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Kuskokwim River Sockeye Salmon Investigations, 2006 and 2007

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CHAPTER 3. OUTREACH AND CAPACITY BUILDING ASSOCIATED WITH THE KUSKOKWIM RIVER SOCKEYE SALMON INVESTIGATIONS

by

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ABSTRACT

During the Kuskokwim Sockeye Salmon Investigation study we developed and implemented an outreach and capacity building plan that was nested within several other more long-term programs. We communicated with the Kuskokwim River Salmon Management Working Group and communities closest to the field research activities focusing on listening as well as informing (two-way communication). We informed the Kuskokwim area general public about this research and applications to management using mass media including newspaper articles, press releases, and radio programs. We taught lessons in village school classrooms about the basics of fisheries science and management to encourage students to pursue fisheries careers and to become involved citizens. We hired several local residents in fisheries technician and intern positions and supported their professional development. Through these activities and processes we focused on building the capacity of all organizations and people involved by learning and teaching one-another and institutionalizing the knowledge and capabilities gained. As a result of these outreach and capacity building efforts, local input was included into the study, relationships were built and strengthened, and communities and the public were better informed about research. Ultimately, this lead to stronger community and general public support for this study and strengthened a foundation of capacity that will hopefully lead to a future of increased cooperation among local residents, rural organizations, and fisheries management agencies.

Key words: capacity building; outreach, education; public involvement; Kuskokwim River; cooperative research

INTRODUCTION

Local involvement can substantially benefit fisheries research and management and it can be an effective tool to guide management decisions and increase community acceptance of those decisions. Historically, however, local residents have often been inadequately informed and involved with fishery management and research in the Kuskokwim Area, which resulted in public distrust of agencies, a lack of public acceptance of agency actions, and squandering of resources (e.g., Appendix 3.A). Public distrust was a strong influence in formation of the Kuskokwim River Salmon Management Working Group in 1988, which is a collection of stakeholders recognized by the Alaska Board of Fisheries as a formal advisory group to the Alaska Department of Fish and Game. This effort along with other similar efforts during the past two decades has been part of a strong statewide movement of agencies and local people working more closely together. Despite this recent success, often the avenues to communicate and work together are not fully developed. Rural organizations and communities may lack the capacity to be effective and independent partners, and agencies may lack the capacity to fully incorporate local involvement. Therefore, the Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative (AYKSSI), primary funding organization of the Kuskokwim sockeye salmon investigation study, requested as part of the study design an outreach and capacity building plan (AYKSSI 2005). This chapter is a description of the outreach and capacity building efforts and the associated results of those efforts.

BACKGROUND

The concept of outreach can be obscure and researchers have interpreted it in many ways. The AYKSSI steering committee also realized that the concept of capacity building in Alaska fisheries management is ambiguous and that little consensus exists about the appropriate tools and approaches (AYKSSI 2006). In fact, the concept of capacity building in many disciplines throughout the world is complicated and ambiguous (Cannon et al. 2005).

There are several definitions and interpretations of the concepts of outreach and capacity, but for the purpose of this study and report we used the following definitions:

1. Outreach: *two-way communication between the agency and the public to establish and foster mutual understanding, promote public involvement, and influence behaviors,*

attitudes and actions with the goal of improving the foundations of stewardship. NOAA Fisheries Services Outreach Strategic Plan (NOAA 2007)

2. Capacity: *the ability of individuals and organizations or organizational units to perform functions effectively, efficiently, and sustainably*. United Nations Development Program (1997) adopted by the AYKSSI Steering Committee (AYKSSI 2006)
3. Capacity Building: *the process by which individuals, groups, organizations, institutions and societies increase their abilities to perform functions, solve problems, and achieve objectives; to understand and deal with their development need in a broader context and in a sustainable manner*. United Nations Development Program (Cannon et al. 2005; UNDP 1997)

Outreach comes in many varieties and can include tenants of congressional, corporate, media, non-governmental organization, and government agency relations (NOAA 2007). However, for the purpose of this report we will focus on public outreach which includes public involvement, public information, public education, and public informational products. Public outreach efforts have two main forms distinguished by the level of public participation. Education or information outreach is focused on delivering a message and increasing the public's awareness and understanding of an issue or project. Public input in this type of outreach is usually collected informally and as a secondary goal. Public participation outreach is focused on collecting public input, usually in a formal manner, to include research and management.

Capacity building is essentially facilitating the change of human behavior on the individual, organizational, or societal level, and is deeply rooted in the field of applied social science. It is ambiguous, uncertain, and complex and there are usually multiple interacting causes for any particular result (Cannon et al. 2005). However, many general themes of successful capacity building programs are available in the literature (Taylor and Clarke 2008; Cannon et al. 2005; Schacter 2000; Land 1999; Morgan 1999; UNDP 1997). Most successful capacity building efforts have the following characteristics:

1. Are evaluative rather than descriptive (i.e., focus on how well the efforts are doing rather than what the efforts are) and use evaluation to promote learning, continual feedback, and adaptation—instead of pursuing attractive methods that may be ineffective (e.g., methods that are easy to understand and implement but do not work, or "pet" methods that are untested).
2. Focus on capacity building as a continuous, iterative process and how well individuals, organizations, or societies perform and support learning—rather than specific, short-term technical outputs.
3. Integrate all levels of capacity building including the individual, organization, and the greater society and focus on encouraging transfer of capacity among these levels.
4. Account for the realities of context specific factors including politics, economics, and culture.
5. Incorporate a strong element of local control and initiative.
6. Balance bottom-up and top-down accountability to ensure that both funding entities' or mentors' desires and recipients' desires are accounted for and included into efforts.
7. Focus on the long-term process and how the individual study will contribute to the long-term capacity building goals—the United Nations suggest that 10 years is an appropriate length of time to implement capacity building programs.

