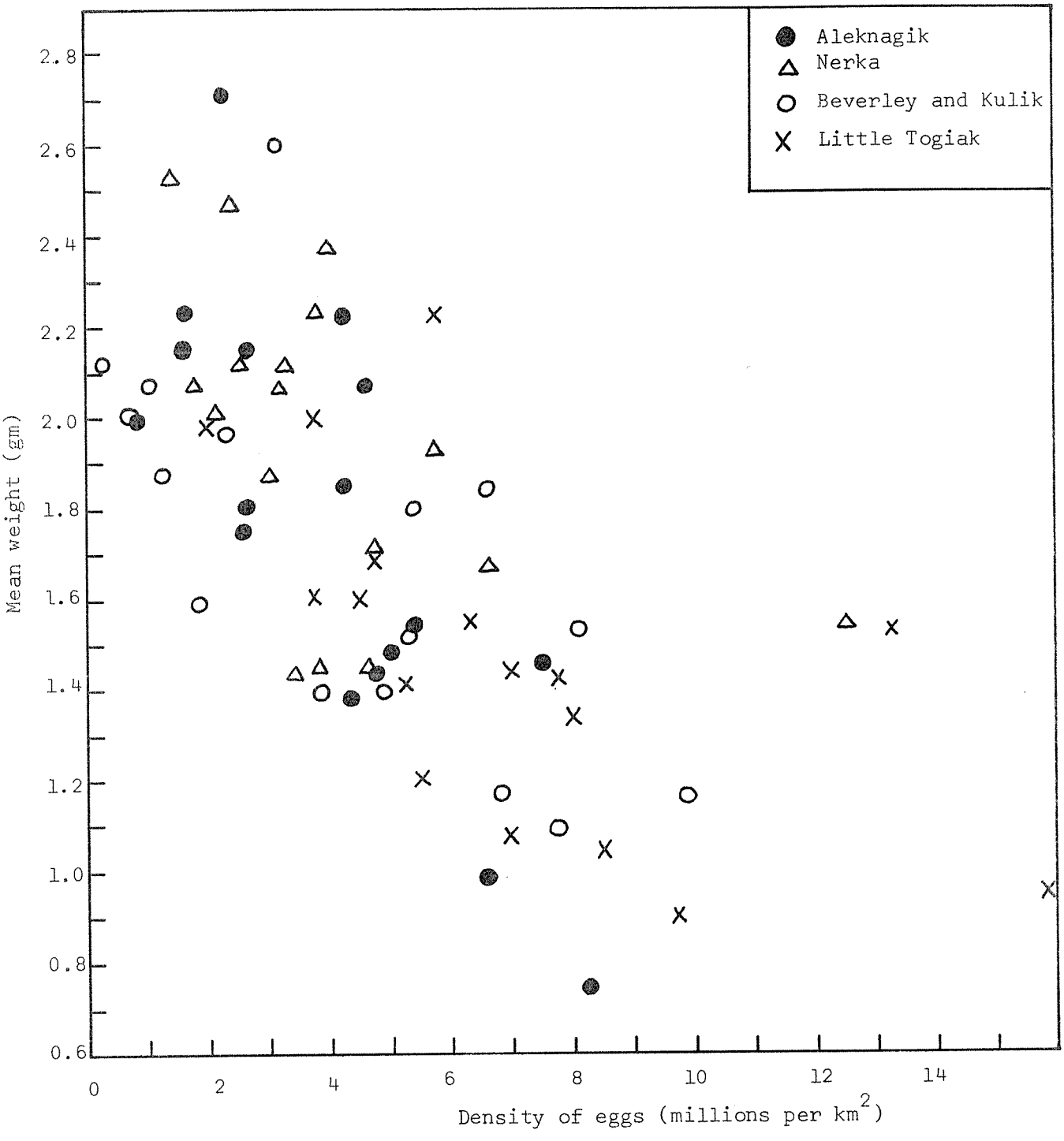


Fig. 3. Scatter diagram of the mean weight of fry on September 1 versus the density of parent eggs.

