

U.S. Fish and Wildlife Service
Office of Subsistence Management
Fisheries Resource Monitoring Program

Togiak River Subsistence Monitoring

Final Report No. FIS01-047

Ralph Andersen/John Chythlook
Natural Resources Department
Bristol Bay Native Association
P.O. Box 310
Dillingham, Alaska 99576

Theodore Krieg
Alaska Department of Fish and Game
Division of Subsistence
P.O. Box 1030
Dillingham, Alaska 99576

Mark Lisac
Togiak National Wildlife Refuge
U.S. Fish and Wildlife Service
P.O. Box 270
Dillingham, Alaska 99576

Jim Larson
King Salmon Fisheries Resource Office
U.S. Fish and Wildlife Service
P.O. Box 277
King Salmon, Alaska 99613

June 2004

FINAL REPORT SUMMARY PAGE

Title: Togiak River Subsistence Harvest Monitoring

Study Number: FIS01-047-1

Investigators/Affiliations:

Ralph Andersen/John Chythlook, Natural Resources Department, Bristol Bay Native Association, P.O. Box 310, Dillingham, Alaska 99576-0310; 907-842-5257; randers@bbna.com

Theodore Krieg, Alaska Department of Fish and Game, Division of Subsistence, P.O. Box 1030 Dillingham, Alaska 99576; 907-842-5925; Theodore_krieg@fishgame.state.ak.us

Mark Lisac, Togiak National Wildlife Refuge, U.S. Fish and Wildlife Service, P.O. Box 270, Dillingham, Alaska 99576; 907-842-1063; Mark_Lisac@fws.gov

Jim Larson, King Salmon Fisheries Resource Office, U.S. Fish and Wildlife Service, P.O. Box 277, King Salmon, Alaska 99613; Jim_Larson@fws.gov

Geographic Area: Bristol Bay

Information Type: Subsistence Fishery Harvest Monitoring and Traditional Ecological Knowledge (TEK)

Issue Addressed:

1. Document subsistence fishery practices and total harvest by species and area by conducting in-season and post season interviews with Togiak River subsistence users, including an estimate of the total number of Togiak households that actively subsistence fish in each study year, and the total subsistence harvest by species, and local residents concerns.
2. Evaluate the current subsistence salmon harvest assessment program (subsistence permits), and enhance the reliability of annual harvest estimates through community outreach and supplemental interviews, to obtain maximum compliance with subsistence fishing permit participation and harvest reporting.

Study Cost: \$148,748

Project Duration: 3/1/01-6/30/04. An extension to end the project in June 2004 was requested in order to accommodate the late date at which the harvest surveys were completed.

Key Words: Bristol Bay Area, Togiak, Togiak River, salmon, Dolly Varden, resident fish, length, sex and scale data, subsistence harvest monitoring, seasonal harvest information.

TABLE OF CONTENTS

FINAL REPORT SUMMARY PAGE.....	ii
TABLE OF CONTENTS.....	iii
ABSTRACT.....	iv
INTRODUCTION.....	1
Background.....	1
OBJECTIVES.....	4
METHODS.....	5
TABLES.....	10-13
RESULTS.....	8
DISCUSSION AND CONCLUSION.....	16
RECOMMENDATIONS.....	24
ACKNOWLEDGEMENTS.....	24
REFERENCES.....	25
APPENDIX I.....	25

ABSTRACT

This study was initiated to document subsistence fishery practices and total harvest by species and area by conducting in-season and post season interviews with Togiak River subsistence users. This study was also designed to enhance the reliability of annual harvest estimates through community outreach and supplemental interviews, to obtain maximum compliance with subsistence fishing permit participation and harvest reporting.

Togiak residents, BBNA Natural Resources staff, and Alaska Department of Fish and Game Sport and Commercial Fisheries Divisions in Dillingham expressed a data need for systematic in-season subsistence harvest data collection to improve the existing information used for management. Togiak National Wildlife Refuge similarly expressed the need for monitoring Dolly Varden, salmon, and other species used in the subsistence fisheries. Due to several circumstances beyond the Investigators' control, the in-season monitoring was not successful.

The effort to evaluate and enhance the subsistence harvest data through work with the existing permit system worked quite well. Post-season interviewing substantially improved the subsistence salmon harvest estimates for the community of Togiak. For each study year, about a third of the total estimated salmon harvests would have been missed had the interviews not occurred. A high level of participation in the survey and the virtual absence of refusals indicate overall support for collection of subsistence harvest data collection in Togiak.

INTRODUCTION

Background

In recent years, Togiak residents have expressed interest in preserving their local fisheries and have expressed a desire to be more involved in monitoring fishing activities on the Togiak River. Alaska Department of Fish and Game Sport and Commercial Fisheries Divisions in Dillingham have also expressed a data need for systematic in-season subsistence harvest data collection, to improve the existing information used for management. Togiak National Wildlife Refuge similarly expressed the need for monitoring Dolly Varden, salmon, and other species used in the subsistence fisheries. This project was also designed to develop an in-season river monitoring program that was identified as a priority by the Bristol Bay Native Association in spring 2000. The project used two technicians hired at Togiak village during the summer salmon season, plus an existing permit vendor in an effort to attain these goals. However, due to circumstances beyond the Investigators' control, the in-season monitoring was not successful. The effort to evaluate and enhance the subsistence harvest data through work with the existing permit system worked quite well.

The village of Togiak is located at the mouth of the Togiak River, the entirety of which flows through the Togiak National Wildlife Refuge. The 809 (2000 census) village residents rely heavily on fish produced in this drainage for both a subsistence and commercial fisheries economy. Although Togiak residents use a wide variety of fish, mammal, bird, and plant resources, salmon and Dolly Varden harvested from the Togiak River system within the Togiak National Wildlife Refuge probably provide the most reliable annual source of subsistence foods (Wright et al. 1985:32-40; Wolfe et al. 1984; Gross 1991). State and Federal Regulations set no seasonal limits on subsistence salmon harvests in Bristol Bay. A 20-year average harvest of approximately 5,000 salmon generally occurs from May to September. Regulations also require a permit for "trout and char", but no harvest assessment program for these species is in place.