OBJECTIVES

1. Include public participation in research with a focus on the Kuskokwim River Salmon Management Working Group;
2. Communicate with communities closest to field research sites about field research activities in their area;
3. Communicate with the Kuskokwim area general public about research methods, applicability to sustainable fisheries management, and results;
4. Teach Kuskokwim youth about fisheries ecology, science, and management;
5. Employ rural Alaskan residents in fisheries research;
6. Build the capacity of the Kuskokwim Native Association and Association of Village Council Presidents (AVCP) in fisheries research; and
7. Build the capacity of the Kuskokwim Area ADF&G Commercial Fisheries Division in community outreach and partnerships with rural Native organizations.

METHODS, RESULTS, AND DISCUSSION

PUBLIC PARTICIPATION IN RESEARCH

The Kuskokwim River Salmon Management Working Group (KRSMWG) is an advisory group composed of representatives from commercial, sport, and subsistence users from throughout the river. They typically meet one or more times per week during the summer fishing season, and once or twice in the post- or preseason (Shelden and Linderman 2007). The KRSWG is an exemplary public participation process and has been working with the Kuskokwim Area ADF&G Commercial Fisheries Division since 1988 (Shelden and Linderman 2007). By nesting our community participation outreach into this existing process we were able to communicate with a wider range of local stakeholders prior to, during, and after the sockeye salmon investigation study as suggested by others (AYKSSI 2006; Cannon et al. 2005; Meffe et al. 2002). Members were introduced to the sockeye salmon investigation project through brief oral updates during summer meetings and through more detailed presentations and discussions at pre and postseason meetings. Input from members was discussed and considered throughout the development and implementation of the sockeye salmon investigation project. The regularity and open forum of the KRSMWG meetings allowed researchers and members to continually communicate about this study and learn together as the study progressed, which is preferred over the traditional form of the researchers coming back to public to present results after the project has been completed (Meffe et al. 2002).

COMMUNICATION WITH AFFECTED COMMUNITIES

The communities of Lower Kalskag, Kalskag, and Aniak are closest in proximity to the tagging site used in the sockeye salmon investigation (see Chapter 1 for details). We described details of project plans to tribal leaders from these communities at the KNA annual Tribal Gathering that was held January 2006 in Aniak. Most of the attendees were already familiar with the associated field activities because of similar projects from previous years that used the same tagging platform (e.g., Stuby 2007; Pawluk et al. 2006).

The community of Sleetmute is closest to the lower Holitna River where researchers planned to operate part of the juvenile salmon habitat usage component of the sockeye salmon investigation (see Chapter 2 for details). Prior to the field activities, we contacted community leaders by

phone, discussed what was planned, and solicited input. We also worked with the Sleetmute Traditional Council and arranged a community meeting in June, 2006, where we presented a slideshow and discussed field research activities to a broad range of residents.

COMMUNICATION WITH GENERAL PUBLIC

In addition to meetings in communities nearest to where research activities were occurring, we made efforts to reach out more broadly through use of local newspapers and radio stations and gave presentations at various regional and tribal meetings. A newspaper article, entitled "Kuskokwim River Sockeye Salmon: Secrets Revealed," described the study methods, relevance to management, and preliminary results of the sockeye salmon investigation (Appendix 3.B). The article was published in August 2006, in the Delta Discover Newspaper (Bethel, Alaska) and posted on the ADF&G website news series, Alaska Fish and Wildlife News (http://www.wildlife.alaska.gov/index.cfm?adfg=wildlife_news.view_article&issue_id=44&articles_id=251). Also, an interview with Doug Molyneaux, ADF&G Kuskokwim River Fisheries Research Biologist, aired in August 2006 on KYUK (Bethel, Alaska public radio station). During the KYUK interview, Molyneaux discussed with news reporter Kenny Steele methods relevant to sustainable fisheries management and preliminary study results.

We also presented study summaries at several regional meetings: Yukon-Kuskokwim Delta Federal Regional Advisory Council; Western Interior Federal Regional Advisory Council; KNA Annual Tribal Gathering; and ADF&G Central Kuskokwim Advisory Committee (Table 3.1). The presentations were generally 15 to 20 minute computer slideshows covering several Kuskokwim Area fisheries projects followed by questions and answers and handouts of project summaries. Ten meetings were initiated in coordination with Tribal councils and village schools in Kuskokwim Area communities (Table 3.2). Meeting announcements were distributed to post offices, Tribal council offices, and various local businesses, plus personal invitations were made to key community leaders. In some instances, independent entities donated door prizes that were advertised and offered to those attending the meetings. Turnout at these meetings was variable, ranging from 2 to 15 people per meeting. Typically, these meetings lasted about two hours and included handouts of project summaries and slideshow presentations with intermittent discussions. Presenters covered several Kuskokwim Area projects at each meeting and spent approximately 5 to 10 minutes on each project. We encouraged questions, discussions, and feedback and adapted the meeting to best address the topics that people desired to discuss. In general, meeting attendants' comments on post-meeting questionnaires indicated that as a result of the meetings they had a better understanding of fisheries research and a better appreciation for how research aides fisheries management.

