

2008
FISHERIES
RESOURCE MONITORING PLAN



FEDERAL SUBSISTENCE MANAGEMENT

C O N T E N T S

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INTRODUCTION

BACKGROUND

Since 1999, under the authority of Title VIII of ANILCA, the Federal government has assumed management responsibility for subsistence fisheries on Federal public lands in Alaska. Expanded subsistence fisheries management has imposed substantial new informational needs for the Federal system. Section 812 of ANILCA directs the Departments of Interior and Agriculture, cooperating with the State of Alaska and other Federal agencies, to research fish and wildlife and subsistence uses on Federal public lands. To increase the quantity and quality of information available for management of subsistence fisheries, the Fisheries Resource Monitoring Program (Monitoring Program) was created within the Office of Subsistence Management. The Monitoring Program was envisioned as a collaborative inter-agency, inter-disciplinary approach to enhance existing fisheries research, and effectively communicate information needed for subsistence fisheries management on Federal public lands.

The mission of the Monitoring Program is to identify and provide information needed to sustain subsistence fisheries on Federal public lands, for rural Alaskans, through a multidisciplinary, collaborative program.

Original guidance for the Monitoring Program was provided by the Federal Subsistence Board and outlined in the *Operational Strategy for Information Management*¹. The Regional Advisory Councils (Councils) have identified important issues and information needs for their regions, with review and update on an annual basis. To ensure that the Monitoring Program addresses the highest priority information needs for Federal subsistence fisheries management, the Office of Subsistence Management began a strategic planning process in 2004 to build on the work done by the Councils. Facilitated workshops for the Southwest, Southcentral, and Southeast regions have been held over the last three years with representatives of Federal and State agencies, academia, Alaska Native and rural organizations, and Councils. Participants at each workshop identified fisheries units for their region; developed goals, objectives, and information needs for each fishery unit; and then prioritized fishery units, goals, objectives and information needs. Final workshop reports for the Southeast, Southcentral and Southwest regions have been completed, and results were used to guide the 2008 Request for Proposals. In addition, issues and information needs for salmon were identified for the Yukon² and Kuskokwim³ regions by interagency strategic planning groups.

To implement the Monitoring Program, a collaborative approach is utilized where five Federal agencies (Fish and Wildlife Service, Bureau of Land Management, National Park Service, Bureau of Indian Affairs, and USDA Forest Service) work with the Alaska Department of Fish and Game, Regional Advisory Councils, Alaska Native organizations, and other organizations. An inter-agency Technical Review Committee provides scientific evaluation of proposals and investigation plans. Public review and recommendations for funding are provided through the Councils. An inter-agency Staff Committee

¹ Krueger, C., Brelsford, T., Casipit, C., Harper, K., Hildebrand, I., Rost, P., Thompson, K., and Jones, L. 1999. Federal Subsistence Fisheries Management: Operational Strategy for Information Management. Report to the Federal Subsistence Staff Committee by the Sub-Committee for the Development of a Blueprint for Interagency Functions, Roles, and Responsibilities. 122 p.

² Yukon River Joint Technical Committee. 2005. U.S. and Canada Yukon River Joint Technical Committee Plan. A.T. Publishing and Printing, Inc., Anchorage, AK.

³ Kuskokwim Fisheries Resources Coalition. 2006. Gap analysis for the Kuskokwim Area salmon research plan. M. Nemeth, editor. LGL Alaska Research Associates, Inc., Anchorage, Alaska.

reviews all recommendations, and reconciles differences between staff and public recommendations. The Federal Subsistence Board (Board) approves annual monitoring plans with the benefit of both a technical recommendation by the Technical Review Committee and public review by the Regional Advisory Councils.

The purpose of this section is to present the Technical Review Committee's funding recommendations for the 2008 Monitoring Plan.

PROJECT EVALUATION PROCESS

The Technical Review Committee evaluates proposals, and subsequently full investigation plans, and makes recommendations for funding. The committee is chaired by the Chief of the Office of Subsistence Management Fisheries Division, and is composed of representatives from each of the five Federal agencies and three representatives from the Alaska Department of Fish and Game. An additional anthropologist from the Minerals Management Service provides additional social science expertise on the Technical Review Committee and provides a balance of disciplines. Fisheries and social science staff from the Office of Subsistence Management provide support for the committee.

Four factors are used to evaluate studies:

1. Strategic Priority

Proposed projects should address the following and must meet the first criteria to be eligible for Federal subsistence funding.

Federal Jurisdiction—Issue or information needs addressed in projects must have a direct association to a subsistence fishery within a Federal conservation unit as defined in legislation, regulation and plans.

Conservation Mandate—Risk to the conservation of species and populations that support subsistence fisheries, and risk to conservation unit purposes as defined in legislation, regulation and plans.

Allocation Priority—Risk of failure to provide a priority to subsistence uses, and risk that subsistence harvest needs will not be met.

Data Gaps—Amount of information available to support subsistence management (higher priority given where a lack of information exists).

Role of Resource—Contribution of a species to a subsistence harvest (e.g., number of villages affected, pounds of fish harvested, miles of river) and qualitative significance (e.g., cultural value, unique seasonal role).

Local Concern—Level of user concerns over subsistence harvests (e.g., upstream vs. downstream allocation, effects of recreational use, changes in fish abundance and population characteristics).

2. Technical-Scientific Merit

The project must meet accepted standards for design, information collection, compilation, analysis, and reporting. Projects should have clear study objectives, an appropriate sampling

design, correct statistical analysis, a realistic schedule and budget, and appropriate products, including written reports. Projects must not duplicate work already being done.

3. Investigator Ability and Resources

Investigators must have the ability and resources to successfully complete the proposed study. These are evaluated using the following information for each investigator:

Ability

- Education and training
- Related work experience
- Publications, reports, and presentations
- Past or ongoing work on Monitoring Program studies

Resources

- Office and laboratory facilities
- Technical and logistic support
- Personnel and budget administration

4. Partnership-Capacity Building

Partnerships and capacity building are priorities of the Monitoring Program. ANILCA mandates that the Federal government provide rural residents a meaningful role in the management of subsistence fisheries, and the Monitoring Program offers tremendous opportunities for partnerships and participation of local residents in monitoring and research. Investigators are requested to include a strategy for integrating local capacity development in their investigation plans. Investigators must complete appropriate consultations with local villages and communities in the area where the project is to be conducted. Letters of support from local organizations add to the strength of a proposal. Investigators and their organizations should demonstrate their ability to maintain effective local relationships and commitment to capacity building.

POLICY AND FUNDING GUIDELINES

Several policies have been developed to aid in implementing funding.

- Studies must be non-duplicative with existing projects. Most Monitoring Program funding is dedicated to non-Federal sources.
- Activities not eligible for funding under the Monitoring Program include: a) habitat protection, restoration, and enhancement; b) hatchery propagation, restoration, enhancement, and supplementation; c) contaminant assessment, evaluation, and monitoring; and d) projects where the primary objective is capacity building (e.g., science camps, technician training, intern programs). These activities would most appropriately be addressed by the land management agencies.
- Proposals may be funded for up to four years duration.

Finances and Guideline Model for Funding

The Monitoring Program was first implemented in 2000, with an initial investment of \$5 million. In 2008, a total of \$6.05 million will be allocated to the Monitoring Program. The Department of Interior, through the U.S. Fish and Wildlife Service, annually provides \$4.25 million. The Department of Agriculture, through the U.S. Forest Service, annually provides \$1.8 million. On an annual basis, this budget funds both continuations of existing studies (year 2, 3 or 4 of multi-year projects), and new study starts. A total

of 43 projects (\$3.8 million) previously approved by the Federal Subsistence Board for 2006 and 2007 will be continued in 2008 (Table 1). Descriptions for these projects can be found in the 2006 and 2007 Monitoring Plans. Beginning in 2008, the Office of Subsistence Management will issue future requests for proposals on a biennial basis. The next call will be issued in November 2008 for the 2010–2013 Monitoring Plan. Budget guidelines are established by geographic region and data type, and for 2008, \$2.1 million is available for new starts. Proposals are solicited according to the following two data types.

1. Stock Status and Trends (SST).

These projects address abundance, composition, timing, behavior, or status of fish populations that sustain subsistence fisheries with nexus to Federal public lands. The budget guideline for this category is two-thirds of available funding.

1. Harvest Monitoring and Traditional Ecological Knowledge (HM-TEK).

These projects address assessment of subsistence fisheries including quantification of harvest and effort, and description and assessment of fishing and use patterns. The budget guideline for this category is one-third of available funding.

2008 FISHERIES RESOURCE MONITORING PLAN DEVELOPMENT

A Request for Proposals was issued in November 2006 that identified 25 priority information needs for Federal subsistence fisheries management. The Office of Subsistence Management and the Technical Review Committee utilized regional strategic plans to identify priority information needs for each region. Researchers utilized the priority information needs to develop proposals addressing the most important knowledge gaps for the management and regulation of Federal subsistence fisheries.

Fifty-four proposals (\$5.0 million) were received in January 2007. These proposals were reviewed by OSM fishery biologists and anthropologists and then the Technical Review Committee. In March of 2007, the Technical Review Committee recommended 34 proposals (\$3.2 million) for investigation plan development. In May of 2007, 30 investigation plans (\$2.7 million) were submitted for funding consideration. The Technical Review Committee recommended funding 23 projects totaling \$2.1 million. Regional Advisory Councils supported the committee's recommendations for all but two of the investigation plans.

The Federal Subsistence Board reviewed the draft 2008 Fisheries Resource Monitoring Plan in December 2007 and selected 23 projects for inclusion in the plan. Subsequent to the Federal Subsistence Board meeting, the Office of Subsistence Management cancelled the lowest priority project, due to budget reductions. Fifteen of the 22 projects funded in 2008 address priority information needs identified in the Request for Proposals. The plan provides 30% of the funding to Alaska Native organizations, 36% to Federal agencies 29% to State agencies and 5% to others (Figure 1).

Tables summarizing the 2008 Fisheries Resource Monitoring Plan are provided on pages 6–10. Descriptions of the projects included in the plan can be found on pages 11–56.

Table 1. 2008 continuation projects approved in 2006 and 2007.**Northern Alaska**

- 06-108 North Slope Dolly Varden Aerial Monitoring
- 07-105 North Slope Dolly Varden Genetic Baseline Completion
- 07-151 Northwest Alaska Subsistence Fish Harvest Patterns and Trends

Yukon

- 06-205 Yukon River Chum Salmon Mixed-stock Analysis
- 06-252 Yukon Flats Non-Salmon Traditional Ecological Knowledge
- 07-202 East Fork Andreafsky River Salmon Weir
- 07-204 Lower Yukon River Salmon Drift Test Fishery
- 07-206 Innoko River Inconnu Radio Telemetry
- 07-207 Gisasa River Salmon Weir
- 07-208 Tozitna River Salmon Weir
- 07-253 Yukon River Salmon Harvest Patterns

Kuskokwim

- 06-303 Kuskokwim River Whitefish Migratory Behavior
- 06-305 Kuskokwim River Inconnu Spawning Distribution
- 06-306 Lower Kuskokwim River Salmon Inseason Subsistence Catch Monitoring
- 06-307 Kuskokwim River Salmon Management Working Group
- 07-302 Kuskokwim River Chum Salmon Run Reconstruction
- 07-303 Kuskokwim River Salmon Age-Sex-Length Assessment
- 07-304 Tatlawiksuk River Salmon Weir
- 07-305 Kanektok-Goodnews Rivers Salmon and Dolly Varden Weirs
- 07-306 Kwethluk River Salmon Weir
- 07-307 Tulaksak River Salmon Weir

Southwest Alaska

- 07-401 Afognak Lake Sockeye Salmon Smolt Assessment
- 07-402 Buskin River Sockeye Salmon Weir
- 07-404 Perryville and Chignik Lake Tributaries Salmon Escapement
- 07-405 McLees Lake Sockeye Salmon Weir
- 07-408 Togiak River Rainbow Smelt Assessment
- 07-452 Kvichak Watershed Subsistence Fishing Ethnography

Southcentral Alaska

- 07-501 Tanada and Copper Lakes Burbot Abundance
- 07-502 Tanada Creek Salmon Weir
- 07-503 Copper River Chinook and Sockeye Salmon Abundance
- 07-505 Long Lake Salmon Weir
- 07-507 Tustemena Lake Coho Salmon Abundance
- 07-509 Kasilof River Steelhead Trout Radio Telemetry

Southeast Alaska

- 06-601 Neva Lake Sockeye Salmon Assessment
- 06-651 Southeast Alaska Customary Trade of Seafood Products
- 07-601 Hatchery Creek Sockeye Salmon Assessment
- 07-604 Klag Lake Sockeye Salmon Assessment
- 07-606 Hetta Lake Sockeye Salmon Assessment
- 07-607 Kanalku Lake Sockeye Salmon Assessment
- 07-608 Klawock Lake Sockeye Salmon Assessment
- 07-609 Falls Lake Sockeye Salmon Assessment
- 07-610 Behm Canal Eulachon Genetics
- 07-651 Hydaburg Sockeye Salmon Customary and Traditional Systems

Organization

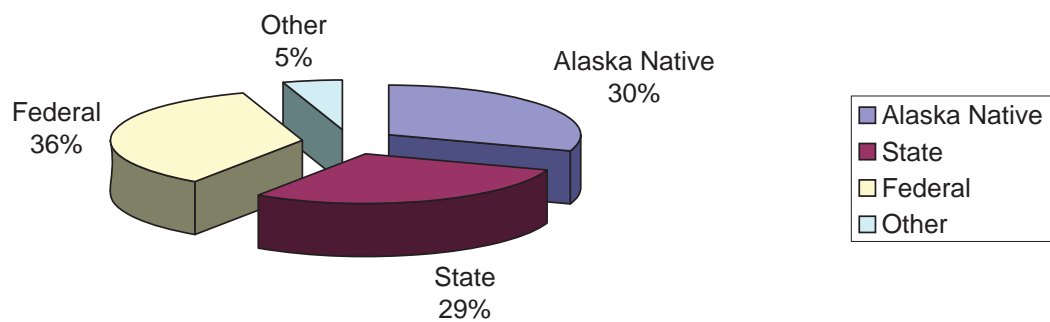


Figure 1. 2008 funding by organization type.