Based upon household surveys, Togiak residents harvested over 15,000 fish other than salmon in 1994/95 (Bristol Bay Native Association and Alaska Department of Fish and Game 1996:19). Dolly Varden (10,847) were the primary species harvested and accounted for 54% of the total harvest. Approximately 63% of the Dolly Varden were harvested in the Lower 20 miles of the

Togiak River, and occurred primarily during the fall (46%), spring (30%), and summer (19%) time periods. Additionally, a large portion of the overall subsistence freshwater fish were harvested in the Lower 20 miles of the Togiak River and accounted for approximately 69% of the total harvest.

The subsistence permit system in Bristol Bay was gradually introduced throughout the area beginning in the 1960s. In the entire Bristol Bay Management Area, State and Federal regulations require that subsistence fishers obtain permits from the Alaska Department of Fish and Game (free of charge), record their daily catches on the permit, and return the permit to the Department at the end of the year. Permits are available from vendors in each Bristol Bay village and from Alaska Department of Fish and Game offices in Dillingham and King Salmon. Overall, Alaska Department of Fish and Game personnel believe that the permit system provides a reliable estimate of total subsistence harvests. Most Bristol Bay households that fish obtain permits and most return them with harvest data at the end of the season. For example, in 1999, 1,013 Bristol Bay households obtained subsistence salmon permits and, overall, 95 percent were returned (Alaska Department of Fish and Game 2000:34).

However, evidence suggests that, historically, the permit system resulted in an underestimate of subsistence salmon harvests in Togiak. For example, in 1987, Gross (1991:96-98) conducted post-season subsistence salmon harvest surveys with Togiak households and compared the harvest estimates with those obtained from permit returns. Of 50 households interviewed who subsistence fished in 1987, only 13 (26 %) had returned subsistence permits. Gross (1991:98) concluded that subsistence harvest estimates based on permits represented only about one half to less than one third of the total subsistence salmon harvest in the community. Gross (1991:11) offered two explanations for “the strong resistance to providing harvest information” on the part of many Togiak households. These were 1) a distrust of agencies and a fear of restrictive regulations; and 2) cultural beliefs relating to animals and the ethic of gift giving. People stated that they believed the harvest data would be used to justify restricting subsistence and that counting fish can result in their leaving the area or refusing to be caught. In the latter view, salmon give themselves as a gift to those that respect natural resources and to count gifts is disrespectful. Gross (1991:12) discovered that asking about numbers of “racks” or “full freezers” was an alternative way to estimate harvests if people objected to counting the fish themselves.

Since 1987, there is evidence that more Togiak households have become willing to obtain permits and record their subsistence harvests. For example, in 1999, due in part to the efforts of the local permit vendor, 73 Togiak households obtained subsistence permits, compared to the previous 10-year average of 34 (Alaska Department of Fish and Game 2000:119; Brown et al. 2000). Of these, 70 (96%) returned the permits to the department. However, without more systematic investigation, it is uncertain whether this larger number of permits includes key harvesting families who in the past objected to reporting their harvests. In the spring of 2000, Bristol Bay Native Association and Alaska Department of Fish and Game conducted a round of systematic household harvest surveys in Togiak. When available, the survey results will be compared with the permit estimates, but preliminary data were not available when the investigation plan for this project was developed.

Thus, the need remains to supplement the permit system in the short term to assess its performance and, if necessary, make adjustments to achieve a more complete estimate of subsistence salmon harvests from the Togiak District. The plan for this project was to integrate in-season and post-season interviewing of subsistence fishers which was to be integrated with the existing permit system for a three-year period. It is anticipated at the conclusion of the project, that the in-season interviewing and most of the post-season interviewing will no longer be necessary as understanding of, and support for the self-reporting procedure through subsistence permit system, is enhanced. This is a desirable outcome in the long term because of the relatively low cost of the permit system, and its overall reliability in the remainder of the Bristol Bay Area.

In planning for this project, the collection of seasonal harvest information was seen as providing valuable data for in-season management. Currently, the only in-season information available is on the commercial fishery harvest and sockeye salmon escapement. Understanding the in-season subsistence harvest trends would allow in-season managers to better estimate whether subsistence needs are being met. These data would help provide more defensible rationale if harvest restrictions are needed on other fisheries to provide for subsistence needs, so therefore it was hoped that this project would provide more in-season data. Lacking this, the subsistence permit data were valuable in continuing to provide post-season information that documented subsistence harvest and use.

OBJECTIVES

Project objectives included the following:

1. Document subsistence fishery practices and total harvest by species and area by conducting in-season and post season interviews with Togiak River subsistence users, including an estimate of the total number of Togiak households that actively subsistence fish in each study year, and the total subsistence harvest by species, and local residents concerns.
2. Evaluate the current subsistence salmon harvest assessment program (subsistence permits) and enhance the reliability of annual harvest estimates through community outreach and supplemental interviews, to obtain maximum compliance with subsistence fishing permit participation and harvest reporting.
3. Develop the local capacity of Togiak area residents to collect scientific data through training and involvement in a joint state and federal data collection project.
4. Provide ADF&G and USFWS with timely in-season data to assist in the assessment of subsistence harvest, run timing, and management.
5. Collect biological data from subsistence harvested fish (salmon, Dolly Varden, and resident fish) to estimate the age, size, sex and maturity composition of the subsistence catch.
6. Prepare an annual report for each of the first two study years and a final report that summarize project findings and accomplishments.

METHODS

The project took place in Togiak and on the Togiak River from approximately June through September in 2001, 2002, and 2003. The project was designed, planned, reviewed, and executed through a partnership between the BBNA, the ADF&G and the USFWS. The goal was to improve the existing salmon harvest assessment program. There were three components to the data collection procedures: subsistence harvest permit program, in-season interviews, and post-season interviews. The first component, the permit program, is the current harvest assessment program. This permit program is supported through State General Funds. In May of each year, ADF&G Division of Subsistence arranges for a Togiak resident to issue subsistence permits in the village as a vendor. Permittees record their daily harvests on the permit. They return the permit when they have completed fishing for the year. ADF&G sends two reminder letters to permittees and if returns are low, supplements permit returns with phone calls or community visits. (This latter step was replaced by post-season interviews, see below). Efforts to bolster the number of subsistence permits were discarded early in the project due to unexpected local apprehension toward the permit system during interviews.