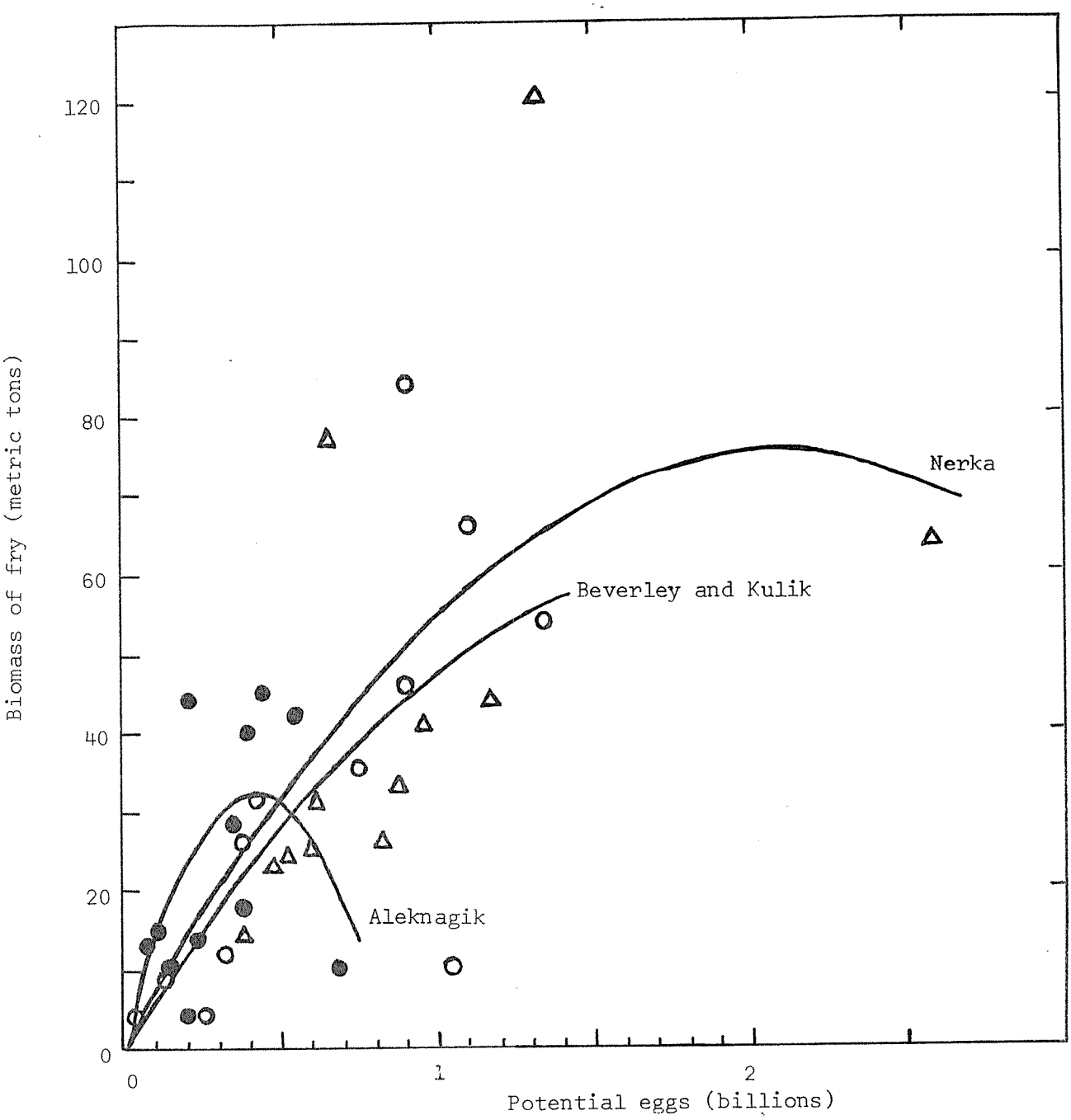


Fig. 4. Relationships between the biomass of fry and the number of parent eggs.

| | | |
|---|---|---|
| ● | Aleknagik | $Y = 152.7X-181.4X^2$ |
| ○ | Beverley and Kulik | $Y = 64.2X-16.8X^2$ |
| △ | Nerka | $Y = 71.5X-17.1X^2$ |