Table 2. Number of projects funded for the 2008 Fisheries Resource Monitoring Plan. Projects include stock status and trends (SST) and harvest monitoring and traditional ecological knowledge (HM-TEK) projects.

Geographic Region	SST	HM-TEK	Total
Northern Alaska	1	0	1
Yukon	4	2	6
Kuskokwim	4	1	5
Southwest Alaska	2	0	2
Southcentral Alaska	4	0	4
Southeast Alaska	2	2	4
Total	17	5	22

Table 3. Cost of projects funded for the 2008 Fisheries Resource Monitoring Plan. Projects include stock status and trends (SST) and harvest monitoring and traditional ecological knowledge (HM-TEK) projects.

Geographic Region	Cost (\$000)		
	SST	HM-TEK	Total
Northern Alaska	\$87	\$0	\$87
Yukon	\$236	\$94	\$330
Kuskokwim	\$395	\$76	\$471
Southwest Alaska	\$233	\$0	\$233
Southcentral Alaska	\$543	\$0	\$543
Southeast Alaska	\$146	\$98	\$244
Total	\$1,640	\$268	\$1,908

Table 4. Northern Alaska region project funded in 2008.

Study #	Title	2008	2009	2010	2011
<u>Stock Status and Trends</u>					
08-103	Kobuk River Sheefish Spawning and Run Timing	\$87.3	\$78.5	\$17.0	\$17.0
	Total	\$87.3	\$78.5	\$17.0	\$17.0

Table 5. Yukon region projects funded in 2008.

Study #	Title	Approved Budget (\$000)			
		2008	2009	2010	2011
<u>Stock Status and Trends</u>					
08-200	Kaltag Chinook Salmon Sampling	\$3.7	\$4.0	\$4.0	\$4.0
08-201	Henshaw Creek Salmon Weir	\$43.9	\$43.2	\$46.2	\$52.3
08-202	Anvik River Chum Salmon Sonar Enumeration	\$68.7	\$71.1	\$73.6	\$75.9
08-206	Yukon and Kuskokwim Coregonid Strategic Plan	\$119.7	\$175.7	\$0.0	\$0.0
<u>Harvest Monitoring and Traditional Ecological Knowledge</u>					
08-250	Use of Subsistence Fish to Feed Sled Dogs	\$42.9	\$31.9	\$0.0	\$0.0
08-253	Yukon River Teleconferences and In-season Monitoring	\$51.1	\$51.1	\$51.1	\$51.1
	Total	\$330.0	\$377.0	\$174.9	\$183.3

Table 6. Kuskokwim region projects funded in 2008.

Study #	Title	Approved Budget (\$000)			
		2008	2009	2010	2011
<u>Stock Status and Trends</u>					
08-300	Aniak River Rainbow Trout Seasonal Distribution	\$54.6	\$38.8	\$0.0	\$0.0
08-302	Lower Kuskokwim Subsistence Chinook Salmon ASL	\$94.0	\$117.6	\$119.1	\$127.5
08-303	George River Salmon Weir	\$162.8	\$171.5	\$150.0	\$142.2
08-304	Takotna River Salmon Weir	\$83.7	\$80.2	\$93.4	\$118.8
<u>Harvest Monitoring and Traditional Ecological Knowledge</u>					
08-351	Tuluksak Subsistence Chinook Salmon ASL	\$75.5	\$79.9	\$15.5	\$0.0
Total		\$470.6	\$488.0	\$378.0	\$388.5

Table 7. Southwest Alaska region projects funded in 2008.

Study #	Title	Approved Budget (\$000)			
		2008	2009	2010	2011
<u>Stock Status and Trends</u>					
08-402	Togiak River Chinook Salmon Radio Telemetry	\$176.4	\$120.7	\$0.0	\$0.0
08-405	Lake Clark Sockeye Salmon Counting Towers	\$56.1	\$57.0	\$58.3	\$59.6
Total		\$232.5	\$177.7	\$58.3	\$59.6

Table 8. Southcentral Alaska region projects funded in 2008.

Study #	Title	Approved Budget (\$000)			
		2008	2009	2010	2011
<u>Stock Status and Trends</u>					
08-501	Copper River Sockeye Salmon Inriver Abundance	\$185.8	\$205.4	\$0.0	\$0.0
08-502	Tustumena Lake Coho Salmon Radio Telemetry & Weirs	\$238.3	\$118.4	\$44.2	\$0.0
08-503	Kasilof River Steelhead Trout Radio Telemetry	\$78.9	\$62.9	\$22.4	\$0.0
08-504	Crooked & Nikolai Creeks Steelhead Trout Weirs & Video	\$40.0	\$45.6	\$12.6	\$0.0
Total		\$543.0	\$432.3	\$79.2	\$0.0

Table 9. Southeast Alaska region projects funded in 2008.

Study #	Title	Approved Budget (\$000)			
		2008	2009	2010	2011
<u>Stock Status and Trends</u>					
08-600	Karta River Sockeye Salmon Assessment	\$111.6	\$123.6	\$0.0	\$0.0
08-607	Unuk River Eulachon Assessment	\$34.0	\$36.4	\$0.0	\$0.0
<u>Harvest Monitoring and Traditional Ecological Knowledge</u>					
08-650	POW Island Steelhead Trout Subsistence Harvest Survey	\$70.4	\$74.0	\$0.0	\$0.0
08-651	Maknahti Island Subsistence Herring Fishery Assessment	\$27.2	\$42.0	\$0.0	\$0.0
Total		\$243.2	\$276.0	\$0.0	\$0.0

Project Number: 08-103
Project Title: Kobuk River Sheefish Spawning and Run Timing
Geographic Region: Northern Alaska
Data Type: Stock Status and Trends
Principal Investigator: Klaus Wuttig, ADF&G Sport Fish Division
Co-Investigator(s): Randy Brown, USFWS, Fairbanks Fish and Wildlife Field Office

Cost: **2008:** \$87,299 **2009:** \$78,534 **2010:** \$17,011 **2011:** \$17,011

Issue

The Kobuk River sheefish *Stenodus leucichthys* population supports a very substantial winter subsistence harvest that occurs in Hotham Inlet and Selawik Lake, and significant in-river subsistence and sport fisheries. Most sheefish are harvested in Hotham Inlet and Selawik Lake where the population is comprised of two discrete spawning populations, the Selawik and Kobuk River populations. The exploitation of these stocks is poorly understood due to incomplete estimates of total annual harvest, unknown stock composition in the mixed-stock winter fisheries, and unknown total exploitable stock abundance. An understanding of these basic elements is necessary to begin to describe the population dynamics of these stocks and identify sustainable harvest levels. Population monitoring is only feasible in river on the individual spawning populations, and estimates have been attained in the Kobuk River during 1995-1997, and in the Selawik River during 1995-1996 and 2004-2005. However, these spawning population estimates are problematic because an unknown but potentially significant proportion of mature fish from each population do not spawn annually and are therefore not enumerated. Prior to additional stock assessments, a better understanding of spawning locations, run timing, and particularly spawning frequency is needed. Estimates of spawning frequency are critical in determining whole population sizes based on in-river spawning population estimates (past and future) and precise descriptions of run timing and spawning locations would provide the basis for improving the design of mark-recapture techniques and provide valuable information for assessing the feasibility of using sonar technology for future enumeration work.

Objectives

1. Document spawning locations within the Kobuk River upstream of the village of Kobuk.
2. Describe the timing of spawning migrations (upstream and downstream) for mature sheefish within the Kobuk River drainage.
3. Estimate the proportion of the sheefish spawning population in 2008 and 2009 that returned annually to spawning areas upstream of the village of Kobuk from 2009 to 2013 such that each annual proportion is within 10% percentage points 90% of the time.
4. Identify and characterize different spawning frequency strategies used by adult sheefish in the Kobuk River, estimate the proportion of adults for each strategy, and estimate the potential variation in the proportion of adult sheefish spawning in any one year.

Methods

During 2008 and 2009, 130 sheefish will be surgically implanted with radio tags each year. Deploying tags over two years will guard against potential temporal variation. Because the spawning population returns to a single, discrete spawning area (i.e. hydrologic unit), behavioral-related differences such

as spawning frequency and selection of spawning areas is not expected to be a function of run timing. Nevertheless, efforts will be made to distribute radio tags in proportion to run strength to help ensure a more random sample. Sex-related differences in spawning behavior are more likely and therefore attempts will be made to distribute radio tags equally among males and females as the run progresses. Radio tags will be operational annually from mid June to mid November over a five-year period. Data related to movements, run-timing and spawning locations will be collected using a combination of aerial tracking surveys, ground-based receiving stations and boat surveys. At a minimum, each cohort of 130 radio-tagged sheefish will be monitored over a four-year period.

Partnerships/Capacity Building

This project is a cooperative effort between ADF&G, USFWS and the National Park Service (NPS), each providing significant in-kind support. Maniilaq and the villages of Shungnak and Kobuk support this project. At least one local hire will be formally employed by ADF&G to assist with sampling of fish and maintenance of tracking stations, and efforts will be made to utilize and compensate locals for logistical support (e.g. boat rentals, boat drivers, and land leases). Developing a trusting relationship among regional communities is vital for project success and future application of study results in sheefish management. To help establish trust, a long-term (2008–2013) educational program on sheefish will be designed to develop strong community interest/support, educate the students and adults about sheefish and the project, and develop fisheries skills in the community. The program will be administered by the ADF&G Rural Outreach Education Program in Kobuk and Shungnak where students will: 1) learn about sheefish and the project; 2) participate in hands-on activities such as practicing surgeries and maintaining their own tracking station in town; 3) monitor the progression of the spawning migration annually “real-time” using all data collected (i.e. aerial surveys and tracking station data); and 4) develop their own synthesis of what they have learned into a presentation to be shared with their community - locally and regionally.

Justification

The proposed work is technically sound and addresses an important subsistence sheefish fishery associated with Gates of the Arctic National Preserve, Selawik National Wildlife Refuge, Kobuk Valley Wilderness Area and Kobuk Valley National Park. Exploitation of sheefish is poorly understood, yielding incomplete information on stock abundance, stock composition, and annual harvest. Results from this work will describe run timing and spawning frequency, giving fishery managers the context for understanding previously completed stock abundance work. Furthermore, information gained in this project will provide a basis for developing future stock assessment projects. This project provides fundamental information needed to manage and sustain subsistence fisheries that target these stocks.

Project Number: 08-200
Project Title: Kaltag Chinook Salmon Sampling
Geographic Region: Yukon
Data Type: Stock Status and Trends
Principal Investigator: Richard Burnham, City of Kaltag

Cost: **2008:** \$3,750 **2009:** \$4,000 **2010:** \$4,000 **2011:** \$4,000

Issue

Knowledge of Chinook salmon mixed stock harvests are a prerequisite to understanding and evaluating changes to stock-specific production. This project helps fulfill the US-Canada Treaty Agreement by estimating the age, sex, length (ASL), and stock composition for the fishery in Subdistrict 4-A. Federal and State managers rate this project as a high strategic priority. The Office of Subsistence Management supported this project in 2001 (01-050), 2004–2006 (04-234) and 2007.

Objectives

1. Collect biological data from 250 Chinook salmon harvested by Kaltag subsistence fishers. These data include scales, sex, length, and an axillary process clip.
2. Record associated data such as date, harvest location, gear type, and mesh size.