The second procedure was in-season interviews. Two (2) LRAs (local research assistants) were hired to travel the lower 20 miles of the Togiak River five (5) times a week, Togiak area beaches, and to and interview fishers at fish camps and fishing sites, depending upon tidal and weather conditions. The interview schedule was intended to focus around periods of the greatest subsistence activity according to tide stages, weekends or commercial fisheries closures. In 2001 and 2002, the research technicians carried ADF&G Subsistence Fishing Permits and were to issue permits in-season. Technicians were instructed to collect information on fisheries effort (number of hours fished), harvest, and mesh size (gear type). They were to record observations by the fishers, such as fish abundance and condition, environmental and social factors that are influencing fishing effort and success, and other observations and traditional knowledge that the fishers wish to share. Data were recorded by species and fishers were reminded to also record the harvests on their permit. If the local researchers observed subsistence nets set out but unattended (this is consistent with regulations), they would attempt to ascertain the nets' owners and interview them in the village. The local researchers were instructed to compile weekly

summaries of harvests and any evaluative information obtained and provide these summaries to the BBNA, the Togiak Traditional Council, the ADF&G, and the USFWS.

In its draft recommendations for a unified subsistence fisheries harvest assessment program, the Subsistence Fisheries Harvest Assessment Working Group (a planning meeting for this project that was composed of federal, state, and tribal representatives) noted that in-season monitoring of subsistence harvests is appropriate under certain circumstances (SFHAWG 2000:10-11). Two of these are relevant for the Togiak River, namely a situation where underreporting of harvests is likely, and where there is a desire to use subsistence harvest data to inform management decisions.

In all three years of the study prior to the summer field season, during the first week of June, the two local research assistants were trained in in-season data collection techniques during a training workshop conducted by the BBNA, the ADF&G, and the USFWS staff in Togiak and Dillingham. ADF&G prepared a training manual for the collection of in-season data . Instruction on biological sampling including genetic sampling and scale and otolith sampling procedures was provided at these workshops, by either ADF&G and USFWS staff or an independent contractor provided by BBNA. In 2001 the training session was held at the BBNA main offices in Dillingham, in early June, and led mainly by Mark Lisac of the Togiak National Wildlife Refuge. In 2002 the workshop was led by Mr. Chris Boatwright, formerly of the Bristol Bay Science and Research Institute, and currently the site administrator of the University of Washington's Fisheries Research Institute Aleknagik campus, as contracted by BBNA. On June 7, 2003, the same workshop for training the two local research assistants was led by Mr. John Chythlook. The workshop was to be supplemented by a general community meeting to review the overall project goals.

In October 2002, ADF&G Division of Subsistence staff traveled to Togiak to work with the local researchers to summarize the in-season data for each household. The local researchers attempted to interview each Togiak household to collect their permit, reconcile data collected in-season with that recorded on the permit, and collect any harvest data not previously recorded. Data were collected for households that fished but did not obtain permits and were not interviewed in-season. With the exception of integrating data collected in-season, this procedure is similar to that used for the subsistence salmon harvest assessment program in the Chignik Management

Area (Fall and Hutchinson-Scarborough 1999). It is hoped that these post-season interviews, conducted by local residents and in the Yup'ik language if necessary, will address the issues identified by Gross (1991) for those households that are reluctant to report harvests. Interviews can use alternatives to “number of fish” (such as racks, buckets, or freezers) and explain the purposes of the project and the applications of the data.

The BBNA worked with the Togiak Traditional Council to develop job descriptions for two (2) local research technicians and one (1) alternate, and advertised the availability of these positions in Togiak to recruit and interview local research technicians for this project. In the event candidates meeting basic eligibility requirements and desired qualifications could not be identified locally, BBNA expanded job advertising and recruitment efforts region wide (throughout Bristol Bay). The successful candidates were employees of BBNA, in accordance with and subject to the Personnel Policies adopted by BBNA. The TNWR had a boat available for the research technicians for this project. A new outboard motor was purchased.

Dolly Varden subsistence harvests. Dolly Varden/arctic char in Togiak are included in three separate categories of fish named in Yup'ik as *anerrluaq* (“Togiak trout”), *yugyaq* (“Dolly Varden” or “char”), and *anyuk* (“sea-run Dolly Varden”) (Fall et al. 1996:16-20). Most are taken in the fall in nets in freshwater (BBNA and ADF&G 1995:21-22). Although regulations require permits for subsistence fishing for “trout” and “char”, no harvest assessment system has been systematically implemented. In this project, households that obtain salmon permits were issued a separate permit for Dolly Varden/arctic char. Local researchers were to collect in-season and post-season harvest data along with information for salmon, and these data were summarized at the end of each study year. After the third year, the project collaborators will make a recommendation to the Alaska Board of Fisheries and the Federal Subsistence Board as to whether continuing the harvest assessment program for Dolly Varden on an annual basis, is necessary.

Biological Data Collection. Subsistence harvested salmon and Dolly Varden (very few), were sampled for age, sex and length data.

Salmon age, sex and length data were collected as per ADF&G standard protocol and utilized Mark-Sense data forms

All Dolly Varden and resident fish species encountered in the subsistence harvest were measured for fork-length and sampled according to protocol used in similar studies (Lisac and MacDonald 1996, Lisac and Moran 1999). All fish were inspected for marks (tags) and their numbers reported to the appropriate agency. A proportional sample of the harvest was sampled for age, sex, maturity, diet, and genetic fin clips. Permission had to be granted for technicians to collect this information, as it required dissection and collection of aging and genetic structures. The anticipated interview schedule focused around periods of the greatest subsistence activity (tide stages, weekends or commercial fish closures). In the event that a subsistence harvest consisted of greater than 100 Dolly Varden, a random grab sample from the harvest was used to represent the catch. A seasonal sample goal based on sampling 10% of the subsistence harvest was 1,000 Dolly Varden.