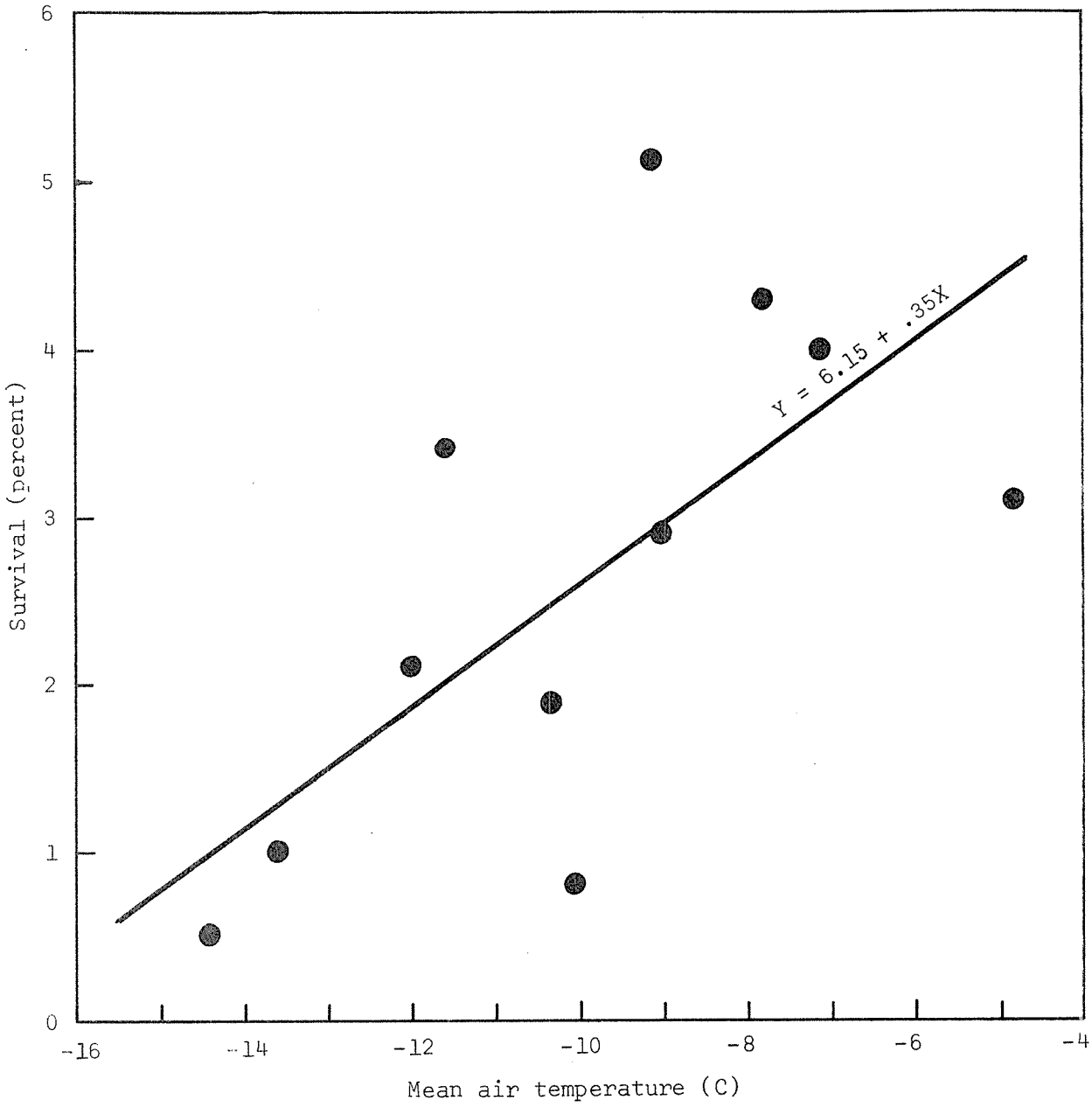


Fig. 5. Relationship between survival from potential eggs to fry and the mean air temperature during December-January for Lakes Beverley and Kulik (excluding years of small escapements).

