

**Special Publication No. 05-13**

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# **Angler Effort Index for the Alagnak River, Alaska, 2000**

**Final Report for Study 01-33  
USFWS Office of Subsistence Management  
Fisheries Information Services Division**

by

**Craig N. Collins**

and

**Jason E. Dye**

September 2005

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries





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September 2005

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## Final Report Summary Page

**Title:** Angler effort index for the Alagnak River, Alaska, 2000

**Study Number:** FIS01-33

**Investigator(s)/Affiliation(s):** Craig N. Collins and Jason E. Dye, Alaska Department of Fish and Game, Division of Sport Fish

**Geographic Area:** Bristol Bay

**Information Type:** Harvest monitoring (index)

**Issue(s) Addressed:** Sport harvest generally does not contribute substantially to total harvest in sockeye salmon runs in Bristol Bay. However, sport harvest of Chinook and coho salmon in Bristol Bay may constitute a substantial portion of overall harvest for those species. Alaska Department of Fish and Game (ADF&G) conducts a statewide harvest mail in survey, which is used to estimate total harvest in large drainages such as the Alagnak River. Cyclical creel surveys to obtain biological samples and more focused sampling of a subsection of the river are also conducted. Information that is currently lacking in these efforts is an indication of how angler effort is partitioned in space and time throughout the river. This information would assist managers in design and interpretation of focused creel surveys for subsections of the river, and potentially improve our ability to understand how the Chinook and coho fisheries are distributed throughout the drainage.

**Study Cost:** \$41,700 (contract with ADF&G was \$9,500)

**Study Duration:** June 2000 to August 2000

**Abstract:** An angler effort survey was conducted on the Alagnak River from 10 June–10 August 2000. This was a collaborative effort between Alaska Department of Fish and Game (ADF&G) Division of Sport Fish, National Park Service, and Bristol Bay Native Association. ADF&G provided detailed data collection instructions and technical review of the project design. Several problems were encountered during the project and it was not completed as scheduled. However, the data collected indicated that there is heavier use of the lower river than the upper river and peak use occurs during July. Rafts were most common in the upper river and decreased in frequency with each downstream segment. Overall use was dominated by the salmon fishery in the tidal section. These data were subsequently used by ADF&G to help design a more comprehensive Alagnak River Chinook and coho salmon creel survey conducted during 2001 and 2002.

**Key Words:** Alagnak River, Alaska Peninsula, angler effort index, Bristol Bay, Bristol Bay area, harvest monitoring, Kodiak, Naknek/Kvichak district, salmon, trout.

**Project Data:** ADF&G did not collect or archive the data for this project. Data should be available from National Park Service.

**Citation:** Collins, C. N. and J. E. Dye. 2005. Angler effort index for the Alagnak River, Alaska, 2000. USFWS Office of Subsistence Management, Fisheries Resource Monitoring Program, Final Report No. FIS01-33. Alaska Department of Fish and Game, Special Publication No. 05-13, Anchorage.

## ABSTRACT

An angler effort survey was conducted on the Alagnak River from 10 June – 10 August, 2000. This was a collaborative effort between the Alaska Department of Fish and Game (ADF&G) Division of Sport Fish, National Park Service, and Bristol Bay Native Association. ADF&G provided detailed data collection instructions and technical review of the project design. Several problems were encountered during the project and it was not completed as scheduled. However, the data collected indicated that during the study year there was heavier use of the lower river than the upper river and peak use occurred during July. Rafts were most common in the upper river and decreased in frequency with each downstream segment. Overall use was dominated by the salmon fishery in the tidal section. These data were subsequently used by ADF&G to help design a more comprehensive Alagnak River Chinook and coho salmon creel survey conducted during 2001 and 2002.

Key words: Alagnak River, Alaska Peninsula, angler effort index, Bristol Bay, Bristol Bay area, harvest monitoring, Kodiak, Naknek/Kvichak district, salmon, trout.