We used multiple methods to inform the public about the Kuskokwim sockeye salmon investigation as suggested by others (Meffe et al. 2002), recognizing the need to balance our efforts within budget and staffing restraints. Building relationships and trust by face-to-face communication is often the key to communicating the sometimes complex messages of fisheries research and management (this is even more apparent in Rural Alaska). However, using mass media outlets such as the Delta Discovery newspaper and the KYUK radio station provided us an avenue to effectively extend outreach to a broader audience than was possible using face-to-face communication alone.

YOUTH EDUCATION

We visited schools 28 times from March 1, 2006 through April 30, 2008 (Table 3.3) and taught Kuskokwim youth about fisheries ecology, science, and management by teaching lessons in their classrooms (see Orabutt and Thalhauser 2008 for more information). We coordinated school visits with community meetings to most efficiently use travel funds and also so that the combined efforts would create a presence in the community. Specific lessons included fisheries careers, local fish species and their life cycles, Kuskokwim fisheries research and monitoring projects, fisheries science techniques such as radiotelemetry, fish anatomy, fish adaptations, fish habitat, stream ecology, and aquatic macroinvertabrates. We used a variety of teaching methods such as slideshows, wet labs, equipment demonstrations, worksheets, games, and hands-on projects. We adjusted the lessons to be age specific and taught kindergarten through twelfth grade students. We requested and received informal feedback from teachers and adjusted lessons accordingly. Teachers indicated that as a result of our school programs their students had a better appreciation for and understanding of fisheries ecology, science, and management. Many teachers also requested that we expand our program in the schools and teach additional lessons.

Children will be the future adult citizens and are still developing core beliefs and attitudes which will affect their life-long behavior of civic involvement. K–12 outreach is a great opportunity for fisheries researchers to help build long-term community capacity and to encourage future participation in fisheries research and management. To participate in a social system such as fisheries management, students need what some educators term a "literacy" of the social system which is to both possess an understanding of the issues, ability to critically think (i.e., apply knowledge to solve real world problems), and the self-confidence to participate (Spirn 2005; Freire and Macedo 1987). This type of knowledge most often comes from students working on real-world problems; still, a close surrogate is for students to work in a mostly independent manor on realistic lessons that have a local setting. Several teachers throughout this project have requested such lessons based on local fisheries research (personal communication Kuspuk School District Science Curriculum Committee; personal communication Linda Cassasas, Kuspuk School District). This type of outreach should be the focus of future efforts associated with Kuskokwim fisheries research projects.

EMPLOYMENT OF RURAL ALASKAN RESIDENTS

We employed three Kuskokwim residents as fisheries technicians to assist with field work associated with the sockeye salmon investigation and to provide ADF&G staff and project leaders with a local perspective on research activities. In addition, we employed ten college interns from Kuskokwim area communities by pooling funds available through the sockeye salmon investigation project with funding from the Partners for Fisheries Monitoring Program (see Orabutt and Thalhauser 2008 for further details). The main goal of the college internship program was to mentor students pursuing fisheries careers. However, we considered in our applicant pool those students with interests in careers outside fisheries, recognizing the experience gained by these future teachers and community leaders can also reap benefits as they become involved in public processes such as the Kuskokwim River Salmon Management Working Group or one of the other public advisory groups. These college interns worked directly with fisheries biologists and technicians and learned about fisheries ecology, science, and career opportunities. Many of these college interns received partial scholarships from funds provided through the sockeye salmon investigation project matched with contributions from Coastal

Villages Region Fund and Barrick Gold Corporation's Donlin Creek Project (now Donlin Creek LLC). We also worked closely with the Alaska Native Science and Engineering Program at the University of Alaska to enroll two of the college interns into that nationally recognized program.

KNA also employed eight Kuskokwim high school students as interns to assist with the associated field research. The high school interns worked directly with fisheries biologists and technicians and learned about fisheries ecology, science, and careers in the process. The high school internships were typically two to four weeks long and were an extension of the existing KNA high school internship program (Hildebrand and Orabutt 2006). These extensions provided the necessary link between the 1-week introductory internships and more advanced college internships and technician positions. Four out of the eight students returned in following years to work in more advanced internship or technician positions.

One of the main purposes of hiring and training rural Alaskan residents is to build the capacity of rural organizations and communities to participate in fisheries research and management. The theory is that by building the capacity of individuals they will in turn build the capacity of their organizations and communities. We have found that this works and in particular Hildebrand and Orabutt (2007) identified and discussed the positive impact on the capacity of Kuskokwim communities. However, the links between individual capacity and organizational and community capacity are not always clear and the transfer of capacity can be inhibited by lack of incentives to use new skills and knowledge, lack of community and peer support, cultural and economic factors, and lack of organizational support (IBRD 2008). Orabutt (2005) recognized that the local hiring and training of employees was slow to transfer into increased capacity of KNA due to low year-to-year employee retention and lack of employee promotion. Field seasons away from friends and family, missing subsistence activities, need for additional education and training to move into leadership positions, lack of year-round employment, and competing job opportunities were several of the many reasons for low employee retention and promotion.