Methods

1. **Study design:** Chinook salmon will be sampled in the round from the Kaltag subsistence harvest as soon after capture as practical. Sampling will occur throughout the duration of the run in proportion to abundance as much as possible. During sampling, all available fish will be sampled for an axillary process clip, scales, sex, and length. Capture method, mesh size, location, date, fish number, scale card number, and genetic vial number will be recorded.
2. **Data collection and reduction:** ADF&G will send sampling supplies to Kaltag before the field season begins in late May. Sampling technicians will be hired before the field season. Sample collection will begin as soon as subsistence fishers start harvesting salmon, usually early to mid-June.

Three scales are collected from the left side of the fish, two rows above the lateral line on the diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin, and then mounted on pre-printed gum cards. Length will be measured from mid-eye to fork of tail to the nearest five mm. Sex will be visually determined from external morphological characteristics or from internal examination of the gonads. Approximately $\frac{3}{4}$ -inch of the auxiliary process is clipped, placed in individually numbered vials, and the vial filled with ethanol. Associated data are recorded in field logbooks and later transferred to Opscan forms. After the majority of the Chinook salmon subsistence harvest has occurred, samples and associated data will be sent to the ADF&G Anchorage office for processing and database entry.

3. **Data reduction:** From August through December, samples will be processed, analyzed and summarized by ADF&G. ASL data will be compiled by the Stock Biology Laboratory and the axillary process clips will be compiled by the Genetics Laboratory to estimate stock composition for Canadian- and US-origin fish. Upon completion of sample processing and analysis, ADF&G will

forward preliminary results to the principal investigator for inclusion in performance, annual, and final reports. ADF&G final reports, which include data collected by the principal investigator, will be forwarded to the PI when available.

Partnerships/Capacity Building

The project directly involves Kaltag residents collecting in-season fisheries data from the subsistence Chinook salmon harvest and is in partnership with the Alaska Department of Fish and Game.

Justification

The project addresses an information need identified in the 2008 Request for Proposals. The project supplements the commercial ASL database by providing 250 samples from subsistence caught Chinook salmon in Subdistrict 4A. The scope of work is reasonable and the objectives are clear, measurable, and achievable. The project provides for direct involvement of a local community (two local hire technicians) in the collection of in-season fisheries data on the subsistence harvest. The project is reasonably priced and the information collected benefits the post-season evaluation of Chinook salmon. Federal and State managers have supported, and the Office of Subsistence Management has provided funds for, this continuation project since 2001.

Project Number: 08-201
Project Title: Henshaw Creek Salmon Weir
Geographic Region: Yukon
Data Type: Stock Status and Trends
Principal Investigator: Brandy Berkbigler, Tanana Chiefs Conference

Cost: **2008:** \$43,872 **2009:** \$43,215 **2010:** \$46,230 **2011:** \$52,280

Issue

Management of Koyukuk River salmon fishery is complex due to the limited number of escapement studies in the drainage. The Alaska Department of Fish and Game, Commercial Fisheries Division has conducted aerial surveys within this drainage since 1960 but the usefulness and reliability of that information is limited. Due to the mixed stock nature of the Yukon River salmon fishery, management practices are complex and the data needed for management must be collected throughout the drainage. The United States Fish and Wildlife Service (USFWS), Fairbanks Fish and Wildlife Field Office have compiled salmon escapement data from Henshaw Creek since 2000. The information collected (genetic fin clips, age, sex, and length) has allowed Federal and State managers to bridge the information gap between projects on the Koyukuk River. The Henshaw Creek weir is the only upper Koyukuk River drainage escapement project and can be used to compare with lower Koyukuk river escapement projects. Chinook *Oncorhynchus tshawytscha* and chum *O. keta* salmon from Henshaw Creek contribute to the subsistence and commercial fisheries harvest occurring in the Yukon River drainage. Subsistence and commercial harvesters along the Yukon and Koyukuk Rivers have identified a concern with the apparent decrease in the size of Chinook salmon. The usefulness in maintaining reliable escapement estimates and continued collection of age, sex and length data at Henshaw Creek will help to assess possible trends in Chinook and summer chum salmon run timing and escapement over time. This project addresses the priority information needs outlined for Yukon River salmon, including maintaining reliable estimates of Chinook and chum salmon escapement over time, and assessment of trends in Chinook age, sex and length. Additionally, with Tanana Chiefs Conference (TCC) as the primary investigator and through the hire of local residents, this project will satisfy the capacity building component addressed in the RFP for Native entities to effectively manage the resources.

Objectives

1. Determine daily run escapement and run timing of adult salmon.
2. Determine age, sex, and length composition of adult salmon.
3. Determine the number of resident fish passing the weir.
4. Serve as an outreach platform for Kanuti National Wildlife Refuge (KNWR) staff and TCC Partners Program fisheries biologist to conduct an onsite science camp.

Methods

A resistance board weir will be installed and operated on Henshaw Creek each year from 2008–2011. A live trap, installed near mid-channel, will allow salmon and resident species to migrate through the weir, where their passage will be enumerated daily and from where fish will be sampled to collect biological information. The weir will be operational from approximately the third week of June until the middle of August. A fish trap will be used to collect and sample salmon for age, length, and sex as they migrate

upstream as well as document the presence of resident fish. Escapement counts will be forwarded to the USFWS office daily. A camp will be established in association with the weir for the crew. The crew will consist of four people on site for the project duration. There will be high emphasis on local hires, most notably from those villages within the vicinity of the study site (Allakaket, Alatna, Bettles, Hughes, and Huslia). Henshaw Creek will also serve as a platform for a one week science camp with KNWR.

Partnerships/Capacity Building

This project has consulted with the Evansville Tribal Council in Bettles / Evansville to rent vehicles that will provide assistance in pre and post season logistics. There has also been consultation with KNWR to provide, in kind support with over wintering storage facilities for gear and annually being a participant in a science camp hosted at Henshaw Creek weir through a Challenge Cost Share Grant with KNWR. TCC will work with refuge staff, the Western Regional Advisory Council, Allakaket, Alatna, Hughes, and Evansville traditional councils to recruit locals. Local community support will be elicited through members at the annual TCC meeting of delegates. This project has been successful in hiring the required weir staff from the local village of Allakaket and plans to keep hiring locally within the communities of the Koyukuk River Drainage.

Justification

The Henshaw Creek weir is the only upper Koyukuk River drainage escapement project and is valuable in providing data to effectively manage the subsistence Yukon salmon fisheries. It provides an educational opportunity to rural students to learn about fisheries science and careers in natural resource management. The project has reached the highest level of capacity building and is a model for future projects in this arena.

Project Number: 08-202
Project Title: Anvik River Chum Salmon Sonar Enumeration
Geographic Region: Yukon
Data Type: Stock Status and Trends
Principal Investigator: Carl Pfisterer, ADF&G
Co-Investigator: Malcolm McEwen, ADF&G

Cost: **2008:** \$68,668 **2009:** \$71,051 **2010:** \$73,554 **2011:** \$76,181

Issue

The Anvik River contributes to the subsistence chum salmon fishery in the lower Yukon River, which is part of the Yukon Delta National Wildlife Refuge. The Anvik River sonar project has provided reliable estimates of chum salmon escapement to the Anvik River since 1979, is one of only two projects in the Yukon River drainage with an established Biological Escapement Goal (BEG) for summer chum salmon, and was identified in the 2008 FRMP as an important priority need in the Yukon Region for maintaining reliable estimates of chum salmon escapement over time. The sonar project's longevity and the river's history of being one of the largest producers of summer chum salmon in the Yukon River drainage combine to make this one of the most important projects for escapement monitoring and management of chum salmon in the Yukon Region.

Objectives

1. Estimate the daily summer chum salmon escapement passing the Anvik River sonar site.
2. Estimate the age and sex composition of the summer chum salmon spawning escapement.

Methods

Objective 1: The Anvik River sonar project will transition to operating a Dual Frequency Identification Sonar (DIDSON) in 2007. The DIDSON produces video like images of fish passing the site. Sonar will be deployed on each bank of the Anvik River and sonar data will be collected for 30 minutes of each hour, 24-hours per day, 7 days a week for the duration of the study. This will provide a total of 12 hours of data per day per bank. Counts will be expanded for the fraction of the day sampled to estimate daily passage.

Objective 2: For age and sex composition, a sample of 162 summer chum salmon will be collected in each of the following time strata: June 17–30, July 1–7, July 8–14, and July 15–30. Scale sample cards and mark-sense forms will be sent to Anchorage for processing at the conclusion of the season. A field notebook will be maintained recording sex, length, date, and gear type for each fish sampled.

Partnerships/Capacity Building

This project provides limited opportunities to develop partnerships and build local capacity. Information from this project is provided to both State and Federal fishery managers and is used in making daily summer chum salmon management decisions. In addition, the data are presented at Yukon River Fisheries Association teleconferences when discussing management actions with subsistence and commercial fishermen.

Justification

This project addresses an information need specifically identified in the 2008 Request for Proposals. The Anvik River is one of the top producers of summer chum salmon in the Yukon River accounting for approximately one third of total production. Approximately 74% of the total subsistence harvest for summer chum salmon occurs in the lower Yukon River. The Anvik River Sonar is an important monitoring project for summer chum salmon to assess run strength and meet biological escapement goals. Because of its 28-year funding history by the State, and the importance of the information to both State and Federal managed fisheries, OSM requires a 50% match by the State in the investigation plan, which is covered by 10.8 months of salary per year of three permanent ADF&G Fishery Biologists (\$84,000+).

Project Number: 08-206
Project Title: Yukon and Kuskokwim Coregonid Strategic Plan
Geographic Region: Yukon
Data Type: Stock Status and Trends
Principal Investigator: Randy Brown, USFWS, Fairbanks Fish and Wildlife Field Office
Co-Investigator: Caroline Brown, ADF&G Subsistence Division

Cost: **2008:** \$119,737 **2009:** \$175,727 **2010:** \$0 **2011:** \$0

Issue

Six whitefish species are commonly recognized in the Yukon and Kuskokwim rivers; sheefish *Stenodus leucichthys*, broad whitefish *Coregonus nasus*, humpback whitefish *C. pidschian*, Bering cisco *C. laurettae*, least cisco *C. sardinella*, and round whitefish *Prosopium cylindraceum*. Major subsistence fisheries take place for sheefish, broad whitefish, humpback whitefish, and Bering cisco at various locations and seasons. Least cisco and round whitefish are also harvested in subsistence fisheries but are generally not as specifically targeted as the others. At this time, no formal monitoring or management programs have been developed in the region for subsistence whitefish fisheries. In fact, our current understanding of whitefish life history and population biology in most areas of the Yukon and Kuskokwim regions is not sufficient to allow monitoring or management programs to be developed.

Geographic distributions of the whitefish species are reasonably well documented in a wide array of formal and informal fish survey reports, and in the general fish guidebooks for the region (McPhail and Lindsey 1970; Morrow 1980; Mecklenberg et al. 2002); however, species and stock-specific data on migrations, spawning habitats, rearing habitats, abundance, harvest levels, and other related information are insufficiently described. A strategic action plan for whitefish species will provide direction for research on these fish important for subsistence by outlining our current understanding of whitefish and whitefish fisheries within the two drainages, identifying information required for monitoring and management, highlighting gaps in biological and life history data, discussing major fisheries issues within the two drainages, and suggesting appropriate methods and approaches for research. Ultimately, an improved understanding of these species will enable the development of effective monitoring and management plans.

Objectives

Develop a strategic plan for research of whitefish species for the Yukon and Kuskokwim river drainages. This plan will include six major components:

1. a review of whitefish fisheries within the two drainages;
2. a review of the biological, life history, and ethnographic studies that have occurred in the region;
3. an assessment of data gaps;
4. a review of methods and approaches that have been used around the world to monitor and manage whitefish species with an assessment of their appropriateness for use in Alaska;
5. a discussion with stakeholders and other interested parties of issues, fisheries, and species of regional concern; and

6. writing and critical review of a strategic plan for whitefish research in the Yukon and Kuskokwim regions.

The plan will aim to provide a region-wide perspective to guide future whitefish research.

Methods

The proposed approach includes several major components, as outlined above. Initially the principal investigators will conduct background research and synthesis of biological and ethnographic studies, documentation of traditional knowledge, harvest data, and management reports. These syntheses will be distributed to a group of delegates with experience in fish biology, anthropology, and fish management, as well as representatives from fishery user groups in the Yukon and Kuskokwim regions. A series of meetings will be convened with these delegates to discuss and debate the information presented in the syntheses, and prioritize critical research needs and approaches. The principal investigators will consider the information from all sources and prepare a strategic plan for research of coregonid species for the Yukon and Kuskokwim river drainages.