It is theoretically possible to sample 100% of the whitefish, rainbow trout, grayling and pike encountered in the subsistence catch. An alternative strategy was to set up a sampling station in the village where subsistence fishers could bring their catch to be sampled. Providing an incentive program, without the appearance of a bounty, will be investigated in future studies. Data were collected and analyzed to allow statistical comparison between years, if sample sizes were large enough. Length frequency distributions were calculated by maturity index and compared over time strata, where sample size was appropriate. Age and genetic structures were archived to be included in future mixed stock genetic analysis and otolith microchemistry studies.

STUDY OBJECTIVES AND RESULTS

The majority of the results pertain to Objectives One and Two in each of the three study years (2001, 2002, and 2003). These objectives were to: document subsistence fishery practices and total harvest by species and area by conducting in-season and post-season interviews with Togiak River subsistence users, including an estimate of the total number of Togiak households that actively subsistence fish in each study year, and the total subsistence harvest by species, and local residents concerns. The other objective was to evaluate the current subsistence salmon harvest assessment program (subsistence permits) and enhance the reliability of annual harvest estimates through community outreach and supplemental interviews, to obtain maximum compliance with subsistence fishing permit participation and harvest reporting.

The third objective was to increase local involvement and capacity building, and this was successful in a limited fashion: while training in biological methods occurred, actual production of in-season data was lacking. With increased oversight and support from the Primary Investigators from the beginning of the project, this would have been greatly enhanced. The remaining three objectives (detailed fully on page 4) involved in-season harvest reporting and biological sampling, both of which were largely unsuccessful.

The following objectives, methods, and results that were used to supplement and evaluate the Harvest Assessment Program therefore address predominantly Objectives One and Two.

In the Togiak District, as in the rest of the Bristol Bay Management Area, subsistence salmon fishers are required to obtain a subsistence permit (free of charge) from ADF&G or the local permit vendor in the community, record their harvests on the permit, and return it to ADF&G when they finish fishing. There are no annual harvest limits for subsistence salmon fishing in the Togiak District.

In each of the three study years, a local Togiak resident was employed to conduct post-season surveys of Togiak households regarding their subsistence salmon harvests. The individual hired was also the subsistence salmon permit vendor. The interviewing took place in early 2002, 2003, and 2004, and pertained to the 2001, 2002, and 2003 fishing seasons, respectively. The goal was to interview every permanent household in the community.

Results: 2001

The initial estimate of Togiak households to interview was 211; of these, it was determined that 25 had moved from the community, making the interview goal 186 households. Of these, 151 were interviewed (81.2 percent) and the rest could not be contacted (Table 1). As shown in Table 2, 48 Togiak households obtained subsistence salmon permits in-season for 2001; of these, 42 were interviewed. An additional 42 households were interviewed who reported subsistence salmon fishing in 2001 but had not obtained a permit; these were added to the permit database along with their estimated harvests. Thus, a total of 90 Togiak households was used to calculate

the subsistence salmon harvest estimate for 2001. Additionally, 67 interviewed households did not have a subsistence permit and did not subsistence fish in 2001.

Table 3 shows subsistence harvest estimates for Togiak subsistence fishers based on data from permits issued in-season and also based on post-season interviews. For 2001, if just in-season permits records had been used, the harvest estimate would have been based on the participation of 48 households. All of these households returned their permits and the total estimated harvest was 4,144 salmon. However, an additional 42 fishing households were identified during post-season interviews and they harvested 2,198 salmon. Thus, the estimated total salmon harvest for Togiak for 2001 is 6,342 salmon. This is about 53 percent higher than if the post-season surveys had not been done. Also, it should be noted that of the 48 households that had obtained permits in-season, 13 reported harvests of “redfish” (spawned-out sockeye salmon) that took place after they had sent in their permits. These harvests totaled 702 salmon. These fish are included in the reported harvests of the pre-interview-issued permit group in Table 3, although they would not have been part of the harvest estimate had the post-season surveys not taken place.

Table 4 reports the total estimated subsistence salmon harvest for the Togiak District for 2001. Because the vast majority of participants in this fishery live in Togiak, it is clear that the post-season survey added substantially to the accuracy of the subsistence harvest estimate.

Table 1. Togiak Interview Samples, 2001, 2002, and 2003.

	2001	2002	2003
Initial Estimate of Households	211	203	189
Households Interviewed	151	158	148
Households No Contact	35	14	22
Households Moved	25	29	19
Households Declined Interview	0	2	0
Revised Estimate of Households	186	174	170
Percentage Interviewed	81.2%	90.8%	87.1%

Table 2. Number of Households Used to Estimate Subsistence Harvests, Togiak, 2001, 2002, and 2003.

	Number of Togiak Households		
	2001	2002	2003
Pre-Interviews:			
Number of Permits Issued	48	35	41
Number of Permits Returned	48	34	38
Number of Permittees Interviewed	42	31	30
Interviews			
Total Interviews	151	158	148
Total Interviewed with Permits	42	31	30
Total Fishing without Permit ¹	42	35	43
Did not fish or have permit ²	67	92	75
Households Included for Harvest Estimate ³	90	70	84

¹ These households were added to the permit roles after the interviewing and are included in the "total number of permits issued" as reported in annual management reports and databases. An except is 2002; interviews were not completed in time to be included in the AMR estimates.

² Non-fishing households were not issued permits or included in the database.

³ This equals the total number of permits issued initially plus the total number of households who did not have permits before being interviewed but who fished.

Table 3. Togiak Residents: Subsistence Salmon Harvest Estimates Based on Permit Reports and Post-Season Interviews.