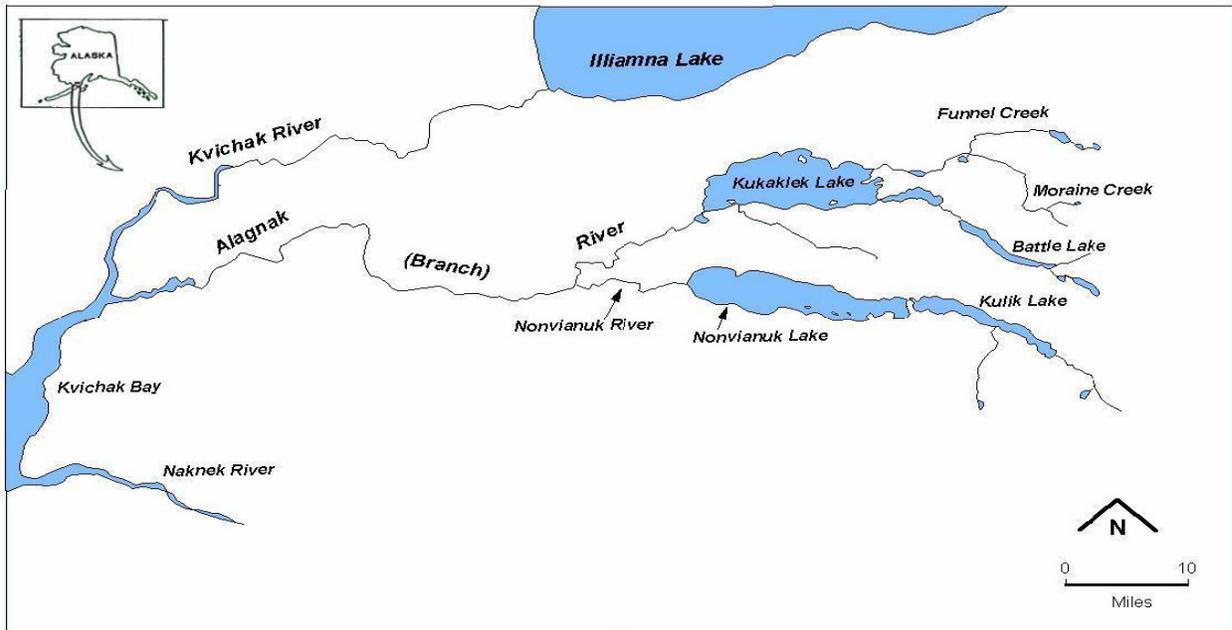
## INTRODUCTION

The Alagnak River, known locally as the Branch River, is located in the Kvichak River drainage approximately 60 km (40 miles) north of the community of King Salmon, Alaska (Figure 1). The Alagnak River hosts significant recreational fisheries for Chinook salmon *Oncorhynchus tshawytscha*, coho salmon *O. kisutch*, chum salmon *O. keta*, rainbow trout *O. mykiss*, and several other species. Anglers typically access the river from various lodges located on the river, and by floatplanes from King Salmon or other lodge sites within the area.

Angler sport fishing effort is estimated by Alaska Department of Fish and Game (ADF&G) Division of Sport Fish through an annual mail survey of a probability sample of households containing one or more licensed anglers, the Statewide Harvest Survey (SWHS). The first SWHS estimate for Alagnak River effort was for 1981, and estimates showed effort was variable during the 1980s. Effort increased substantially in the late 1980s and early 1990s, but decreased during the mid and late 1990s (Mills 1982-1994; Howe et al. 1995-1996, 2001*a-d*). Since 1991, SWHS estimated angler effort has averaged 8,673 angler days.

In response to the increased sport fishing effort at the Alagnak River during the early 1990s, the Alaska Board of Fisheries (BOF) reduced the daily bag limit of Chinook salmon in Bristol Bay fresh waters from 3 fish, of which 2 could exceed 28 inches in length, to 3 fish, of which one could exceed 28 inches in length. In addition, the BOF established a Bristol Bay annual bag limit of five Chinook salmon (5 AAC 67.020) as well as a spawning season closure from August 1 to April 30 (5 AAC 67.010). Guides were also prohibited from retaining fish while guiding (5 AAC 67.036). At the same time, the coho salmon daily bag limit was reduced from five fish per day to three fish per day (5 AAC 67.022).