Partnerships/Capacity Building

A number of potential participants from several organizations have been contacted to assess the interest level in the proposal project, and responses have been favorable. The contact list includes individuals from the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service, Alaska Department of Natural Resources, the Association of Village Council Presidents, Tanana Chiefs Conference, the Council of Athabascan Tribal Governments, the Kuskokwim Native Association, and the Yukon River Drainage Fisheries Association. In addition, a representative from the Yukon-Kuskokwim Delta, Western Interior, and Eastern Interior Regional Advisory Councils will be invited to participate in the meetings. Letters of support have been requested from a number of organizations.

Justification

This proposal addresses a priority information need identified in the 2008 Request for Proposals. Subsistence whitefish fisheries are second only to salmon in importance as a food resource for the Yukon and Kuskokwim rivers. With little information available about basic stock structure and life history information, subsistence management for whitefish stocks remains largely passive. The proposed study would identify biological and social science gaps in existing information, and explore appropriate methods for assessment, research, and management. Additionally, the group would develop criteria that could be used to assign relative priority levels among fisheries, species, user-groups, research objectives, and management options. The end product will be a peer reviewed strategic plan for research of whitefish species for the Yukon and Kuskokwim river drainages that can be used to direct future coregonid research and funding.

Project Number: 08-250
Project Title: Use of Subsistence Fish to Feed Sled Dogs
Geographic Region: Yukon
Data Type: Harvest Monitoring and Traditional Ecological Knowledge
Principal Investigator: David Andersen, Research North
Co-Investigator: Cheryl Scott, Alaskan Connections

Cost: **2008:** \$42,921 **2009:** \$31,920 **2010:** \$0 **2011:** \$0

Issue

It has been 16 years since the use and feeding of sled dogs has been systematically examined in the Yukon River drainage. A 1991 ADF&G study found that approximately 5,000 sled dogs in 32 Yukon River communities were being maintained to varying degrees using subsistence-caught fish and that more than 250,000 small salmon were being utilized each year to feed dogs. In the intervening decade and a half, salmon runs and salmon harvests have declined, sometimes dramatically. In 2000, the total subsistence harvest of Yukon River small salmon was estimated at less than 100,000 fish with an estimated 21,000 salmon utilized for dog food. It seems improbable that dog team owners heavily reliant on salmon to feed their dogs could cope with such significant reductions in salmon harvests without reducing kennel size or altering long-standing feeding practices, or both. The effects of these changes on the size, number, and use of dog teams in rural communities are unknown. The baseline data set collected in 1991 provides a rare opportunity to examine the dynamics of one of the more significant uses of subsistence-caught fish in interior Alaska during a time of unprecedented change. This study proposes to update the 1991 data set using the same methods and communities, to understand what changes have occurred with regard to village dog teams and the strategies mushers have utilized to feed them. Current information on this important issue will help Federal managers to be proactive and to better understand factors affecting subsistence fisheries along the Yukon River.

Objectives

1. Estimate the number of sled dogs in rural Yukon River Communities.
2. Describe contemporary uses of dog teams in Yukon River Communities.
3. Assess the extent to which subsistence-caught fish (salmon and non-salmon) are used to feed dogs.
4. Compare these data with data gathered in 1991 to assess changes and evaluate implications for subsistence management.

Methods

A two-year project is proposed, sampling the same seven study communities and using the same basic methodology as the 1991 study in order to achieve a comparable data set and assess specific changes. The project will utilize standard ethnographic research methods including face-to-face household surveys conducted with all dog-team owners in each survey community and key respondent interviews with a small subset of dog-team owners. Research practices will adhere to recognized social science ethics standards and principles for the conduct of research in the Arctic. The seven study communities proposed for sampling are: Fort Yukon, Huslia, Kaltag, Manley Hot Springs, Russian Mission, St. Marys, and

Tanana. Together, these communities are thought to represent the diversity of the Yukon River drainage in terms of geography, Native cultures, fishery resources, and participation in dog mushing activities.

Partnerships/Capacity Building

Community partnerships will be encouraged and enhanced through the hiring of local assistants in each community. Local assistants will be instrumental in identifying survey households and will accompany and assist the researcher during survey and interview sessions. Although the duties of each local assistant are expected to involve only 10–15 hours of work over a several day survey period, participation as the local assistant will provide that individual with important insight into social science data collection methods and will build capacity by contributing to the work experience, or expanding the pool, of individuals in rural communities familiarized with this kind of work.

Justification

This project is recommended for funding. The investigation plan addresses an important issue for Federal subsistence fisheries management, and will provide a diachronic perspective much needed to understand changing subsistence practices and inform subsistence management in an area with numerous conservation units. The project is technically sound, with solid objectives and proven methodology. The time frame and budget are reasonable. Investigators are uniquely well qualified to conduct the proposed work, as they did the original study 16 years ago.

Project Number: 08-253
Project Title: Yukon River Teleconferences and In-season Monitoring
Geographic Region: Yukon
Data Type: Harvest Monitoring and Traditional Ecological Knowledge
Principal Investigator: Jill Klein, Yukon River Drainage Fisheries Association
Co-Investigator: Jonathon Gerken, USFWS Fairbanks Fish and Wildlife Field Office

Cost: **2008:** \$51,000 **2009:** \$51,000 **2010:** \$51,000 **2011:** \$51,000

Issue

The proposed project deals with an important subsistence resource (salmon) in an area with multiple Federal conservation units. Improving management of this resource and finding ways to incorporate users and local knowledge into resource management is a priority for the Yukon-Kuskokwim Delta, Western Interior, and Eastern Interior Regional Advisory Councils, management agencies and tribal organizations. In-season teleconferences and in-season harvest interviews are a practical method for improving communication and bringing these entities together.

Objectives

1. Maintain and expand communication and information sharing between the Yukon salmon fishery users and agency staff through weekly in-season teleconferences.
2. Promote local involvement in Yukon River fisheries management through capacity building and participation.
3. Promote inter-agency information sharing for Yukon River salmon fisheries with State, Federal and international entities (i.e., ADF&G, U.S. Fish & Wildlife Service, Yukon River Salmon Committee, Canada and Department of Fisheries and Ocean, Canada).
4. Foster increased participation, timely sharing and uniform reporting of in-season information from fishers to managers and vice versa.
5. Document local salmon run timing and perceived abundance of salmon in the Yukon River drainage through summer and fall fishing seasons.
6. Estimate the weekly average subsistence harvest progress for Chinook salmon in 10 communities within the drainage.

Methods

Teleconference calls will be facilitated once a week during the 2008–2011 fishing seasons by the YRDFA Executive Director and/or staff on every Tuesday of the season at 1300 hours (Alaska Time). Following each call YRDFA will distribute a short summary, detailing announcements of the management decisions, management rationale and key points of subsistence users and public.

The inclusion of in-season harvest interviewers as consistent participants in the teleconference calls will provide a greater consistency in reporting subsistence harvest information. Ten interviewers will be selected and hired by YRDFA from the communities of Emmonak, Marshall, Holy Cross, Kaltag, Huslia, Allakaket, Galena, Beaver, Circle, and Eagle. Interview methodology and information collection

will follow the methods outlined by Gerken and Holder (2005). Preseason training will occur to ensure interviewers are collecting information appropriate to the methodology.

Partnerships/Capacity Building

Teleconferences are a practical method for bringing together a diverse group of local users that utilize and manage the salmon resource. However, participation in each teleconference call varies dependent upon salmon run timing and management actions. A summary of attendance on the 2006 teleconferences indicated that community attendance declined throughout the season after the historical quarter point of the run, June 15, in the lower river, traditionally the beginning of commercial fishing in the lower river. Similarly, an increase in community attendance was observed prior to the first fall season commercial period occurring on July 28. The use of teleconferences to promote information sharing is a valuable tool if communities participate, but without attendance the utility is diminished.

Justification

The Technical Review Committee recommends funding Option B of this project pending modifications as outlined above. Specifically, investigators need to correctly characterize how the information will be used, and also revise objectives to include no more than three. The project addresses an important subsistence resource (salmon) in an area with multiple Federal conservation units. Improving management of this resource and finding ways to incorporate users and local knowledge into the management of this resource has been a priority of the three area Regional Advisory Councils (Western Interior, Eastern Interior and Yukon-Kuskokwim Delta). The project is a collaborative effort, and investigators have the capability to successfully conduct the project. The methods are basic, but overall the project is technically sound and the budget is reasonable.

Project Number: 08-300
Project Title: Aniak River Rainbow Trout Seasonal Distribution
Geographic Region: Kuskokwim
Data Type: Stock Status and Trends
Principal Investigator: Klaus Wuttig, ADF&G Sport Fish Division
Co-Investigator: Corey Schwanke, ADF&G Sport Fish Division
 Dave Orabutt, Kuskokwim Native Association
 Derek Radar, Kuskokwim Native Association

Cost: **2008:** \$52,284 **2009:** \$37,182 **2010:** \$0 **2011:** \$0

Issue

The rainbow trout *Oncorhynchus mykiss* population in the Aniak River contributes significantly to the local subsistence harvest of freshwater fish and also supports an increasingly popular rainbow trout sport fishery. Customary and traditional use determinations of rainbow trout are in Federal regulation for the nearby communities of Aniak, Chuathbaluk, and Upper and Lower Kalskag. Currently, there is a strong local concern about an apparent large decline in the population of rainbow trout in the Aniak River since the mid 1980s. Historic and baseline information on their life history, abundance, and stock composition does not exist and is needed to formulate and implement regulations to properly manage the rainbow trout for the purpose of satisfying a diversity of user groups while ensuring long-term sustainability. Therefore, the goal of this study is to collect information on the seasonal movements of rainbow trout in the Aniak River to determine if discrete stocks exist within the drainage. In the absence of abundance-based information, quantifying rainbow trout movements will help to identify the distribution(s) of those fish affected by the subsistence and sport fisheries. The telemetric data, survey or catch information attained during radio-tagging operations, and interviews are needed in designing a mark-recapture experiment to estimate population size to address relevant issues such as population closure, timing of sampling, and selection of index areas.

Objectives

1. Describe the seasonal (summer 2008 to winter 2009/2010) distributions of mature sized rainbow trout ≥ 420 mm FL in the Aniak River implanted with radio transmitters during the summer feeding period when rainbow trout distributions are most widespread.
2. For each of the four hydrologic units (Salmon River, Kipchuk River, the East Fork Aniak River to the Kipchuk River, and mainstem Aniak River from the Kipchuk River to the Buckstock River) estimate the proportion of radio-tagged rainbow trout that remained in the hydrologic unit where they were tagged. These estimates will be made for each aerial tracking survey and each estimated proportion will be within 25 percentage points of the true value 95% of the time.

Methods

During the summer of 2008, 125 rainbow trout will be radio-tagged during the peak spawning period of Chinook and chum salmon (late July–early August). Radio tags will be systematically deployed throughout what is believed to most (e.g., >90%) of their summer distribution. These fish will be monitored over an approximately 18-month period and will be used to describe seasonal movement patterns, locate significant spawning and overwintering areas, and identify potentially unique stocks within the drainage that may be differentially affected by the subsistence and sport fisheries.

Partnerships/Capacity Building

KNA and ADF&G, Sport Fish Division, have developed a meaningful relationship through the Chinook salmon telemetry projects on the Kuskokwim and Holitna Rivers (FIS 02-046 and 05-302). This developing relationship is vital to develop local support for this project, particularly in the interpretation of the data collected for formulating future regulations or management plans. KNA is very supportive of this project, are co-investigators on this project, and will have direct, meaningful participation in field work, project planning, report reviewing, and community outreach. KNA has agreed to provide an intern and technician for the field work, and in communities most affected, to coordinate local outreach efforts including traditional council or community meetings, regional meetings, school visits, and news letters/articles. Consultations with the Yukon Delta National Wildlife refuge are ongoing and the refuge has agreed to provide in-kind support (e.g., use of aircraft for aerial surveys).

Justification

This is a well designed study that potentially could address a long term resource issue. The investigators are qualified and experienced in conducting this type of project. The technical merit, investigator ability and partnership and capacity building component of this investigation were all rated high. The investigators addressed study design concerns raised by the TRC in the 2006 IP review. Local concern over stock declines observed by subsistence fishermen raises the potential for regulatory action for the Federal Subsistence Board. Information on basic stock biology of Aniak River rainbow trout will be necessary to evaluate the sustainability of current subsistence harvest levels and the potential harvests from the catch and release sport fishery. Matching funds of over \$95,000 by ADF&G make this project very compelling.

