

Technical Paper No. 341

Exploring Approaches to Sustainable Fisheries Harvest Assessment in Northwest Alaska

by

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Alaska Department of Fish and Game

Division of Subsistence



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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft ³ /s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols

alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

<i>all commonly-accepted abbreviations</i>	
<i>e.g., Mr., Mrs., AM, PM, etc.</i>	
<i>all commonly-accepted professional titles e.g., Dr., Ph.D., R.N., etc.</i>	
Alaska Administrative Code	AAC
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	\$, ¢
months (tables and figures):	first three letters (Jan, ..., Dec)
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mid-eye-to-fork	MEF
mid-eye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations

alternate hypothesis	H _A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2 , etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	log ₂ , etc.
minute (angular)	'
not significant	NS
null hypothesis	H ₀
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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ASSESSMENT IN NORTHWEST ALASKA**

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ABSTRACT

This report presents a plan for a continuing harvest assessment program for subsistence hunting, fishing, and gathering for 11 rural communities in Northwest Alaska. The program involves a cooperative group of state and federal agencies, tribes, communities, non-governmental organizations, and industries. The program provides a framework for subsistence harvest assessment through periodic household surveys, and seeks to integrate other subsistence-related studies whenever possible. The plan rests on 3 foundations: 1) recommendations from a series of planning efforts that began in 1995, 2) recommendations from 146 participants in 11 community meetings held in Northwest Alaska in 2006 and 2007, and 3) lessons learned during prior harvest assessment efforts in Alaska. The program was intended to be an evolution of, not a break from, previous harvest assessment efforts in Northwest Alaska. Agencies and organizations in Northwest Alaska have indicated they would support a coordinated approach to subsistence harvest assessment. By institutionalizing a continuing program, by improving the harvest survey instrument, by developing a multi-year schedule for sampling communities, and by distributing survey costs among several parties, the cooperators seek efficiencies that will make an annual harvest assessment program affordable and sustainable.

Key words: harvest assessment, subsistence fishing, chum salmon, *Oncorhynchus keta*, sheefish, *Stenodus leucichthys*, whitefish, *Coregonus* spp., *Prosopium* spp., Dolly Varden, *Salvelinus malma*, caribou, *Rangifer tarandus*, moose, *Alces alces*, bearded seal, *Erignathus barbatus*, beluga whale, *Delphinapterus leucas*, Kotzebue District, Ambler, Buckland, Deering, Kiana, Kivalina, Kobuk, Kotzebue, Noatak, Noorvik, Selawik, Shungnak, Cape Krusenstern National Monument, Kobuk Valley National Park, Kotzebue Sound, Noatak National Preserve, Selawik National Wildlife Refuge.

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INTRODUCTION

This report presents a plan for a continuing and evolving harvest assessment program for subsistence hunting, fishing, and gathering for 11 rural communities in Northwest Alaska¹. The program involves a cooperative group of state and federal agencies, tribes, communities, non-governmental organizations, and industries. The plan provides a framework for continuing subsistence harvest assessment through periodic household surveys, and seeks to integrate other subsistence-related studies with the harvest assessment program whenever possible.

This harvest assessment plan is a result of series of planning efforts funded by the U.S. Fish and Wildlife Service (USFWS), the Alaska Department of Fish and Game (ADF&G), the University of Alaska, and the National Science Foundation (NSF). The foundation for these efforts was laid at a 1995 conference in Girdwood, Alaska, the Conference on Harvest Assessment, which attracted more than 200 government managers, subsistence users, data collectors, and researchers from Alaska, Canada, and Greenland (Trent et al. 1996). After the conference, planning efforts scaled down to the state level (Fall and Shanks 2000), the regional level (Fall 2003), and finally – in projects such as this one – to the local level.

In this effort, Maniilaq Association, the Northwest Arctic Borough (NWAB), and the ADF&G Division of Subsistence held a series of meetings in each community in Northwest Alaska to explore approaches to harvest assessment. From those meetings, from the recommendations of prior planning efforts, and from their own experiences administering harvest assessment surveys, investigators developed a harvest assessment plan for Northwest Alaska. Summaries of the community meetings and the plan itself are presented in this report.

Agencies and organizations in Northwest Alaska have indicated they would support a coordinated approach to subsistence harvest assessment. By institutionalizing a continuing harvest assessment program, by improving the survey instrument, by developing a multi-year schedule for sampling communities, and by distributing survey costs among several parties, the cooperators seek efficiencies that will make an annual survey program affordable and sustainable.

BACKGROUND AND RATIONALE

For this project, Northwest Alaska was defined as all lands and waters that drain into Kotzebue Sound and the Chukchi Sea between Cape Espenberg and Point Hope, including marine waters under both state and federal jurisdictions. The project area encompassed a variety of political boundaries similar, but not always identical, to the project area, such as:

- The Northwest Arctic Borough (a political subset of the State of Alaska).
- The NANA Region (an Alaska Native corporation).
- The Northwest Arctic Region (a federal subsistence management area).
- The Kotzebue Area (a fishing regulatory area that extends south to Cape Prince of Wales).
- Game Management Unit 23 (a hunting regulatory area that extends north to Cape Lisburne).

Northwest Alaska encompasses about 100,000 km² which, if it were a state, would make it the 35th largest state in the United States, about the same size as Ohio. The project area includes both state and federal waters used for subsistence fishing by these communities, such as the Noatak River, Kobuk River, Selawik River, Buckland River, Goodhope River, Kotzebue Sound, nearshore waters of the Chukchi Sea,

¹ This project was funded to explore approaches to sustainable *fisheries* harvest assessment. During project meetings, participants were asked about harvest assessments of fish, as well as other species commonly used for subsistence. Only 10 of 145 participants (6%) recommended harvest assessments of fish and not of other species. So the harvest assessment plan presented in this report includes fish, wildlife, and plants, as recommended by the participants.

and numerous coastal lagoons. The area includes portions of the Bering Land Bridge National Preserve and Gates of the Arctic National Park. It also includes the entire Kobuk Valley National Park, Cape Krusenstern National Monument, Noatak National Preserve, and Selawik National Wildlife Refuge.

The project area also includes the traditional territories of 11 *Iñupiaq* Eskimo societies (Burch Jr. 1998). During the 20th century, these societies coalesced into 11 small predominantly Native communities ranging in size from 109 people in Kobuk to 3,082 people in Kotzebue (U. S. Census Bureau 2001). These communities include Ambler, Buckland, Deering, Kiana, Kivalina, Kobuk, Kotzebue, Noatak, Noorvik, Selawik, and Shungnak (Figure 1). In the 2000 census, more than 80% of the 7,208 residents of the area were Alaska Native or American Indian, primarily *Iñupiaq* Eskimo (U. S. Census Bureau 2001).

Alaska Natives, including the *Iñupiaq* of Northwest Alaska, are among the very few indigenous peoples of the world who inhabit their traditional territories. In rural Alaska, Alaska Natives usually are a majority of the populations in their territories. Their territories have been largely unaffected by agriculture, industrial development, or roads. They manage their political and economic affairs through both traditional (tribal) and contemporary (borough and corporate) structures. They continue to rely substantially on hunting, fishing, and gathering to provide for their sustenance.

Subsistence fishing occurs nearly year-round in communities throughout the Northwest Alaska Region. Major subsistence fisheries target chum salmon *Oncorhynchus keta*, sheefish *Stenodus leucichthys*, Dolly Varden *Salvelinus malma*, whitefishes *Coregonus* spp., *Prosopium* spp., burbot *Lota lota*, northern pike *Esox lucius*, and saffron cod *Eleginus gracilis*.

The amounts of all species harvested for subsistence are not well documented. Formal harvest reporting methods – permits and reports required by regulation and submitted by users – provided incomplete harvest information for rural Alaska (Fall and Shanks 2000:28; Pedersen 1996). Comparing survey estimates generated from Division of Subsistence in-person household surveys to data from regulatory harvest reports, Georgette (1994) estimated that only about 11% of the caribou *Rangifer tarandus* harvest from the Western Arctic Caribou Herd (WACH) was reported through the regulatory harvest reporting system.

In Alaska, both state and federal laws provide priorities for subsistence hunting and fishing over other consumptive uses, such as commercial fishing. Aboriginal hunting and fishing rights were extinguished by the Alaska Native Claims Settlement Act in 1971. Recognizing the lack of legal protection for Alaska's subsistence traditions, and mindful of the risks to subsistence posed by competing commercial and recreational uses, both the Alaska legislature and the U.S. Congress subsequently adopted laws intended to preserve opportunities for customary and traditional uses of fish and wildlife in Alaska.

Under the Marine Mammal Protection Act of 1972, "coastal Alaska Natives" were granted an exemption which allowed them to continue to hunt for marine mammals for subsistence and handicrafts. Subsequently, a number of co-management organizations were formed to manage different species of marine mammals, including the Alaska Beluga Whale Commission, the Alaska Eskimo Whaling Commission, the Alaska Nanuuq Commission, the Eskimo Walrus Commission, and the Ice Seal Commission. In 1978, the Alaska legislature adopted a law providing a priority for subsistence over other consumptive uses of fish and game (AS 16.05.258). Under this law, the Alaska Board of Fisheries and the Alaska Board of Game manage for subsistence uses on state and private lands. Under the Alaska National Interest Lands Conservation Act (ANILCA) adopted in 1980, the Federal Subsistence Board manages for subsistence uses on federal public lands (about 60% of the state). Under migratory bird treaties adopted in 1999, subsistence hunts in Alaska were established for permanent residents of villages within subsistence harvest areas.

Thus, a wide variety of management regimes need current subsistence harvest information to fulfill their particular responsibilities for managing fish, game, migratory birds, marine mammals, lands, and waters in Northwest Alaska. In addition, subsistence harvest information is needed to determine the amount

reasonably necessary for subsistence as required by Alaska state law (AS 16.05.258), and to provide communities with a baseline record of their harvests in the event of ecological disasters or adverse industrial development.

To date, harvest assessment efforts in the Northwest Alaska Region have been intermittent, species-specific, conducted by different entities, and driven by agencies' data needs, not by a coordinated strategy. In an annual report for this study, Magdanz et al. (2007) reviewed the harvest data available for the Northwest Alaska Region, and found that subsistence harvest information for salmon was collected on an annual basis from 1994 to 2004 in 6 project communities (Ambler, Kiana, Kobuk, Noatak, Noorvik, and Shungnak), but was not collected regularly in the other 5 Northwest Alaska communities of this region. For some communities, such as Selawik, no harvest information was available for any fish species. Since 1968, the Division of Subsistence has conducted comprehensive baseline harvest surveys once in Deering, Shungnak, and Buckland, and twice or more in Kivalina, Noatak, and Kotzebue. In the 5 other Northwest Alaska communities, comprehensive harvest surveys have never been conducted. Given the variation in harvest patterns among the communities and over the years, it was not possible to generate reliable, region-wide harvest estimates for subsistence-caught fish, let alone all subsistence resources.