In addition to the SWHS, there have been several onsite surveys of the Alagnak Chinook and coho salmon fisheries. These surveys were conducted to gather fishery information not available from the SWHS. The Chinook salmon fishery was first surveyed onsite in 1988 (Brookover 1989) and again in 1989 (Dunaway 1990). In 1993, an onsite fisheries study addressed both the Chinook and coho salmon fisheries, and for the first time assessed angler success and harvest practices, as well as collected more detailed information on angler demographics and gear preferences (Dunaway 1994). Due to limited funding in 1998, ADF&G Division of Sport Fish confined the angler study to the Chinook salmon fishery. In the 1998 study, angler effort was



**Figure 1.**—The Alagnak River drainage in the Southwest Alaska Management Area.

indexed, catch and harvest rates were estimated, angler demographics and tackle selection were characterized, and biological samples were collected from the sport harvest (Naughton and Gryska 2000).

At one time, sport fisheries for Alagnak River salmon occurred primarily in the lower 12 miles of the river, but as effort increased, the sport fishery expanded to include the lower 25 miles of the river as well. The potential impacts to Chinook and coho salmon stocks from the expanding sport fishery in the lower reaches of the Alagnak River have been a source of concern to resource managers, local residents, and members of the sport fishing industry for some time. The concerns were especially apparent during the limited design and scope of the 1998 survey.

In Bristol Bay Native Association’s (BBNA) spring 2000 information needs assessment project (BBNA *Unpublished*), Levelock and nearby villages identified concerns for the Alagnak River, including the need for assessing harvest of freshwater fish, the need for a creel survey of the sport fishery, and the need for assessment of salmon escapements. National Park Service (NPS) has expressed similar concerns because the river uplands are designated as Wild and Scenic under NPS jurisdiction.

ADF&G Division of Sport Fish shares these concerns, especially given that the 1999 and 2000 spawning escapements for the Alagnak River were half the long term average (Sands et al. 2001). However, the fishery has expanded to a longer section of the river than ADF&G can put adequate resources to monitoring with the design of previous studies. During the summer of 2000, this project to index angler effort in the Alagnak River was funded by the U.S. Fish and Wildlife Service, Office of Subsistence Management (OSM), and conducted jointly by NPS Katmai National Park and BBNA. Preliminary data from the effort index was used in part to develop a subsequent comprehensive two-year creel survey project on the Alagnak River, funded by OSM.

## OBJECTIVES

Objectives for the 2000 survey were to:

1. Count anglers and boats within designated Alagnak River subsections throughout the summer.
2. Describe the distribution of angler effort within the study site, and over the time period of the study.

## METHODS

### STUDY AREA

The survey area extended from the mouth of the Alagnak River upstream to the confluence of Kukaklek and Nonvianuk rivers. The Alagnak River was divided into four recognizable and functional subsections by consulting with the Water Resources Division and the Biological Resources Division of the U.S. Geological Survey, who have ongoing projects on the river.

The Alagnak River was divided into four subsections as follows: tidal, lower, middle, and upper. Descriptions of the subsections are listed below, with distances measured from the mouth and traveling in the upstream direction:

- Tidal; from 0 to 20.5 km (Alagnak River mouth to Upper Barge)
- Lower; from 20.5 to 55.5 km (Upper Barge to Katmai Lodge)
- Middle (Braids); from 55.5 to 67.5 km (Katmai Lodge to Charlie Andrews' cabin)
- Upper; from 67.5 to 89.8 km (Charlie Andrews' cabin to the confluence).

The designation of four subsections within the river was designed to allow patterns of use to be characterized throughout the river.

### DATA COLLECTION

The original sampling schedule went from 6 June through 14 September with sampling scheduled every 2 days throughout that period. Detailed field methodology is described in Dunaway (*Unpublished*). A summary of the field methodology follows.

Two angler counts within the entire Alagnak River were to be conducted during each sampling day. One count was to be the count of record, and the second, a non-record count, was conducted to obtain information about variability within the counts. Angler counts between days were alternated between an upstream and a downstream pass through the fishery. The angler counts obtained during the non-record count were less rigorous, as the crew had the flexibility of stopping during a count to handle trespass issues with Alaska Native allotments. The counts could not be used to estimate angler effort for the fishery, since all possible count times were not surveyed. If the distribution of angler effort throughout the sampling day did not vary during the course of the survey, then the counts obtained by this design represented a relatively unbiased index of the angler effort during the days sampled (i.e., larger count = more angler effort). Conversely, if the within-day distribution of angler effort varied during the course of the survey (for example if anglers shifted from morning to evening fishing), then the angler count would not be an unbiased index of the angler effort.

