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1981 STREAM SURVEY AND SUMMARY REPORT

by Leslie Slater

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ALEUTIAN ISLANDS UNIT  
ALASKA MARITIME NATIONAL WILDLIFE REFUGE  
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ALASKA REGION

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Stream surveys of the major salmon "runs" on Adak were conducted on a regular basis beginning in 1977. Their completion was dependent on time constraints and availability of personnel. Adak's salmon populations have not warranted more intensive studies because of the relatively low fishing pressure (Love 1976). However, the counts have yielded population trend data which can be used in the future when evaluating management programs. Counts of pink salmon (Oncorhynchus gorbuscha) were emphasized, although other species were noted as well.

#### STUDY AREA

Adak Island, located 177°W longitude, 52°N latitude, lies 2080 km southwest of Anchorage in Alaska's Aleutian Chain, approximately due west of Vancouver, B. C. It is 680 km southeast of Attu Island, the western extremity of the Chain. Adak is typical of chain islands: volcanic origin; moderately rugged terrain with elevations ranging from 1189 m to sea level. Surface cover consists of maritime tundra and is devoid of trees. The entire 64,583 ha island is part of the Aleutian Islands Unit of The Alaska Maritime National Wildlife Refuge. In 1959, Public Land Order 1949 designated 25,417 ha of the island's northern portion as a military reservation.

The specific study area is confined to those streams which empty into the Kuluk Bay area and are accessible from the Adak Naval Station (Fig. 1). This area is located on the northeast portion of the island. The combined lengths of the streams totals 11 km of available spawning habitat (Table 1).

Table 1. Lengths of streams surveyed on the Adak Naval Station Adak, Alaska.

<u>Stream</u>	<u>Length</u> (km)
NavFac Creek	1.3
Finger Bay	2.4
Big Thumb Bay	1.6
Little Thumb Bay	2.1
Scabbard Bay	<u>3.6</u>
Total	11.0

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However, streams found in less accessible areas on Adak and on other islands were surveyed on an "opportunistic" basis in conjunction with other studies such as boat surveys (Appendix 1). NavFac, Big Thumb Bay, and Finger Bay streams have been censused on a more regular basis than other streams because of their popularity to fishermen and proximity to base.

#### EQUIPMENT

The following gear is needed for each observer:

- 1 pair hip boots
- 1 tallywhacker (2 optional)
- 1 Rite-in-the-Rain notebook, pencil

#### WEATHER

As in all research operations in the Aleutians, weather played an important role in accomplishing projects. Optimum conditions for conducting stream surveys included the following criteria: wind speed of 14 mph or less, and uniform cloud cover, which varied in altitude (scattered clouds allowed direct sunlight through, thus producing glare reflecting from the water). Rain also reduced the visibility of the fish by disrupting the stream's surface. Streams were surveyed during optimal conditions, with a few exceptions.

#### PROCEDURE

Surveys were conducted in two basic ways; if only one person participated, the observer walked upstream in the middle of the stream course, tallying all Pink salmon that passed swimming downstream, and all carcasses. Counts of other species were estimated rather than tallied. These species were Dolly varden (Salvelinus malma), silver salmon (Oncorhynchus kisutch) and red salmon (O. nerka).

If two people counted the salmon, one person walked along each side of the stream bank beginning at the mouth. The observers kept an even pace and spacing so that disturbance to the fish was minimized. Walking in this manner, the census was accomplished in one of three ways: 1) Each person counted to the middle of their side of the stream; 2) Each person counted from the opposite side of the stream to the middle; 3) Each person tallied all salmon seen and the average of the counts was used as the actual total. For methods 1) and 2), the tallied numbers were added together for the final total.

The end of the stream survey was reached at one of the following points:  
1) A large physical barrier prevented the salmon from spawning further upstream or 2) Salmon were not seen within a 75-100 m length of spawning habitat beyond areas that were in use.

Surveys began in mid to late August, and continued through the "run" to count the peak numbers of spawning salmon. Counts once every 2 weeks at each location seemed sufficient for current available budgets. Raw data from the counts were then transferred to the biological files at the refuge headquarters.