Prior approaches to harvest assessment offered subsistence-based communities little opportunity to participate in long-term planning processes. With very few exceptions – the Native Village of Kotzebue's harvest assessment effort being one (Whiting 2006) – harvest assessment projects were designed and conducted by fish and wildlife management agencies, not by communities or tribes. As a rule, each agency conducted its own harvest assessment projects. Each agency addressed different species (e.g., salmon, waterfowl, migratory birds, wildlife) and different research needs, often using different sampling methods and survey instruments.

These problems have not been limited to Northwest Alaska, but are widespread in the circumpolar north. They were a primary reason that the 1995 Conference on Harvest Assessment in Girdwood was convened. Participants agreed that several broad elements were necessary for successful harvest assessment (Trent et al. 1996:5-6), including:

1. Managers and users must both see the benefits of harvest data.
2. Managers and users should both clearly understand the links between harvest data and management actions.
3. Researchers should pinpoint at the outset what they need to know, collect only necessary data, limit how often they ask for information, and make it easy for users to provide information.
4. Local people should have a significant part in designing surveys, and local people should be hired and trained to collect data.
5. Managers should recognize and find ways of incorporating traditional knowledge in harvest assessment and management.
6. Managers should promptly share information with local communities.
7. Managers and users should trust and respect each other.

Following the Girdwood conference, the USFWS Office of Subsistence Management funded a series of projects to discuss approaches to harvest assessment. In 2000, the Alaska Intertribal Council and the ADF&G Division of Subsistence convened a Subsistence Fisheries Harvest Assessment Working Group (SFHAWG) that included federal, state, and tribal members. This group assembled available subsistence fisheries information for Alaska and developed a set of recommendations for a unified subsistence fisheries harvest assessment program (Fall and Shanks 2000). Then, in a second project, the Alaska Intertribal Council and the ADF&G Division of Subsistence conducted a series of statewide workshops, one in each region, to discuss approaches to fisheries harvest assessment. Generating sustainable harvest

assessments was an action item recommended by the participants in the Kotzebue workshop in November 2002 (Fall 2003). That effort led directly to this project.

These prior planning efforts provided guidelines for discussions with tribal council members and the public. Prior efforts and this project increased the public's understanding of harvest assessment, and helped build support for long-term harvest assessment programs in Northwest Alaska.

Given the historical reliance on survey methods in Northwest Alaska, the ability of survey methods to collect demographic and economic information as well as to generate comprehensive harvest estimates, and the poor past performance of regulatory harvest reporting systems, the assumption was that a long-term harvest assessment program for Northwest Alaska would rely on household survey methods. Assuming there was support for harvest surveys, then the questions to be addressed in the planning process included:

- How often should communities be surveyed?
- Should surveys be administered to a census of households or to a representative sample of households?
- Which species should be included in the surveys?
- Which agencies or organizations should conduct the surveys?

OBJECTIVES

This project had 2 primary objectives:

1. Meet separately with each of the 11 tribal councils in the Northwest Alaska Region to a) discuss the benefits and risks of harvest assessment, b) review existing harvest data and its uses, and c) solicit recommendations for the type of harvest assessment program, if any, the community would like to have.
2. Produce a working plan outlining one or more possible long-term, sustainable approaches to regional fish and wildlife harvest assessment, based on tribal councils' recommendations.

METHODS

This project was divided into 3 phases. During the first phase, completed during 2005-2006, investigators combined historical harvest information into a comprehensive regional harvest database. During the second phase, 2006-2007, investigators met with tribal councils in each community, summarized harvest information specific to that community, and discussed approaches to harvest estimation. During the third phase, 2007-2008, investigators developed a working plan for a long-term sustainable program to assess harvests in Northwest Alaska.

The original principal investigators on this project, Susan Georgette and Enoch Shiedt, resigned from ADF&G and the Maniilaq Association, respectively, midway through the first year of the project. James Magdanz was appointed to replace Susan Georgette and Paulette Lambert was designated to replace Enoch Shiedt. Paulette Lambert was subsequently replaced by Caleb Pungowiyi, who was subsequently replaced by Hazel Smith as the principal investigator from the Maniilaq Association. In fall 2006, the Northwest Arctic Borough expressed interest in the project, and in May, 2007, ADF&G and the NWAB signed a cooperative agreement so that ADF&G could provide support to the NWAB in scheduling and assisting with the community meetings. The borough assigned Brenda Goodwin and Penny Hodges to the project.

PHASE 1: DATA REVIEW

As a first step in generating and presenting community harvest summaries, investigators compiled a regional harvest database by merging regional data from 2 Division of Subsistence databases, the CSIS² and the Alaska Subsistence Fisheries Database (ASFDB) (Caylor and Brown 2006), from ADF&G Division of Commercial Fisheries annual management reports (Banducci et al. 2003), and from projects not yet included in statewide databases (e.g., Magdanz et al. 2004). Once complete, the regional database allowed investigators to evaluate the quality of the data, as well as to summarize and compare all available harvest information for a single community, any group of communities, a single species, or for a category of species.

PHASE 2: COMMUNITY MEETINGS

In the second phase, investigators met with the tribal councils and members of the public in 10 of the 11 project communities, and with tribal staff in the 11th community, Kotzebue (Table 1). At the meetings, researchers delivered a Microsoft PowerPoint³ presentation about the history of harvest assessment in their community and in the Northwest Alaska Region; the results of harvest survey projects administered from 1994-2004; the benefits and risks of harvest assessment; and possible options for systematic harvest assessment in the future. The presentation included pie charts showing amounts contributed by the top 10 species harvested in 3 communities. Community members were notified about the meeting through local media.

Before each presentation except Kotzebue, investigators distributed a one-page questionnaire about harvest assessment approaches and asked attendees to complete it after the presentation so as to provide a starting point for open discussion. During these discussions, the investigators answered questions and solicited ideas and preferences from the attendees for a long-term harvest assessment program in their community.

PHASE 3: PLAN DEVELOPMENT

Following completion of the 11 meetings, the investigators compiled the recommendations of the tribal councils and presented the results to the Northwest Arctic Borough Assembly (Appendix A). Investigators then developed a plan for a harvest assessment program for Northwest Alaska. The program was intended to be an evolution of, not a break from, previous harvest assessment efforts in Northwest Alaska, such as the ADF&G Northwest salmon surveys (conducted from 1994 to 2004) and Western Arctic Caribou Herd (WACH) surveys (which began in 1998 and were continuing in 2009).

This report summarizes results from the 11 community meetings, including the attendees' responses to the questionnaires, as well as other public comments captured at the meetings. It then presents a harvest assessment plan and an example modular survey instrument (Appendix B).

MEETING RESULTS

Topics discussed during the 11 community meetings ranged from whether or not to conduct harvest assessment in the community; the frequency and scope of harvest surveys; survey methods, including sampling; to the role of tribes, agencies, and organizations in harvest assessment. In 10 of the 11 meetings, 146 council members and interested public filled out the questionnaire. The administrators from the Native Village of Kotzebue elected not to use the questionnaire, instead submitting written comments after the meeting describing their harvest assessment program (Appendix C). In addition, a summary meeting was held with the NWAB Assembly on August 28, 2007.

² Alaska Department of Fish and Game Division of Subsistence Community Subsistence Information System. <http://www.subsistence.state.ak.us/CSIS>.

³ Throughout this document software products are described. These product titles are included because they are established standards for the state, department, and/or division, and do not constitute product endorsement.

In response to the question, “How often should we survey your village?” only 6% of respondents in the 10 communities said “Never.” The most common response, an average of 57%, was that surveys should be conducted “Every year.” Even more participants, 71% on average, thought surveys should include every household in the community. And 45%, on average, thought surveys should be conducted with every household every year, the most frequently-recommended frequency and sampling strategy. Comments included:

- “If you do it yearly you could see the trends. In the long run, you could see some years when they didn’t get much caribou.” (Noatak)

In response to the question, “Which species should be included?” the most common answer was caribou, from an average of 91% of the participants. Next was moose *Alces alces*, with 80%, followed by salmon and beluga whale *Delphinapterus leucas* with 77%. Of the 18 species listed on the questionnaire, 11 were recommended for inclusion by an average of 50% or more of the participants. The 11 species included salmon; whitefishes; sheefish; Dolly Varden; caribou; moose; beluga whales; bearded seals *Erignathus barbatus*; and various unspecified species of geese, ducks, and berries. On average, participants recommended that 9 species be included; the most common recommendation included 10 species. One Noorvik respondent recommended that 27 species be included, and this person added 9 species to the questionnaire, including beavers *Castor canadensis*; muskrats *Ondatra zibethicus*; and unspecified species of greens, roots, and medicinal plants. Comments included:

- “It would be interesting if you had a number for caribou harvests. A lot has changed. Hardly any caribou.” (Kivalina)
- “Bear population is important.” (Noatak)

In response to the question, “Who should do the surveys?” an average of 57% of participants thought the tribes should be involved, and 26% thought tribes alone should be involved. More commonly, though, participants thought 2 or 3 organizations should be involved, most frequently a cooperative effort between the tribes, Maniilaq Association, and ADF&G. In those communities where the NWAB was a choice, it was also frequently recommended as one of several cooperators. The tribes and other organizations were preferred in 8 of the 10 communities; ADF&G and the NWAB were preferred in Deering; and Maniilaq Association was preferred in Noatak. Only 12 of 146 respondents (8%) thought more than 3 organizations should be involved. Comments included:

- “Let the tribes do the surveys, so maybe [people] could have some sort of income.” (Kobuk)
- “Should be done by local people.” (Buckland)
- “MOA with tribes. Share data. Federal and state agencies [should] directly work with tribes, answer to tribes.” (Ambler)
- “Maniilaq on behalf of the tribes. U.S. Fish and Wildlife Service to avoid confusion.” (Noatak)
- “I think it should be Fish and Game, but Maniilaq should have part of it.” (Noatak)
- “Every department and organization should work together. Different tasks for different groups. Keep everyone on the ‘same page.’” (Selawik)
- “[Use] Iñupiaq translator.” (Kivalina)

There were some unexpected and creative comments, such as administering the surveys over the Internet or in conjunction with NANA Regional Corporation meetings. And there were comments about environmental quality issues. Other comments included:

- “Door prizes for participants, for more thorough and completed surveys.” (Noatak)

- “Consider on-line access for subsistence gatherers to provide information. Tribes can assist those who need help to get it done.” (Kiana)
- “Do the surveys in conjunction with other meetings, like the annual NANA meeting (you will get high numbers). Surveys should also ask about edible and medicinal plants, roots, and berries. Results should be given back to those who participate and request feedback.” (Noorvik)
- “Air. Check our atmosphere for quality and see if it is safe.” (Buckland)

Discussion at the meetings returned frequently to animal populations, animal behavior, animal health, and environmental contamination. Attendees seemed most concerned about the availability and quality of their subsistence resources and less concerned about the numbers of fish and wildlife harvested, which was not unexpected. Overall, there was widespread support for harvest assessment in general, involving all major species on a regular basis. People were interested in the results, and expressed appreciation for the presentation of their own community’s harvest history. On the 146 questionnaires, only one written comment could be construed as negative. At almost every meeting, a few people made complimentary comments on the questionnaires, such as:

- “Be good to let the villages know the results and updates, and any concerns or precautions villages need to learn.” (Kivalina)
- “We’re the most regulated people in the United States. Now we need harvest tickets, permits, license just to live our way of life.” (Selawik)
- “We depend on subsistence for our food. Thank you for your work today.” (Buckland)
- “This data is very helpful to our village's members.” (Noatak)
- “Keep checking our subsistence resources. For our peace of mind, we’ll know for sure that what we are eating is healthy enough. Thanks, and keep up the great work you all do for us.” (Noorvik)

On July 19, 2007, after the 10 community meetings had been conducted, investigators met with administrators for the Native Village of Kotzebue. The administrators were already familiar with harvest data for Kotzebue because they had been collecting the data, so investigators did not make a presentation on Kotzebue harvest data. Instead, they briefly summarized the state of harvest assessment in Northwest Alaska, discussed the results of meetings in other communities, and discussed the recent harvest surveys by the Native Village of Kotzebue. The administrators commented that:

- The Native Village of Kotzebue has a harvest assessment protocol in place,
- The Village Council supports that protocol,
- Future harvest assessment efforts of tribal members should be consistent with that protocol,
- Harvest surveys of tribal households should be conducted by the Native Village of Kotzebue,
- Harvest surveys of non-tribal Kotzebue households should use a protocol consistent with the village’s protocol (instrument, sampling, etc.), and
- Efforts by the Native Village of Kotzebue should be coordinated with efforts by others (i.e., occur at the same time).

Two action items resulted from the meeting: 1) the publication of a report summarizing the 2002-2004 tribal harvest survey results, and 2) the inclusion of a short summary of the survey protocol used by the Native Village of Kotzebue, into this harvest assessment plan. The council subsequently approved the report for release; it is now available to the public (Whiting 2006). The Native Village of Kotzebue’s comments on the harvest assessment program appear in this report as Appendix C.

THE HARVEST ASSESSMENT PLAN

The plan presented here rests on 3 foundational elements. First are the recommendations on harvest assessment developed by the series of efforts since the 1995 Girdwood conference (Trent et al. 1996; Fall and Shanks 2000; Fall 2003; Walker 2009). Second are the recommendations from participants in 11 community meetings held in Northwest Alaska in 2006 and 2007. Third are the lessons learned about subsistence harvest survey design, survey administration, data analysis, and results publication during the investigators' prior subsistence harvest assessment efforts in Alaska.

Under this plan, subsistence harvests would be assessed using periodic household surveys administered on a rotating schedule designed to survey each community no less often than once every 5 years and, ideally, more often than that. In addition to addressing timing, the plan addresses data needs, survey instruments, survey administration, program coordination, program funding, and program implementation.

DATA NEEDS

Subsistence harvest data are most obviously useful for managing fishing and hunting, but also are useful for managing other human activities that could impact fish and wildlife, and for evaluating environmental, social, and economic change over time. Subsistence data may be needed by other agencies – environmental impact assessments directed by the U.S. Environmental Protection Agency are one example – and these agencies may have little to no experience in subsistence harvest assessment.

Identifying subsistence-related research problems was the first step in assessing data needs. This project identified 5 research problems, listed below, and presents a discussion of the scope of information required to address these problems:

1. Managing fish and wildlife where demand exceeds supply.
2. Sustainably allocating fish and wildlife among competing uses.
3. Documenting subsistence economies.
4. Assessing and mitigating impacts from development.
5. Monitoring long-term ecological conditions.

To manage species where demand may exceed supply, managers need timely harvest data for selected species, in some cases on an annual basis. Fortunately, this involves only a handful of fish and wildlife species in Northwest Alaska at this time. To sustainably allocate fish and wildlife, regulatory bodies need periodic harvest data over time that accounts for normal variations in harvests, which for some species can mean decades. To better document Alaska's subsistence economy, policymakers need substantially complete estimates of harvests and better descriptions of subsistence systems. To assess impacts or long-term changes, investigators need an initial comprehensive survey to collect baseline subsistence harvest, social, and economic data; they also need a post-impact survey to measure changes and assess impacts.

Although addressing any of the data needs can be difficult, the more complex research problems are those that address impact assessment and ecological monitoring, because the nature and scope of the potential impacts and the course of human adaptations are not known in advance. For example, residents of Northwest Alaska might adapt to persistent and adverse changes in caribou migration patterns by increasing their moose or salmon harvests or by purchasing imported foods. The latter adaptation would imply increased reliance on wage labor or transfer payments. Fully evaluating the impact of changes in caribou migrations would require information on caribou movements, caribou harvests, caribou harvest locations, other species' harvests, employment, wages, other types of income, and perhaps household spending patterns. Thus, impact assessment and ecological monitoring require a greater scope than basic harvest assessment.

The challenges of collecting basic subsistence data are not as daunting as they might seem. Figure 2 illustrates the concentrations of harvests by species (in edible pounds) in 7 Northwest communities for which comprehensive survey data were available. In 2 of the communities, Noatak and Shungnak, 5 species accounted for about 90% of the harvest. In 4 communities, Deering, Kiana, Kivalina, and Kotzebue, 10 species accounted for 90% of the harvest. In only 1 community, Buckland, did as many as 15 species account for 90% of the harvest. In all the communities, 95% of the harvest was on fewer than 20 species. Thus, substantially complete community harvest estimates can be derived from a relatively small number of species, although the species of interest will vary by community.

In the community meetings, perhaps not coincidentally, most respondents recommended including about 10 species. Species recommended for assessment were those most frequently harvested or most highly valued. In the former group were caribou and salmon, the first and second species in terms of harvests, respectively, and the first and second species recommended for harvest assessment by meeting participants. In the latter group were geese and ducks, highly-valued species recommended for assessment even though harvests were relatively small.

SURVEY INSTRUMENT

In designing a survey instrument, investigators had 2 goals: 1) to collect data that would be comparable with previous data, and 2) to develop a single core instrument equally useful in a 2-page salmon survey or a 30-page comprehensive survey.

To do this, investigators combined and refined several previous survey instruments – including an annual salmon survey, an annual big game survey, and a periodic comprehensive subsistence survey – into a singular modular survey instrument which could be expanded to meet many data needs. In its simplest form, the survey includes a core harvest module that collects, for example, salmon or big game harvests on the front and back of a single sheet. By adding more core harvest modules, the single-species survey evolves into a comprehensive survey, while maintaining comparability with single-species efforts. Additional modules were developed to collect demographic, economic, spatial, assessment, or social network data as needed, all using the same basic design as the core module. The master instrument is a single Microsoft Excel file; the core harvest module and additional modules are a series of worksheets in that file.

In the master instrument, many survey questions are the same as, or similar to, questions in prior harvest assessment tools. Existing subsistence harvest databases do not need to be changed. What has changed is the reliance on a single, scalable, easily modified survey instrument, instead of several instruments.

SAMPLING STRATEGY

This harvest assessment program is intended to generate harvest estimates for multiple resources for each community in Northwest Alaska, so each community would be sampled independently. A program intended to generate a single harvest estimate for the region, such as the migratory bird harvest assessment program conducted by the Alaska Migratory Bird Co-Management Council, employs a different strategy. In the past, three sampling strategies have been used for community harvest assessment surveys: 1) a census of all households, 2) a simple random sample of some households, and 3) a stratified random sample of two or more groups of households.

Except for Kotzebue, the communities in Northwest Alaska are small. In the 10 smaller communities, the median community in 2000 included 383 people living in 83 households (U. S. Census Bureau 2001). Division of Subsistence protocols state that random samples require a minimum of 30 households and confidence increases substantially as samples increase to 60 or more households. If the sampling goal was 60 randomly-sampled households in each study community, then every household would be surveyed in 3 communities (Kobuk with 26 households, Deering with 42 households, and Shungnak with 54 households), and more than one-half of the households would be surveyed in 5 other communities (Kivalina, Ambler, Buckland, Kiana, and Noatak).

Random samples are valid only if they are representative; that is, if the surveyed and unsurveyed households are similar. In the typical subsistence harvest assessment survey, community residents administer most of the surveys. Local crews are familiar with the households in their communities and, if sampling goals are less than a census, the crews tend to survey high-harvesting households and ignore low-harvesting households. “Why talk to them? They don’t get anything.” If this occurs, estimates will be biased high. To avoid this problem, the harvest assessment program must provide either on-site supervision or thorough training for local crews.

Assuming, though, that a representative sample was achieved, most estimation procedures require that data be normally distributed. Subsistence harvests, however, are not normally distributed: variation is high. Typically, a few households harvest extremely large quantities of wild foods and redistribute their harvest to other households, while many other households harvest little or no wild foods (Wolfe 1987; Magdanz et al. 2006). This practice, unless accounted for in survey design, reduces precision and confidence in estimates. For species harvested in large amounts by a few specialized households – migratory birds are a common example – confidence intervals can exceed the estimates.

These factors – small populations, potential sampling biases, skewed distributions – argue for a census approach. Except for Kotzebue, which has 889 households, the median number of households in Northwest Alaska communities is about 80, an achievable census sample in most circumstances. Except for the regional center of Kotzebue, participants and investigators agreed that a census was the preferred sampling strategy. Although a 100% sample was rarely achieved in practice, large samples improved precision and confidence in the estimates.