	Permits	Sockeye	Chinook	Chum	Pink	Coho	Total
<u>A. Harvest Year 2001</u>							
Pre-Interview-Issued Permits							
Reported Harvest	48	2,264	1,274	322	27	257	4,144
Estimated Harvest	48	2,264	1,274	322	27	257	4,144
Post-Interview-Issued Permits							
Reported Harvest	42	1,777	273	32	3	113	2,198
Total Estimated Harvest							
Reported Harvest	90	4,041	1,547	354	30	370	6,342
Estimated Harvest	90	4,041	1,547	354	30	370	6,342
<u>B. Harvest Year 2002</u>							
Pre-Interview-Issued Permits							
Reported Harvest	34	2,231	682	588	10	234	3,745
Estimated Harvest	35	2,297	702	605	10	241	3,855
Post-Interview-Issued Permits							
Reported Harvest	35	1,446	248	97	0	139	1,930
Total Estimated Harvest							
Reported Harvest	69	3,677	930	685	10	373	5,675
Estimated Harvest	70	3,730	943	695	10	378	5,757
<u>C. Harvest Year 2003</u>							
Pre-Interview-Issued Permits							
Reported Harvest	38	2,358	538	403	417	579	4,295
Estimated Harvest	41	2,544	580	435	450	625	4,634
Post-Interview-Issued Permits							
Reported Harvest	43	1,772	462	63	13	171	2,481
Total Estimated Harvest							
Reported Harvest	81	4,130	1,000	466	430	750	6,776
Estimated Harvest	84	4,283	1,037	483	446	778	7,027

Table 4. Estimated Subsistence Salmon Harvests, Togiak District, 2001, 2002, and 2003.

Year	Residence Category	Permits		Estimated Harvests					
		Issued	Returned	Sockeye	Chinook	Chum	Pink	Coho	Total
2001 ^a	Togiak	90	90	4,041	1,547	354	30	370	6,342
	Other	1	1	40	30	5	30	10	115
	Total	91	91	4,081	1,577	359	60	380	6,457
2002 ^b	Togiak	70	69	3,730	943	695	10	378	5,757
	Other	1	1	21	0	0	0	0	21
	Total	71	70	3,751	943	695	10	378	5,778
2003	Togiak	84	81	4,283	1,037	483	446	778	7,027
	Other	8	8	120	171	0	5	105	401
	Total	92	89	4,403	1,208	483	451	883	7,428

a The original analysis incorrectly showed one permit as unreturned. This accounts for the slight difference between the estimate reported here and that appearing in the Bristol Bay Annual Management Report (AMR).

b Because the interview data were collected after submissions to the annual management report, Togiak District subsistence harvest estimates appearing in the AMR are based solely on pre-interview permit returns and do not match the estimate provided here.

Results: 2002

For 2002, the initial estimate of Togiak households to interview was 203; of these, it was determined that 29 had moved from the community, making the interview goal 174 households. Of these, 158 were interviewed (90.8 percent), 14 could not be contacted, and two declined to be interviewed (Table 1). As shown in Table 2, 35 Togiak households obtained subsistence salmon permits in-season for 2001; of these, 31 were interviewed. An additional 35 households were interviewed who reported subsistence salmon fishing in 2002 but had not obtained a permit; these were added to the permit database along with their estimated harvests. Thus, a total of 70 Togiak households was used to calculate the subsistence salmon harvest estimate for 2002. Additionally, 92 interviewed households did not have a subsistence permit and did not subsistence fish in 2002.

Table 3 shows subsistence harvest estimates for Togiak subsistence fishers based on data from permits issued in-season and also based on post-season interviews. Unfortunately, the post-season interviews for 2002 were completed after the subsistence harvest data had been provided to the Division of Commercial Fisheries for inclusion in the 2002 annual management report. Therefore, the estimates appearing in the AMR are based just on permit returns and are clearly incomplete and an underestimate of the total harvest. The data presented in Table 3 and Table 4 are a better estimate of subsistence salmon harvests in the Togiak District for 2002.

For 2002, if just in-season permits records are used, the harvest estimate is based on the participation of 35 Togiak households. All but one of these households returned their permits and the total estimated harvest for this group was 3,855 salmon. However, an additional 35 fishing households were identified during post-season interviews and they harvested 1,930 salmon. Thus, the estimated total salmon harvest for Togiak for 2002 is 5,757 salmon. This is about 50 percent higher than the estimate derived solely from the returned permits. Also, it should be noted that of the 35 households that had obtained permits in-season, 9 reported harvests of “redfish” (spawned-out sockeye salmon) that took place after they had sent in their permits. These harvests totaled 430 salmon. These fish are included in the reported harvests of the pre-interview-issued permit group in Table 3, although they are not part of the harvest estimate reported in the AMR, for the reasons stated above.

Table 4 reports the total estimated subsistence salmon harvest for the Togiak District for 2002 based on permit returns and post-season surveys. Because the vast majority of participants in this fishery live in Togiak, it is clear that the post-season survey added substantially to the accuracy of the subsistence harvest estimate for 2002.

Results: 2003

For 2003, the initial estimate of Togiak households to interview was 189; of these, it was determined that 19 had moved from the community, making the interview goal 170 households.

Of these, 148 were interviewed (87.1 percent) and the rest could not be contacted (Table 1). As shown in Table 2, 41 Togiak households obtained subsistence salmon permits in-season for 2003; of these, 30 were interviewed. An additional 43 households were interviewed who reported subsistence salmon fishing in 2003 but had not obtained a permit; these were added to the permit database along with their estimated harvests. Thus, a total of 84 Togiak households was used to calculate the subsistence salmon harvest estimate for 2003. Additionally, 75 interviewed households did not have a subsistence permit and did not subsistence fish in 2003.

Table 3 shows subsistence harvest estimates for Togiak subsistence fishers based on data from permits issued in-season and also based on post-season interviews. For 2003, if just in-season permits records had been used, the harvest estimate would have been based on the participation of 41 households. All but three (3) of these households returned their permits and the total estimated harvest would be 4,634 salmon if data from just this subset of fishers were used. However, an additional 43 fishing households were identified during post-season interviews and they harvested 2,481 salmon. Thus, the estimated total salmon harvest for Togiak for 2002 is 7,027 salmon. This is about 54 percent higher than the estimate would have been had the post-season surveys not been done. Also, it should be noted that of the 41 households that had obtained permits in-season, six (6) reported harvests of “redfish” (spawned-out sockeye salmon) that took place after they had sent in their permits. These fish are included in the reported harvests of the pre-interview-issued permit group in Table 3, although they would not have been part of the harvest estimate had the post-season surveys not taken place. (The database for 2003 does not separate out these added harvests from the number of sockeye salmon reported on the returned permits themselves.)

