

A-Y-K REGION

YUKON ESC. REPORT # 3

ANVIK RIVER COUNTING TOWER PROJECT, 1971

Robert C. Lebida  
Fishery Research Biologist

Alaska Department of Fish and Game  
Division of Commercial Fisheries  
Anchorage, Alaska

April 13, 1972

## ANVIK RIVER COUNTING TOWER PROJECT, 1971

### INTRODUCTION

To effectively manage the Yukon River king and chum salmon fisheries, it is important that accurate estimates of escapement be available. Since 1961, tag and recovery studies have been conducted on the Yukon River to determine the numbers of adult king and chum salmon which form the annual spawning escapement; however, little success has been achieved towards this goal utilizing present methods.

New enumerating procedures with emphasis directed toward monitoring escapement quality and magnitude in index streams were needed. Establishing several counting stations in selected tributaries would enhance determining good escapement indices. The Anvik River, believed to be a major chum and king salmon producing system, was therefore selected for a pilot study utilizing a counting tower for salmon enumeration in the Yukon River drainage.

All phases of the 1971 project were exploratory. Reconnaissance surveys were made to locate and establish a suitable counting tower site with construction of a temporary tower if feasible. Preliminary observations and counts of migrating salmon were to be made if possible. Studies were also to be conducted to determine age, sex and size structure of spawned out salmon.

### METHODS AND MATERIALS

A log counting tower, nearly 35 feet high, was erected on the Anvik River (Figures 1 and 2), approximately 1.5 miles below the mouth of the Swift River, by a 3 man crew on an experimental basis to evaluate its suitability in enumerating migrating salmon within the system. The tower was located on the upstream point of a large gravel bar dividing the river into two channels. Excessive river width at this site proved unsuitable for counting salmon and the tower was abandoned.

A second counting structure was constructed approximately 8 miles below the mouth of the Swift River. This structure consisted of a log platform suspended between two live trees at a height of 36 feet above the ground on a 10 foot high cutbank located on the west side of the river.

The average water depth at the counting tower site was 3 feet with a river width of approximately 125 feet. However, 25 feet of the width



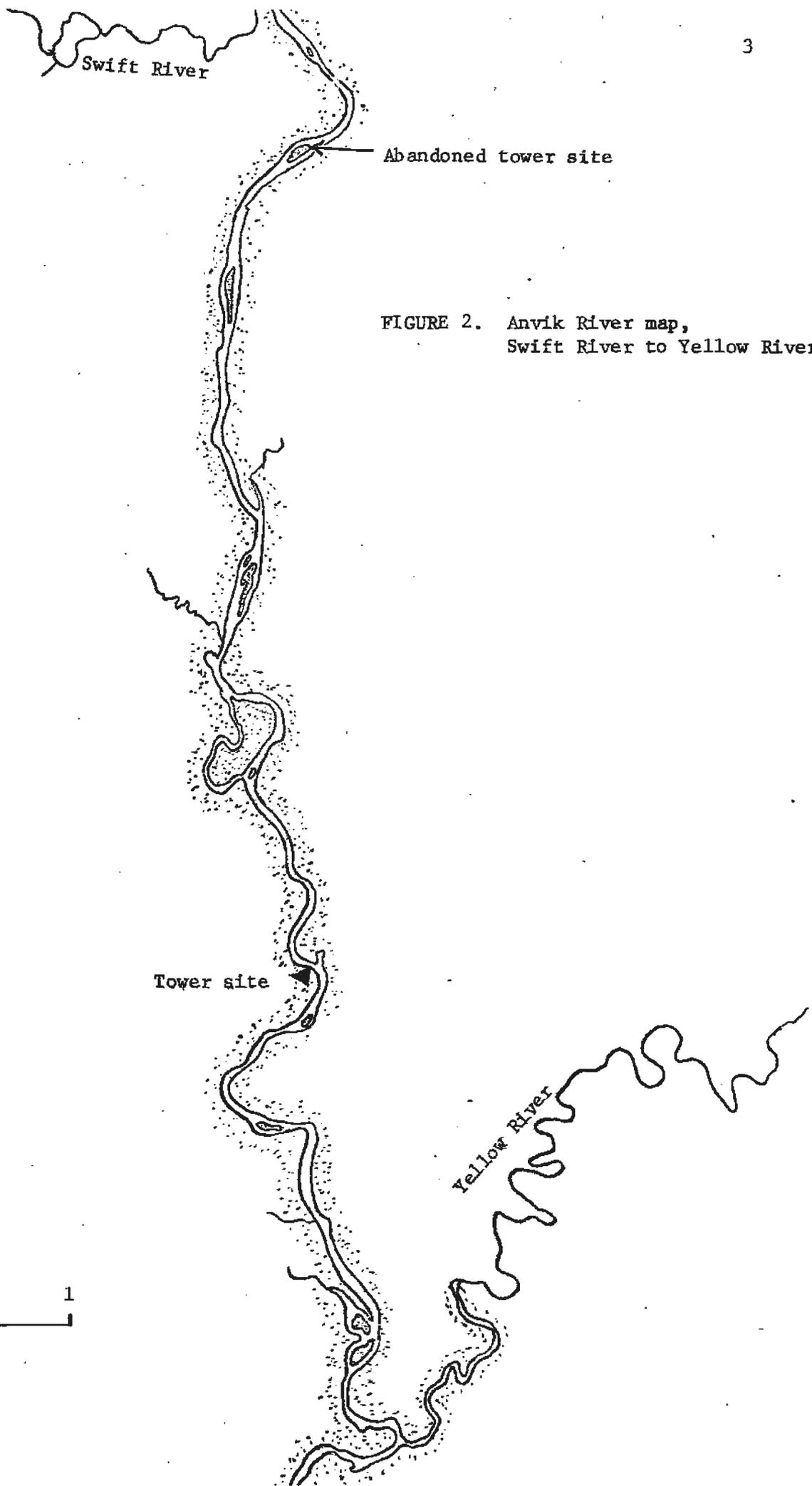
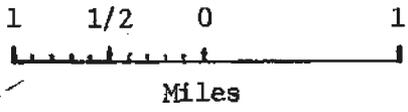