In Kotzebue, with 889 households, the Native Village of Kotzebue and the investigators agreed that a stratified random sample was the preferred sampling strategy. This method has been employed in Kotzebue 4 times: once by ADF&G (Georgette and Loon 1993) and 3 times by the Native Village of Kotzebue (Whiting 2006). Investigators in these studies used a 3-strata sample, surveying at least 30 high-harvesting, 30 medium-harvesting, and 30 low-harvesting households. Variations in harvests within each stratum were much smaller than in the community as a whole, and more normally distributed, which improved confidence and precision in the estimates. The Native Village of Kotzebue proposed continuing this sampling strategy among its member tribal households (about one-half of the population of Kotzebue); while ADF&G would survey a random sample of at least 30 non-tribal Kotzebue households. Harvest estimates would be calculated for each stratum separately, then combined to derive a total community harvest estimate.

Virtually all the subsistence harvest survey data collected before 1980 – which would be very useful today – lack sampling information and thus cannot provide comparable estimates (e.g., Raleigh 1957; Saario and Kessel 1966; Wilimovsky and Wolfe 1966).

PROGRAM ADMINISTRATION

A harvest assessment program involves more than administering household surveys or individual user permits. A successful program requires well-documented sampling strategies, training for survey crews, consistent survey instruments and implementation, harvest estimates that account for unsurveyed households, regular publication of results (ideally in a web-searchable database), and durable data repositories for both harvest data and household lists. Many Alaska organizations have conducted subsistence harvest surveys; however, very few have maintained durable harvest assessment programs. Successful long-term harvest assessment programs typically have been cooperative programs involving multiple organizations. That is the approach envisioned here.

During this project, public support for tribal involvement in harvest assessment was high. Most residents of the region were members of tribes, and tribes were more familiar with their members’ subsistence harvest and use patterns than any other organization. Most participants in the planning meetings also recommended that tribes partner with one or more regional organizations. Only one Northwest Alaska

tribe – the Native Village of Kotzebue – had demonstrated an ability to conduct a multi-year harvest assessment program. Other than the Native Village of Kotzebue, no Northwest Alaska tribes or local community organizations had implemented a long-term harvest assessment program, nor were any likely to develop that capacity in the foreseeable future.

On the regional level, several organizations have the capacity to operate a harvest assessment program. The Maniilaq Association and the NWAB cooperated in this planning process, and have conducted household surveys for their own programs. In the 1970s, the NANA Regional Corporation assisted in a harvest survey that included all communities in Northwest Alaska (Patterson 1974).

Two regional organizations already have major harvest assessment programs in place in Northwest Alaska. The Division of Subsistence routinely conducts subsistence harvest surveys throughout the state, and has administered most of the recent harvest assessment efforts in Northwest Alaska. The Alaska Migratory Bird Co-Management Council, through the USFWS migratory bird program and the Division of Subsistence, regularly administers household surveys to a stratified random sample. Other efforts have been made by the Selawik National Wildlife Refuge, which administered a comprehensive survey in Selawik for the 2006 harvest year, and by various marine mammal co-management commissions that obtain subsistence harvest information from hunters in Northwest Alaska communities.

The most effective approach, consistent with the recommendations from the communities, would be to establish a regional program involving one management agency (ADF&G or USFWS), one regional organization (Maniilaq Association, the NANA Regional Corporation, or the NWAB), and a local government organization in each community. In consultation with the other members of the program, the management agency would develop the survey instrument, enter and analyze survey data, publish results, store raw data, and maintain household lists. Working with communities, the regional organization would consult with the agency on the survey instrument and sampling strategies, train survey crews, supervise survey administration in each of the communities, and review the survey results. Tribes would be responsible for administering surveys in their own communities, with on-site supervision from the regional organization as required. Depending on the capacities of cooperating organizations, responsibilities could be redistributed among cooperators.

FUNDING

Some of the funding needed to support a harvest assessment program is already in place; but additional funds are needed to support a continuing, comprehensive program. The Division of Subsistence has relied on state general funds (GF) to support staff who administer and conduct the harvest assessment projects. The Division also has received harvest assessment funding from a variety of other sources. The GF amount has varied from year to year depending on allocations, the scope of the harvest assessment projects, and the amounts contributed by others.

Since 1998, the ADF&G Division of Wildlife Conservation has provided up to \$30,000 annually to support WACH harvest assessment in game management units 22 and 23. These funds have been distributed among the Division of Subsistence, Kawerak, Inc., and Maniilaq Association to conduct harvest surveys in 1 to 3 Northwest Alaska communities each year. In some years, the National Park Service (NPS) also contributed approximately \$4,000 to support these harvest assessment efforts, funds that were used primarily to support Maniilaq Association's involvement. The NPS also funded comprehensive household surveys in Deering, Buckland, Kiana, and Noatak, but as individual projects and not as an ongoing harvest assessment program. In 2008, the NWAB included \$50,000 for subsistence harvest assessment as part of its coastal management plan. In 2009, the Selawik National Wildlife Refuge contributed \$2,500 for travel associated with a big game harvest assessment project. Commitments from these organizations are expected to continue, and provide initial funding for the ongoing harvest assessment program. The Division of Subsistence continues to solicit additional funds to support a sustainable long-term program.

The Western Arctic Caribou Herd Working Group has recommended a range-wide harvest survey be conducted in all WACH using communities simultaneously. If funded, that too could help support this program. If the necessary funds are procured, then the program will ideally be able to rapidly expand efforts to administer surveys in every WACH community in 2 successive years, then return to a revolving schedule of community surveys similar to the current WACH schedule but at a much larger geographic scale.

The greatest challenges facing the establishment of a long-term sustainable harvest assessment program are fluctuations in funding amounts and uncertainties in funding sources. The program, like the survey instrument, must be flexible enough to respond to changes in the funding environment but maintain data integrity and comparability. One way to achieve this flexibility is to rely on temporary, community-based contractors – as the current harvest assessment efforts often do – to collect the data. Scalability is more difficult for data analysis and report publication, but can be facilitated through standardization of survey instruments, database formats, and publications.

IMPLEMENTATION

Implementation of this plan is not predicated on a particular event, but rather involves integration of new harvest assessment projects with existing programs, a process that has already begun. The modular survey instrument was first used for comprehensive surveys in Kiana in 2007 (funded by NPS and ADF&G). A simple big-game version of the modular instrument was used in Deering in 2008 to gather harvest data for Western Arctic Caribou Herd management. Finally, a combination of industry funds from Teck Cominco Alaska, Inc. and agency funds from the ADF&G Division of Wildlife Conservation supported comprehensive surveys in Noatak and Kivalina in 2008.

The latter project provided an example of how another agency's specific data needs could be incorporated into a general harvest assessment program. The National Environmental Policy Act (NEPA) scoping process associated with a proposed expansion of the Red Dog Mine resulted in the identification of a need for new subsistence information for a supplemental environmental impact statement (SEIS). Stephen R. Braund and Associates (SRB&A) had already received a subcontract with Tetra Tech, Inc., to prepare portions of the SEIS for the U.S. Environmental Protection Agency. In October 2007, ADF&G Division of Subsistence staff were requested to expand planned big game harvest surveys in Noatak and Kivalina to include comprehensive harvest surveys in early 2008, which provided an opportunity to implement the plan being developed for this project. As hoped, this plan successfully provided the framework for combining funds, for efficiently collecting data, and for reducing respondent burden.

To build on these initial successes, resolutions of support from regional organizations and commitments of agency funding to a durable harvest assessment program would help ensure its continued success. One of the recommendations of this project (below) is that agencies and regional organizations review the final plan, consider (and hopefully adopt) resolutions of support, jointly determine which agency and regional organization should administer the program, and gather commitments from funding sources. A formal implementation meeting could be an appropriate forum for determining program administration.

DISCUSSION

At the 1995 Girdwood conference, participants recognized that “the biggest hurdle may be the mistrust that has built up over decades of misunderstandings and cultural clashes” and many said that the conference was a good first step to resolving those conflicts (Trent et al. 1996:11). Subsequent efforts – especially harvest assessment programs conducted under the guidelines developed at Girdwood – seem to have increased support for harvest assessment substantially. In several communities, participants mentioned the annual salmon survey research, which was discontinued in 2004 due to a loss of funding support, as a positive example of harvest survey research that provided regular results to the communities (Georgette 1996a, 1996b; Georgette and Utermohle 1997, 1998, 1999, 2000, 2001; Georgette et al. 2003a, 2003b, 2004; Georgette and Koster 2005).

During the round of community meetings for this project, 94% of meeting participants thought surveys should be conducted, 57% thought they should be conducted every year, and 45% thought every household should be surveyed every year. Support for tribal involvement was widespread. Tribes were not only mentioned more often than any other organization, they were the most-often mentioned organization in 8 of the 10 communities. However, only about 30% of the participants thought the tribes should act alone. Of the 80 participants who favored tribal involvement, 43 (54%) thought the tribes should partner with another organization.

Residents of the salmon and WACH harvest survey communities had received summaries of prior research results at the completion of prior projects (or, in the case of salmon, each project year). However, for most residents, the PowerPoint presentations developed for this project were the first comprehensive review of harvest information they had seen for their communities, and the first opportunity they had to compare their communities' harvests with other communities in the region. The variation among communities in the species harvested was considerable, and of interest to the audiences. Residents were also interested in the time series data of per capita harvests by community from 1964 to 2004 and the time series data of total harvests in Kivalina from 1964 to 1992. Several residents of Kivalina commented that they would find it interesting if another comprehensive survey were conducted in Kivalina.⁴

Participants were interested in the review of historical harvest data, which showed that at that time, neither the annual subsistence harvest of major fish species in Northwest Alaska, nor the total annual subsistence harvest, was known. Agency efforts have been mostly uncoordinated, except through the efforts of local non-profit organizations and regional agency staff. Although there is a harvest reporting system in regulation for many big game species, comparisons of harvest reports with harvest survey data suggested that only about 1 in 5 moose harvested by residents was being reported. Compliance with the paper-based harvest reporting system has been low for decades, as reported in one of the first critical assessments which appeared 25 years ago (Moore 1984; see also Andersen and Alexander 1992).

The recommendations of the participants were consistent with agency goals: more frequent surveys focused on key species, using a census approach in all communities except Kotzebue. Small populations, potential sample biases, and skewed distribution all argued for the census approach. Perhaps even more important, the public finds census results more credible.

CONCLUSIONS

Current, reliable information on subsistence harvests in Northwest Alaska is essential for fish and wildlife management agencies. Subsistence information also is valuable for tribal and community governments, for regional organizations, for resource industries, and for the general public. To achieve this, researchers recommend:

1. That agencies and organizations in Northwest Alaska consider and adopt the plan presented here to support an annual, continuing harvest assessment program in Northwest Alaska using periodic household surveys.
2. That tribal governments in each community actively participate in data collection and review. This is especially important in Kotzebue, where the Native Village of Kotzebue has successfully conducted several years of harvest assessment research. Tribes were named most often in response to the question: "If your village is surveyed, who should do the surveys?"
3. That the agencies and organizations select one or two regional entities with harvest assessment capabilities to coordinate a continuing harvest assessment program in cooperation with the tribes. Candidates (in the order they were named in the community meetings) include: ADF&G, NWAB,

⁴ In February 2008, comprehensive surveys were completed in Kivalina and Noatak for another project, following the research plan developed for this project.