Project Number: 08-302
Project Title: Lower Kuskokwim Subsistence Chinook Salmon ASL
Geographic Region: Kuskokwim
Data Type: Stock Status and Trends
Principal Investigator: Doug Molyneaux, ADF&G Commercial Fisheries Division
Co-Investigator: Greg Roczicka, Orutsaramiut Native Council

Cost: **2008:** \$90,923 **2009:** \$112,305 **2010:** \$113,772 **2011:** \$121,920

Issue

About 80% of the Kuskokwim River Chinook subsistence harvest is taken from the lower river, which is within the boundaries of the Yukon Delta National Wildlife Refuge. The 2008 Request for Proposals seeks projects that quantify and assess subsistence salmon harvest in the region, and there is special need to also quantify the annual age, sex, and length (ASL) composition of the subsistence harvest. In addition, managers must consider the ASL composition of the spawning escapement and commercial harvest when formulating fishery management strategies. Chinook salmon mature and return to spawn over a wide range of ages, and the array of age classes span a size range much broader than any other salmon species. Kuskokwim River subsistence fishers harvest a large fraction of the total annual Chinook salmon run, and these fishers commonly employ practices that selectively take the larger and older fish. One of the consequences of this selective harvest practice is that it leaves a higher proportion of smaller Chinook salmon to spawn each year. Managers are concerned about hereditary implications of this practice that could lower the average age and size of maturity of future generations of Chinook salmon returns. In addition, there is concern that selective harvest practices removes a disproportionate fraction of female Chinook and that this removal could result in critically low egg deposition, especially in years of low escapement. Notwithstanding these concerns, subsistence fishers clearly prefer to harvest large Chinook.

Also at issue is how the subsistence fishery is impacted by the commercial fishery. The Alaska Board of Fisheries (BOF) reestablished a directed commercial fishery for Chinook in the lower Kuskokwim River during their January 2007 meeting, and gave managers the option to allow use of gillnets with up to 8-inch stretched mesh sizes (large mesh), a practice that has not been allowed since 1984. The default option is to restrict commercial fishers to using 6-inch or smaller mesh size (small mesh). The selectivity of small mesh web in the commercial fishery actually has a strong mitigating effect to the large mesh web preferred by subsistence fishers.

The potential of a commercial fishery with large mesh web has raised concerns among Federal subsistence users that the commercial fishery would directly compete with subsistence fishers for the same segment of the Chinook salmon run—large fish, and would progressively reduce the availability of larger Chinook salmon to upstream subsistence users. A large mesh commercial fishery would also compound the impacts of selective harvest practices described above for the subsistence fishery.

Objectives

1. Describe the annual ASL composition of Chinook salmon in the lower Kuskokwim River subsistence harvest.
2. Characterize the annual ASL composition of Chinook salmon in the lower Kuskokwim River subsistence harvest by gear type (i.e., gillnets with mesh of 6 inches or smaller, gillnets with mesh between 6 and 8 inches, gillnets with mesh of 8 inches or larger, and rod and reel).

3. Characterize and compare the annual ASL composition of Chinook salmon in the lower Kuskokwim River subsistence harvest by temporal strata (i.e., fish harvested for the early, middle and late portions of the run).

Methods

This study estimates the ASL composition of the subsistence harvest of Chinook salmon in the lower Kuskokwim River by recruiting subsistence fishers from Bethel and lower river villages to collect ASL data from their subsistence catches, and then applying the findings to the total subsistence Chinook harvest in the lower river. This study is a continuation of FIS 05-306. Lower Kuskokwim River is defined as the portion of the river from Eek Island at the mouth of the Kuskokwim River upstream to Tuluksak (rkm 192).

Partnerships/Capacity Building

ADF&G/CF and ONC will conduct this project in partnership. ADF&G/CF is responsible for data collection from communities outside the Bethel area, for data processing, and reporting. ONC is responsible for data collection from Bethel and fish camps within a few miles of Bethel. ONC has applied for an OSM Partners Biologist position under the 2008 Request for Proposals, and if funded, the ONC Partners Biologist will be involved with data processing and reporting.

Justification

This investigation plan is seeking continuation funding for the collection and analysis of biological age-sex-length (ASL) samples from subsistence caught Chinook salmon harvested in the lower Kuskokwim River. Technical questions regarding sampling procedures have been addressed by the investigators. The investigators have demonstrated the ability of conducting this work in a timely and professional manner. Collection of biological samples from the Chinook salmon subsistence harvest have been identified as a high priority by the Kuskokwim Fisheries Resource Coalition (KFRC) and Kuskokwim Salmon Strategic Plan. Collection of samples from subsistence fisheries requires the support and cooperation of subsistence users; consideration of local social and cultural values must be respected when undertaking scientific sampling of subsistence foods. For this reason, ONC, the traditional tribal council for the Bethel area, plays a major role in social/cultural aspects of this project and the successful implementation and community support of this project.

Project Number: 08-303
Project Title: George River Salmon Weir
Geographic Region: Kuskokwim
Data Type: Stock Status and Trends
Principal Investigator: Doug Molyneaux, ADF&G Commercial Fisheries Division
Co-Investigator: David Orabutt, Kuskokwim Native Association
 Daniel Costello, ADF&G Commercial Fisheries Division

Cost: **2008:** \$158,982 **2009:** \$167,394 **2010:** \$145,864 **2011:** \$138,163

Issue

George River salmon contribute to subsistence, commercial, and recreational fisheries within the Yukon Delta National Wildlife Refuge. Contributing to numerous initiatives that are inclusive of the entire Kuskokwim River drainage, the George River weir is one of several projects used to develop reliable estimates of abundance, run timing, stock structure, productivity, and carrying capacity of salmon stocks over a broad geographic scale in the Kuskokwim Region. The project provides fundamental escapement information necessary to facilitate in-season management decisions and to assess trends in salmon populations. This project incorporates substantial capacity building and outreach components. Natural resource development in nearby drainages is expected to intensify subsistence and recreational use of George River salmon populations, heightening the need for continued monitoring of George River salmon escapements.

Salmon escapements to the George River weir have been monitored successfully since 1996. Information from this project has become integrated into the annual management process, both by providing insights into escapement and stock specific run timing through the fishery. The escapement age, sex, and length information collected at George River provides part of the context needed to assess the impacts of subsistence harvest practices.

Objectives

1. Determine daily and annual escapements of Chinook, chum, sockeye, and coho salmon to the George River from 15 June to 20 September.
2. Estimate the age-sex-length (ASL) composition of total Chinook, chum, and coho salmon escapements to the George River from a minimum of three pulse samples, one collected from each third of the run, such that the simultaneous 95% confidence intervals of age composition in each pulse are no wider than 0.20 ($\alpha = 0.05$ and $d = 0.10$).
3. Serve as platforms to facilitate other fisheries research projects (e.g., tagging studies).

Methods

Investigators will install a resistance board weir on the lower George River. Passage chutes in the weir will allow fish to be speciated and counted as they pass upstream, and a live trap will be used to sample salmon for scales, sex and length information, and for tag recovery. ASL data is processed post-season under the *Kuskokwim Salmon ASL Assessment Project* (FIS 07-303). Investigators will also record daily water temperature, water level, and weather conditions. A local technician hired by KNA will operate

the project along with a lead crew member provided by ADF&G. The project will serve as a platform for several research initiatives proposed to AYK-SSI beginning in 2008, and for continuation of a high school internship program funding which is being sought through separate sources.

Partnerships/Capacity Building

ADF&G and KNA operate the George River weir jointly. Planning, operation and data analysis associated with the weir is done jointly by staff from KNA and ADF&G. KNA has a proven track record of effective involvement in weir operation. Past interactions between KNA, ADF&G/CF, and local communities has created a high level of public awareness about salmon management and stock status, and has fostered career interests in fisheries through the student internship program.

Justification

Although the cost of this project has increased significantly for the reasons provided by the investigators, the TRC recommends continued funding of this project. The George River weir provides important information to in-season subsistence fishery managers and continuation of the weir is important for monitoring escapement of Chinook, chum and coho salmon in the middle Kuskokwim River. Data from this project is used in-season to assess escapements and postseason for run reconstruction studies currently being developed for Chinook, chum and sockeye salmon stocks in the Kuskokwim River. Salmon produced in the George River provide a clear nexus to large subsistence salmon fisheries in the Yukon Delta NWR. The project is technically sound and the investigators have an excellent record for completing the proposed work and delivering quality work products in a timely manner. A high level of capacity building has been developed between ADF&G and KNA as co-investigators of this project. Public outreach, opportunities for high school and college internships, and a strong sense of community involvement and identification with this project have been accomplished and should continue.

Project Number: 08-304
Project Title: Takotna River Salmon Weir
Geographic Region: Kuskokwim
Data Type: Stock Status and Trends
Principal Investigator: Doug Molyneaux, ADF&G Commercial Fisheries Division
Co-Investigator: Carole Absher, Takotna Tribal Council
 Daniel Costello, ADF&G Commercial Fisheries Division

Cost: **2008:** \$82,967 **2009:** \$79,923 **2010:** \$92,867 **2011:** \$118,410

Issue

Takotna River salmon contribute to subsistence, commercial, and recreational fisheries within the Yukon Delta National Wildlife Refuge, and the Takotna River weir contributes to numerous initiatives that are inclusive of the entire Kuskokwim River drainage. As the only ground-based escapement monitoring project in the upper Kuskokwim River drainage, the Takotna River weir is one of several projects used to develop reliable estimates of abundance, run timing, stock structure, productivity, and carrying capacity of salmon stocks over a broad geographic scale in the Kuskokwim Region. The project provides fundamental escapement information necessary to facilitate in-season management decisions and to assess trends in salmon populations. This project is essential as a platform for several other projects and for developing escapement goals.

Salmon escapements to Takotna River weir have been monitored successfully since 2000. Information from this project has become integrated into the annual management process, by providing escapement and stock specific run timing data.

Objectives

1. Determine daily and annual escapements of Chinook, chum, sockeye, and coho salmon to the Takotna River upstream of the village of Takotna from 24 June to 20 September.
2. Estimate the age-sex-length (ASL) composition of total Chinook, chum, and coho salmon escapements to the Takotna River from a minimum of three pulse samples, one collected from each third of the run, such that the simultaneous 95% confidence intervals of age composition in each pulse are no wider than 0.20 ($\alpha = 0.05$ and $d = 0.10$).
3. Serve as platforms to facilitate other fisheries research projects (e.g., tagging studies).
4. Mentor high school students through the TTC high school internship program.

Methods

Investigators will install a resistance board weir on the Takotna River. Passage chutes in the weir will allow fish to be speciated and counted as they pass upstream, and a live trap will be used to sample salmon for scales, sex and length information, and for tag recovery for proposed tagging projects. Investigators will also record daily water temperature, water level, and weather conditions. A local technician hired by TTC will operate the project along with a lead crew member provided by ADF&G. The project will also serve as a platform for an established high school mentorship program operated by TTC in which local students will assist in weir operations as part-time employees.

Partnerships/Capacity Building

Takotna River weir will be operated as a partnership between ADF&G/CF and TTC. ADF&G/CF will provide crew members and biologist support, and TTC will provide crew members and high school interns. TTC will assume primary responsibility for logistic support during the field season, and ADF&G/CF will assume primary responsibility for technical support and post-season data analysis and reporting. Focus areas of both partners differs, but each has equal standing. Decisions as to planning, operations, and data interpretation are derived through joint consultation. Past interactions between TTC, ADF&G/CF, and local communities has created a high level of public awareness about salmon management and stock status, and has fostered career interests in fisheries through the student internship program.

Justification

The Takotna River weir provides important information to in-season subsistence fishery managers and continuation of the weirs is important for monitoring escapement of Chinook, chum and coho salmon in the upper Kuskokwim River. The project is also used as a capture site for several mark/recapture studies currently ongoing in the Kuskokwim drainage. The project is technically sound and the investigators have demonstrated the capability to conduct the proposed work in a timely and professional manner. The capacity building elements of this project have been given recognition by educators and community leaders.

Project Number: 08-351
Project Title: Tuluksak Subsistence Chinook Salmon ASL
Geographic Region: Kuskokwim
Data Type: Harvest Monitoring and Traditional Ecological Knowledge
Principal Investigator: Ken Harper, USFWS Kenai Fish and Wildlife Field Office
Co-Investigator: Steve Miller, USFWS Kenai Fish and Wildlife Field Office

Cost: **2008:** \$89,663 **2009:** \$96,482 **2010:** \$34,444 **2011:** \$0

Issue

The Tuluksak River Chinook salmon escapement typically has a low percentage of females, ranging between 14% and 37% and averaged 26% between 1991 and 2006. The lowest female percentages correspond with the highest total harvests of subsistence and commercial fisheries, that occurred in the early 1990s. Direct causal effects from the high utilization years have not been established. In 2006, female Chinook salmon comprised 28% of the escapement in the Tuluksak River, although this number was derived from one of the lowest Chinook salmon escapements documented in the history of the Tuluksak River weir. Heavier than normal harvest pressure on the Tuluksak River natal stock may have occurred. High fuel costs exceeding \$5.00 per gallon may have shifted fishing pressure from an active drift gillnet fishery in the main Kuskokwim River to a passive set-net fishery along channels in the Kuskokwim River leading to and channels within the Tuluksak River. An intensive in-river fishery targeting a specific river's salmon population may negatively affect size, age and sex composition.

