

RESEARCH PROJECT SEGMENT

State: Alaska

Project No.: F-9-3 *Name:* Sport Fish Investigations of Alaska.

Study No.: R-IV *Study Title:* A Study of Dolly Varden in Alaska.

Job No.: R-IV-D *Job Title:* Dissemination of Information Col-
lected on Dolly Varden.

Period Covered: July 1, 1970 to June 30, 1971.

ABSTRACT

Two reports on the information collected under the Dolly Varden study were published this year. These were titled "Age, food, and migration of Dolly Varden smolts in Southeastern Alaska" and "Age, food, and migration of sea-run cutthroat trout at Eva Lake, Southeastern Alaska."

RECOMMENDATIONS

A considerable amount of information remains to be published on the Dolly Varden study. Therefore, it is recommended that this job be continued.

OBJECTIVES

To write and publish information collected on anadromous Dolly Varden in Southeast Alaska.

FINDINGS

Two reports on the information collected under the Dolly Varden study were published this year. These were on Dolly Varden smolts and on cutthroat trout. Abstracts of these reports are:

Armstrong, R. H. 1970. Age, food, and migration of Dolly Varden smolts in Southeastern Alaska. J. Fish. Res. Bd. Canada 27:991-1004.

Dolly Varden (*Salvelinus malma*) smolts were enumerated and sampled in 1967, 1968, and 1969 at Hood Bay Creek, a nonlake system on Admiralty Island, and in 1962, 1963, and 1964 at Eva Lake, on Baranof Island.

Dolly Varden smolts left Hood Bay Creek from early May to late June and from early September to mid-November. At Eva Lake, a smolt migration occurred in May and June but not during the fall. Most of the smolts at Hood Bay Creek belonged to age-groups II, III, and IV and at Eva Lake to age-groups III and IV. Smolts from the two systems were similar in size, varying from 100 to 180 mm in fork length, with annual mean lengths ranging from 134 to 136 mm.

Insects and fry of chum (*Oncorhynchus keta*) and pink salmon (*O. gorbuscha*) were the principal food items of Dolly Varden and coho salmon (*O. kisutch*) smolts sampled at the Hood Bay Creek weir in May and June. Dolly Varden smolts leaving Hood Bay Creek in the fall fed primarily on salmon eggs, whereas insects were the principal food items of smolts sampled at the Eva Lake weir.

Suggestions for management of Dolly Varden are given. The number of eggs, fry, or smolts necessary to maintain a given run of Dolly Varden indicates a high return from smolts and a low return from eggs or fry. Transplanting smolts from one system to another to establish or enhance a population in a depleted system is suggested.

Armstrong, R. H. 1971. Age, food, and migration of sea-run cutthroat trout *Salmo clarki*, at Eva Lake, Southeastern Alaska. Trans. Amer. Fish. Soc. 100(2):302-306.

Information was collected on sea-run cutthroat trout (*Salmo clarki*) from the Eva Lake system on Baranof Island, Southeastern Alaska.

Migrations of 1,210 to 1,594 out-migrants and 1,203 to 1,682 in-migrants were recorded at a weir across the outlet of Eva Lake. Migration peaks occurred in mid-May (out-migrants) and mid-September to early October (in-migrants). No movement of cutthroat was noted at the weir from December through February. Ages of out-migrant cutthroat ranged from 3 to 10, with the majority showing 5, 6, and 7 annuli on their otoliths. The numbers of annuli considered to be formed prior to smolt migration were 2 (3%), 3 (80%), and 4 (17%). Stomach contents consisted primarily of salmon young and insects during the summer and stickleback and insects during the winter in Eva Lake. The fish fed mostly on insects during their out-migration and amphipods and salmon young in salt water. Results of the Eva Lake study and other studies on sea-run cutthroat are compared.

A report on homing and migration of anadromous Dolly Varden in Southeastern Alaska was submitted to the Fisheries Research Board of Canada for their review. This was returned for rewriting. It was decided to incorporate information collected on maturity, spawning frequency, smolt transplant, and displacement experiments into this report. Submittal of the report for reconsideration is planned by September, 1971.

The data collected for the report on competition for food and space between rearing Dolly Varden and coho has been analyzed. This report should be ready for submittal by early 1972.

In addition to the annual reports of progress, the following reports of information collected under the Dolly Varden study have been published since the beginning of the project in 1962:

1. Armstrong, Robert H. 1965a. Annotated Bibliography on the Dolly Varden Char. Alaska Department of Fish and Game, Research Report Number 4. 26 pp.

2. _____ . 1965b. Some Feeding Habits of the Anadromous Dolly Varden, Salvelinus malma (Walbaum), in Southeastern Alaska. Alaska Department of Fish and Game, Informational Leaflet Number 51. 27 pp.
3. _____ . 1965c. Some Migratory Habits of the Anadromous Dolly Varden, Salvelinus malma (Walbaum), in Southeastern Alaska. Alaska Department of Fish and Game, Research Report Number 3. 36 pp.
4. Armstrong, Robert H. and Roger F. Blackett. 1966a. Digestion Rate of the Dolly Varden. Transactions of the American Fisheries Society, 95(4):429-430.
5. _____ . 1966b. Use and Evaluation of Dart Tags to Study the Migration Habits of Dolly Varden, Salvelinus malma (Walbaum). Transactions of the American Fisheries Society, 95(3):320-322.
6. Armstrong, Robert H. and William A. Morton. 1969. Revised Annotated Bibliography of the Dolly Varden Char. Alaska Department of Fish and Game, Research Report Number 7. 108 pp.
7. Armstrong, Robert H. and Peter C. Winslow. 1968a. An Incident of Walleye Pollock Feeding on Salmon Young. Transactions of the American Fisheries Society, 97(2):202-203.
8. Blackett, Roger F. 1968. Spawning Behavior, Fecundity, and Early Life History of Anadromous Dolly Varden, Salvelinus malma (Walbaum), in Southeastern Alaska. Alaska Department of Fish and Game, Research Report Number 6. 85 pp.
9. Blackett, Roger F. and Robert H. Armstrong. 1965a. Collection of Two Abnormal Dolly Varden: One with Two Dorsal Fins, the Other with Incomplete Pigmentation. Transactions of the American Fisheries Society, 94(4):409.
10. Heiser, David W. 1966. Age and Growth of Anadromous Dolly Varden Char, Salvelinus malma (Walbaum), in Eva Creek, Baranof Island, Southeastern Alaska. Alaska Department of Fish and Game, Research Report Number 5. 26 pp.

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