Maniilaq Association, USFWS, and NPS. Each of these entities maintains offices in Northwest Alaska and has contributed to harvest assessment efforts in the past.

4. That communities be surveyed as often as possible, given available funds, but not more often than once a year and not less than once every 5 years. In the meetings, 57% of respondents recommended annual surveys, although at this time, funds are not available to conduct surveys in every community every year.
5. That the coordinating entities and tribes develop an annual schedule of communities to be surveyed. This schedule should be coordinated with adjacent regions that depend on the caribou from the Western Arctic Caribou Herd in order to facilitate an annual estimate of WACH subsistence harvests.
6. That surveys attempt to contact all occupied households in all communities except Kotzebue, where a stratified random sample is recommended. In the meetings, 72% of respondents recommended that all households be surveyed.
7. That surveys include salmon, Dolly Varden, sheefish, whitefishes, caribou, moose, bearded seals, beluga whales, geese, ducks, and berries (unless a species is not locally available). These species were named by at least 50% of the community meeting respondents. As a general practice, surveys should be limited to the most commonly-used species in each community.
8. That a standard modular survey form, similar to the form in Appendix B, should be adopted. We recommend using only those survey modules limited to the species above, as well as the assessment modules.
9. That data entry, storage, and analysis be conducted by the ADF&G Division of Subsistence, which has become the statewide repository for most subsistence harvest assessment data.
10. That the ADF&G Division of Subsistence add community summary data to the Division's Community Subsistence Information System (CSIS).
11. That a succinct annual project summary be distributed to each household in the region each year.
12. That the coordinating entity or entities make an annual presentation to the NWAB Assembly and the Northwest Regional Advisory Council summarizing the current results of the harvest assessment project.

The members of the tribal councils and public who attended the project meetings were supportive of subsistence research in general, and interested in better assessment of harvests in particular, in order to better track and understand changes in subsistence practices. Participants also wanted to know the results of the research in their communities. Implementation of a comprehensive harvest assessment program is still to come, yet this study already has influenced harvest assessment in Northwest Alaska.

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FIGURES AND TABLE



Figure 1.—Northwest Alaska and the project communities.

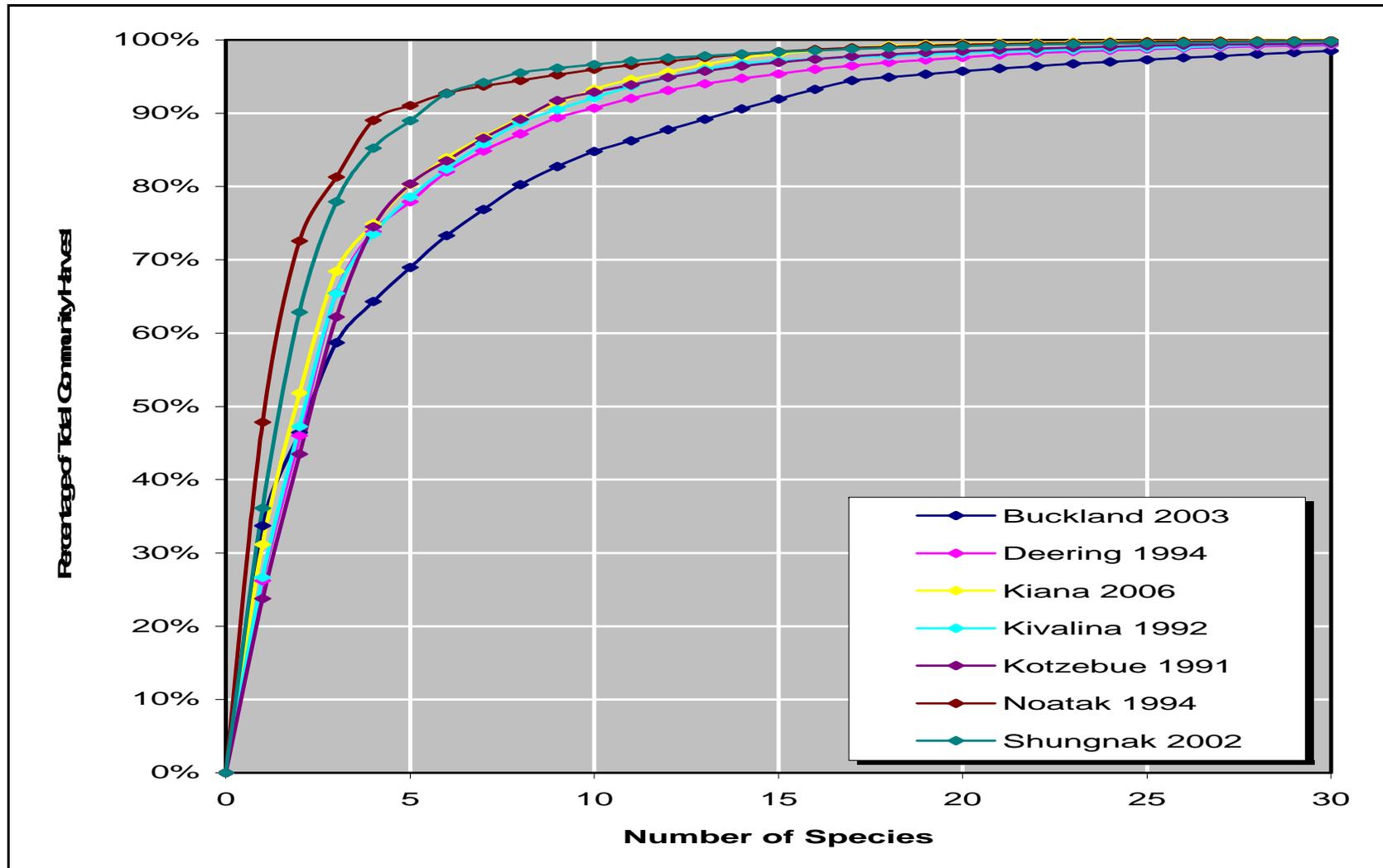


Figure 2.—Concentration of harvests by species and community.

Table 1.–Meeting dates and numbers of respondents.

Community	Community meeting dates	Number of people responding to questionnaire
Ambler	5/3/2007	11
Buckland	9/19/2006	42
Deering	5/11/2007	8
Kiana	5/10/2007	8
Kivalina	5/8/2007	7
Kobuk	5/3/2007	12
Kotzebue	7/19/2007	-- ^a
Noatak	4/11/2006	7
Noorvik	5/14/2007	8
Selawik	5/9/2007	9
Shungnak	5/4/2007	34
ALL COMMUNITIES		146

a. Native Village of Kotzebue administrators elected not to use the questionnaire. Instead, they submitted written comments after the meeting describing the harvest assessment program conducted by the IRA. These comments appear as Appendix C.

APPENDICES

Appendix A.–Presentation to the Northwest Arctic Borough Assembly.

Documenting Village Subsistence



What Works Best for Northwest Alaska?

A research project funded by
Fisheries Information Service, U.S. Fish & Wildlife Service
FIS 04-157

How We Started...

Regional Meeting on Harvest Assessment, November 2002



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What Are We Doing... & Why?



- We want to improve our knowledge of subsistence.
- Agencies want to know the total take of fish and game.
- But only about 1 out of 5 people send in harvests reports.
- Surveys give us the most reliable information.
- But only a few villages are surveyed each year.
- So what do the villages want us to do?
- To start the discussion, this presentation reviews the data we have...

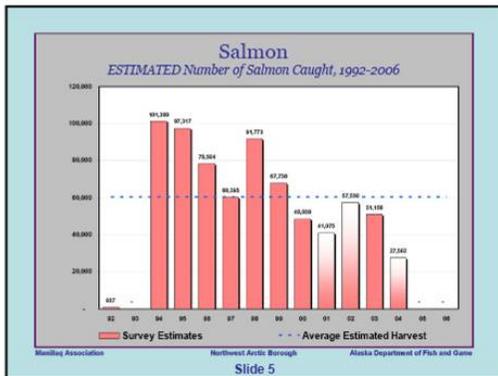
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Harvest Surveys Procedures



- Surveys are voluntary
- Data are confidential
- Data are not used for enforcement
- Results are summarized for the entire community, not for individual households
- Tribal offices approve surveys before they are done
- Surveys are done in person rather than by mail or phone
- Proper "sampling" is essential to a good survey