Adequate escapements to individual tributaries and main stem spawning areas are required to maintain genetic diversity and sustainable harvests. Stocks or species returning in low numbers, or early and late portions of runs may be incidentally over harvested by intensive fishing pressure on abundant stocks. Data on escapement is lacking for many individual stocks in the Kuskokwim River drainage. It is important to monitor the fish returning to the Tuluksak River for in-season management and to build a database to establish escapement goals. Information on the abundance, run timing and subsistence use of Chinook salmon in the Tuluksak River is needed to ensure its conservation.

Objectives

1. Estimate the age, sex, and length composition of the Chinook salmon subsistence harvest in each of three zones near the confluence of the Kuskokwim and Tuluksak rivers such that simultaneous 95% confidence intervals of 0.20.
2. Test the hypothesis that the age, sex, and length composition of the Chinook salmon harvested in the subsistence fishery does not differ among three zones near the confluence of the Kuskokwim and Tuluksak rivers.
3. Test the hypothesis that the age, sex, and length composition of Chinook salmon harvested in the subsistence fishery near the confluence of the Kuskokwim and Tuluksak rivers does not differ from that of the escapement that passes the Tuluksak River weir, with a probability of at least 0.65 to detect a difference of at least 0.10 between any two sex at age proportions.

Methods

Local residents will be hired through the Tuluksak village council to conduct sampling during the season. The subsistence fishing area around the confluence of the Tuluksak and Kuskokwim rivers will be divided

into three zones constructed to capture potential differences in fishing gear and location. The statistical criteria can be satisfied with a sample size of approximately 225 fish from each zone to account for incomplete age and sex information based on 10 sex at age categories (two sexes and ages 1.1, 1.2, 1.3, 1.4, and 1.5). Harvests occur throughout the period from late May to mid-July, though the majority of the harvest will likely be taken in early to mid-June. An attempt will be made to collect ASL data from each Chinook salmon in a catch being sampled to avoid potential bias caused by the selection of individual fish.

Chinook salmon sampled from the Tuluksak River escapement will be pooled into a single sample that will be treated as a simple random sample. A chi-square test of homogeneity will be used to test the hypothesis that the sex at age composition of the resultant harvest and weir samples do not differ. ANOVA will be used to test the hypothesis that mean length does not vary between the harvest and weir, by sex at age category.

Partnerships/Capacity Building

Capacity building will continue, as the USFWS mentors and trains 2 village technicians and high school students. We have developed a formal agreement that has been signed by both parties committing the Service to train village personnel. This will provide an educational basis for employees and the village government to further their understanding of the management of lower Kuskokwim River commercial and subsistence fisheries.

Justification

While not identified as a priority in the Request for Proposals, the issue that would be addressed by this project, a low proportion of females in the Tuluksak River Chinook salmon spawning escapement, is of great concern to fishery managers. This project would provide information that would indicate whether Chinook salmon subsistence fisheries near the Tuluksak River are harvesting a disproportionately high proportion of females. While the investigators successfully addressed the technical issues identified in the TRC proposal review, the following items in the investigation plan need to be addressed and modifications made where needed: 1) participating families should be using gillnet gear representative of that used by most other families in each zone; 2) the field season should be shortened to about 1.5 months to reduce project costs while still obtaining needed information; 3) to further reduce costs, consideration should be given to hiring only one weir technician, if the investigators are successful in hiring a local individual to coordinate and monitor sampling; and 4) consultations need to be held with Tuluksak Native Community to obtain their cooperation and input on the proposed project.

Project Number: 08-402
Project Title: Togiak River Chinook Salmon Radio Telemetry
Geographic Region: Southwest Alaska
Data Type: Stock Status and Trends
Principal Investigator: Cheryl Dion, USFWS Anchorage Fish and Wildlife Field Office
Co-Investigator: Pat Walsh, USFWS Togiak National Wildlife Refuge
 Robbin LaVine, Bristol Bay Native Association

Cost: **2008:** \$176,376 **2009:** \$120,656 **2010:** \$0 **2011:** \$0

Issue

Chinook salmon *Oncorhynchus tshawytscha* are important for subsistence, sport, and commercial harvest in the Togiak River. The Alaska Department of Fish and Game (ADF&G) has established an escapement goal in the watershed of 10,000 Chinook salmon based on aerial surveys. Average estimated Chinook salmon spawning escapement from 1995 to 2004 was 13,134 fish, with an average harvest of 10,282 fish, representing a 44% exploitation rate. In 2005 9,500 Chinook salmon were harvested with escapement estimated at 10,188, representing a 48% exploitation rate (Westing et al. 2006). The Office of Subsistence Management, through its strategic planning process, has identified the need to obtain reliable escapement estimates for Chinook salmon in the Togiak River (OSM 2005). The Bristol Bay Regional Advisory Council has also identified the need for improved monitoring of salmon escapement in the Togiak River (OSM 2003). The USFWS will use mark-recapture methods to estimate the total abundance of Chinook salmon and to investigate the effectiveness of aerial surveys to monitor Chinook salmon escapement in the Togiak River watershed.

Objectives

1. Estimate the proportion of Chinook salmon migrating past a weir on Gechiak Creek;
2. Estimate the abundance of Chinook salmon escaping into the Togiak River watershed such that the estimate will have a 90% probability of being within 25% of the true abundance;
3. Estimate the weekly age and sex composition of spawning Chinook salmon in Gechiak Creek, such that simultaneous 90% confidence intervals have a maximum width of 0.20;
4. Estimate the mean length of Chinook salmon by sex and age;
5. Document Chinook salmon spawning locations in the Togiak River watershed; and
6. Evaluate the effectiveness of aerial spawning ground surveys for monitoring Chinook salmon abundance in the Togiak River watershed.

Methods

The USFWS will conduct a mark-recapture experiment to estimate the abundance of Chinook salmon in the Togiak River watershed. Fish will be captured and marked with radio transmitters in the lower 5 km in the mainstem of the Togiak River. The marking location is upriver from the majority of the harvest, so estimates of abundance will be related to the escapement. Capture effort will be controlled to deploy tags in proportion to abundance. Chinook salmon will also be tagged with colored spaghetti tags to test the feasibility of identifying the presence of spaghetti tagged fish at the Gechiak Creek weir using underwater

video. These tags will serve as a secondary mark to determine loss of radio tags. The recapture event will consist of a fixed receiver station co-located with a video equipped weir on Gechiak Creek. Additional receiver stations will be placed at strategic locations within the watershed. Multiple searches from a fixed-wing aircraft will be conducted to locate marked fish in other areas of the Togiak River watershed, verify accuracy of fixed telemetry stations, and to document Chinook salmon spawning activity and locations.

Partnerships/Capacity Building

The USFWS Anchorage Fish and Wildlife Field Office will be responsible for the day-to-day operations at the project sites and will provide biological expertise and training to conduct the study, a crew leader, a technician, and two volunteers. BBNA will work with the Village of Togiak to provide one local hire to work with the weir crew and one local hire to work with the gillnetting and tagging crew. Togiak NWR will conduct aerial surveys and provide logistical support.

Justification

Obtaining reliable estimates of spawning escapement over time, identifying critical factors, and describing timing and migration patterns for Togiak River Chinook salmon is a high priority information need identified in the 2008 Request for Proposals. Togiak River Chinook salmon provide an important fishery for subsistence, sport and commercial harvesters. Improved information on Chinook salmon spawning escapement will provide for better management and will help evaluate the effectiveness of aerial surveys. The investigators have been responsive to the TRC comments in developing the investigation plan and have included a substantial match of \$112,000 in 2008 and \$96,000 in 2009, providing greater than a 50% match as requested in the RFP.

Project Number: 08-405
Project Title: Lake Clark Sockeye Salmon Escapement and Population Monitoring
Geographic Region: Southwest Alaska
Data Type: Stock Status and Trends
Principal Investigator: Dan Young, National Park Service
Co-Investigator: Carol Ann Woody, US: Science and Education
 Robbin LaVine, Bristol Bay Native Association

Cost: **2008:** \$56,052 **2009:** \$56,962 **2010:** \$58,318 **2011:** \$59,633

Issue

This project continues monitoring sockeye salmon escapement to the Lake Clark drainage in southwest Alaska. Escapement monitoring on the Newhalen River has been funded by OSM since 2000 to provide a reliable estimate of escapement to Lake Clark. Obtaining reliable estimates of spawning escapement over time is the number one priority identified in the Bristol Bay-Chignik Strategic Plan and was specifically identified in the 2008 request for proposals. This project will provide information on daily and annual Lake Clark escapement estimates, run timing, and salmon age, sex and length composition, which will aid in assessing whether escapement is adequate to meet subsistence needs and evaluating current stock status and trends. The Lake Clark drainage is located within the Federally managed Lake Clark National Park and Preserve.

Since 1996, sockeye salmon returns to the Kvichak River and Lake Clark watersheds have declined for unknown reasons. The Kvichak River escapement has been below the minimum escapement goal in five of the last seven years and the average escapement of sockeye salmon to Lake Clark during 2000–2006 has been about 68% lower than the documented escapements in 1980–1984. Concurrent with declines in escapement, subsistence harvest in the Kvichak River drainage has declined from an average of about 60,000 fish harvested annually to 38,000 fish harvested in 2004.

Objectives

1. Estimate sockeye salmon escapement to Lake Clark.
2. Determine age, sex and length composition of the Lake Clark escapement

Methods

Sockeye salmon will be counted and sampled as they ascend the Newhalen River. Standard ADF&G counting tower protocols will be used to enumerate fish. Age, sex and length data will be collected from sockeye salmon in collaboration with the subsistence communities of Newhalen/Iliamna and Nondalton. Locally hired technicians will assist with escapement monitoring and sampling the age composition of the subsistence catch.

Partnerships/Capacity Building

This project has an established history of partnerships and capacity building. The USGS and NPS have successfully administered FIS 01-095 *Population monitoring of sockeye salmon from Lake Clark and the Tazimina River*, FIS 00-042 *Population assessment of Lake Clark sockeye salmon*, and FIS 05-402 *Lake Clark sockeye salmon escapement and population monitoring* in collaboration with the Kijik Corporation,

Southwest Region

Nondalton Tribal Council and Villagers, Iliamna/Newhalen Villagers, and the Universities of Alaska and Montana. Local youth have been trained as biotechnicians and future project leaders through an intern program initiated in 2000.

A partnership with Bristol Bay Native Association has been added to this project to formalize partnering between NPS and local Native organizations and to assist with hiring local residents.

Justification

Lake Clark sockeye salmon escapement monitoring has been identified as a high priority information need in the strategic plan for this area as well as by the Regional Advisory Council. This project will continue monitoring efforts previously funded through Monitoring Program since 2000. There continues to be strong community support for continuing this project, and past efforts by investigators have been highly successful in hiring, training, and mentoring local high school and college students. The investigators have included a substantial match of \$45,420, providing an 81% match to requested funds. Finally, the investigators and their agencies are well qualified to conduct and administer this work.

Project Number: 08-501
Project Title: Copper River Sockeye Salmon In-river Abundance
Geographic Region: Southcentral Alaska
Data Type: Stock Status and Trends
Principal Investigator: Keith van den Broek, Native Village of Eyak
Co-Investigator: Michael Link, Jason Smith, Guy Wade, LGL AK Research Assoc.

Cost: **2008:** \$185,809 **2009:** \$205,385 **2010:** \$0 **2011:** \$0

Issue

Copper River sockeye salmon sustain large and important subsistence fisheries under Federal jurisdiction; and subsistence, commercial and sport harvests are significant in comparison to abundance. Management of Copper River sockeye salmon is complex due to inter-annual variation in the size and timing of stocks, fisheries that target a mixture of stocks and difficulties in estimating abundance due to the physical characteristics of the drainage. Recently, returns of sockeye salmon to several tributaries of the upper Copper River basin (e.g., Gulkana Hatchery, Tanada Creek weir) have been lower than expected given the acoustic-based estimates of abundance obtained from the Miles Lake sonar site. To further confound certainty in the abundance estimates provided by the Miles Lake sonar, the Alaska Department of Fish and Game (ADF&G) is close to completion in upgrading their Bendix acoustic system with a newer and much different acoustic system (dual frequency identification sonar—DIDSON). The management system and management plans for Copper River sockeye salmon have been built around the old Bendix sonar counts. The degree of comparability of the old and new acoustic systems is uncertain and the efficacy of the original Bendix acoustic counter has never been independently validated with an alternative technique.

We propose to use an independent technique to validate estimates provided by the new acoustic system and to the extent it remains, the Bendix-based estimates at Miles Lake. The purpose of this project is to use mark-recapture methods to estimate the weekly abundance of sockeye salmon returning to the Copper River above Miles Lake and compare these estimates to those provided by the Miles Lake sonar. The information collected from this project can be used by fishery managers to better manage the subsistence fishery for individual stocks, which ultimately could lead to increased subsistence harvest opportunities.