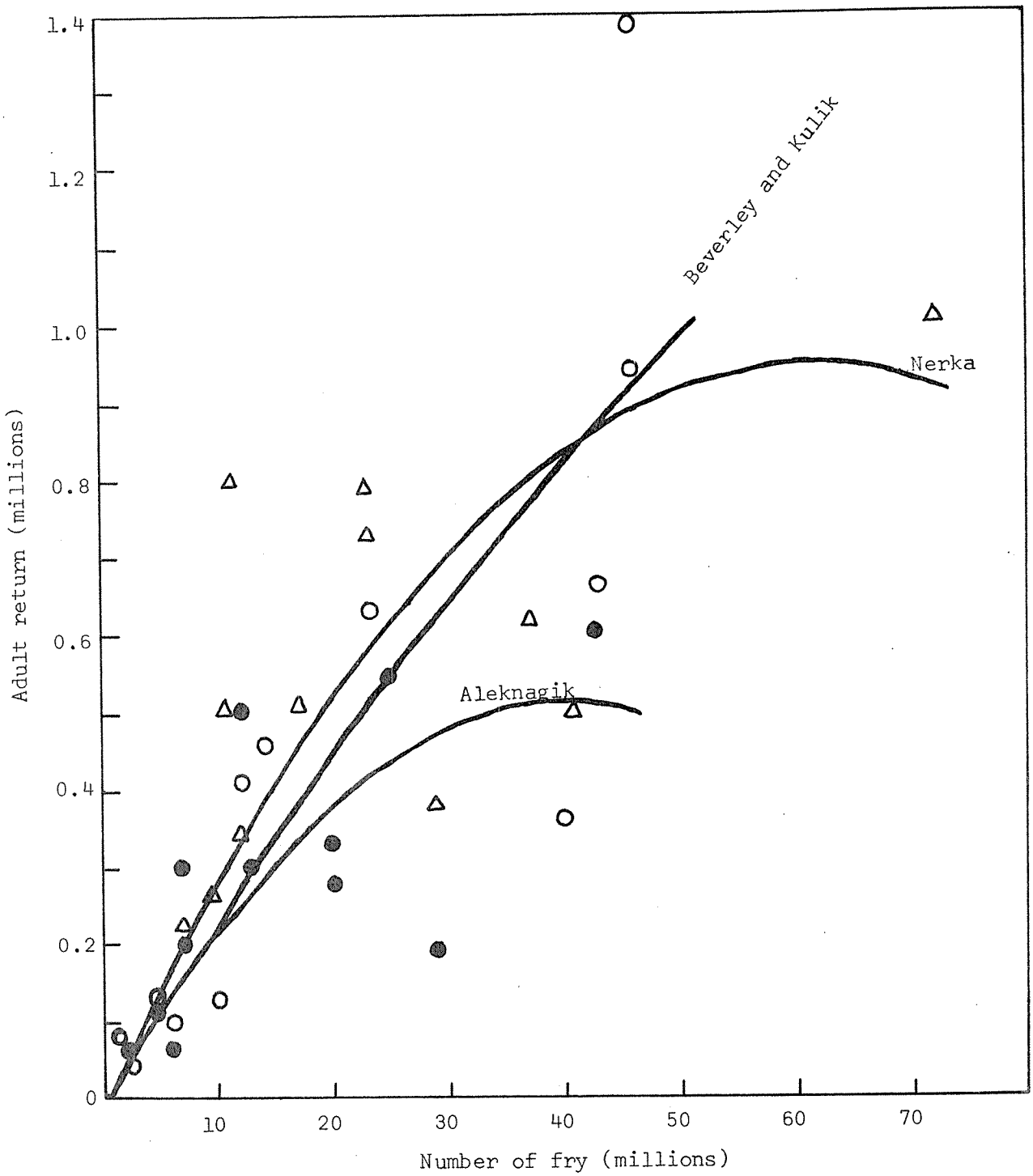


Fig. 6. Relationships between adult returns and number of fry.

