STUDY 9.

DISTRIBUTION OF JUVENILE SALMONIDS IN RUSSELL AND NUNATAK FIORD STREAMS

Rationale

After Russell Fiord is dammed by the Hubbard Glacier, rising water in "Russell Lake" will inundate most anadromous fish habitat in all streams entering Russell Fiord and Nunatak Fiord. Knowledge of the distribution of stream-rearing salmonids will enable fisheries managers to estimate losses from flooding and determine appropriate restoration strategies.

Objectives

The objective of this study was to determine the summer distribution of juvenile salmonids in Russell and Nunatak Fiord streams.

Summary of Results

Rearing salmonids were captured in 30 of 102 streams sampled in Russell and Nunatak Fiords in 1988. Juvenile Dolly Varden were widely distributed in the 30 streams, whereas coho were captured in only 9 streams in the southern portion of Russell Fiord. Streams that did not have juvenile salmonids were usually short and steep and had poor spawning and rearing habitat.

METHODS

From 8 July through 15 September 1988, ADF&G personnel surveyed 102 streams in Russell and Nunatak Fiords to document salmonid distribution and species composition. Streams with rearing salmonids were usually sampled more than once (range 2-10 times), whereas streams without rearing salmonids were sampled only once. Two streams cataloged with rearing salmonids in 1988 were resampled in August 1989.

Juvenile fish were captured with baited minnow traps. In 1988, 1-7 traps were placed in the lower 300 m of each stream and fished for 1-2 hours. In 1989, 20 minnow traps were set for 1 hour in a 50 m reach located approximately 200-500 m upstream of each stream's mouth. All juveniles captured were enumerated by species, and any adult fish observed were recorded. Water temperature was measured with a hand-held thermometer, and stream width and depth were visually estimated in every stream. Subjective descriptions of water velocity (slow to very fast) and turbidity (clear to heavily silted) were also recorded.

RESULTS

Thirty streams with rearing salmonids were identified; 20 in the southern quarter of Russell Fiord, 5 in Nunatak Fiord, and 5 in the remainder of Russell Fiord (Fig. 9.1; Table 9.1). Dolly Varden were widely distributed throughout the 30 streams in Russell and Nunatak Fiords, whereas coho salmon were captured only in nine streams in the southern quarter of Russell Fiord (Table 9.1). Catches indicate that Dolly Varden density probably was moderate to high, whereas coho density was low. The only stream where substantial numbers (>100) of juvenile coho were captured was stream number 750 (Fig. 9.1). Between 1988 and 1989, the difference in the observed numbers of coho in stream number 750 and Dolly Varden in stream number 768 (Table 9.1), may have been partially the result of species misidentification. Adult coho (2-100 fish) were observed only in streams 750 and 768 (Fig. 9.1) in September 1988. Other species captured included sculpins and threespine stickleback.

Streams in Russell and Nunatak Fiords that lacked rearing salmonids were typically short and steep, and had poor spawning and rearing habitat. Streams with rearing salmonids were mostly clear, ranging from 1 to 10 m wide, 5 to 60 cm deep, and 5 to 20°C.

DISCUSSION

Dolly Varden were the most common salmonid captured in streams in Russell and Nunatak Fiords; coho were the only other salmonid captured and were scarce. Timing of surveys precluded the capture of other species, such as pink and chum salmon, because they had already emigrated to sea. In addition, no adult pink salmon were observed in any streams in July and August, indicating a possible year-class failure as a result of the 1986 closure of Russell Fiord. The damming of Russell Fiord by Hubbard Glacier from late May to October 1986 may have obstructed the spawning migration of adult pink salmon and resulted in no spawning and consequently no adults in 1988. Historically, pink salmon have been present in Russell Fiord; over 45,000 pinks were harvested by beach seine in 1952 in Yakutat and Disenchantment Bays and Russell Fiord (Knapp 1952).

Most inlet streams in Russell and Nunatak Fiords are "HC" channels (steep, contained streams). According to the USFS Channel Type Classification System, these streams typically provide poor spawning and rearing habitat (Paustian 1992). This agrees with the 1988 fish survey: approximately 70% of the streams examined had no rearing salmonids. Because most fish sampling was conducted in the lower stream reaches, however, some rearing salmonids may have been missed in the upper reaches. In the few streams with rearing salmonids, fish were present in the lower stream reaches where gradient was low; these were often "MM" and "MC" channels (Paustian 1992), which provide low to moderate spawning and rearing habitat (Paustian 1992). (A complete description of channel types in Russell and Nunatak Fiord streams is available from the USFS, S. Paustian, Tongass National Forest, Chatham Area, 204 Siginaka, Sitka, AK 99835).

