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Natural Resource Internship Program

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Abstract

The Kuskokwim Native Association and the Alaska Department of Fish and Game have offered fisheries internships to about 15 high school students a year since 1999. The purpose of the program is to encourage community involvement in Kuskokwim River fisheries management through engaging youth (ages 14-19) in operational monitoring and research projects. The program is a one to two week summer internship that takes place at fisheries research camps. Interns gain fisheries field work experience by counting salmon passage through weirs, sampling salmon for age-sex-length analysis, collecting salmon fin tissue for genetic analysis, recording stream physical conditions, and living in remote camp environments. Interns also learn fisheries research, management, and ecological concepts through a curriculum of readings and activities that teach through a blend of traditional ecological knowledge and western science. Seven high school interns have been later hired by either the Alaska Department of Fish and Game or Kuskokwim Native Association as fisheries technicians. In 2004, we had 20 interns that were from seven villages. This has been an excellent opportunity for communities to participate in fisheries research and for students to explore career opportunities in the natural resources field.

Key Words: Capacity building, chinook salmon, intern, salmon, subsistence, traditional ecological knowledge, weir, western science, Kuskokwim River

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INTRODUCTION

The Kuskokwim River drainage provides extremely important fisheries resources that have supported a subsistence lifestyle for thousands of years. Salmon contribute as much as 53 percent of the total pounds of fish and wildlife harvested annually in a Kuskokwim area community, and as much as 650 pounds per capita in some communities (Coffin 1991). Not only are fish an important food resource in the Kuskokwim River drainage, the harvest of fish is a tradition that is essential for allowing local residents to express their cultural heritage.

There are many competing demands and pressures on the fisheries resources of the Kuskokwim River drainage (e.g. commercial fishing, sports fishing, and resource development). There is a strong need for fisheries research and monitoring in the Kuskokwim River drainage to ensure subsistence fisheries are not harmed by these increasing pressures. Historically, local residents have felt left out in the fisheries research and monitoring process and there has been misunderstandings and only intermittent local support for such projects. Kuskokwim Native Association has become involved in many fisheries projects in an attempt to foster relationships among local residents and management agencies.

The goal of the Natural Resource Internship program is to help foster relationships through engaging youth and communities in fisheries research projects. The internship program was started in 1998 and has evolved to offer about 15 internships a year at fish weirs operated jointly by KNA and Alaska Department of Fish and Game (ADFG) Commercial Fisheries Division. There are four objectives to this program: 1) foster a greater understanding among regional youth about natural resource management issues and data collection methods by involving students directly in area fisheries projects; 2) teach interns basic salmon management and conservation concepts; 3) diversify the employment opportunities for area residents and develop a skilled pool of future technicians to work on local cooperative fisheries projects; and 4) encourage participants to pursue higher education and full-time careers in natural resource management.

METHODS

The host projects for 2004 were the George and Tatlawiksuk River Weirs. These are salmon escapement monitoring project operated by KNA and ADF&G Commercial Fisheries Division that use floating resistance board weirs. The George and Talawiksuk Rivers are tributaries to the middle Kuskokwim River that support runs of chinook salmon *Onchorhynchus tshawytscha*, chum salmon *O. keta*, and coho salmon *O. kisutch* with small numbers of sockeye *O. Nerka* and pink salmon *O. gorbuscha*. The George River joins the Kuskokwim River at the Georgetown community and the Tatlawiksuk River joins the Kuskokwim River 16 miles upriver from the Stony River community.

The program has included 15-20 interns between the ages of 14 and 19 from the KNA region but individuals from other areas have been accepted when there was additional space. A short description of the program and applications were sent to all area high schools and traditional councils in the spring. The applications include a short personal survey form, parental consent form, and an essay question. Applicants were judged for their sincerity and interests based on their response to the essay question. Successful applicants were sent a list of necessary clothing and equipment that would be needed.