To help transfer individual capacity to community capacity, we first sought to increase our employees' job satisfaction, job pride, and desire and ability to share their experiences. We focused on training employees on the importance of fisheries research and the integral role they play in implementing the field research and serving as a liaison between their communities and fisheries researchers. We also focused on employee community building by encouraging clear and continual communication, a spirit of cooperation among all partners' staff, and a common focus on achieving the goals and objectives of the research project. We asked our employees to share their experiences with others and documented their experiences with photos to aid in their informal communication with their family and community. We required many of our interns to create and deliver presentations to various public and professional audiences so that they shared their experiences in a formal manner. KNA took additional steps and developed a stronger training program, step-by-step position ranking system, stronger mentoring, and more focus on higher education (Orabutt and Thalhauser 2008). In response, employees have shown greater learning, more excitement, more positive attitudes, and more thorough understandings of the mission, goals, and objectives of fisheries research and management (authors' observation). These efforts have resulted in greater employee job satisfaction and an increase in employee retention and promotion. KNA and AVCP leadership have taken more ownership of these capacity building efforts which leads to stronger inner-organizational support and ultimately more effective capacity building. The response in Kuskokwim villages has been positive. At community and advisory group meetings, many local residents reported increased learning about

and support for fisheries research and management in their communities resulting from local employment in the fisheries field. Though these employee systems are still in beginning stages, fragile, and in need of continual improvement, this intentional change in our approach to hiring and training local fisheries employees is an exemplary case of capacity building.

This example of successfully addressing the fisheries employee system at KNA, illustrates the complexities of organizational capacity building and the need to look beyond the obvious technical needs (e.g., fisheries biologist) of rural Alaskan Native organizations. Technical needs are very real and it is essential that rural Native organizations have qualified biologists managing their fisheries programs. However, all those involved in organizational capacity building must continually consider the organizational development factors of planning, human resources management, and business administrative principles, and how these factors play out in the relationships among the individuals, organizations, and communities.

CAPACITY BUILDING: KNA AND AVCP

The KNA and AVCP staff agreed to specific responsibilities and attempted to incorporate these responsibilities into each organization as a whole. When this worked, it represented true capacity building as a process. We were not always successful and often the responsibilities were completed by one of the already overworked biologists which did not represent capacity building so much as it did a temporary fix.

Staff from KNA, AVCP, and ADF&G worked closely together and communicated often to support each other's efforts in ensuring all objectives of the sockeye salmon studies were completed. Both AVCP and KNA assisted with proposal and study plan development, hired and managed interns and technicians, directly assisted with tagging salmon at the fish wheels and surveying juvenile salmon in the Holitna River, implemented an outreach program within their respective villages, and assisted in final report writing. In addition, KNA secured all land use permits, led the Aniak River tag recovery project, and assisted with maintaining remote radio receivers. This represented a new partnership between AVCP and ADF&G and an increase in involvement by AVCP in Kuskokwim fisheries research. This represented a continued partnership between KNA and ADF&G. The KNA's responsibilities were similar to but more involved than those of past salmon tagging projects (e.g., Stuby 2007; Pawluk et al. 2006).

The KNA and AVCP staff "learned by doing" as they conducted research and outreach for this project. Participating in the mentoring of college students and technicians furthered fisheries staff abilities to recruit and work with local residents. KNA and AVCP also learned from their local employees which helped further develop programs to better serve local needs. KNA and AVCP staff built greater networking skills, built stronger relationships with agency staff, and learned how to facilitate effective partnerships. KNA and AVCP staff also gained skills and insights into further developing their fisheries outreach program and adapting it to the interests of their communities. Through the outreach program, KNA and AVCP staff traveled to numerous communities and communicated directly, shared information, and built relationships which will be helpful to planning future research.

CAPACITY BUILDING: ADF&G

The capacity building goals of Alaska fisheries funding agencies and project leaders are usually focused on building the capacity of rural residents, rural organizations, and rural communities as were our initial goals of this effort. However, we realized that through fisheries studies such as

the sockeye salmon investigations, the Kuskokwim Area ADF&G Commercial Fisheries Division continues to build their capacity as individuals and an organization to conduct outreach and work with local Native organizations, individuals, and communities. The ADF&G staff worked closely with KNA and AVCP staff to meet the objectives of this study and to support the professional development of Kuskokwim residents hired into intern and technician positions. In addition, ADF&G staff conducted outreach including working closely with the KRSMWG, writing news articles, visiting schools, interviewing with the local radio news station, and presenting results at regional and community meetings. The ADF&G staff "learned by doing" as they conducted this project and thus increased ADF&G capacity in community outreach and partnerships with Rural Alaskan Native organizations. In addition, as the ADF&G staff worked with local employees they received feedback and learned more about the Kuskokwim area from the perspective of local residents.