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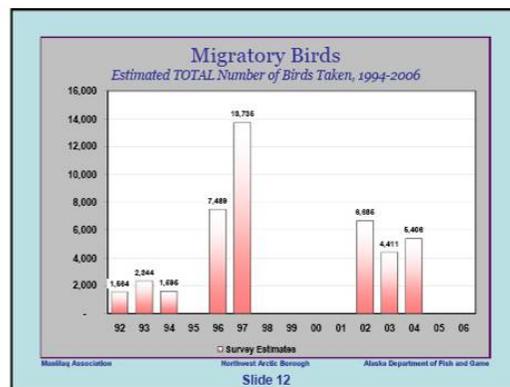
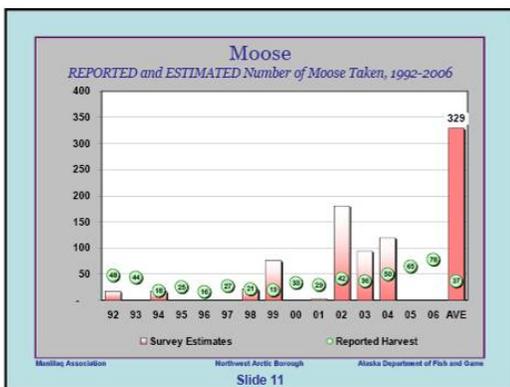
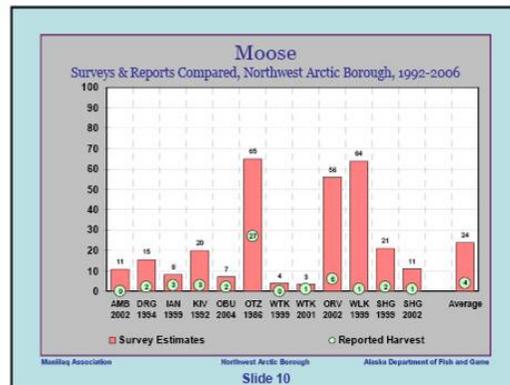
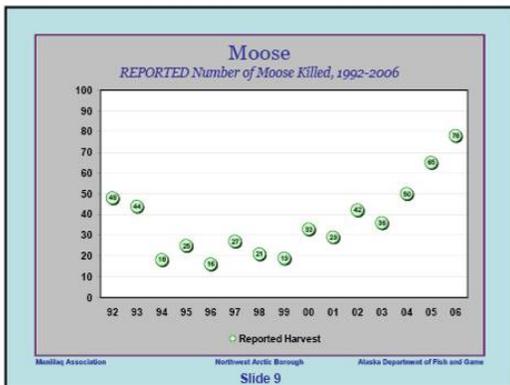
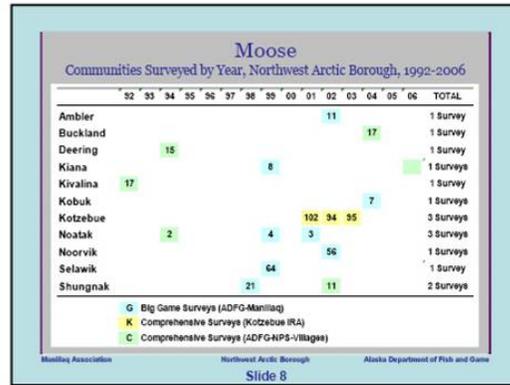
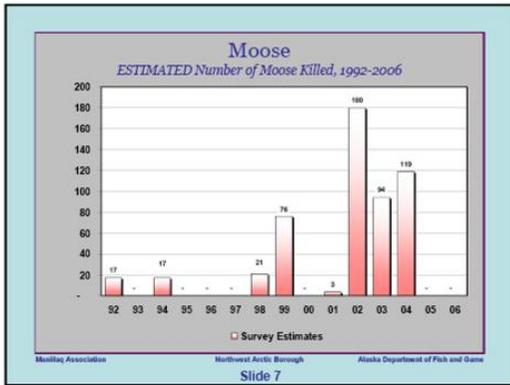


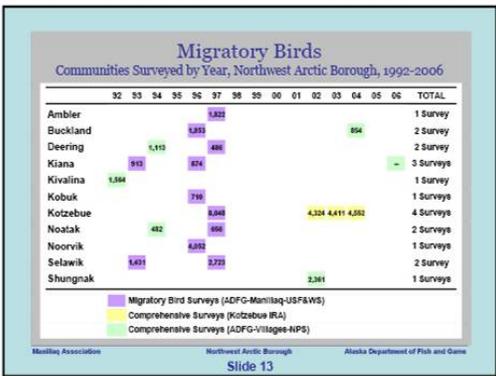
Salmon

Communities Surveyed by Year, Northwest Arctic Borough, 1992-2006

	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	TOTAL
Ambler			6,440	8,566	9,157	2,712	2,817	696	5,800				1,941	1,513		5 Surveys
Buckland														8,523		1 Survey
Deering				4,716												1 Survey
Kiana			4,062	5,091	5,863	3,298	3,066	3,882	3,967	5,379				3,173	4,096	10 Surveys
Kivalina	907															1 Survey
Kobuk			6,372	2,360	1,821	829	1,811	1,860	393	2,346			1,471	3,997		10 Surveys
Kotzebue			53,818	13,874	23,351	27,821	42,294	32,840	37,744	8,447	36,749	19,717				10 Surveys
Noatak			5,960	6,460	16,882	4,333	2,827	1,626	2,385	2,442	1,991	2,274	5,293			11 Surveys
Noorvik			18,642	15,575	16,981	16,166	18,238	12,618	12,188	17,112	18,083	9,271	2,361			11 Surveys
Selawik																0 Surveys
Shungnak			8,812	5,890	8,648	5,115	4,716	3,868	2,345	4,130	1,847	2,824	4,282			11 Surveys

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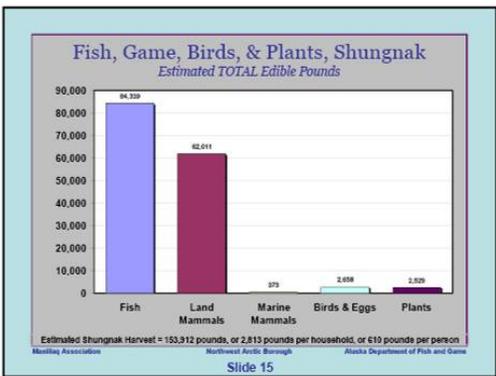
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Comprehensive Community Surveys

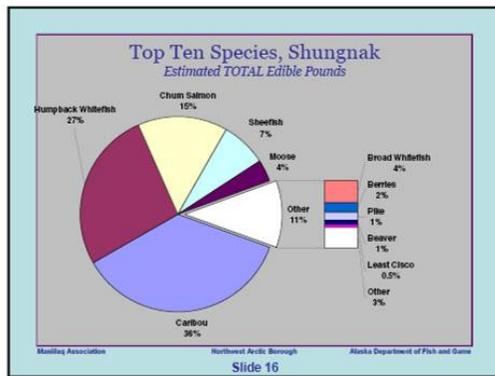
- Occasionally done, usually in one village at a time
- Completed in 2000's for Shungnak, Buckland, and Kiana
- Completed in 1990's for Kotzebue, Noatak, and Deering
- Covers all species of fish and animals
- Sponsored by tribal councils, ADF&G, and National Park Service

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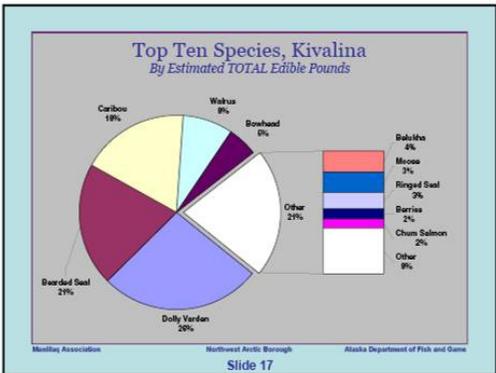
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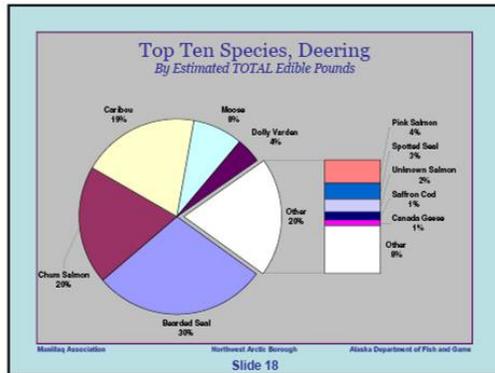
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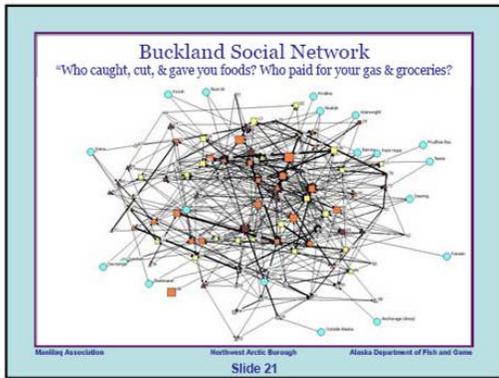
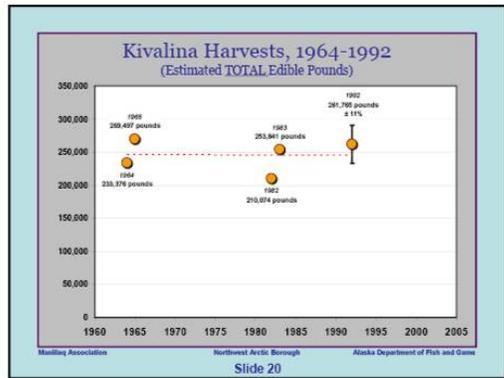
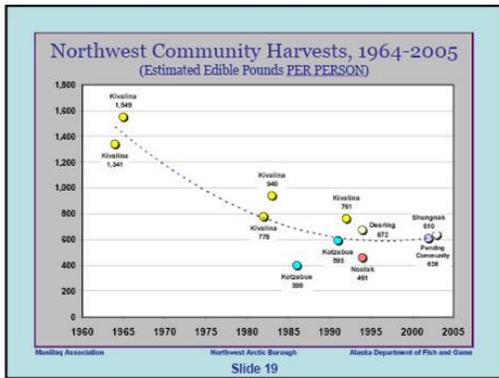
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The Situation Now...

- Uneven Coverage
Some villages and some species have harvest data
Other villages and some species have little or no harvest data
- Haphazard Mix
Projects have different purposes
Projects have different funding sources
- Consider a more efficient, predictable approach
- Deliberate approach might be able to obtain stable funding

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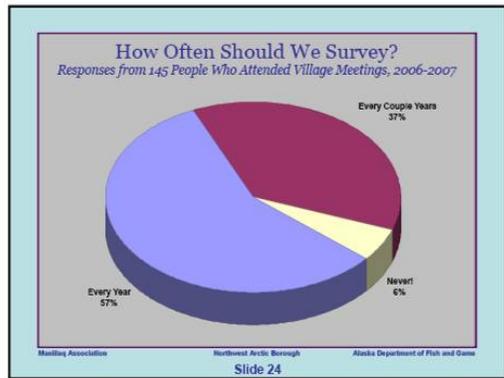
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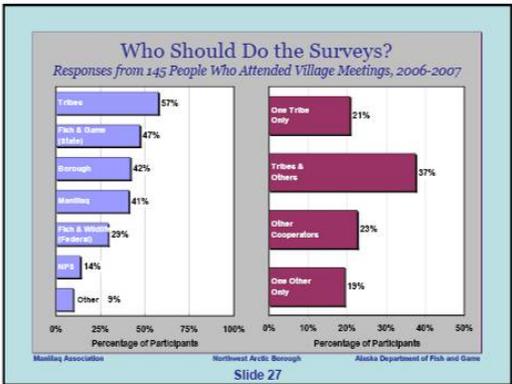
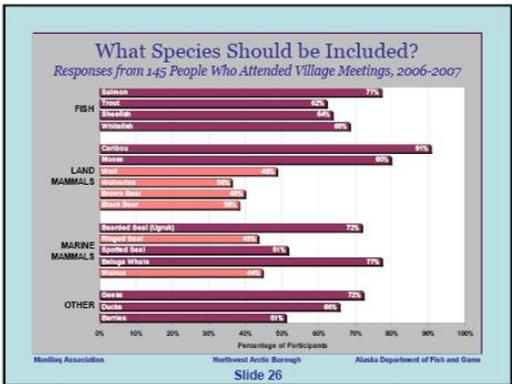
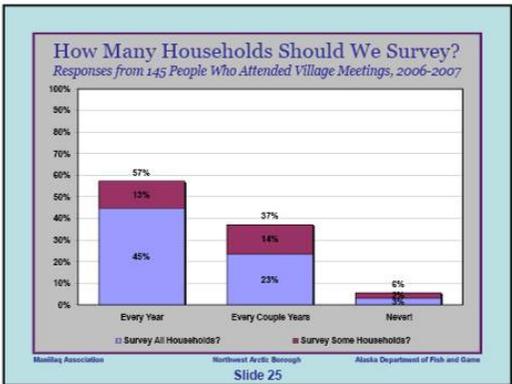
Ideas & Options

- How often should we survey?
 Every Year Every Couple Years Never!
- How many households should we survey?
 All Households Only Some Households
- Which species should be included?
 Fish Game Marine Mammals Other
- Who should do the surveys?
 Tribes Manillaq Department of Fish & Game
- National Park Service U.S. Fish & Wildlife Service
- Other ideas?

