

STATE OF ALASKA

William A. Egan, Governor



Annual Report of Performance for
SPORT FISH STUDIES

by

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RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations
of Alaska.

Project No.: F - 9 - 6

Study No.: G - II Study Title: SPORT FISH STUDIES.

Job No.: G - II - K Job Title: Studies of Introduced Black-
fish in Waters of South-
central Alaska.

Period Covered: July 1, 1973 to June 30, 1974.

ABSTRACT

The original introduction of Alaska blackfish, Dallia pectoralis, has spread naturally through inter-connecting waterways, and been transplanted - contrary to state law - by private individuals into several adjacent lakes which are annually stocked with rainbow trout, Salmo gairdneri. Preliminary investigation indicates growth and survival of rainbow trout may be substantially reduced if there is serious competition for available food resources and habitat.

Collections of rainbow trout and blackfish were made bi-weekly at Lower Fire Lake near Eagle River to obtain stomach samples for food habit analyses and comparison of food resource utilization between the two species.

One hundred and forty blackfish collected from Lower Fire Lake ranged in length from 75 to 242 mm and averaged 182 mm. The mean weight of the 70 females sampled was 39.8 gm and the mean length 164.6 mm. The mean weight of the males was 81.9 gm and the mean length 198.8 mm.

RECOMMENDATIONS

Present objectives should be expanded to include the following:

1. Determination of age and length at maturity.

2. Determination of spawning periods.
3. Fecundity.
4. Correlation of temperature units with developmental stages.
5. Early life history stages.

OBJECTIVES

1. To determine the general distribution and spread of Alaskan blackfish in waters of the Anchorage area.
2. To determine the ecological relationship of introduced Alaskan blackfish to stocked rainbow trout in managed lakes.
3. To determine through laboratory tests the minimum effective rotenone concentration required to control and eliminate blackfish populations.

TECHNIQUES USED

Distribution of blackfish in lakes and streams of the area were determined through collection of fish by seine, traps, electrofishing and visual observation.

Stomach contents of rainbow trout and blackfish obtained from specimens gill netted in Lower Fire Lake were preserved in 4% formolin for subsequent analysis.

Other pertinent biological data such as lengths, weights, and sex composition of blackfish was made. Total length to the nearest millimeter and the weight to the nearest gram were recorded for each fish. Sex was determined by examination of gonads. Otoliths and scale samples were collected for age determinations.

Unfortunately, assimilation of data has not been completed as of report time due to personnel changes, consequently information obtained during the 1973 field season will be incorporated into the 1974 (F-9-7) report.

FINDINGS

In Alaska, the blackfish, Dallia pectoralis, range extends throughout the lowlands from the central Alaska Peninsula, north along the arctic coast to the Colville River and to the interior (Yukon-Tanana River) drainages. Introductions have extended the range of the blackfish to the Anchorage area.

The original introduction of blackfish into the Anchorage area was apparently in the Hood-Spenard Lake complex. They have spread naturally through interconnecting waterways, and been transplanted by private individuals into several lakes which the Sport Fish Division ordinarily stocks with rainbow trout, Salmo gairdneri, (Maps 1 and 2).

The introduction of the blackfish has already had a detrimental impact on sport fishing in some Anchorage waters, as the fish compete with other species such as rainbow trout and grayling, Thymallus arcticus. Jewell Lake, a popular rainbow trout fishing lake near Dimond Boulevard in Anchorage, was treated with rotenone in October, 1972, in an attempt to eradicate a large blackfish population.

Other known populations of blackfish occur in Lower Fire, DeLong, Meadow, and Connors lakes. Lakes and streams surveyed for distribution of blackfish during 1973 is presented in Table 1.