Objectives

To estimate the annual in-river abundance of sockeye salmon returning to the Copper River in 2008 and 2009 such that the estimates are within 25% of the true values 95% of the time.

Methods

This project will use two-event mark-recapture methods to estimate the weekly abundance of sockeye salmon at Baird Canyon in 2008–09. For the first event, sockeye salmon will be externally tagged with T-Bar anchor tops containing passive integrated transponders (TBA-PIT) daily at three fishwheels operated in Baird Canyon (rkm 66) from mid May to late August. These fishwheels will be located upstream of the Miles Lake sonar site and downstream of any in-river fisheries and major spawning tributaries. The second event will consist of fish examined for tags at two fishwheels located near Canyon Creek (rkm 157), located 12 km downstream of Chitina, AK. The fishing sites at Baird Canyon and Canyon Creek have been used successfully by the project team for these purposes since 2002. Data at both camps will be

recorded electronically using FS2001 PIT scanners and PDA handheld computers. Data will be stored in a Microsoft Access database, and analyzed using Microsoft Excel and the computer program SPAS.

Partnerships/Capacity Building

This project gives NVE an opportunity for meaningful inclusion in the research and long-term management of Copper River sockeye salmon. NVE will oversee all aspects of the project and provide critical logistical, technical and field assistance, thereby acquiring the array of skills needed to carry out major fisheries assessment projects. NVE fishery technicians will acquire the necessary skills and experience required for this and other fisheries research jobs. This project will allow NVE to further develop the skills of its members via local training, hiring for key positions in future fisheries assessment projects, and recruiting and encouraging young people to get an education in fisheries and natural resource management. This project will also promote interaction between a major subsistence group (NVE) and fisheries management agencies (ADF&G Commercial Fisheries Division). Finally, the overall study design will engage tribal organizations from different regions of the Copper River drainage in discussions on the project and promote interactions amongst subsistence users.

NVE will continue to work with the Tribal Council, staff, consultants and government agencies to identify key personnel to help carry on a long-term program. NVE will also actively participate in the workshop held at the end of each field season to review the project and discuss future refinements. These consultations will culminate in the overall assessment of the project that will drive the development of a long-term program, if deemed necessary.

Justification

Assessment of in-river abundance of Copper River sockeye salmon was identified as a high priority information need in the 2008 Request for Proposals. Sockeye salmon sustain a large and important subsistence fishery in the Copper River. In 2006, a total of 18,000 fish were harvested by Federal subsistence fishers. Currently, in-river abundance is estimated using sonar at Miles Lake. Independent estimation of sockeye salmon abundance would provide important verification of sonar passage estimates and help resolve whether offshore distribution and species apportionment significantly bias sonar assessment of sockeye salmon.

Project Number: 08-502
Project Title: Tustumena Lake Coho Salmon Radio Telemetry and Weirs
Geographic Region: Southcentral Alaska
Data Type: Stock Status and Trends
Principal Investigator: Douglas Palmer, USFWS Kenai Fish and Wildlife Field Office
Co-Investigator: Kenneth Gates, USFWS Kenai Fish and Wildlife Field Office

Cost: **2008:** \$238,250 **2009:** \$118,360 **2010:** \$44,236 **2011:** \$0

Issue

The Federal Subsistence Board granted Ninilchik residents customary and traditional use for all fish species on Federal waters within the Kasilof River watershed in January 2006. The Federal Subsistence Board has addressed several regulatory proposals for Kasilof River salmon and steelhead trout since 2006. We lack basic population size and distribution information on coho salmon. The development of new Federal subsistence fisheries has triggered a need for information on the abundance, run-timing and distribution of coho salmon in the Kasilof River watershed.

Objectives

1. Determine the abundance and run-timing of adult coho salmon entering Glacier, Indian, Nikolai, and Shantatalik creeks.
2. Detect the ultimate spawning destination upstream of Silver Salmon rapids (rkm 24), via the presence of at least two tagged fish, of a population comprising 10% or more of all the coho salmon passing the capture site during each temporal stratum with probability 0.8.
3. Test the hypothesis that the distributions of spawners among strata are equal.

Methods

Feasibility work for this proposal was funded in out-of-cycle proposals 07-506 *Coho salmon spawning assessment in Tustumena Lake tributaries* and 07-507 *Run timing, abundance, and distribution of coho salmon in the Kasilof River watershed*. This proposal will build on information collected during these initial investigations.

Fish weirs equipped with underwater video equipment will be used to determine the run-timing and abundance of adult coho salmon in four tributaries of Tustumena Lake; Glacier, Indian, Nikolai, and Shantatalik creeks. These four streams are currently considered the primary contributors to the upper Kasilof River coho salmon population based on aerial and ground surveys and conversations with area residents. We will also deploy up to 150 radio transmitters in adult coho salmon to identify other potential spawning areas in the upper Kasilof River watershed.

Partnerships/Capacity Building

This project has been discussed with the Kenai National Wildlife Refuge and Alaska Department of Fish and Game. Consultations are currently ongoing with the Department and will continue throughout the project. We also plan to advertise and hopefully recruit qualified seasonal fishery technicians from the community of Ninilchik to assist with field operations.

Justification

This project is of the highest strategic importance for Federal subsistence management in the Southcentral region, and directly addresses data needs for assessing possible changes to coho salmon harvest guidelines. Currently, the Federal Board has expanded subsistence fishing opportunities in the Kasilof River drainage. Information from this project would provide more accurate spawning abundance estimates than are currently available through ground and aerial surveys. Information from this project would increase the chances of correctly determining and meeting spawning escapement needs and making correct management decisions for this emerging subsistence fishery. If this project is funded, the Technical Review Committee will assess the need for long-term monitoring after two years of project results.

Project Number: 08-503
Project Title: Kasilof River Steelhead Trout Radio Telemetry
Geographic Region: Southcentral Alaska
Data Type: Stock Status and Trends
Principal Investigator: Kenneth Gates, USFWS Kenai Fish and Wildlife Field Office
Co-Investigator: Douglas Palmer, USFWS Kenai Fish and Wildlife Field Office

Cost: **2008:** \$78,860 **2009:** \$62,938 **2010:** \$22,395 **2011:** \$0

Issue

The Federal Subsistence Board granted Ninilchik residents customary and traditional use for all fish species on Federal waters within the Kasilof River watershed in January 2006. The Federal Subsistence Board has addressed several regulatory proposals for Kasilof River salmon and steelhead trout since 2006. Adult steelhead trout which spawn or over-winter in the upper Kasilof River watershed can be harvested in Federal subsistence rod and reel fisheries. A better understanding of movement patterns and over-wintering and spawning locations is needed to ensure conservation of steelhead trout in the Kasilof River watershed.

Objectives

1. Describe the freshwater migratory patterns and over-wintering distribution of radio-tagged adult steelhead trout which enter the Kasilof River during the fall.
2. Identify spawning areas selected by radio-tagged steelhead trout.

Methods

Feasibility work for this proposal was funded in out-of-cycle proposal 07-509 *Spawning and seasonal distribution of steelhead trout in the Kasilof River watershed*. This proposal requests funding for one additional year of radio tagging and follow-up monitoring to build on information collected during the initial radio-tagging effort in 2007.

Radio telemetry will be used to uniquely identify and track individual steelhead trout in the Kasilof River watershed. A target goal of 80 radio transmitters will be surgically implanted in steelhead trout captured in the mainstem Kasilof River between September and freeze-up. A variety of gear types will be used to capture fish for radio-tagging, including nets and sport fishing gear. Freshwater migratory patterns and over-wintering and spawning locations of radio-tagged steelhead will be determined throughout the fall, winter, spring, and early summer using a combination of fixed data-logging receiver stations and mobile tracking.

Partnerships/Capacity Building

This project has been discussed with the Kenai National Wildlife Refuge and Alaska Department of Fish and Game. Consultations are currently ongoing with the Department and will continue throughout the project. We also plan to advertise and hopefully recruit qualified seasonal fishery technicians from the community of Ninilchik to assist with field operations.

Justification

Assessment of steelhead distribution in the Kasilof River is a priority information need specifically identified by the Federal Subsistence Board. Little is known about distribution of steelhead in the Kasilof River watershed. Currently, the known population of steelhead trout is a few hundred fish. The combination of this proposed project and Investigation Plan 08-502 on coho salmon will allow steelhead spawning and distribution to be evaluated at less cost than a stand alone project. Knowledge gained in this project would help guide the Board in making regulatory decisions and help Federal managers develop effective long term monitoring tools.

Project Number: 08-504
Project Title: Crooked and Nikolai Creeks Steelhead Trout Weirs and Video
Geographic Region: Southcentral Alaska
Data Type: Stock Status and Trends
Principal Investigator: Kenneth Gates, USFWS Kenai Fish and Wildlife Field Office
Co-Investigator: Douglas Palmer, USFWS Kenai Fish and Wildlife Field Office

Cost: **2008:** \$39,965 **2009:** \$45,565 **2010:** \$12,590 **2011:** \$0

Issue

The Federal Subsistence Board granted Ninilchik residents customary and traditional use for all fish species on Federal waters within the Kasilof River watershed in January 2006. The Federal Subsistence Board has addressed several regulatory proposals for Kasilof River salmon and steelhead trout since 2006. Crooked and Nikolai creeks are the only two streams within the Kasilof River watershed known to support steelhead trout. Annual returns to each stream are typically a few hundred fish. Adult steelhead trout which spawn or over-winter in the upper Kasilof River watershed can be harvested in Federal subsistence rod and reel fisheries. Annual escapement monitoring in Crooked and Nikolai creeks will be necessary to ensure conservation of these small populations.

Objectives

1. Determine the abundance and run-timing of adult steelhead trout entering Crooked and Nikolai creeks.
2. Estimate the age, sex and length of adult steelhead trout entering Crooked and Nikolai creeks.
3. Determine if the steelhead trout spawning in Crooked and Nikolai creeks are genetically distinct from one another and, if so, estimate the level of genetic differentiation.

Methods

Weirs equipped with underwater video systems will be used to determine the run-timing and abundance of adult steelhead trout returning to Crooked and Nikolai creeks during 2008 and 2009. Each weir and video system will be installed by April 20 and will operate through May 31 each year. The weirs and video systems will be unmanned except during times of maintenance and sampling. Sampling will be conducted weekly at each weir to estimate age and length composition of the return. Sex composition of the return to each stream will be determined using video images. Fin tissue will be collected from a sample of 50 adult steelhead trout at each weir. Genetic samples will be forwarded to the Conservation Genetics Laboratory in Anchorage for processing and analysis.

Partnerships/Capacity Building

This project has been discussed with the Kenai National Wildlife Refuge and Alaska Department of Fish and Game. Consultations are currently ongoing with the Department and will continue throughout the project. We also plan to advertise and hopefully recruit qualified seasonal fishery technicians from the community of Ninilchik to assist with field operations.

Justification

At this time Nikolai Creek is one of only two tributaries in the Kasilof River watershed known to support steelhead. Continued assessment of abundance in Nikolai Creek is needed for responsible management of a subsistence steelhead fishery. Little is known about abundance and distribution of steelhead trout in the Kasilof River watershed. Information gained from the combination of this project and FIS Project 08-503 *Spawning and seasonal distribution of steelhead trout in the Kasilof River* will help evaluate the effectiveness of using Crooked and Nikolai creeks as long-term monitoring tools. The investigator will also monitor abundance of Crooked Creek steelhead trout. The Technical Review Committee will assess the need for long-term monitoring after two years of project results.

Project Number: 08-600
Project Title: Karta River Sockeye Salmon Assessment
Geographic Region: Southcentral Alaska
Data Type: Stock Status and Trends
Principal Investigator: Cathy Needham and Lisa Lang, Organized Village of Kasaan (OVKa)
Co-Investigator: Jan Conitz and Scott Host, ADF&G Commercial Fisheries Division
 Susan Howell and Delilah Brigham, US Forest Service
 Glenn Chen, Bureau of Indian Affairs

Cost: **2008:** \$104,218 **2009:** \$116,217 **2010:** \$0 **2011:** \$0

Issue

This project will assess the sockeye population for the Karta River, the traditional and current subsistence use area for the Tribe. In reference to the 2008 Request for Proposals and the Strategic Plan for the Subsistence Fisheries Resource Monitoring Program, Southeast Region (2006), this proposal addresses the highest priority species (sockeye salmon) and information need (estimate the current escapement). In addition, the Karta Lake system is ranked sixth on the list of prioritized systems.

Objectives

1. Count the number of sockeye salmon into the Karta River using a weir.
2. Estimate the number of sockeye salmon into the Karta River using mark-recapture methods with a coefficient of variation less than 10%.
3. Estimate the age, length, and sex composition of returning sockeye salmon into the Karta River system, based on a sample size equivalent to 6% of the number returning, with an estimated coefficient of variation for the two major age classes of 10% or less.