## RESULTS

The results of the surveys are shown in Table 2. Counts show a high variability between years, even when they were completed at nearly the same time each year. Surveys were completed too irregularly to offer a fair comparison of monthly peak numbers. However, comparison of the peak numbers on a yearly basis indicates a general increase in pink salmon numbers.

Red and silver salmon were seen during some of the surveys. NavFac Creek was the only stream noted to have red salmon, when 1 was seen 19 November 1980. Silver salmon have been seen (and caught) in NavFac Creek and the streams flowing into Finger, Scabbard, and Big Thumb Bays. Galas Point, on the western side of Kagalaska Island, is also noted for its fairly large run of silvers.

Dolly varden were the second most common fish counted. However, individuals of this species more than 25 cm long were rarely seen.

Only Finger Bay, NavFac Creek, and Big Thumb Creek were censused in 1981. Time constraints, inclement weather and transportation problems didn't allow all the planned surveys to be completed.

## DISCUSSION

The data collected since 1977 seem to indicate a wide fluctuation in pink salmon populations on Adak. However, there are several factors which influence the accuracy of the counts. Perhaps the most variable is the difference between observers' proficiency. The observer may miss tallying a significant number of fish while concentrating on walking on slippery rocks. Because of the overwhelming numbers of salmon seen during the run, the novice observer may over estimate the population. This, I believe, is the case in the final 1981 counts at Finger Bay, where 38,000 fish were reported. An inspection by more experienced biologists leaned toward a more

Table 2. Maximum fish counts, 1977-1981, near Adak Naval Station, Alaska. Blank spaces indicate that surveys were not conducted at that time.

<u>SPECIES</u>	<u>YEAR</u>	<u>Finger Bay</u>	<u>NavFac Creek</u>	<u>Big Thumb Bay</u>	<u>Little Thumb Bay</u>	<u>Scabbard Bay</u>
Pink Salmon	1977	2300+				
	78	14000				
	79					
	80	7059	894		1	Few remains
	81	38000*	400			
Silver Salmon	1977	2			1	
	78					
	79				X	
	80		4	1		
	81	1	X			
Dolly Varden	1977					
	78					
	79					
	80		36 (10-25cm)	150	4	
	81	203 (15cm)	45 (25cm)			
Red Salmon	1977					
	78					
	79					
	80		2			
	81					

\* See Text

X-Counts were conducted late in the run, so that few or no salmon were seen. However, general observations by U.S. Fish and Wildlife Service employees and fishermen confirmed the presence of fish earlier in the season.

conservative estimate of 25,000-28,000, which still exceeded previous records. Despite the observer bias inherent in the stream surveys, the method used provides reliable data about population trends (Netsch, pers. communication).

According to Netsch of the U.S. Fish and Wildlife Service, salmon populations in the North Pacific Ocean are expected to continue to increase over the next few years, providing that winters remain relatively mild. Salmon counts thus far on Adak would support this prediction. Also, pink salmon have a two year life cycle which causes two genetically distinct populations in each spawning stream. The reasons for differences between the populations, in both the numbers and sizes of fish, are unknown. In some areas, only one population spawns in significant numbers, thus leaving fewer fish in an "off" year (Baily 1969).

Variation in counts is also affected by the stream water height, which changes according to the amount of precipitation and the tides. The observer may not always have the opportunity to walk the same route up the stream, so the surveys differ slightly from one another. An effort was made to consistently survey streams during either high or low tides throughout the run.

#### RECOMMENDATIONS

There are several aspects of stream surveys which can be improved:

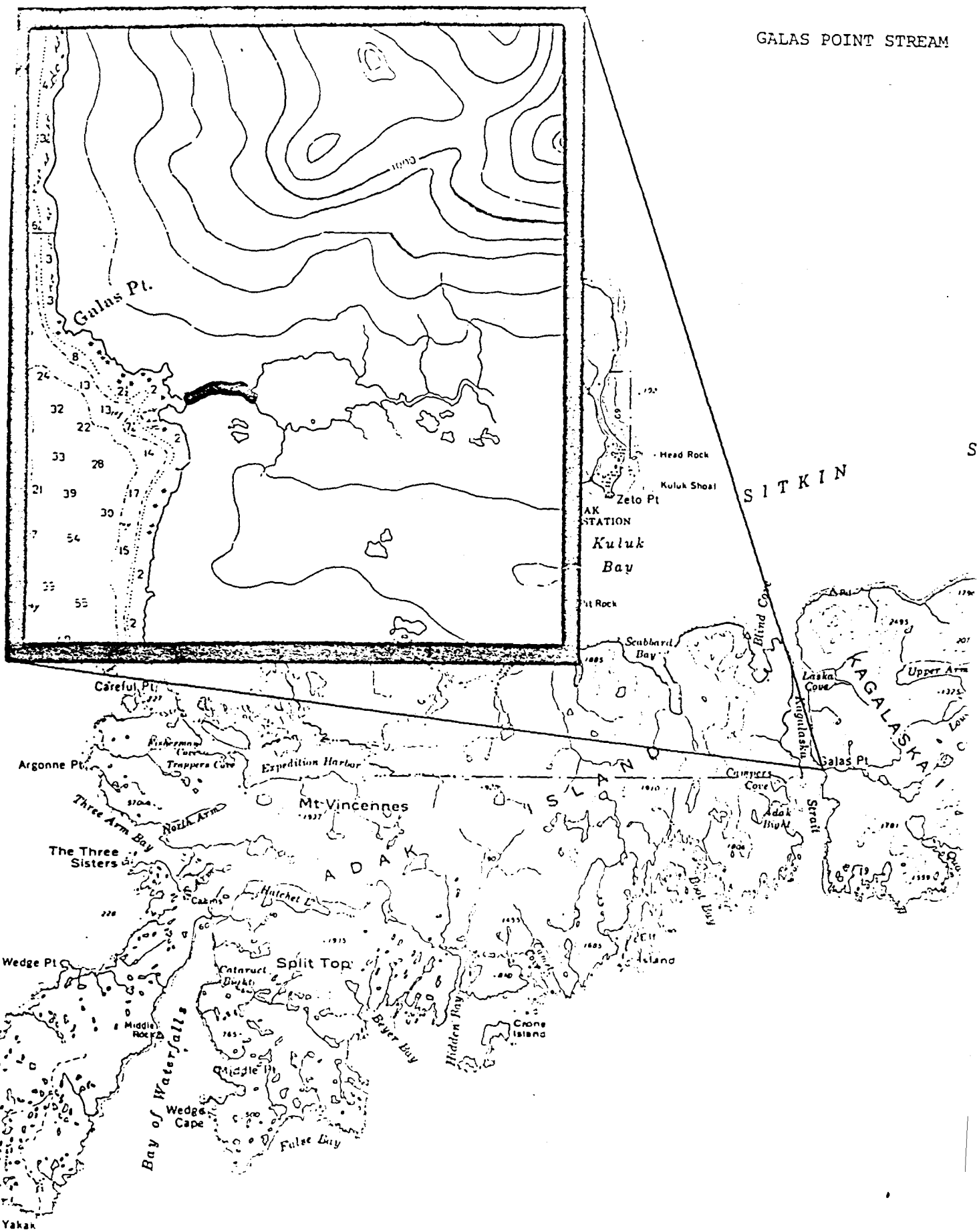
- 1) Continue counts through December for silver salmon. These should be completed every 3-4 weeks after the pink salmon run decreases/ends.
- 2) Conduct counts in the early morning on weekdays at Finger Bay and NavFac Creek to reduce interference with fishermen.
- 3) Allow time for training and practice of novice observers. It would be helpful to practice for 15-30 minutes a day before the actual count so the beginner becomes accustomed to the procedure.
- 4) Have two observers at the larger streams such as Finger Bay, Hatchet Lake, Galas Point, and NavFac Creek.
- 5) Conduct periodic surveys in conjunction with other projects at Galas Point, Long Lake, and Hatchet Lake streams.
- 6) When 2 observers counted, the greatest accuracy seemed to be attained when method 3 was used. This method allows a quick comparison and adjustment of the numbers tallied, and immediately shows any gross error in observer proficiency.