RECOMMENDATIONS

1. Future outreach and capacity building efforts need to be more evaluative and focused on "how well" rather than "what" we are doing. Investigators can add simple measures to their studies that will greatly aid in their individual efforts. Techniques such as interviewing meeting participants, surveying residents, and using advisory groups as focus groups to determine their opinions on outreach and capacity building efforts would be relatively easy to implement and would have the potential for substantially useful outcomes. The National Science Foundation (2008) recommends that 5–10% of a program budget be spent on evaluation (Frechtling-Westat 2002).
2. Future capacity building efforts need to focus more on capacity building as a process rather than capacity building as a quick technical fix. Our experience was consistent with the literature in that capacity building that focused on the process (i.e., how individuals, organizations, or societies behave) represents more stable and institutionalized change. Fisheries funding and mentoring agencies should be more concerned with how things are being completed rather than if things are being completed.
3. Ideally, technicians and interns should be continually employed on a part-time basis during the winter to assist with community outreach efforts such as teaching in the schools and hosting community meetings. This would aid in transferring capacity from the individual to the community and also increase the stature associated with working in fisheries.
4. Project leaders should invite prominent local leaders, elders, and local advisory members who are most supportive of capacity building efforts to speak to fisheries technicians and interns at preseason training to better aid in connecting the individuals to the community and to encourage the often younger interns and technicians.
5. Investigators need to continue to focus on employee retention and management including continuing to build a more supportive work environment and employee community.
6. Project leaders need to investigate the barriers to intern and technician recruitment into the fisheries career field. Part of this could be working with groups such as Alaska Native Science and Engineering Program that offer a more continuous and integrated junior high school through college support framework that includes academics as well as internships and social components.
7. Project leaders need to continue to encourage local control and initiative by frequent and clear communication with organization and community leaders. Biologists need to talk

with Native organization board of directors and executive directors as well with other community leaders.

8. Capacity building efforts of future studies need to strategically contribute to the long-term goals of capacity building. Proposals and study designs should specifically state how this will happen.
9. Proposals and study designs of future studies need to clearly identify capacity building in fisheries management agencies as a goal and tailor objectives to achieving this goal, rather than just tacking it on in some token manner.
10. Project leaders should forge new partnerships with local teachers and schools and create realistic local environment-based lesson using project data and study designs. These efforts would amplify research contributions and aid in developing future scientist and encourage future community participation.

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TABLES

Table 3.1.–Regional meetings that included presentations about the Kuskokwim River sockeye salmon investigation.

Meeting or Event	Location	Date	Estimated Number of People Attending
KNA Tribal Gathering	Aniak	January 16–18, 2006	45 people: 10 council members, 20 organization representatives, and 15 community members
Western Interior Regional Advisory Council Meeting	Koyukuk	March 7–9, 2006	Council members, area biologists, and community members
Kuskokwim River Salmon Management Working Group	Bethel (Teleconference)	Throughout summer 2006	Working Group members, area biologists, and community members
Yukon-Kuskokwim Delta Regional Advisory Council Meeting	Bethel	September 5–6, 2006	Council members, area biologists, and community members
Western Interior Regional Advisory Council Meeting	Ruby	September 12–13, 2006	Council members, area biologists, and community members
Kuskokwim Fisheries Interagency Meeting	Anchorage	November 7–8, 2006	Area biologists, funding organization representatives, regional agency staff, and advisory group members
Central Kuskokwim State Advisory Committee	Aniak	November 29, 2006	Committee members, area biologists, and community members
KNA Tribal Gathering	Aniak	January 25–26, 2007	48 people: 12 council members, 20 organization representatives, and 16 community members
Yukon-Kuskokwim Delta Regional Advisory Council Meeting	Hooper Bay	March 13–15, 2007	Council members, area biologists, and community members
Kuskokwim Fisheries Interagency Meeting	Anchorage	April 17–18, 2007	Area biologists, funding organization representatives, regional agency staff, and advisory group members
Western Interior Regional Advisory Council Meeting	Aniak	March 6–7, 2007	Committee members, area biologists, and community members
Kuskokwim River Salmon Management Working Group	Bethel	Throughout summer 2007	Working Group members, area biologists, and community members
Yukon-Kuskokwim Delta Regional Advisory Council Meeting	Marshall	September 5–6, 2007	Committee members, area biologists, and community members
Western Interior Regional Advisory Council Meeting	Galena	October 30–31, 2007	Committee members, area biologists, and community members
Kuskokwim Fisheries Interagency Meeting	Anchorage	November 28–29, 2007	Area biologists, funding organization representatives, regional agency staff, and advisory group members
Western Interior Regional Advisory Council Meeting	Fairbanks	February 28–29, 2008	Committee members, area biologists, and community members
Yukon-Kuskokwim Delta Regional Advisory Council Meeting	Lower Kalskag	March 20–21, 2008	Committee members, area biologists, and community members

Table 3.2.–Community outreach meetings associated with the Kuskokwim River sockeye salmon investigation.