Table 4 reports the total estimated subsistence salmon harvest for the Togiak District for 2003. Because the vast majority of participants in this fishery live in Togiak, it is clear that the post-season survey added substantially to the accuracy of the subsistence harvest estimate.

DISCUSSION AND CONCLUSIONS

Clearly, the post-season interviewing substantially improved the subsistence salmon harvest estimates for the community of Togiak. For each study year, about a third of the total estimated salmon harvests would have been missed had the interviews not occurred.

Also, the very high level of participation in the survey and the virtual absence of refusals indicate overall support for collection of subsistence harvest data collection in Togiak. It is uncertain why about half the subsistence salmon fishers in Togiak do not obtain a permit each year, even though they are willing to be interviewed post-season. Perhaps the face-to-face contact with a local community resident encourages otherwise reluctant individuals to provide harvest estimates.

In the future, an effort should be made through the local permit vendor to contact all known subsistence fishers in Togiak at the beginning of the fishing season to encourage them to obtain a permit (which is required by regulation). Because of limited funding, it is unlikely that contacting and interviewing about 150 households in Togiak annually is sustainable. If most known subsistence fishers obtain permits and return them in response to reminder letters (as do most subsistence fishers in most other Bristol Bay communities), perhaps a more limited post-season set of interviews could be conducted with those households who likely fished but do not appear on the list of permit holders at the end of the fishing season.

In 2002, the project's Togiak River technicians documented a maximum of four subsistence nets on the Togiak River for as long as four days. One net for subsistence was observed on the beach of Togiak Bay for a prolonged period of time. No subsistence fishing was observed with a rod and reel. BBNA's technicians occasionally encountered individuals who were actively fishing, but declined to be interviewed or to have their catch sampled. The technicians did not encounter any subsistence fishers amenable to participating in in-season interviews.

In 2003, one subsistence net was also observed on the beach for a prolonged period of time. Four subsistence nets were observed through the course of the summer, but with lack of staff for a significant part of the summer, there were significant gaps in observations. No subsistence fishing was observed with rod and reel. River technicians made many observations that subsistence fishers were not encountered that were amenable to interviews during the course of their efforts.

2. Evaluate the current subsistence salmon harvest assessment program (subsistence permits) and enhance the reliability of annual harvest estimates through community outreach and supplemental interviews to obtain maximum compliance with subsistence fishing permit participation and harvest reporting.

ADF&G Staff in Dillingham and BBNA are trying to enhance the reliability of annual harvest estimates through community outreach and supplemental interviews to obtain maximum compliance with subsistence fishing permit participation and harvest reporting.

A local vendor issued all of the subsistence salmon permits for Togiak residents before and during this project. Technicians were trained to issue permits if they encountered anyone that wanted a permit and had not obtained one from the permit vendor. The Technicians issued no subsistence salmon permits. The lack of subsistence fishers encountered on the river hindered community outreach during the season. Many local residents were busy commercial fishing and not encountered by the technicians. Subsistence needs may also have been met from take-home of commercial catch.

Cooperation of qualified federal subsistence residents in the Togiak River drainage to have their catches sampled can best be described as apprehensive. This has been an ongoing issue for sometime between the village residences and the Cooperating Partners. A community meeting was implemented by ADF&G Division of Subsistence in October 2002 to foster community support for the subsistence harvest post-season interviews.

The Togiak River Technicians encountered the same sampling challenges in 2003 as in 2002, including starting after the major subsistence harvests, community misinformation, and few river

subsistence nets. The first year was successful in getting the project up and running, but not in gaining community cooperation or adequate sample size. Community cooperation is the most influential factor to project success. Despite the poor returns, there are fish being smoked and put away; we simply are not sampling them. Subsistence rules on confidentiality and voluntary reporting result in little ability to attain sufficient data without community and individual understanding, cooperation, and support. Additionally, many local residents have little confidence in State and Federal management agencies due to past events.

BBNA staff arranged a meeting with the Togiak Traditional Council in early June 2003 to thoroughly explain the project before the start of the 2003 season. Initial hiring of technicians with the council recommendation was done at this time. In 2003, the final field season for this project, there was considerable difficulty in keeping technicians employed. Two technicians started working around June 16th, but after training one was only available for work for two weeks. Hiring of additional employees was hindered by lack of available staff.

3. Develop the local capacity of Togiak area residents to collect scientific data through training and involvement in a joint state and federal data collection project.

Two Togiak residents approved by the Togiak Traditional Council were hired as Togiak River Technicians to monitor the river. They were trained to conduct in-season interviews with subsistence fishers, issue permits, and collect subsistence harvest data and biological samples on the Togiak River.

Fish sampling training was conducted in Dillingham (June 20, 2002) for all the technicians hired for the Togiak project. Chris Boatright, Bristol Bay Science Research Institute (BBSRI) demonstrated to the sampling crew how to properly collect scales, extract otoliths, and collect genetic fin clips. Each field technician participated in the activities and gained valuable hands-on experience. Mark Lisac, Togiak National Wildlife Refuge Fisheries Biologist, presented the local hire technicians an overview of the objectives specified in the investigation plans of this project. Mr. Lisac also demonstrated how to accurately complete the Federal Subsistence reporting forms. Chris Boatright did the same with ADF&G age-weight-length (A-W-L) reporting forms. Mark Lisac and Dan Kingsley trained the technicians about how to properly identify the

differences between Dolly Varden and Arctic Char trout. In addition, time was spent identifying the sex and maturity of various salmonid species utilizing exterior characteristics

In 2003, John Chythlook trained the two technicians (including one returning technician) in the same methods. First Aid/CPR training was also given at the same time.