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Our Goals...

- Meet the needs of the agencies and the villages
- Involve tribal and regional organizations
- Encourage support from the public
- Share project results with the villages

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Thanks for Your Help!

Alaska Department of Fish and Game
Northwest Arctic Borough
Maniilaq Association

A research project funded by
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FIS 04-157

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Appendix B.–Kivalina survey instrument, 2008.

NW COMPREHENSIVE SURVEY 2/15/2008

<h2 style="margin: 0;">COMPREHENSIVE SUBSISTENCE SURVEY</h2> <h3 style="margin: 0;">KIVALINA, ALASKA</h3> <p style="margin: 0;">January to December, 2007</p>			
<h4 style="margin: 0;">COOPERATING ORGANIZATIONS</h4>			
DIVISION OF SUBSISTENCE ALASKA DEPT OF FISH & GAME BOX 689 KOTZEBUE, AK 99752 (800) 478-3420	NATIVE VILLAGE OF KIVALINA BOX 51 KIVALINA, AK 99750 (907) 645-2153	TRIBAL AFFAIRS MANILAQ ASSOCIATION BOX 256 KOTZEBUE, AK 99752 (800) 478-3312	PLANNING DEPARTMENT NORTHWEST ARCTIC BOROUGH BOX 1110 KOTZEBUE, AK 99752 (800) 478-1110



We are doing this survey to better understand subsistence in Alaska. Similar surveys have been conducted in more than 100 Alaska communities, including Deering, Buckland, Kotzebue, Kivalina, Noatak, Shungnak, Shishmaref, and Wales. Surveys help us estimate subsistence harvests. Surveys also help us describe the role of subsistence in Alaska's economy.

The survey asks how much fish, game, birds, and plants your household harvested last year. It also asks about who lived in your household, and what kind of jobs they had last year. It asks about your household's income last year.

We will NOT identify your household. We will NOT use this information for enforcement. Participation in this survey is voluntary. If you start a survey, you may stop at any time.

HOUSEHOLD ID:		
COMMUNITY ID:	KIVALINA	191
RESPONDENT ID:		
INTERVIEWER:		
INTERVIEW DATE:		
START TIME:		
STOP TIME:		
DATA CODED BY:		
DATA ENTERED BY:		
SUPERVISOR:		

HOUSEHOLD MEMBERS HOUSEHOLD ID

First, I would like to know a few things about the people in your household. I want to know only about permanent members of your household, including college or high school students who return home every summer. I am NOT interested in people who lived with you temporarily, even if they stayed several months.

Between JANUARY and DECEMBER, 2007...
...who lived in your household?

ID#	IS THIS PERSON ANSWERING QUESTIONS ON THIS SURVEY? <i>(circle)</i>	MALE OR FEMALE? <i>(circle)</i>	ALASKA NATIVE? <i>(circle)</i>	IN WHAT YEAR WAS THIS PERSON BORN? <i>(year)</i>	HOW IS THIS PERSON RELATED TO HEAD 1? <i>(relation)</i>	HOW MANY YEARS HAS THIS PERSON LIVED IN KIVALINA? <i>(number)</i>	IN 2007, WAS THIS PERSON AN ACTIVE SUBSISTENCE HARVESTER? <i>(circle)</i>	<i>(comments)</i>
HEAD 1	N Y	M F	N Y			YRS	N Y	
01								
<i>Enter spouse or partner (including "play wife" or "play husband") next. If household has a SINGLE HEAD, leave HEAD 2 blank.</i>								
HEAD 2	N Y	M F	N Y			YRS	N Y	
02								
<i>Enter children (oldest to youngest), grandchildren, grandparents, brothers, sisters, and other household members below.</i>								
03	N Y	M F	N Y			YRS	N Y	
04	N Y	M F	N Y			YRS	N Y	
05	N Y	M F	N Y			YRS	N Y	
06	N Y	M F	N Y			YRS	N Y	
07	N Y	M F	N Y			YRS	N Y	
08	N Y	M F	N Y			YRS	N Y	
09	N Y	M F	N Y			YRS	N Y	
10	N Y	M F	N Y			YRS	N Y	
11	N Y	M F	N Y			YRS	N Y	
12	N Y	M F	N Y			YRS	N Y	
13	N Y	M F	N Y			YRS	N Y	
14	N Y	M F	N Y			YRS	N Y	
15	N Y	M F	N Y			YRS	N Y	
16	N Y	M F	N Y			YRS	N Y	

PERMANENT HH MEMBERS: 01 KIVALINA: 191

INSTRUCTIONS

Next, I am going to ask about your subsistence activities. I will be asking the same questions about different kinds of fish and game. Before I continue, I wanted to talk about those questions. I will use salmon as an example, but the questions will be the same for other species, such as caribou or berries.

When I ask...

- **Did members of your household use or try to catch salmon?**

I am asking about all the people we just listed, the permanent residents of your household. Even if I should say:

- **Did YOU use salmon?**

I mean all the people living in your household. In this survey, "you" always means everybody living in your household.

When I ask...

- **Do members of your household usually fish for salmon?**

Answer YES if you fished for salmon in at least five out of the last ten years.

Answer YES even if you just helped someone in another household fish.

When I ask...

- **Last year, did members of your household USE salmon?**

Answer YES if any member of your household caught salmon for subsistence, even if you then gave it all away.

Answer YES if someone shared salmon with your household, even if you then gave it all away.

Answer NO if the only salmon you ate was at someone else's home or at a community feast.

Answer NO if the only salmon you ate was purchased in a store.

When I ask...

- **Last year, did members of your household try to catch salmon?**

Answer YES if any member of your household tried to catch salmon, even if you did not actually get anything.

Answer YES even if you caught salmon accidentally, such as when you were seining for whitefish.

Answer YES if you caught salmon anywhere in Alaska.

Answer NO if the only salmon you caught were released alive.

Answer NO if the only salmon you tried to catch were outside the state of Alaska.

When I ask...

- **Last year, how many salmon did members of your household catch?**

INCLUDE all the salmon caught by all members of your household.

INCLUDE your share of cooperative harvests, such as your share from a seine.

INCLUDE salmon you gave away, even if you never brought any home.

INCLUDE salmon that you retained from your commercial catch for your own use.

DO NOT include salmon given to you by someone in another household or community.

DO NOT include salmon caught by visitors in the household.

DO NOT include salmon that were caught and then released alive.

When I ask...

- **Did your household share salmon with others? or**
- **Did other households share salmon with your household?**

Answer YES if salmon was shared, traded, or bartered with your household.

Answer YES even if all the salmon you received was then given away.

Answer NO if the only salmon you shared was eaten at someone else's home or at a community feast.

Answer NO if the only salmon you shared was bought or sold.

HARVESTS: SALMON HOUSEHOLD ID

Do members of your household USUALLY fish for SALMON for subsistence?..... N Y

Between JANUARY and DECEMBER, 2007...

...Did members of your household USE or TRY TO CATCH salmon?..... N Y

IF NO, go to the next harvest page.

If YES, continue on this page...

Please estimate how many salmon ALL MEMBERS OF YOUR HOUSEHOLD CAUGHT for subsistence use this year, including with a rod and reel. INCLUDE salmon you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID YOUR HOUSEHOLD...			HOW MANY OF THOSE WERE CAUGHT JUST FOR DOGS? UNITS	IN 2007...	
	...USE ? ?	...TRY TO CATCH ? ?	...CATCH WITH GILL NET OR SEINE?	...CATCH WITH ROD AND REEL?	...CATCH WITH OTHER GEAR?		...DID YOUR HH SHARE WITH OTHERS?	...DID OTHERS SHARE WITH YOUR HH?
	<i>(circle)</i>		<i>(number taken by each gear type)</i>				<i>(number)</i>	<i>(ind, lbs)</i>
CHUM SALMON <i>Oaluwruaq</i> 111020003	N Y	N Y					N Y	N Y
PINK SALMON <i>Amagtuk</i> 114000003	N Y	N Y					N Y	N Y
COHO SALMON <i>Oaluwruaq</i> 112000003	N Y	N Y					N Y	N Y
SOCKEYE SALMON <i>Oaluwruaq</i> 115000003	N Y	N Y					N Y	N Y
KING SALMON <i>Oaluqpuik</i> 113000003	N Y	N Y					N Y	N Y
UNKNOWN SALMON 119000003	N Y	N Y					N Y	N Y

Comments on this table are welcome!

On map, mark where household CAUGHT salmon.

If person doesn't know how many they caught, but knows how many buckets, sacks, or tubs they caught, use table to estimate number of fish.