Table 9.1—Catch of juvenile salmonids in inlet streams in Russell and Nunatak Fiords. Fish were captured in minnow traps from July through September 1988 and August 1989. Streams without salmonids are omitted. Stream locations are shown in Figure 9.1; stream identification numbers, assigned during the 1988 survey, refer to relative distances between streams.

Stream	Coho salmon	Dolly Varden
	Russell Fiord	
1	3	30
9	11	17
15	0	5
42	1	41
52	0	13
73	0	5
75	0	7
90	2	2
100	0	9
251	0	1
606	0	121
610	0	8
644	0	35
652	0	10
655	0	9
677	9	59
689	0	7
707	0	98
719	4	70
730	0	12
736	2	36
750	0 (147)*	89 (50)*
753	0	7
754	0	6
768	2 (31)*	133 (3)*
	Nunatak Fiord	
10	0	4
11	0	4
26	0	2
40	0	3
41	0	3
Total	34 (178)*	846 (53)*

* 1989

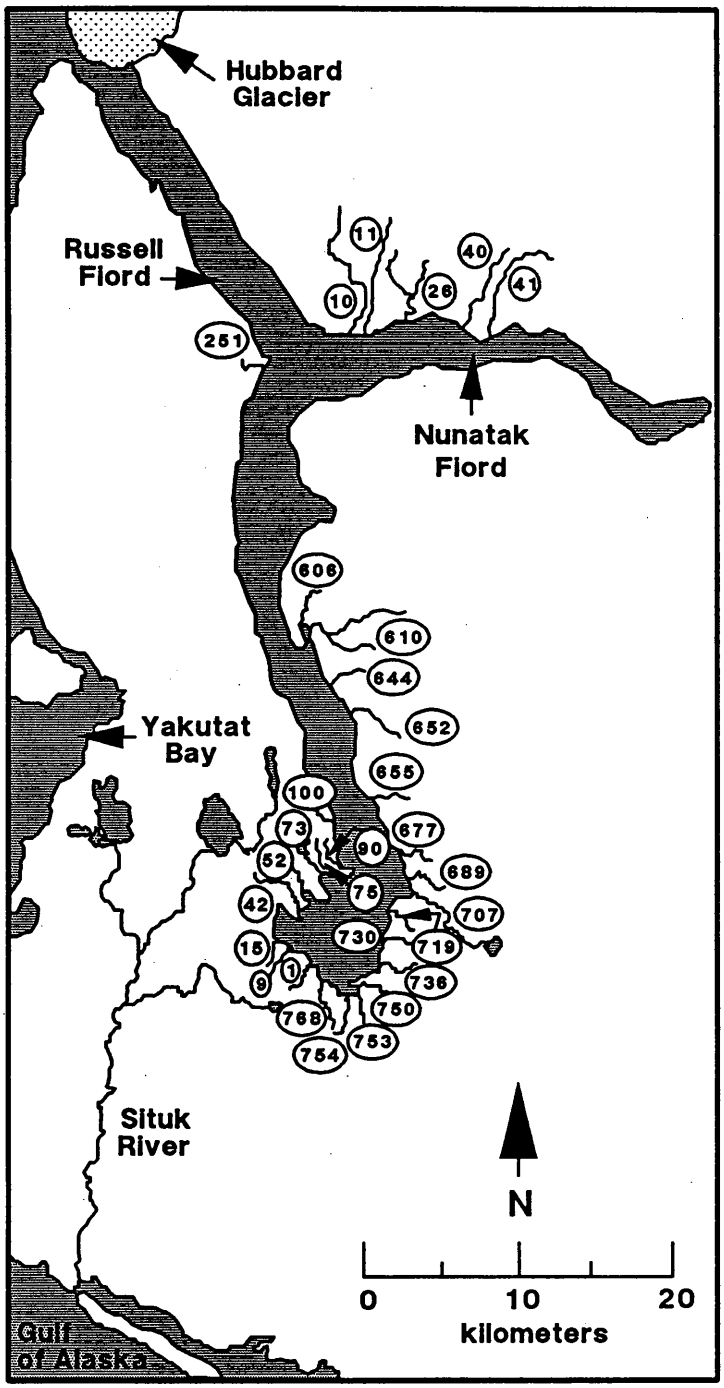

Figure 9.1—Streams with anadromous salmonids in Russell Fiord and Nunatak Fiord, 1988 and 1989. Streams without salmonids are not shown. Stream identification numbers, assigned during the 1988 survey, refer to relative distances between streams.