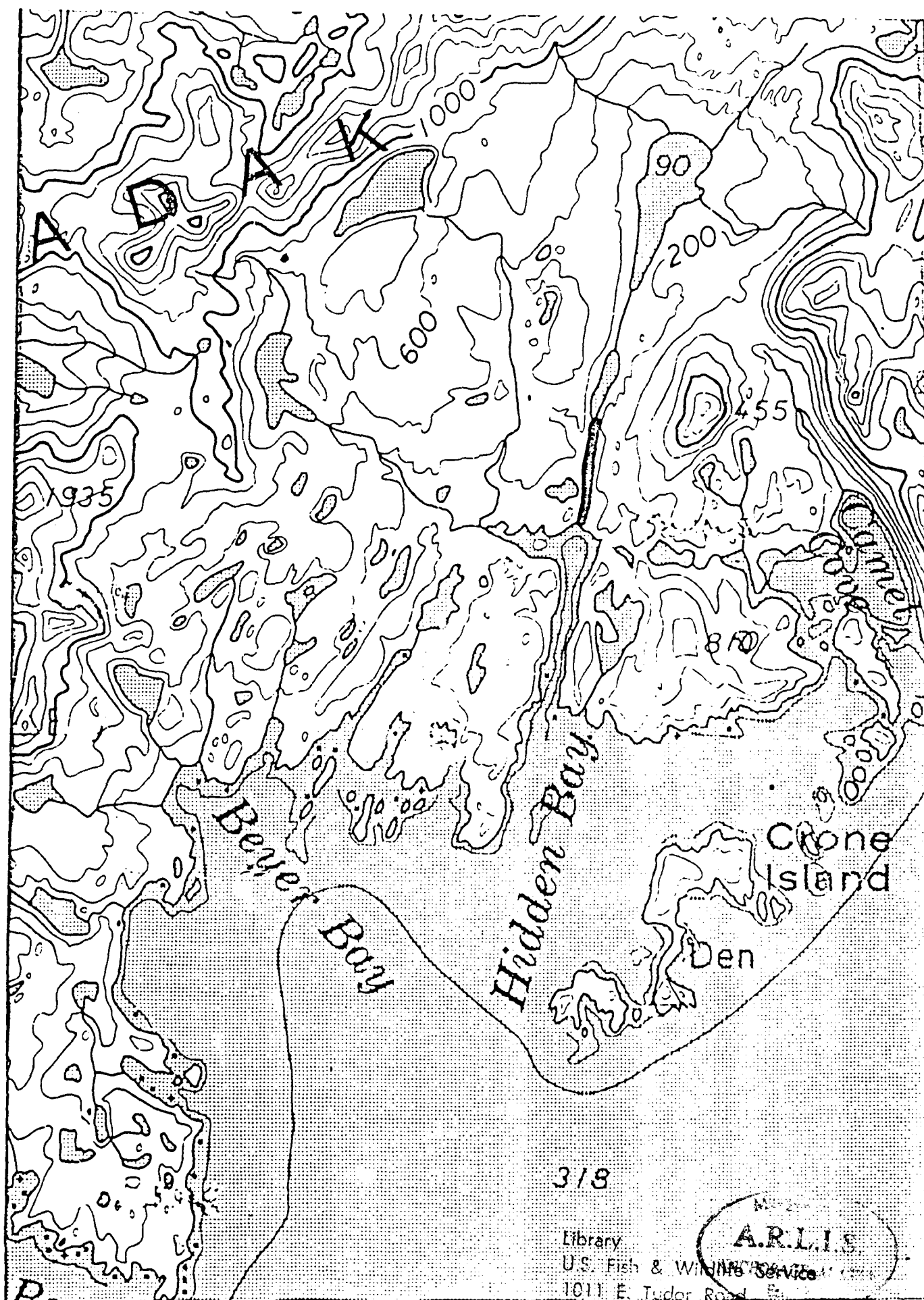
APPENDIX 1. Locations of streams periodically surveyed.





# GALAS POINT STREAM





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