| | | |
|---|---|---|
| ● | Aleknagik | $Y = .0251X - .00031X^2$ |
| △ | Nerka | $Y = .0307X - .0025X^2$ |
| ○ | Beverley and Kulik | $Y = .0242X - .00009X^2$ |

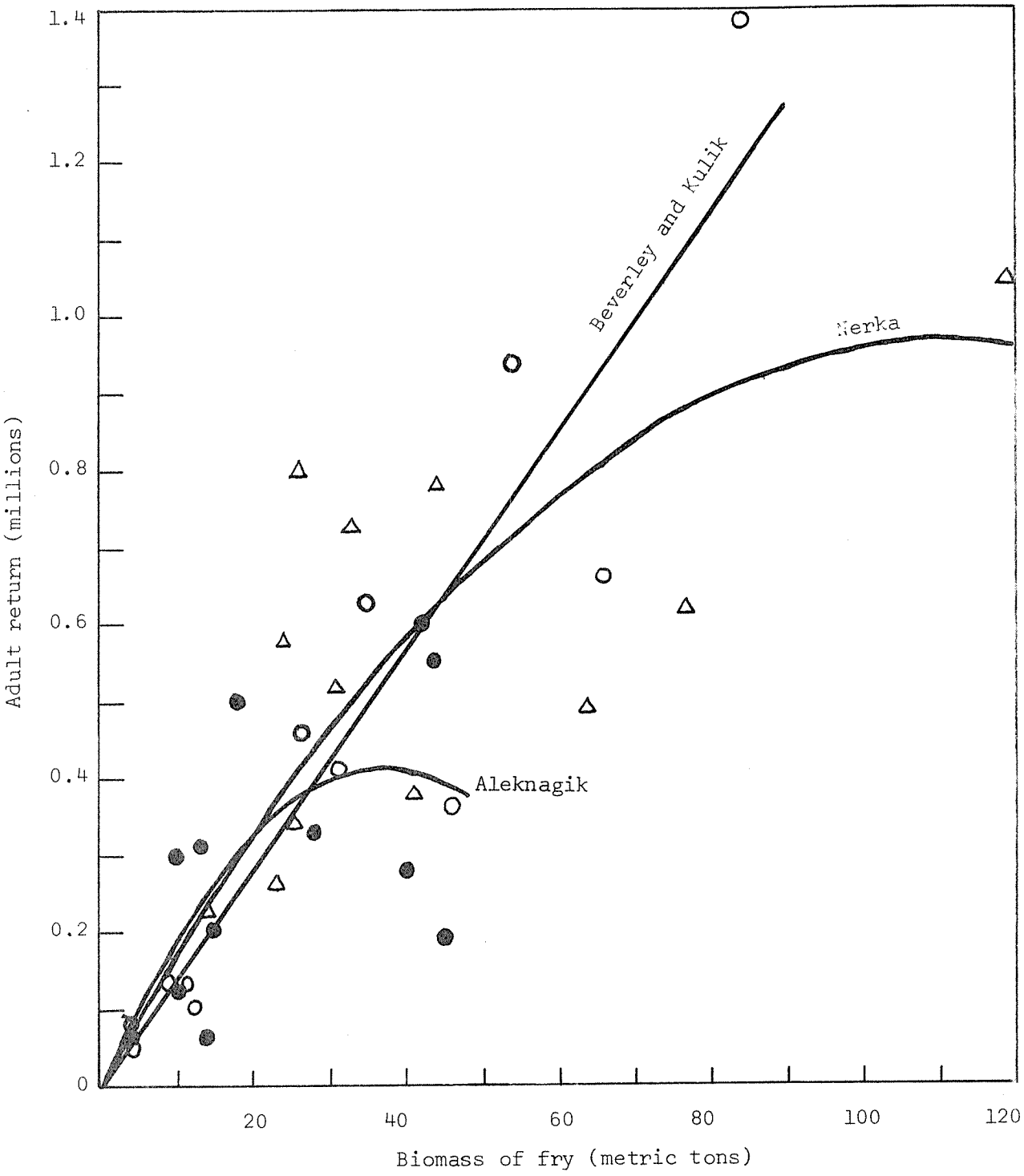


Fig. 7. Relationships between adult returns and the biomass of fry.