Meeting or Event	Location	Date	Estimated Number of People Attending
Kwethluk IRA Council Meeting	Kwethluk	March 21, 2006	5 council members
Tuluksak Tribal Council Meeting	Tuluksak	April 17, 2006	6 council members
Goodnews Bay Tribal Council	Goodnews Bay	May 15, 2006	5 council staff
Stony River Community Meeting	Stony River	December 7-8, 2006	3 council members
Crooked Creek Community Meeting	Crooked Creek	December 12, 2006	11 people: 2 council members, 1 adult community member, and 8 high school students
Lime Village Community Meeting	Lime Village	January 16, 2007	6 people: 2 council members and 4 community members
KNA Intern Aniak Community Presentations	Aniak	August 15, 2007	5 adult community members
Lower Kalskag Community Meeting	Lower Kalskag	December 12, 2007	15 people: 3 council members and 12 community members
Red Devil Community Meeting	Red Devil	December 18, 2007	6 people: 2 adult community members and 4 children
Anaik Community Meeting	Aniak	April 17, 2008	4 people: 1 council member and 3 community members

Table 3.3.–School presentations about the Kuskokwim River sockeye salmon investigation.

School Visited	Location	Date	Estimated Number of People Attending
Kwethluk High School	Kwethluk	March 21, 2006	30 students, 4 teachers/admin staff, and 5 community members
Tuluksak High School	Tuluksak	April 17, 2006	15 high school students
Chuathbaluk School	Chuathbaluk	April 24, 2006	25 students and 3 teachers
Aniak High School	Aniak	April 25, 2006	12 students and 1 teacher
Kalskag High School	Kalskag	May 2, 2006	30 students and 1 teacher
Goodnews Bay High School	Goodnews Bay	May 16, 2006	12 students and 1 science teacher
Aniak High School	Aniak	December 4–5, 2006	12 students and 1 teacher
Stony River Schools	Stony River	December 7–8, 2006	15 people: 6 K–4 grade, 6 6–12 grade, 2 teachers, and 1 teachers aid
Crooked Creek Schools	Crooked Creek	December 11–12, 2006	44 people: 16 K–3 grade, 12 4–6 grade, 12 7–12 grade, 3 teachers, and 1 teacher aid
Lime Village Schools	Lime Village	January 16, 2007	9 students 7–12, 1 teacher, and 1 teacher aid
Napaskiak High School	Napaskiak	January 22, 2007	30 students and 2 teachers
Oscarville School	Oscarville	January 29, 2007	10 students and 2 teachers
Napakiak School	Napakiak	January 30, 2007	12 students and 1 teacher
Akiak High School	Akiak	March 20, 2007	30 students and 1 teacher

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Table 3.3.–Page 2 of 2.

School Visited	Location	Date	Estimated Number of People Attending
Tuluksak High School	Tuluksak	April 10, 2007	13 high school students
Bethel Regional High School	Bethel	April 12, 2007	16 ecology/biology students
Mt. Edgecumb	Sitka	April 15–16, 2007	20 students: many top YK Delta students attend this school
Quinhagak High School	Quinhagak	May 8–9, 2007	17 students, 1 science teacher, and 1 principle
Kwethluk High School	Kwethluk	May 10, 2007	30 students
Nunapitchuk High School	Nunapitchuk	May 17, 2007	10 students
Tuntutuliak Schools	Tuntutuliak	May 18, 2007	9 students and 2 teachers
Aniak Elementary School	Aniak	November 7, 2007	25 students and 1 teacher
Kalskag Schools	Kalskag and Lower Kalskag	December 10–13, 2007	125 students and 5 teachers
Red Devil Schools	Red Devil	December 17–19, 2007	15 students and 2 teachers
Chuathbaluk School	Chuathbaluk	December 20, 2007	30 students and 4 teachers
Aniak High School	Aniak	March 25–26, 2008	30 students and 1 teacher
Sleetmute Schools	Sleetmute	April 14–15, 2008	6 students and 2 teachers
Crooked Creek Schools	Crooked Creek	April 15–16, 2008	30 students, 4 teachers, and 1 teachers aid

APPENDIX 3.A: ADF&G MEMO REGARDING OPERATION OF LOWER KUSKOKWIM RIVER TEST FISHERY

State of Alaska Memorandum

Department of Fish and Game

Commercial Fisheries Management and Development Division

TO: Tom Kron
AYK Regional Supervisor
Anchorage

DATE: 3 June, 1996

FILE: LKTF96ME.DOC

PHONE: 543-2648

FROM: Doug Molyneaux
Kuskokwim Research Biologist
AYK - Bethel

SUBJECT: Operation of the Lower Kuskokwim Test Fishery in 1996

It just recently came to my attention that the Association of Village Council Presidents (AVCP) and the Bering Sea Fishermen's Association (BSFA) intend to operate the Lower Kuskokwim Test Fishery (LKTF) in 1996, in spite of repeated recommendations to the contrary. The purpose of this memo is to describe my reasons for not supporting the continued operation of the LKTF, discuss some concerns in how it will be operated, and offer some possible alternatives which would be more promising investments for the available funds.