Angler counts of record were to take a maximum of 4 hours from beginning to end, and were to commence exactly at the time scheduled. They were considered instantaneous and represent angler effort at the time the count was conducted. The starting time for the count of record was 10:00 AM. Once at the starting point, the survey technicians were to count all apparent anglers while driving the boat at a constant rate of speed through the fishery to the far boundary of the study area. Apparent anglers were defined as people who were handling or using fishing rods and tackle; including people who may have temporarily interrupted their fishing to reposition their boat, land a fish, repair their gear (tie on a new lure, fix a tangle, etc.) or assist another person with their fishing activities, or to eat lunch. An apparent angler did not include a boat operator who did not operate fishing gear, or a person who was engaged in some other activity not associated with angling. Count start and stop times and angler and boat counts were to be recorded for each of the four river subsections. Missed counts were documented and a brief explanation for the missed count was recorded (date, time, river subsections).

The crew leader was to maintain a daily log and report both the count of record and the non-record count to the NPS project supervisor via telephone immediately after returning to the Village of Levelock.

The Village of Levelock routinely patrols the river throughout the summer, primarily to handle trespass issues with Alaska Native allotments. Those river patrols were refined, allowing the opportunity to collect sport angler data throughout the entire river corridor. Two residents of Levelock Village were to travel either up or down the Alagnak River every other day by jet boat to or from the confluence of the Kukaklek and the Nonvianuk rivers. For each group of apparent anglers encountered, they were to record the date, time, and location; whether the group was associated with motorized or non-motorized boats; and the number of anglers within the group.

Data was provided to BBNA, NPS and ADF&G during the study, and summarized and analyzed during the winter by NPS. The analysis focused on patterns of seasonal distribution of angler effort in the different reaches of the river. The data were also used to help design a more comprehensive creel survey that was conducted during the 2001 and 2002 Alagnak River Chinook and coho salmon fisheries.

## **DATA ANALYSIS**

The daily angler counts conducted represent an index of angler effort, expressed as angler-days (one angler fishing for any amount of time during a day). Only a summary of the daily counts by study area and subsection was performed. Relative effort among subsections and study areas was compared.

## **RESULTS**

Only a limited amount of effort data was collected (Figure 2). The spatial and temporal distribution of effort was not well characterized in this study, but the data reliably indicated that the lower section of the river received heavier use than the upper river, and that peak usage occurred during July. Rafts were most common in the upper river but decreased in frequency of use with