| | |
|---|---|
| ○ Beverley and Kulik | $Y = .0142X$ |
| △ Nerka | $Y = .076X - .0001X^2$ |
| ● Aleknagik | $Y = .0222X - .0003X^2$ |

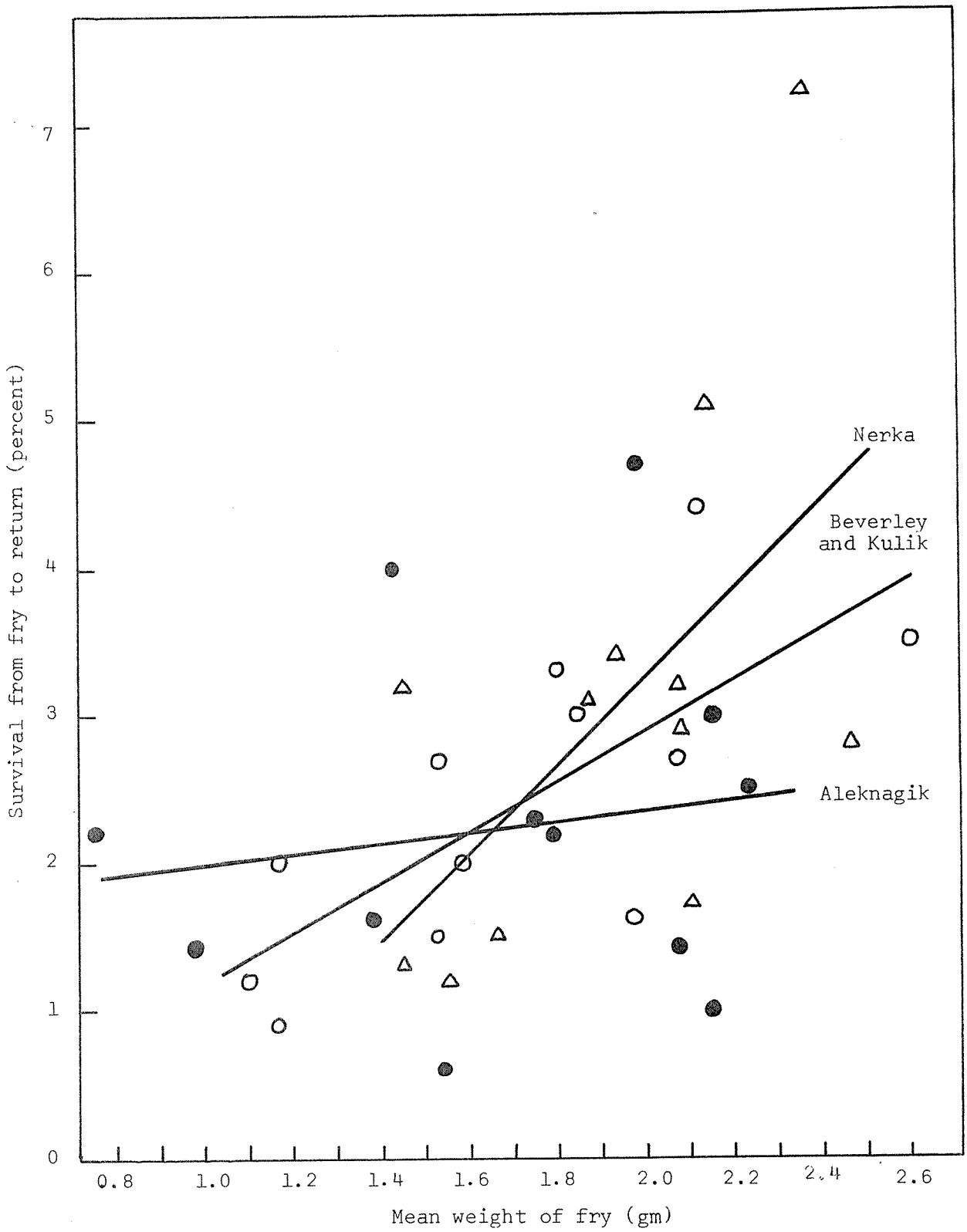


Fig. 8. Linear relationships between survival from fry (late summer) to adult returns.