Interns were transported from their village to the fish weirs by commercial plane to Aniak, by float plane from Aniak to the mouth of the George or Tatlawiksuk River, and then by small boat to the weir. First year interns stay at the weir for one week and consecutive year interns can stay for two weeks. However, this year our interns only stayed for one week periods. At the weir, interns completed a curriculum of fieldwork, camp living, and book work. After successfully completing the internship, interns receive a \$250 stipend.

Interns learned fish monitoring techniques through participation in weir installation and maintenance, counting salmon passage through the weirs, and collecting salmon biological data (age-sex-length). Interns learned camp living skills through sharing camp maintenance duties such as dishes, cleaning, and cooking. Weir crews assisted interns with independent field learning activities such as habitat profiling (i.e. stream temperature, river stage, and water chemistry), surveying macro invertebrates (collecting and identifying), surveying other animal activity in the stream corridor and underwater surveying of stream habitat, juvenile salmon and adult salmon. Interns were also given a reading list that includes articles and materials related to fisheries (Appendix A). Interns were required to turn in a written report that includes a three-page question and answer sheet (Appendix B) and a daily journal.

RESULTS

Twenty interns from seven villages successfully completed the program in 2004. Since the program began 92 interns have successfully completed the internship and seven interns continued in fisheries as either college interns or technicians. All interns were taught basic aquatic resource management principles and data collection techniques through the curriculum of field work. Required self directed study and readings taught interns about salmon management and conservation. The experiences that the interns gained from their internships gave them an understanding of fisheries work and made them more qualified as future fisheries workers. As part of the mentoring process, the weir field crews explained future employment and education opportunities and interns were encouraged to apply for KNA scholarships. Reviews from weir crew members were mostly favorable and many potential returning interns can be anticipated.

This program has generated interest and understanding of fisheries research and management within local communities. Student interns experience first hand how western science works to protect their fisheries resources. This experience is shared and

continues to be shared within their community and extended family. It has been the experience of our organization and members that fisheries research projects are now no longer a place where government agencies perform esoteric operations with questionable goals but have become places where our young people work to ensure healthy fisheries resources. The internship program builds community trust and ownership of fisheries research projects.

Future

Several meetings between KNA staff and Kuskpuk School District staff have opened a deeper dialogue. The current intern curriculum meets many state math and science standards but there are no means of determining if an intern sufficiently fulfills the requirements. The staffs of KNA and Kuskpuk School District are working on a series of worksheets that would track interns' progress at meeting state standards during the internship. Interns in 2005 will be able to meet state standards using their internship experiences. The prospect of meeting these standards (a step to graduating earlier) will make the internship more attractive and inspire ambition in interns. In addition, these meetings have opened a discussion of incorporating the readings and materials of the project curriculum into the classroom.

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APPENDIX A

Required reading for interns during a week at fish camp. Other reading materials were available for reference and special activities (e.g. juvenile sampling).

Day One

Read handout: Weirs

Read handout: Camplife—what to bring, what to leave, what to expect

View: Salmon life cycle tape

Day Two

Read handout: Methods to Assess Spawning Escapement, Overview of the Kuskokwim Area Salmon Management Tool Box. March 2001

Day Three

Read: Chapter one of Adopting a Stream (pages 1-13): The Secret Life of a Stream

Day Four

Read: Chapter two of Adopting a Stream (pages 14-21): Fishes

Day Five

Read: Chapter three of Adopting a Stream (pages 22-26): Aquatic Insects

Day Six

Read: Chapter four of Adopting a Stream (pages 27-29): Stream Ecology

Read: Chapter five of Adopting a Stream (pages 30-32): Other Stream Animals

APPENDIX B

Following are the questions (with the answers) asked of each student during the week. These questions were written in a binder and given to each student at the beginning of the week so they knew what to expect, and had an idea of what questions to ask, or what particular information they should pay attention to. Their responses to these questions were collected along with their journals and used to determine if their stipend was warranted.

What are natural resources?

All things found in nature that are used by humans for their benefit. Such things include oil, natural gas, coal, gold, gravel, moose, beaver, and fish.

What are renewable natural resources?

Name a few that aren't mentioned above. Living things that reproduce and generate offspring. Trees (firewood and building materials), salmon berries and blueberries, salmon, caribou, foxes, ptarmigan and spruce grouse.