4. Provide ADF&G and USFWS with timely in-season data to assist in the assessment of subsistence harvest, run timing, and management.

BBNA reported all subsistence activities such as number of samples collected, fish species, sample gender, number of subsistence participants and the number of subsistence nets encountered by the field technicians to all Cooperating Partners (USF&W and ADF&G) on a daily basis in 2002. With significant periods without staff during all years of this project, the collection of in-season data was abbreviated, at best.

Due to small sampling size, very little in-season data was available in the 2002 and 2003 seasons. The technicians indicated that more people would have been observed on the river if the project had started earlier. Inconsistent runs of variable size also reduced catch and potential sampling. Most of the sampling season there were only three or four subsistence nets on the Togiak River, consequently, the opportunity to collect data was minimal. Significant periods with lack of staff also hindered the collection of in-season data.

5. Collect biological data from subsistence-harvested fish (salmon, Dolly Varden, and resident fish) to estimate the age, size, sex and maturity composition of the subsistence catch.

During July 2002 BBNA, in consultation with USF&WS, ADF&G, and OSM, decided to change the sampling schedule specified in the Investigation Plan due to the following reasons:

Poor numbers of samples collected during the 2001 and June/July 2002 sampling seasons, low number of Chinook and sockeye in the Lower Togiak River during the early portion of the 2002 season, and interest expressed by ADF&G in obtaining more data on subsistence captured Chinook salmon in the spring.

In 2002 the subsistence monitoring project began June 24th. In comparison, the monitoring in 2001 began on June 23 and at that time; the most recent five-year average for subsistence-caught Chinook indicated that approximately 36% of the season total had been harvested. Although ADF&G assesses Chinook spawning escapement via aerial survey on the Togiak River, the Division of Commercial Fisheries indicated that in-season subsistence information would be useful to assess relative Chinook and Coho run strength and timing. In-season information at the beginning of the Chinook and Coho salmon runs would aid the management of the sport fishery as well. Adjustment of the river-monitoring schedule to meet these objectives was discussed prior to the start of the 2002 season. An earlier start date for the 2003 season was anticipated, however, due to lack of staff, this didn't occur as planned.

The TNWR personnel also expressed their interest in developing a better database of resident species harvested in the Togiak River subsistence fishery. This target subsistence fishery usually occurs during October and November and through the ice in the winter months.

The TNWR's primary role is to conduct training, provide logistical and project support, provide biological sampling protocol, assist in project investigation planning, and provide one seasonal work month to process all non-salmon biological data collected. TNWR personnel provided equipment necessary for the technicians to collect biological data from resident fish and anadromous Dolly Varden. Photo albums of resident freshwater fish in various color phases and identifying characteristics were provided. Biological data, genetic tissue and otoliths were archived with the Fisheries Genetics Lab (USFWS) in Anchorage. The otoliths were archived at the Togiak Refuge Office in Dillingham, Alaska, and were to be processed to determine ages at a later date.

It was anticipated that sampling would be more successful during the third year of this project as residents became more aware of the project objectives and benefits and allowed their harvest to be sampled. The modified survey schedule that extended the 2002 monitoring project into the fall was intended to enhance the possibility of sampling the Dolly Varden harvest. Commencing the 2003 monitoring project in March was intended to increase the potential to collect samples

from the spring subsistence ice fisheries, when a large portion of Dolly Varden and other resident freshwater fish harvests occurred.

As previously discussed, the Togiak subsistence project-sampling regime was modified because of the lack of salmon subsistence samples being collected in the Lower Togiak River (2001, 2002). The following changes were suggested by BBNA and agreed on by Theodore Krieg, ADF&G subsistence biologist, and Mark Lisac, USF&W Togiak NWR fisheries biologist:

Modify the weekly sampling schedule from five days a week to two or three days a week effective July 10, 2002.

Reduce the Coho subsistence-sampling schedule to accommodate additional winter freshwater subsistence sampling.

Start sampling freshwater subsistence sampling from fish captured through the ice in February/March 2003.

Start subsistence Chinook sampling during the month of May 2003.

Through the 2001 season, the crew got a total of 119 subsistence caught salmon scale samples, with the breakdown as follows:

Sockeye	48
Chinook	17
Coho	43
Chum	11

Through July 11, 2002, the crew sampled a total of eighty-two (82) subsistence-caught salmon. Scale samples were collected from:

Chinook	17
Sockeye	35
Chum	30

Between July 11-26, 2002, the technicians reported that there was only one, and on occasions, no subsistence nets present on the beach and in the lower Togiak River. The crew on several

occasions reported that they had to resort to setting their own personal subsistence net to collect samples.

In 2003, the earlier start was not implemented due to lack of available staff. If opportunities to sample fish caught in the fall and early winter fishery became available, BBNA staff (John Chythlook) and Togiak National Wildlife Refuge staff (Mark Lisac) had agreed to coordinate in obtaining samples as available, but opportunities did not arise.

In 2003, scale samples were collected from:

Chinook	18
Sockeye	38
Chum	5

6. Prepare an annual report for each of the first two study years and a final report that summarize project findings and accomplishments.

An annual report was filed for this project in October 2003, but not in previous years, though periodic performance reports have been filed. Due to changes in the Partners for Fisheries Monitoring staff biologist position at the lead agency (BBNA), annual reports were not submitted as scheduled.

Successes include the ADF&G subsistence permit process that was in place before the start of this project, and the post-season household surveys. This part of the project has continued to be the most useful part, although attempts to increase the number of subsistence permits issued were discontinued early on due to apprehension toward the system (it was perceived that the information provided on this form could be used for enforcement purposes). Community involvement at this level has generally been good, though perhaps not representative of the entire community.

For the in-season monitoring portion of the project, there was continued difficulty keeping staff hired. In 2001, the project was off to a late start due to lack of staff. The summer sampling season was very slow, in part due to apprehension by residents of a perceived threat to their

subsistence catches by cooperating with the local technicians. It was very similar in 2002, with the season ending early because of the unfortunate death of one of the technicians in a non-work related accident. Internal changes in staffing at BBNA in 2002 and 2003 also decreased staff logistical support to this project. In 2003, as in previous years, there was considerable difficulty in keeping more than one person employed as a technician in Togiak throughout the summer.