The objectives of the LKTF, as described by AVCP, are to determine the relative timing and run abundance of salmon species as they enter the lower Kuskokwim River. A test fishery can only provide reliable run timing information if the project is optimally located and optimally performed. Test fisheries can also approximate *within season* changes in salmon abundance, but the information only applies to the point where the test fishery is being operated. Again, the usefulness and reliability of this information is dependent on the project being optimally placed and optimally executed. Estimating *between season* differences in abundance is a weak point for even the most optimally located and executed test-fish projects. This was discussed at length during our preseason staff meeting and during preparation for the April 1996 Board of Fisheries meeting. The LKTF is not optimally placed and it cannot be optimally executed, therefore the project objectives cannot be achieved

The LKTF is located near the mouth of the Kuskokwim River and this results in a number of overwhelming challenges. Most notably, this portion of the river is a milling area for adult salmon. Returning salmon periodically hold in the area, for a variable period of time, to allow their bodies to adapt to the transition into freshwater and to await environmental cues which prompt upstream migration. On occasions when milling is prolonged test-fish catches can be exceptionally high and can lead observers to the false conclusion that the salmon run is strong. During these instances the good catches are a result of the build-up of milling fish. The good catches do not necessarily mean the run is strong. This milling phenomenon has misled managers in the past and confounds efforts to use lower river test fisheries as a measure of run timing and relative run abundance.

The expansive size and channel dynamics of the lower Kuskokwim River also thwart efforts to develop a reliable test fishery in the area. At the point where the LKTF is operated, the river is approximately four miles across with two prominent channels, each channel being a mile in width. The profile of each of these channels is exceptionally dynamic. Even the barge traffic must switch between channels every few years. Certainly the fish behavior is affected by these changing current patterns and this would profoundly impact the between season comparability of any test fish data.

A secondary effect of the expansive size of the lower Kuskokwim River is that modestly high winds, 20 to 25 knots, create very rough boating conditions. The wind and waves make it difficult to keep the nets fishing well. During high wind events the fishers are commonly forced to stay on the beach. This is especially bad for a test fish index because, as observed in other test fisheries, the best catches often occur during high wind events. Again, these conditions significantly erode the reliability of any lower river test fishery as an index of run timing and relative abundance.

Disposal of the catch has been another problem of test fisheries operated in the lower Kuskokwim River. Commercial outlets are not readily available, so early in the season the test-fish catches are distributed to subsistence users. But that option quickly dissipates in the second half of June when catches increase and chum salmon dominate. Commercial processors can be coaxed to take the fish when they have tenders passing through the area, but tenders are not always available and dedicated tendering just for the test fishery is a costly venture. As a result, the test-fishers typically undertake measures to intentionally reduce their catches. Among the methods are shortening the drift times, using shorter nets, or reducing the number of drifts conducted each tide. The alternative is to not fish at all and that alternative has occasionally been invoked. Again, these operational shortfalls erode the reliability of the LKTF as an index of run timing and relative abundance.

Test fisheries have been tried in the lower Kuskokwim River for decades and all have failed for basically the same reason - the lower Kuskokwim River is a poor location for a test fishery. In their justification for operating the LKTF, AVCP states that careful management is needed to provide proper salmon management. Given the shortfalls described above, it seems clear that the LKTF does not qualify as a “careful” management tool. As such, it will not contribute to “proper” salmon management; in fact, the opposite is likely to be true. The Department should not invest any further resources into this black hole when other, more promising work is so desperately needed in the area. The welfare of the salmon and public would be better served if efforts were focused on more rigorously operated run assessment and spawning ground assessment projects.

I would hope that staff from the BSFA would reconsider their plans to fund the operation of the LKTF. Those funds could be put to much better use if invested in other run assessment and spawning ground assessment projects. For example, the operating time for the George River weir, Kwethluk River counting tower, and Kanektok River counting tower could be extended to include coho salmon. Coho salmon are poorly studied in the Kuskokwim Area. Extremely little is known about their spawning escapement levels. Meanwhile, that species is rapidly becoming the most valuable salmon resource in the Area. Managers are pressured to allow greater and greater commercial harvest of coho salmon as other economic opportunities dwindle. The impact of the increased harvest levels is unknown.

At the very least, the BSFA funds could be redirected to extend operation of the existing cooperative escapement projects so they provide more complete coverage of the chum salmon run. This is especially important during the first few years during which these projects are operated because the actual run timings are poorly studied or unknown and reliable estimates cannot be made for that portion of the run not counted. Currently, funding levels for all three projects require that counting operations be discontinued by about July 31. It is unknown whether this will be sufficient time to span the entire chum salmon escapement past the George River weir. For the Kwethluk River, during the one year when U.S. Fish and Wildlife operated a weir on the river, 84% of the chum salmon passage had occurred by July 31. In a neighboring stream, the Tuluksak River, a weir was operated for four years and the chum salmon passage by July 31 ranged from 72% to 90%. The most comparable stream for estimating chum salmon run timing for the Kanektok River is the Goodnews River. Chum salmon passage at the Middle Fork Goodnews River weir averages 97% through July 31 (sockeye average 99%). Clearly, the need to extend operational time is mostly at the George River weir and the Kwethluk River counting tower.

Another potential application for the BSFA funds is to extend the genetic stock identification baseline of chum salmon in the Kuskokwim Area. There are numerous gaps in the genetics baseline, especially in the upper Kuskokwim drainage and in the late spawning chum salmon populations.