Methods

A 200 foot channel-spanning aluminum bipod weir will be constructed across the Karta River. On one section of the weir, an entrance cone leading into an 8' x 8' trap will be constructed to capture fish migrating upstream to spawn. The weir will operate from early June through September of each year, and all fish crossing the weir will be identified and counted. Approximately 15% of the sockeye salmon that cross the weir will be marked with a fin clip. Towards the end of the field season, crews will fly into the known sockeye spawning grounds and attempt to recapture fish that were marked at the weir. Mark-recapture data will be sent to the Alaska Department of Fish and Game (ADF&G) for data analysis, to provide a secondary escapement estimate to compare back to the real number of fish counted across the weir. In addition, approximately 600 sockeye, distributed across the entire run for each year, will be sampled for age, sex and length data. Sampled fish will be measured and sexed on site. Scales will be removed and sent to ADF&G to be read to determine age.

Partnerships/Capacity Building

The Organized Village of Kasaan has been working with a team of cooperating agencies on Prince of Wales Island since the beginning of 2005 on fisheries projects with steelhead and sockeye. A strong

partnership between Federal, State and Tribal government has been established, with key players working together across projects.

This project will continue to rely on the strong partnerships built with local agencies, and will assist OVKA in continuing to build it's Fisheries program so that the Tribe can address subsistence issues important to it's Tribal members. In addition the project offers local hiring opportunities for field crews. Some crew have been trained under other projects and this project secures position over time, and offers the opportunity for new Tribal members to be trained and employed by the Tribe.

Justification

This is a proven weir project which will provide reliable estimates of the annual escapement and age composition of sockeye salmon into the Karta Lake system which is an important subsistence resource for the community of Kasaan. Project costs are reasonable and all project funds go directly to OVKA. There is some question regarding the current status of this stock — recent estimates of escapements and subsistence harvests are less than they were 20 years ago. This project must make better use of the foot survey counts and mark-recapture data collected by ADF&G from 1995 to 2003; doing so will yield annual estimates of escapement for 19 of the past 27 years. The Technical Review Committee requests a revised investigation plan to incorporate both a mark-recapture estimate of the abundance of sockeye salmon in McGilvery and Andersen Creeks and a basic assessment of the current status of the stock based on historical escapement and harvest estimates. A moderate increase in project costs and involvement by the ADF&G co-investigators are expected in the revised investigation plan.

Project Number: 08-607
Project Title: Unuk River Eulachon Assessment
Geographic Region: Southcentral Alaska
Data Type: Stock Status and Trends
Principal Investigator: Todd Tisler, US Forest Service

Cost: **2008:** \$34,030 **2009:** \$36,425 **2010:** \$0 **2011:** \$0

Issue

Eulachon production from the Unuk River area is important ecologically and to subsistence and personal use fishermen in Ketchikan and Metlakatla. The harvest of eulachon in the Unuk River takes place in waters under Federal jurisdiction. The Unuk eulachon run has declined in recent years and very few eulachon returned to spawn in 2004, 2005, 2006, and 2007. The fishery was closed in 2006 and 2007. Reliable assessments of the annual abundance of eulachon in the area are needed to understand the status of the stock and responsibly manage the Federal subsistence fishery. This was identified as a priority information need in the 2006 Southeast Alaska Strategic Plan and in the 2008 Request for Proposals.

Objectives

1. Describe the timing, distribution, and abundance of eulachon returning to the Unuk River area.
2. Estimate the age, sex, length and weight composition of eulachon spawning in the Hooligan River, Landing Slough, and lower Unuk mainstem areas so that the estimated coefficient of variation for the principal age class is less than 15%.
3. Assess the status and management options for Unuk eulachon.

Methods

Surveys will be done each spring to assess the timing, distribution, abundance, and age, sex, and size composition of eulachon in the Unuk River area. The goal of this project is to make consistent, observer-independent, qualitative and quantitative assessments of the abundance of eulachon in the Unuk River area. All the main locations where eulachon have been observed in the past will be surveyed so we can best monitor their annual distribution and abundance. Records will be kept on survey conditions, the abundance of live and dead eulachon, the abundance of eulachon eggs, and the number and activity of birds and mammals in the area. During the month of March, project personnel will do daily foot and boat surveys of the six main eulachon spawning locations in the lower Unuk River area—Hooligan River, Upper Landing Slough, Lower Landing Slough, Side Channel, Matney Slough, and Lower Unuk mainstem. Survey routes and data collection methods will be standardized for each location. Numbers of small and large schools will be counted when counting individual fish is impossible. In three principal spawning locations, Hooligan River, Side Channel, and Matney Slough, the abundance of live eulachon in will be measured as a percentage of the stream bottom covered with fish (or eggs) at each of the 6 to 11 numbered stations in each location. The Unuk estuary, upper Burroughs Bay, Klahini River, and Chickamin River will also be surveyed but less intensively. Photos will be used to document survey conditions and eulachon abundance. If Federal subsistence fishing is allowed, fishing activities will be closely monitored and the harvest will be sampled to estimate the number and pounds of the harvest and the age, sex, and size composition of the fish.

There is very little stock assessment and management information for Borroughs Bay and Chickamin River eulachon. However, the available information needs to be compiled and summarized along with the information collected by this project. The emphasis will be to develop the best time series of annual abundance estimates and look at relationships among harvests, escapements, and returns. Finally, we will compare this information with that for other eulachon runs along the coast to assess the status of Unuk eulachon and propose a management plan for restoring and maintaining this run and a subsistence fishery.

Partnerships/Capacity Building

The Forest Service has been working with the local eulachon fishers, the communities of Metlakatla, Ketchikan, and Saxman, and biologists with ADF&G, Forest Service, Canadian Department of Fisheries and Oceans, and others to better understand the use, status, and management of Unuk eulachon. This project promotes this information sharing. Project funds will employ local residents and benefit the local economy. The Forest Service will solicit bids from local property owners for the field housing.

Justification

This project addresses an issue specifically identified in the 2008 Request for Proposals. The project has high strategic value since eulachon returns to the Unuk River have been dismal in recent years, and there is a severe conservation issue. There is also a fundamental lack of knowledge regarding population dynamics of this stock. The investigation plan describes a very workable and repeatable methodology and will greatly improve the documentation over past surveys. The information will be used to evaluate the stock status to ensure appropriate harvest levels.

Project Number: 08-650
Project Title: POW Island Steelhead Trout Subsistence Harvest Survey
Geographic Region: Southcentral Alaska
Data Type: Harvest Monitoring and Traditional Ecological Knowledge
Principal Investigator: Cathy Needham, Organized Village of Kasaan
 Tony Christianson, Hydaburg Cooperative Association
Co-Investigator: Pat Petrivelli, Bureau of Indian Affairs
 Jeff Reeves, US Forest Service

Cost: **2008:** \$65,092 **2009:** \$73,390 **2010:** \$0 **2011:** \$0

Issue

The disparity between steelhead harvests recorded in confidential surveys and steelhead harvests reported in the permitting process has been documented in a previous FIS study (Turek 2005). This project will collect and analyze data through a confidential harvest survey in all Prince of Wales Island communities and compare this information with the reported harvests to provide a direct measure of the level of disparity. Follow-up interviews with steelhead harvesters will elicit the rationale for their level of participation in the Federal subsistence fishing permitting process. The information collected by this research project addresses the validity and reliability of subsistence harvest data for Prince of Wales steelhead, an information need for Southeast Alaska.

Objectives

1. Accurately estimate the subsistence steelhead harvests on Prince of Wales Island by conducting household surveys in all the communities and compare these harvests with the harvests reported by Federal permit holders.
2. Describe the factors affecting participation in the permitting process.

Methods

This project will gather data on steelhead harvest levels through confidential household surveys in each community on Prince of Wales Island. These data will be summarized and compared with data reported through the permitting process. Interviews will be conducted with subsistence steelhead harvesters identified from the household harvest surveys about the level of their participation in the Federal permitting process. The reasons and constraints for their participation from the first year of the study will be used to construct an ethnographic decision model. This model will be field tested on the key interviews conducted during the second year of the study. Findings from the household harvest surveys and the key interviews will be analyzed and included in the final report which will be reviewed during a community meeting on Prince of Wales Island.

Partnerships/Capacity Building

The Hydaburg Cooperative Association and Organized Village of Kasaan will lead this project, in collaboration with the other two Tribes on Prince of Wales Island (Craig Community Association and Klawock Cooperative Association), the Bureau of Indian Affairs Subsistence Branch and the U.S. Forest Service staff in Craig responsible for implementing the subsistence steelhead permitting on Prince of

Wales Island. Preliminary discussions with all collaborators started in early in 2006, and phone calls and a teleconference have occurred more recently to formulate this proposal.

This project continues to develop upon relationships between the Prince of Wales Tribes and the Federal government, in working together to address subsistence priorities important to the communities. Through continued partnerships, HCA and OVKA can maintain their capacity building for the development of their fisheries programs.

Justification

This project is recommended for funding with modification. The project addresses a high priority issue for the Federal Subsistence Program, in an area with considerable Federal jurisdiction. Investigators have performed well on previous Monitoring Program projects. The collaborative nature of the project and the strong capacity building component greatly strengthen the proposal. However, some technical issues need to be addressed in a revised investigation plan before the project moves forward.

Project Number: 08-651
Project Title: Maknahti Island Subsistence Herring Fishery Assessment
Geographic Region: Southcentral Alaska
Data Type: Harvest Monitoring and Traditional Ecological Knowledge
Principal Investigator: Helen Dangel Lorrigan, Sitka Tribe of Alaska
Co-Investigator: Thomas Thornton, Portland State University

Cost: **2008:** \$27,162 **2009:** \$42,023 **2010:** \$0 **2011:** \$0

Issue

In 2006, 610 acres of submerged lands around Maknahti Island were included in the Federal Subsistence Management area. The Federal Subsistence Board has deferred a proposal to close this area to all non-Federal subsistence users. To understand the importance of the customary and traditional herring egg fishery in the Maknahti Island waters, Sitka Tribe seeks to gather historical and contemporary subsistence fishing information related to efforts made and harvests received in this area.

Objectives

Document and describe the customary and traditional herring egg fishery in Maknahti Island Federal waters, including harvest, effort, and customary and traditional practices.

To achieve this objective, Sitka Tribe of Alaska will:

1. Gather and analyze contemporary information on the subsistence harvest and use of herring eggs in Maknahti Island Federal waters
2. Gather and analyze historical Information on subsistence harvest and use of herring eggs in Maknahti Island Federal waters.

Methods

1. Contemporary Data Collection: Companion herring egg harvest survey

STA proposes to develop a number of survey questions to supplement the Herring egg Harvest Survey in 2008 and 2009, focusing specifically on harvest and use of the Maknahti area. The existing survey instrument was developed in consultation with ADF&G. Under this project, additional questions will be asked to get at site specific locations of harvest, and effort directed at harvest in this area. The harvest survey is administered to about 150 households, based on the most recent census of subsistence harvesting households in the Sitka Sound subsistence herring fishery. The sample surveyed includes routine and high harvesting households. The additional questions will be asked of all survey participants, although responses will not be included for ADF&G analysis due to local concerns about the site specific information being used against subsistence users.

2. Historical Information Collection

Sitka Tribe of Alaska will work in coordination with Dr. Thomas Thornton, who is currently applying for a grant from North Pacific Research Board to document the historic herring egg spawning and massing areas in Southeast Alaska and how those areas relate to historic subsistence and non-subsistence herring uses in Southeast Alaska. This study will use archaeological, historical, and environmental records as well as ethnographic interviews with contemporary local experts involved with herring fisheries. A key

objective of Dr. Thornton's project is to understand changes in herring stocks, spawning and massing patterns, and uses over long time scales, as complement to more detailed recent records kept by ADF&G since 1980.

Partnerships/Capacity Building

Sitka Tribe of Alaska has been collaborating with ADF&G from 2002–2006 on an annual customary and traditional herring egg harvest survey. This project will build upon that collaboration. STA has been working with USFS Sitka District Ranger Office on herring issues for the past year, since the Maknahti Island Federal waters were identified. Because Sitka's subsistence herring egg harvest is the last of its kind through the State, STA works with Alaska Natives around the state who either harvest or receive eggs from the Sitka subsistence herring egg fishery.

Justification

This project is recommended for funding. The project addresses a high priority information need specifically identified by the Federal Subsistence Board at its January 2007 meeting. The project appears to be a good collaborative effort between Sitka Tribe of Alaska and Portland State University, with some consultation on the part of the USDA Forest Service. The study design has some minor technical issues that investigators need to address or clarify. The budget is reasonable, and includes a significant match (\$61,416). The project includes a good capacity building effort, and the investigators are qualified to do the work.