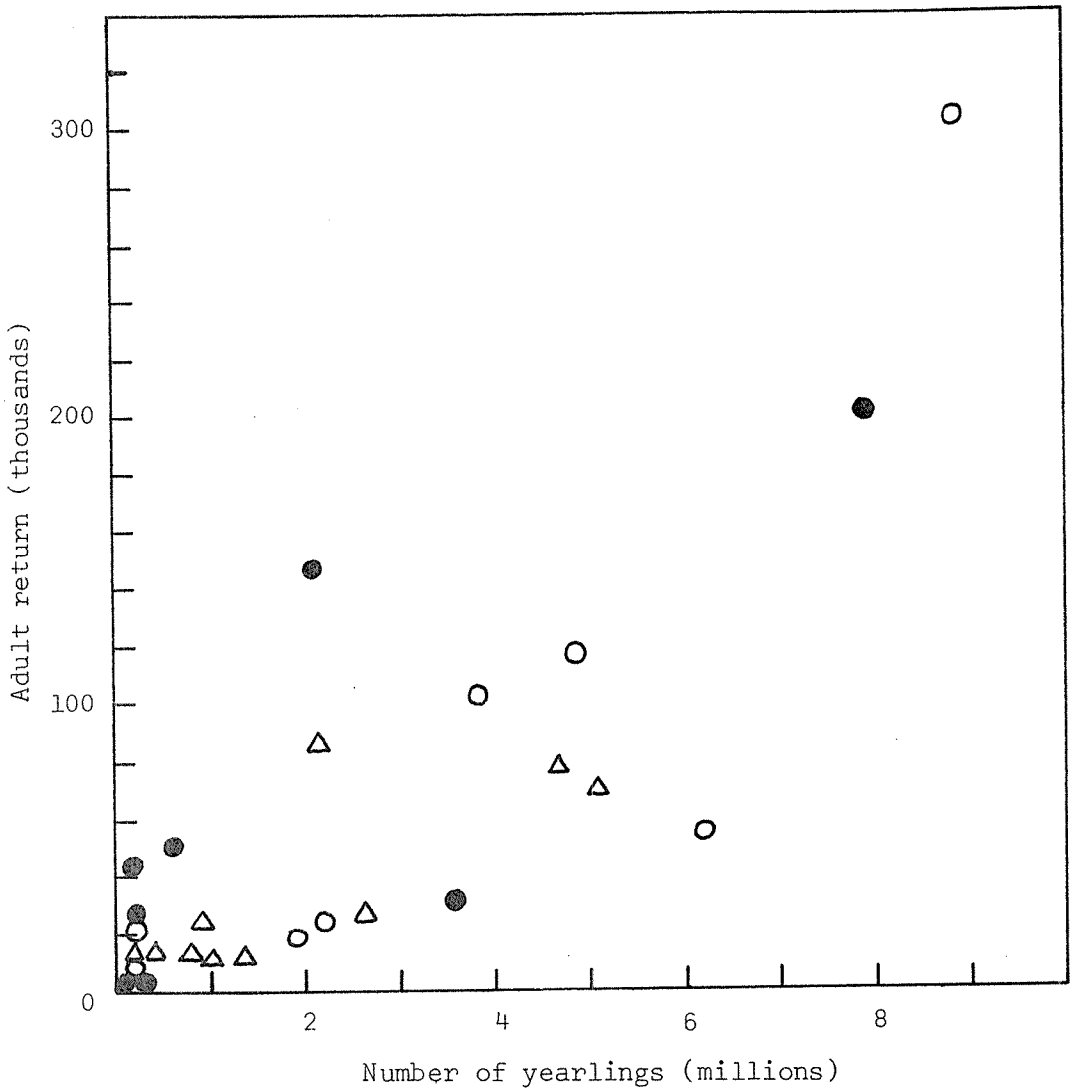


Fig. 9. Plot of the number of returning adults (age 2.2 and 2.3) on the number of yearlings in late summer.