Staff time in the Kuskokwim is already fully allocated. I don't believe any staff member can afford to help BSFA and AVCP operate the LKTF as we have in the past. Given the shortfalls described above it would not be prudent to reallocate any staff time to the LKTF since it will not prove to be a rigorous and useful management tool. If AVCP is allowed to operate the LKTF without support from the Department, then some issues need to be addressed:

1. Can the test fishery be operated when the subsistence fishery is closed?
2. Can AVCP sell fish caught in the test fishery?
3. How are ADF&G staff to deal with the public and Working Group if data from the LKTF conflicts with other more rigorously operated run assessment projects?
4. If we support the test fishery, in any way, does this not imply that we feel the project has merit? And how is this viewed by observers from outside the Kuskokwim Area? Are we going to use this type of information in Emergency Orders to justify announcements of commercial fishing periods? Will this information appear in the AMR and the BOF reports? Will our continued support for the project contribute to the erosion of the Departments credibility in managing salmon in the Kuskokwim Area?

cc:

Buklis
Cannon
Bromaghin
Burkey
Anderson

APPENDIX 3.B: DELTA DISCOVERY ARTICLE KUSKOKWIM RIVER SOCKEYE SALMON: SECRETS REVEALED

Kuskokwim River Sockeye Salmon: Secrets Revealed

By Doug Molyneaux and Sara Gilk

Sockeye salmon in the Kuskokwim River have largely been a mystery to the biologist charged with managing salmon harvest. Considered an "incidental species," the sockeye entering the Kuskokwim River every June and July were mostly thought to be traveling to Telaquana Lake in the Stony River drainage, which is about the only place in the Kuskokwim basin with the type of lake characteristic of "text book" sockeye salmon habitat.

"Text book" sockeye typically lay their eggs in or near lakes. After the eggs hatch, the offspring live in the lake for one to three years, then migrate to the ocean where the young fish live another two or three years before returning to their birth place to spawn and die. But Kuskokwim River sockeye are teaching us that they are not a "text book" variety.

An investigation by the Alaska Department of Fish and Game, in partnership with Kuskokwim Native Association, National Park Service, Natural Resource Consultants, Inc., and Association of Village Council Presidents, seeks to learn where Kuskokwim River sockeye are spawning, and where the juvenile sockeye are rearing before they go out to sea.

In 2005 Coastal Villages Region Fund provided seed money for a pilot project whose results prompted a full scale investigation scheduled for 2006 and 2007. Funding for the investigation is from Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative, with matching funds from Coastal Villages Region Fund, the Federal Office of Subsistence Management, National Park Service, and the State of Alaska.

In this investigation biologists are using radiotelemetry to uncover some of the sockeye's secrets. About 500 sockeye were caught this year in specially modified fish wheels operated near Kalskag, and the fish were helped to swallow a small radio transmitter. The transmitter is a slippery two inch long cylinder that sits in the stomach of the fish. Salmon don't eat while they are migrating up the river, so the transmitter does not interfere with the fish.

Each transmitter has a unique number, which is like giving each fish a unique name. The transmitter sends out a signal broadcasting that number similar to how a radio station like KYUK or KSKO sends out a signal broadcasting music. But you cannot hear the music of KYUK or KSKO unless you have a radio to receive the signal. In this same way, the number identifying the transmitter in a sockeye salmon is broadcast continually, but you can only hear the number if you have a "receiver".

Not all sockeye caught in the fish wheels get a radio transmitter. Fish are carefully selected in a way that mirrors sockeye salmon abundance as the run builds, peaks, and then tapers off. The selection also mirrors differences in sockeye abundance between the north and south banks.

Biologists use radiotelemetry to track the location of each fish. Every few weeks a biologist gets into a small airplane to survey the Kuskokwim River basin. Holding a receiver in his or her lap, the biologist listens for the transmitter signals of sockeye salmon. Unlike a radio station, the signal broadcasted by the transmitter in sockeye can only be heard over a short distance. When the biologist hears a signal they know they are close to the salmon, and they mark the location on a map. The result is a map that shows were these fish are traveling and spawning.

The investigation is not yet complete, but to everyone's astonishment, only 17 percent of the sockeye have gone to Stony River and Telaquana Lake. The majority of sockeye, 70 percent, are instead going up the Holitna River, and they are not spawning near any lake like "text book" sockeye.

In another part of the study, we are finding that after they hatch the young Holitna sockeye are rearing in spring-fed side-sloughs in the Holitna basin. This is also very different from the "text book" version of sockeye life history, but the Holitna sockeye are doing very well.

One of the important aspects of this finding is that it highlights the importance of the Holitna River basin for salmon production. In addition to sockeye, the Holitna River basin produces perhaps as much as a half of all Kuskokwim River king salmon, plus it is a major producer of chum and coho salmon. The Holitna River basin feeds subsistence fishers throughout most of the Kuskokwim River, and supports the modest commercial fishery of the lower Kuskokwim River.

In recognition of its importance, some village councils are moving to have the Holitna basin established as a Fish and Game reserve. The proposed reserve would be open to hunting, trapping, and fishing, but other development would be limited so as not to harm the fish and wildlife. The groups currently spearheading this initiative are Orutsaramuit Native Council of Bethel and Sleetmute Traditional Council. The Alaska Board of Game has already recognized and endorsed this proposal, and it will go before the Alaska Board of Fisheries for endorsement when the Board of Fisheries meets January 31 to February 5 in Anchorage. Actual establishment of the reserve will take an act of the State Legislature.

Doug Molyneaux and Sara Gilk are Kuskokwim Area salmon research biologists for the Alaska Department of Fish and Game.