This project fell short of expectations in sampling and reporting due to several unexpected difficulties such as variable staff availability and decreased community involvement due to perceived threat to their resources. It also had a very broad scope, with many different objectives. With fewer objectives and more direct on-the-ground staff involvement, participation may have been enhanced.

RECOMMENDATIONS

While a project of this scope could succeed, it would likely need to have a much greater amount of on-ground support from either agency or BBNA staff built into the project. It was originally written into this project that it could develop into a longer-term monitoring project. As it stands, this is not recommended at this time. With careful and very specific project design this could be accomplished, however this should be approached as a new project rather than as an extension of this current existing one.

In the future, possible project design for in-season monitoring should include support staff from either the agencies or BBNA in the village to provide logistic, scientific and moral support to the local research assistants. This would need to be implemented from the very beginning of the project, so that the community and the research assistants retain faith in the project and its results. Also, projects should be very specific as to their purpose, and it should be clear that there is community agreement as to what that purpose is before the project begins. For the purposes of in-season monitoring projects, there has to be adequate agreement from the community as a whole as to the purpose(s) and result(s) of the project. From the perspective of this project, more complete results would likely have been achieved if a different approach was taken. Several simpler projects with very well-defined goals to work toward in a realistic and short time period, and staff and individuals directly responsible for the accomplishment of each objective would have been ideal.

ACKNOWLEDGEMENTS

The U.S. Fish and Wildlife Service, Office of Subsistence Management, provided \$148,748 in funding support for this project through the Fisheries Resource Monitoring Program, under agreement number FIS-047-1.

REFERENCES

- Alaska Department of Fish and Game. 2000. Annual Management Report, 1999, Bristol Bay Area. Division of Commercial Fisheries, Regional Information Report No. 2A2000-xx. Anchorage.
- Alaska Department of Fish and Game. 2000b. Effort, harvests, and catches statistics for sport fisheries in southwest Alaska, 1977 – 1999. Preliminary data tables. Alaska Department of Fish and Game Sport Fish Division, Dillingham, Alaska.
- Bristol Bay Native Association and the Alaska Department of Fish and Game. 1996. The Harvest and Use of Freshwater Fish in Togiak and Manokotak, 1994-95. Natural Resource Department, Bristol Bay Native Association and Division of Subsistence, Alaska Department of Fish and Game. Dillingham.
- Brown, Louis A., David A. Caylor, Gretchen B. Jennings, and Charles J. Utermohle. 2000. Alaska Subsistence Fisheries Database. Version 3.00 for Microsoft Access 97. Division of Subsistence. Juneau.
- Fall, James A., Molly B. Chythlook, Janet C. Schichnes, and Judith M. Morris. 1996. An Overview of the Harvest and Use of Freshwater Fish by the Communities of the Bristol Bay Region, Southwest Alaska. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 166. Juneau.
- Fall, James A. and Lisa Hutchinson-Scarborough. 1999. Overview of Chignik Management Area Subsistence Salmon Fishery. Report to the Alaska Board of Fisheries, Kodiak, Alaska, January 1999. Alaska Department of Fish and Game, Division of Subsistence. Anchorage.
- Gross, Joseph. 1991. Subsistence Fishing Patterns on the Togiak River and the Impact of Sport Fishing (revised). Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 203. Juneau.
- Lisac, M.J. and J.R. Moran. 1999. Migratory behavior and seasonal distribution of Dolly Varden *Salvelinus malma* in the Togiak River watershed. Togiak National Wildlife Refuge. Progress report, U.S. Fish and Wildlife Service, Dillingham, Alaska.
- Lisac, M.J. and R.D. Nelle. 2000. Migratory behavior and seasonal distribution of Dolly Varden *Salvelinus malma* in the Togiak River watershed. Togiak National Wildlife Refuge. Final report, U.S. Fish and Wildlife Service, Dillingham, Alaska.
- Lisac, M.J. and R. MacDonald. 1996. Age, weight and length statistics of Togiak River drainage resident fish species, Togiak National Wildlife Refuge, Alaska, 1993 – 1995. U.S. Fish and Wildlife Service, Fishery Data Report Series Number 96-3. Dillingham, Alaska.
- MacDonald, R. 1997. Length frequency and age distribution of resident fish collected from rivers within Togiak National Wildlife Refuge, Alaska, 1996. U.S. Fish and Wildlife Service, Fishery Data Report Series Number 97-4. Dillingham, Alaska.
- Subsistence Fisheries Harvest Assessment Working Group. 2000. [Draft] Recommendations for a Unified Subsistence Harvest Assessment Program.
- Wolfe, Robert J., Joseph J. Gross, Steven J. Langdon, John M. Wright, George K. Sherrod, Linda J. Ellanna, Valerie Sumida, and Peter J. Usher. 1984. Subsistence-Based Economies in Coastal Communities of Southwest Alaska. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 89. Juneau.

Wright, John M., Judith M. Morris, and Robert Schroeder. 1985. Bristol Bay Regional Subsistence Profile. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 114. Juneau.

Appendix I

Abbreviated Interviewer Protocol

The interviewer was to do the following:

1. Determine if anyone in the household subsistence fished for salmon in the study year.
2. If yes, determine if the household had obtained a subsistence salmon permit and if so, if they had returned it.
3. If the household had returned the permit, the interviewer asked if any additional fishing had taken place after the permit had been sent in. If so, an estimate of the additional harvest was obtained.
4. If the household had a permit but had not returned it, the permit was collected and the harvests verified, or if the permit had been misplaced, estimates of harvests were obtained through retrospective recall.
5. If households had subsistence fished but had not obtained a permit, the household was interviewed to obtain harvest estimates for the study year.
6. Each of these households was assigned a permit number and added to the permit database.
7. Households that said they did not subsistence salmon fish were not interviewed and were not added to the database.