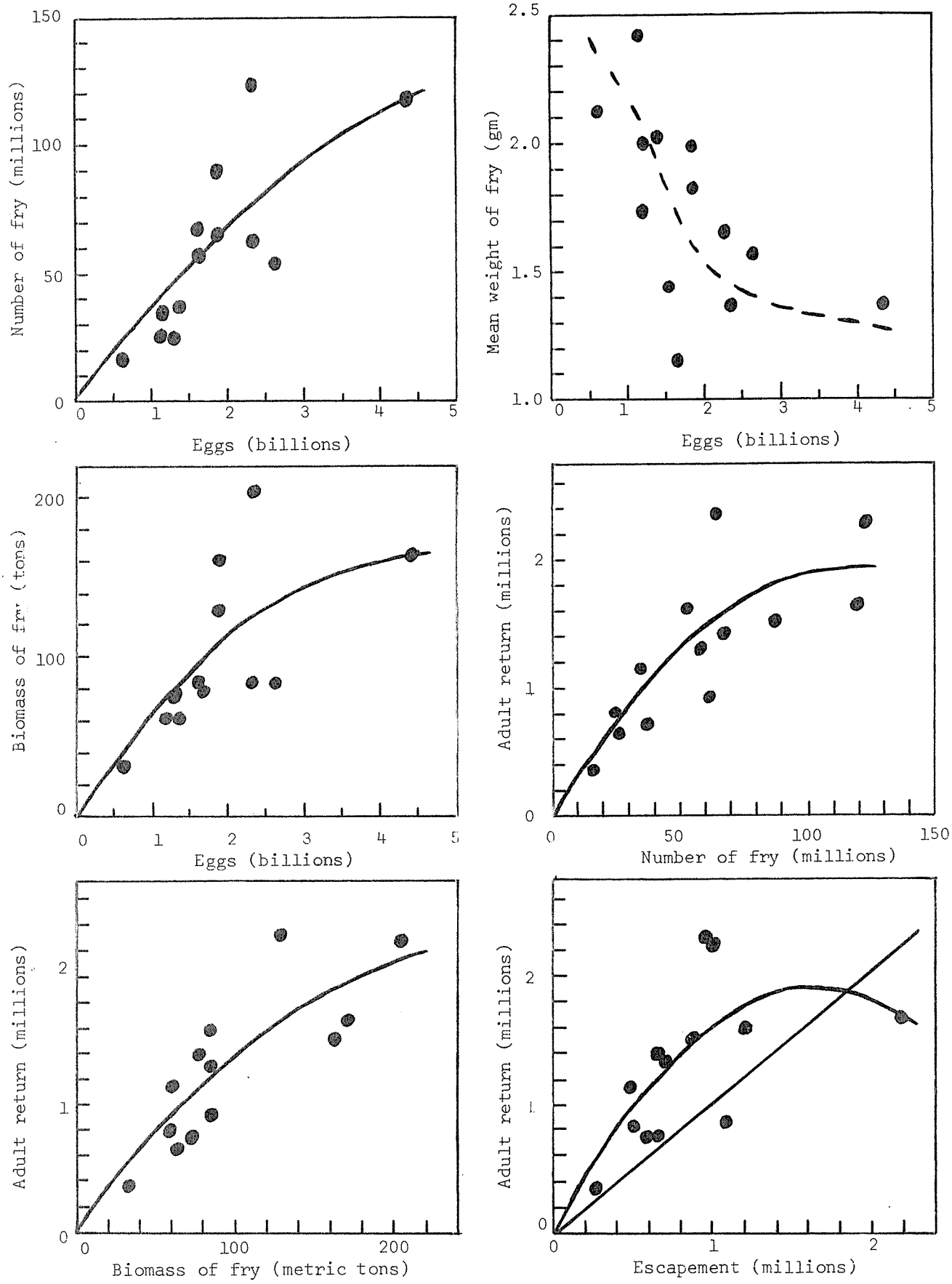


Fig. 10. Production statistics for sockeye salmon in the Wood River lakes, 1957-1969 brood years.