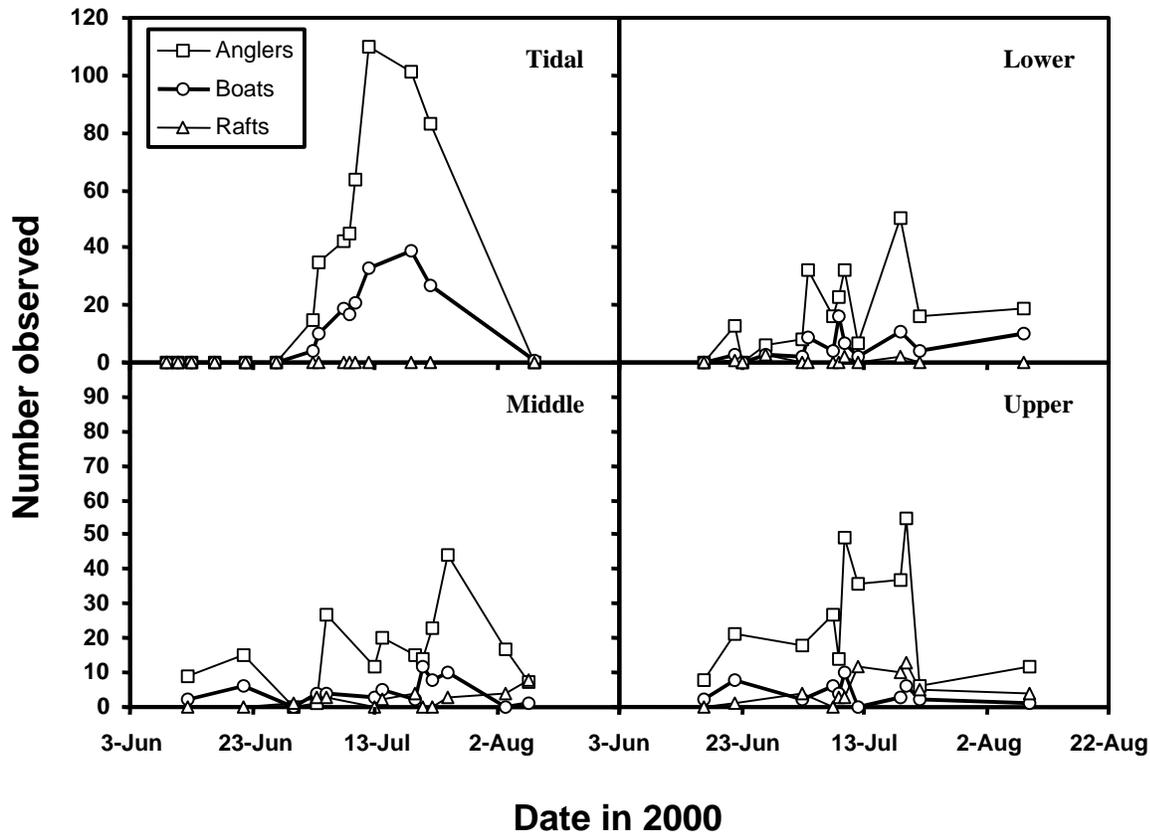


Figure 2.—Angler, boat, and raft counts for the Alagnak River in summer 2000.

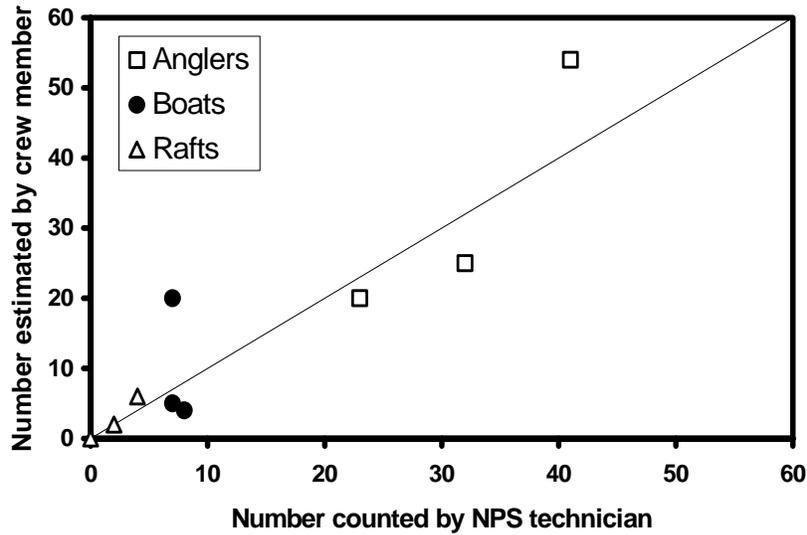
each downstream segment. The salmon fishery dominated the use of the Alagnak River’s tidal section. Overall, use was relatively similar among the other three sections.

This information was useful in helping to design the sampling schedule and sampling locations for a more comprehensive Alagnak River salmon creel survey conducted by ADF&G and funded by OSM during 2001 and 2002.