FIGURE 2. Anvik River map,  
Swift River to Yellow River



was too shallow to allow fish passage under normal conditions. The flow rate in front of the tower was estimated at 3 miles per hour at low water. Flood lamps strung across the river and powered by a gasoline generator were used to illuminate the water during hours of darkness.

Sample counts were made during July 24-26 from the tower to test site suitability. A carcass survey was conducted by boat from the mouth of the Swift River to the village of Anvik to recover tags and survey salmon species composition, specifically to determine if a significant pink salmon population utilized the system for spawning.

## RESULTS

Exploratory surveys conducted during early July located a suitable salmon counting tower site on the Anvik River. Lateness of the season and rising, turbid waters, the result of heavy rains, precluded any significant counting. A preliminary count conducted on July 24 during the hours of 1600-2200 indicated 300 chum and 5 king salmon per hour were migrating past the tower. A summary of tower counts is presented in Table 1.

During the period of July 27-29, a salmon carcass survey was conducted by boat from the mouth of the Swift River to the village of Anvik. A total of 2,673 chum carcasses was enumerated. Of these, 493 were accounted for between the mouth of the Swift River and the tower site on July 27. On July 28, 1,715 carcasses were counted between the tower site and the mouth of the Yellow River. During July 29, 465 carcasses were accounted for from 15 miles above Anvik to the village proper. The survey recovered 8 tags from summer chums resulting in a tagged:untagged ratio of 334:1. Of the 8 recoveries, 3 occurred between the tower site and the mouth of Yellow River with the remaining 5 recovered above the village of Anvik. Tag loss was evidenced on 2 carcasses. Salmon carcasses of other species were not observed.

## DISCUSSION

Enumerating migrating salmon in the Anvik River appears feasible. Weather and related river conditions seem to be the only limiting factors. The tower site must be located above the mouth of the Yellow River since the Anvik River is relatively clear above its confluence with the Yellow River. Below the Yellow River, which has a yellow-brown stain, the Anvik River is relatively turbid and difficult to observe salmon.

Improvements needed are the addition of a light-colored underwater background panel to insure adequate contrast between the fish and bottom under all reasonable weather and water conditions. In addition, flood lights extended across the entire width of the river will be needed to provide illumination during hours of darkness. A short weir is planned for the riverbank opposite the tower site to aid in guiding fish closer to the counting tower.

TABLE 1. Summary of Anvik River preliminary tower counts, 1971.

Date	Hours counted	<u>Upstream</u>		<u>Downstream</u>	
		Kings	Chums	Kings	Chums
7/24	6	31	1,791	2	33
7/25	2	8	386	0	0
7/26	<u>10</u>	<u>14</u>	<u>1,251</u>	<u>0</u>	<u>1</u>
Total	18	53	3,428	2	34

During 1972, studies will be conducted to obtain daily and seasonal timing plus magnitude of salmon escapement. Biological observations and collection of data as well as carcass surveys will be continued.

#### SUMMARY

1. Exploratory surveys located a suitable counting tower site on the Anvik River.
2. Preliminary counts were conducted of salmon passing the tower.
3. Carcass surveys accounted for 2,673 chum salmon and 8 tag recoveries.
4. Escapement studies will be continued during 1972 on the Anvik River.