What is meant by sustainable use of resources?

Using renewable resources wisely so that there are enough to go around for future generations.

There are some major differences between salmon and these other species of fishes; rainbow trout, Dolly Varden, lush, whitefish, pike and grayling. Can you think of the most important difference, and why it is so important?

Within a few weeks after spawning the salmon die. Their remains are eaten by many insects, birds, animals and fish (young and adult); the nutrients are used for growth. Plants also take up these nutrients through their roots and use the nutrients in a similar way as the animals, basically for growth.

What is the term used for salmon or other fish that spend their adult lives in the ocean, then return to freshwater to spawn pretty much in the same location that they were born?

Anadromous

What other species of fish found in this area are anadromous?

Smelt, sheefish, and some Dolly Varden and some whitefish.

Do salmon from the Atlantic Ocean die after spawning like the Pacific salmon we have?

No

What's the term used for fish that spend all their lives in freshwater?

Resident species

Name some resident species.

Pike, lush, grayling, blackfish, lake trout, rainbow trout, Arctic char.

Do all salmon spend the same amount of time in fresh or salt water?

No

Are all king salmon the same size when they return to spawn?

No

If not, why is that?

They spend different amounts of time in the ocean, some only 1 1/2 years while some 6 or 7 years.

So why then are pink salmon the smallest and all the same size?

They all spend the same amount of time in the ocean, about 1 1/2 years.

Sockeye (red), coho (silver) and chum must spend sometime in between 1 1/2 and 6 years in the ocean – how much?

Sockeye – 2 to 3

Chum – 3 or 4

Coho – 1 1/2

Since there are differences between adult salmon and how much time they spend in the ocean, is it possible that there are similar differences between the time that young salmon spend in freshwater before they leave for the ocean?

Yes, pink and chum salmon young go downriver and into the ocean when they are only several months old. The others usually spend at least 1 year or more in freshwater before going to sea.

Salmon grow quickly while in the ocean because food is plentiful, but do they eat when they return to local rivers to spawn?

No

What color are salmon when they leave the ocean and begin to swim up the Kuskokwim River?

Silver

How do salmon change when they are nearing spawning time?

They get darker (often reddish), their flesh begins to rot, sex organs mature, the males get hooked jaws and sharp teeth.

How do salmon find their way back to the same streams where they were born?

By smell, each stream has its own odor due to geology and other natural factors.

When salmon die, what happens to their bodies?

The flesh rots

- 1) Flesh is partially eaten by other animals (bears and birds)
- 2) They are partially eaten by insects (those living in water and on land)
- 3) They decompose and their nutrients (nitrogen, phosphorus and carbon) dissolve into the water and soil
- 4) Plants take up the nutrients from the soil and water

Name 3 animals that rely on adult salmon for food.

Bears, eagles, osprey, otters, gulls and occasionally wolves

Name 3 animals or other fish that rely on juvenile salmon for food.

King fishers, terns, mergansers, otters, pike, rainbow trout, sheefish, grayling, Dolly Varden

APPENDIX C

Selected pictures of interns working at the fish weirs.



Figure C-1: Intern Crystal Sakar netted a chinook salmon from the trap at George River weir to measure it for Age-Sex-Length.



Figure C-3: Interns Aaron Morgan and Patrick Morgan inspecting the George River weir for holes.



Figure C-2: Intern Gusty Gusty maintaining camp at the Tatlawiksuk River weir.



Figure C-4: Intern Cathrine Keane displays a chum salmon before she measures it for Age-Sex-Length sampling.



Figure C-5: Intern Mark Vanfleteren counting salmon passage at the George River.



Figure C-7: Intern Phillip Morgan poses after measuring a bin of salmon for Age-Sex-Length at the Tatlawiksuk River weir.



Figure C-6: Intern Cassandra Bobby prepares to show a friend from Stony River how to do Age-Sex-Length sampling at the Tatlawiksuk River weir.



Figure C-8: Intern Alfred Kvamme records data while a crew member and another intern measure salmon for Age-Sex-Length.