## DISCUSSION

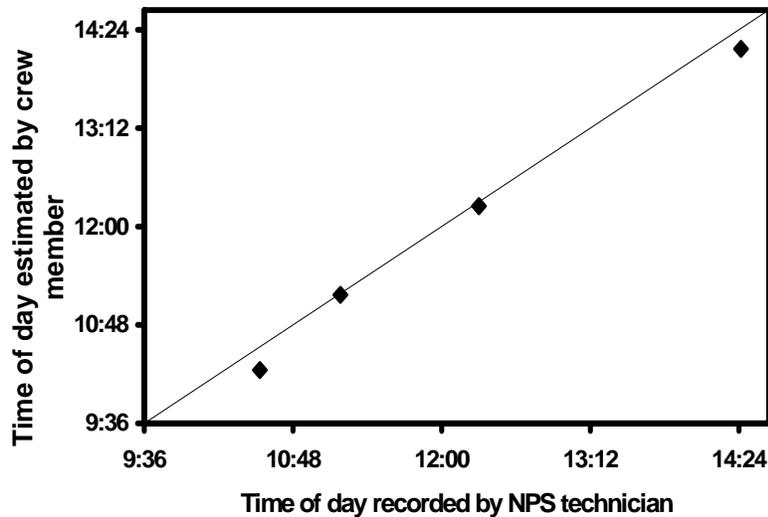
Despite a technically sound study design, several problems were encountered during the 2000 Alagnak River angler effort index survey; therefore, it was not completed as originally scheduled. The original schedule was to conduct counts every other day from June 10 through September 15. The dates that were actually sampled were confined to June 10 through August 10. Scheduling problems included three primary sources: mechanical problems, conflicting missions, and budgetary confusion. Mechanical trouble with boat motors greatly limited the ability of the crew to accomplish counts for extended periods of time in June and July. Later, the crew was divided and partially diverted to Kvichak patrols, during which time it is unclear whether any Alagnak counts were conducted. The budgetary situation exacerbated the problem. The project funding contracted to ADF&G arrived too late to help plan this index project, and instead was used to begin planning of a subsequent creel survey on Alagnak River salmon fisheries. Adequate timing for budget allocations is essential to success of future projects.

In addition, there was difficulty in getting technicians to agree on how to record data as it was observed. During one sampling event, a NPS observer went along with the technicians to record data simultaneously with the technicians. The recorded data from the NPS observer were somewhat different from that of the technicians in counts of apparent anglers and number of boats (Figure 3). The number of rafts recorded (Figure 3), which were low in number, and the time of day (Figure 4) were relatively consistent between the observer and the technicians.



**Figure 3.**-Simultaneous counts of anglers, boats, and rafts by a NPS technician and a Levelock Village crew member.

Note: The technician used a tally counter and recorded data promptly at the end of each river section. The crew member counted without mechanical assistance and recorded the data after the entire survey was completed (hence the term “estimated” on the graph).



**Figure 4.**-Time of day recorded by NPS technician at the end of each river section and by Levelock Village crew member who recorded data at the end of the survey.

To make sure that there was opportunity to properly record data, smaller, more usable versions of data sheets, as well as tally counters, were delivered to the technicians, but few counts were received subsequent to those actions. Because ADF&G did not supervise the technicians, it is not clear whether the sheets or counters were used in the field after being distributed.

ADF&G provided detailed written instructions for conducting the effort index counts; however, due to the extenuating circumstances described below, the field technicians were under-trained and under-supervised during the field portion of the project. Training was originally set up for a full day of counts with two NPS employees and the Levelock Village technicians, with one NPS employee to remain in the field with the crew for the first week. The technicians, however, experienced motor trouble and arrived only in time to receive verbal instructions and instruction and data sheets, but had to leave at that point to get the motor repaired. Due to the length of time needed for repairs, the scheduled on-site training was never accomplished. This led to some poor data collection habits before the NPS staff could again team up with the technicians in the field.

## **RECOMMENDATIONS**

Future collaborative projects of this type should include on-the-job training as originally intended with this project, and full-time on-site supervision, which was not part of the planning for this project. After a demonstration of their commitment to the project and a couple seasons of data collection, staff would be more prepared to operate on their own with an understanding of the methods and rigor necessary for appropriate data collection.

## **ACKNOWLEDGEMENTS**

U.S. Fish and Wildlife Service, Office of Subsistence Management, provided ADF&G with \$9,500 in funding support for this project through the Fisheries Resource Monitoring Program, under agreement number 70181-0J304. We appreciate the partnership with National Park Service, as well as Bristol Bay Native Association and Levelock Village.

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