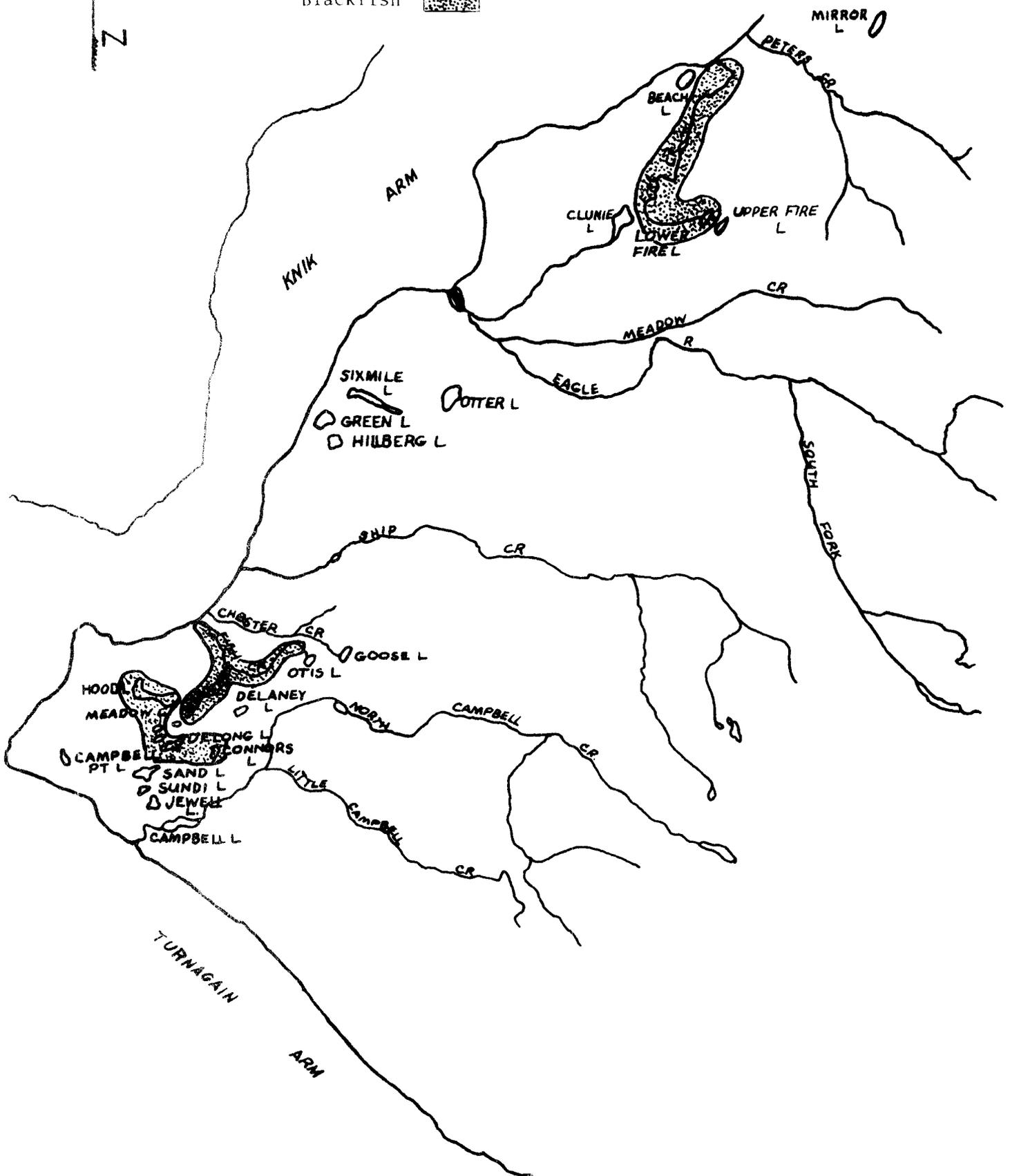
TABLE 1. Anchorage Area Lakes and Streams Checked for Alaska Blackfish, 1973.

<u>Name</u>	<u>Date</u>	<u>Capture Method</u>	<u>Blackfish Recorded</u>
Lower Fire Lake	5/24	Gill Net	X
Lake Otis	6/12	Gill Net	-
Goose Lake	6/12	Gill Net	-
Sundi Lake	6/14	Gill Net	-
Connors Lake	6/19	Gill Net	X
Upper Fire Lake	6/21	Gill Net	-
Fish Creek	6/26	Electro.	X
Marsh, Tudor & L. Otis	6/27	Electro.	-
Chester Creek	6/27	Electro.	-
Fire Creek	6/28	Electro.	X
Delaney Lake	7/13	Electro.	-
Sand Lake	7/13	Electro.	-
Meadow Lake	7/13	Electro.	X
Six-Mile Lake	7/27	Gill Net	-
Upper Fire L. Outlet	7/31	Electro.	-
Peters Creek	7/31	Electro.	-
Mirror Lake	7/31	Electro.	-
Eklutna River	7/31	Electro.	-
Campbell C., at BLM	8/ 1	Electro.	-
Mirror Lake	8/10	Gill Net	-
Otter Lake	10/12	Rotenone	-
Jewell Lake	11/ 6	Gill Net	-
Green Lake	11/ 7	Gill Net	-
Hillberg Lake	11/ 7	Gill Net	-
Beach Lake	11/ 8	Gill Net	-
Clunie Lake	11/ 8	Gill Net	-

Analysis of blackfish stomach contents obtained from Lower Fire Lake has not been completed. However, cursory examinations of some stomachs indicate the food of adults consists of smaller blackfish. Studies by Osdick and Nordome (1959) indicate that snails, clams, trichoptera larva, and isopods are all important foods. It appears blackfish consume many of the same food

Map No. 1. Distribution of Alaska Blackfish

Blackfish 



organisms required by rainbow trout and directly compete with trout in the lakes where both are present.

McPhail-Lindsey (1970) records a male specimen at 165 mm in length and 50 gms in weight. Literature reviewed indicates that the largest blackfish specimen ever recorded was 205 mm (Bean, 1880). A blackfish collected from Jewell Lake on October 31, 1972, measured 304 mm (total length) and weighed 366 gms. A sample of 140 blackfish gill netted from Lower Fire Lake in 1973 ranged in length from 75 to 242 mm with a mean of 182 mm. Weights from collected fish ranged from 11 to 138 gms with an average of 63 gms. The mean weight and length of 70 females was 39.8 gm and 164.6 mm, respectively. The mean weight of the males was 81.9 gm and the mean length 198.8 mm. Conditions are so favorable for growth of blackfish in Anchorage lakes that the fish are up to several times heavier in weight than the largest specimens recorded from their natural areas of occurrence.

Static bioassays testing the toxicity of rotenone to blackfish at different concentrations and temperatures were not conducted as scheduled due to a complete loss of specimens in the holding tanks. Attempts will be made during 1974 to accomplish this objective.

Stocking and management programs involving rainbow trout planted in lakes with blackfish populations may be seriously threatened if there is substantial predation by blackfish on fry or fingerling size plants. Growth and survival of rainbow trout may be substantially reduced if there is serious competition for available food resources and habitat. Therefore, continual investigations of the blackfish distribution, life history, and ecology as related to their control and potential fishery management implications is essential.

LITERATURE CITED

McPhail, J. D., and C. C. Lindsey. 1970. Freshwater Fishes of Northwestern Canada and Alaska. Fisheries Research Board of Canada. Bulletin 173, pp. 211-215.

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