	5-Gallon Bucket	Shopping (AC) Bag	Garbage Sack	Gunny Sack	Metal Washtub	Garbage Can	55-Gallon Drum
Salmon (Chum, Sockeye, Coho)	4	2	7	12	15	24	35
Salmon (Pink)	10	5	20	33	42	67	100
Salmon (King)	1	1	2	3	4	7	10
Whitefish (Humpback)	21	11	43	71	89	143	214
Whitefish (Round)	30	15	60	100	125	200	300
Whitefish (Broad)	7	3	13	22	28	44	67
Whitefish (95% HB, 5% Rnd)	22	11	43	72	91	145	217
Whitefish (Unknown Species)	12	6	24	40	50	80	120
Cisco, Bering	24	12	48	80	100	160	240
Sheefish	2	1	4	6	8	13	19
Trout	6	3	13	21	27	43	64
Tomcod (Saffron Cod)	30	15	60	100	125	200	300
Blue Cod (Arctic Cod)	185	92	369	615	769	1231	1846
Flounder	20	10	40	67	83	133	200
Burbot	5	3	10	17	21	33	50
Northern Pike	6	3	13	21	27	43	64
Grayling	24	12	48	80	100	160	240
Smelt	150	75	300	500	625	1000	1500
Herring	115	58	231	385	481	769	1154

NON-COMMERCIAL SALMON: 04

KIVALINA: 191

HARVESTS: OTHER FISH HOUSEHOLD ID

Do members of your household USUALLY fish for other fish for subsistence, such as TROUT or SHEEFISH?..... N Y

Between JANUARY and DECEMBER, 2007...
 ...Did members of your household USE or TRY TO CATCH other fish?..... N Y

IF NO, go to the next harvest page.
IF YES, continue on this page...

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD CAUGHT for subsistence use this year, including with a rod and reel. INCLUDE other fish you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID YOUR HOUSEHOLD...			HOW MANY OF THOSE WERE CAUGHT JUST FOR DOGS?	UNITS <i>(ind, lbs)</i>	IN 2007...	
	...USE ? <i>(circle)</i>	...TRY TO CATCH ? <i>(circle)</i>	...CATCH WITH GILL NET OR SEINE? <i>(number taken by each gear type)</i>	...CATCH WITH ROD AND REEL? <i>(number)</i>	...CATCH WITH OTHER GEAR? <i>(number)</i>			...DID YOUR HH SHARE WITH OTHERS? <i>(circle)</i>	...DID OTHERS SHARE WITH YOUR HH? <i>(circle)</i>
TROUT <i>Qalukpiq</i> 125006013	N	Y						N	Y

On map, mark where household CAUGHT trout.

WHITEFISH <i>Qalupiaq</i> 126400000	N	Y	N	Y				N	Y
---	---	---	---	---	--	--	--	---	---

On map, mark where household CAUGHT whitefish.

SHEEFISH <i>Sii</i> 125600003	N	Y	N	Y				N	Y
BURBOT (MUDSHARK) <i>Titaaliq</i> 124800003	N	Y	N	Y				N	Y
NORTHERN PIKE <i>Siulik</i> 125400003	N	Y	N	Y				N	Y
GRAYLING <i>Subukpaugaq</i> 125200003	N	Y	N	Y				N	Y
TOMCOD <i>Uugaq, Igaluaq</i> 121010003	N	Y	N	Y				N	Y
BLUE COD <i>Qaluaq</i> 121002003	N	Y	N	Y				N	Y
	N	Y	N	Y				N	Y
	N	Y	N	Y				N	Y
	N	Y	N	Y				N	Y

Between JANUARY and DECEMBER, 2007...
 ...Did your household use or catch any other kind of other fish such as HERRING or CLAMS?..... N Y
IF YES, enter the name in a blank row and answer the questions in the table above.

HARVESTS: LARGE LAND ANIMALS

HOUSEHOLD ID

Do members of your household USUALLY hunt for large land animals for subsistence, such as CARIBOU or MOOSE?..... N Y

Between JANUARY and DECEMBER, 2007...
 ...Did members of your household USE or TRY TO CATCH large land animals?..... N Y

IF NO, go to the next harvest page.
IF YES, continue on this page...

Please estimate how many large land animals ALL MEMBERS OF YOUR HOUSEHOLD CAUGHT for subsistence use this year. INCLUDE large land animals you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID MEMBERS OF YOUR HOUSEHOLD CATCH?												IN 2007...					
	...USE ?	...TRY TO CATCH ?	SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS (ind...)	...DID YOUR HH SHARE	...DID OTHERS SHARE	
	(circle)	(circle)																WITH OTHERS?	WITH YOUR HH?	
CARIBOU <i>Tutu</i> 211000000	N	Y	N	Y																
211000001																				
211000002																				
211000009																				

On map, mark where household SEARCHED FOR and CAUGHT caribou.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID MEMBERS OF YOUR HOUSEHOLD CATCH?												IN 2007...					
	...USE ?	...TRY TO CATCH ?	SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS (ind...)	...DID YOUR HH SHARE	...DID OTHERS SHARE	
	(circle)	(circle)																WITH OTHERS?	WITH YOUR HH?	
MOOSE <i>Timiikaq</i> 211800000	N	Y	N	Y																
211800001																				
211800002																				
211800009																				

On map, mark where household SEARCHED FOR and CAUGHT moose.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID MEMBERS OF YOUR HOUSEHOLD CATCH?												IN 2007...					
	...USE ?	...TRY TO CATCH ?	SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS (ind...)	...DID YOUR HH SHARE	...DID OTHERS SHARE	
	(circle)	(circle)																WITH OTHERS?	WITH YOUR HH?	
GRIZZLY BEAR <i>Aktaq</i> 210800000	N	Y	N	Y																

On map, mark where household SEARCHED FOR and CAUGHT grizzly bear.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID MEMBERS OF YOUR HOUSEHOLD CATCH?												IN 2007...					
	...USE ?	...TRY TO CATCH ?	SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS (ind...)	...DID YOUR HH SHARE	...DID OTHERS SHARE	
	(circle)	(circle)																WITH OTHERS?	WITH YOUR HH?	
DALL SHEEP <i>Ipnaiq</i> 212200000	N	Y	N	Y																

On map, mark where household SEARCHED FOR and CAUGHT dall sheep.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID MEMBERS OF YOUR HOUSEHOLD CATCH?												IN 2007...					
	...USE ?	...TRY TO CATCH ?	SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS (ind...)	...DID YOUR HH SHARE	...DID OTHERS SHARE	
	(circle)	(circle)																WITH OTHERS?	WITH YOUR HH?	
MUSKOXEN <i>Uminmak</i> 212000000	N	Y	N	Y																

On map, mark where household SEARCHED FOR and CAUGHT muskoxen.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID MEMBERS OF YOUR HOUSEHOLD CATCH?												IN 2007...					
	...USE ?	...TRY TO CATCH ?	SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS (ind...)	...DID YOUR HH SHARE	...DID OTHERS SHARE	
	(circle)	(circle)																WITH OTHERS?	WITH YOUR HH?	
	N	Y	N	Y																
	N	Y	N	Y																

Between JANUARY and DECEMBER, 2007...
 ...Did your household use or catch any other kind of large land animals such as BLACK BEAR?..... N Y

IF YES, enter the name in a blank row and answer the questions in the table above.

LAND MAMMALS: 10

KIVALINA: 191

HARVESTS: SMALL LAND ANIMALS

HOUSEHOLD ID

Do members of your household USUALLY hunt or trap small land animals for subsistence, such as WOLF or WOLVERINE?..... N Y

Between JANUARY and DECEMBER, 2007...
 ...Did members of your household USE or TRY TO CATCH small land animals?..... N Y

IF NO, go to the next harvest page.

IF YES, continue on this page...

Please estimate how many small land animals ALL MEMBERS OF YOUR HOUSEHOLD CAUGHT for subsistence use this year. INCLUDE small land animals you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting or trapping with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID MEMBERS OF YOUR HOUSEHOLD CATCH?												UNITS (ind...)	IN 2007...					
	...USE ?	...TRY TO CATCH ?	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER		UNKNOWN	...DID YOUR HH SHARE	...DID OTHERS SHARE			
			(enter number by sex and month of take)													WITH OTHERS?	WITH YOUR HH?				
	(circle)	(circle)														(circle)					
WOLF <i>Amagug</i> 223200000	N	Y															ind	N	Y	N	Y
WOLVERINE <i>Oapvik</i> 223400000	N	Y															ind	N	Y	N	Y
ARCTIC FOX <i>Ousraaq</i> 220802000	N	Y															ind	N	Y	N	Y
RED FOX <i>Kavugtuq</i> 220804000	N	Y															ind	N	Y	N	Y
BEAVER <i>Paluqtag</i> 220200000	N	Y															ind	N	Y	N	Y
	N	Y															ind	N	Y	N	Y
	N	Y															ind	N	Y	N	Y
	N	Y															ind	N	Y	N	Y
	N	Y															ind	N	Y	N	Y
	N	Y															ind	N	Y	N	Y
	N	Y															ind	N	Y	N	Y
	N	Y															ind	N	Y	N	Y

On map, mark where household SEARCHED FOR and CAUGHT small land animals.

Between JANUARY and DECEMBER, 2007...
 ...Did your household use or catch any other kind of small land animals such as MARTEN, LYNX, or MUSKRAT?..... N Y

IF YES, enter the name in a blank row and answer the questions in the table above.

LAND MAMMALS: 10

KIVALINA: 191

HARVESTS: MARINE MAMMALS

HOUSEHOLD ID

Do members of your household USUALLY hunt for MARINE MAMMALS for subsistence, such as BEARDED SEAL or RINGED SEAL?..... N Y

Between JANUARY and DECEMBER, 2007...
 ...Did members of your household USE or TRY TO CATCH marine mammals?..... N Y

IF NO, go to the next harvest page.
IF YES, continue on this page...

Please estimate how many marine mammals ALL MEMBERS OF YOUR HOUSEHOLD CAUGHT for subsistence use this year. INCLUDE marine mammals you gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID MEMBERS OF YOUR HOUSEHOLD CATCH?												IN 2007...							
	...USE?	...TRY TO CATCH?	SEX	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	UNITS	...DID YOUR HH SHARE	...DID OTHERS SHARE			
	(circle)	(circle)		(enter number by sex and month of take)												(ind...)	WITH OTHERS?	WITH YOUR HH?				
BEARDED SEAL	N	Y	N	Y													ind	N	Y	N	Y	
<i>Ugruk</i>																						
300802000																						
300802002																						
300802001																						
300802009																						

On map, mark where household SEARCHED FOR and CAUGHT bearded seal.

RINGED SEAL	N	Y	N	Y												ind	N	Y	N	Y
<i>Natchig</i>																				
300810000																				

On map, mark where household SEARCHED FOR and CAUGHT ringed seal.

BELUGA WHALE	N	Y	N	Y												ind	N	Y	N	Y
<i>Sisuaq</i>																				
301602000																				

On map, mark where household SEARCHED FOR and CAUGHT beluga whale.

WALRUS	N	Y	N	Y												ind	N	Y	N	Y
<i>Aiviq</i>																				
301400000																				

On map, mark where household SEARCHED FOR and CAUGHT walrus.

SPOTTED SEAL	N	Y	N	Y												ind	N	Y	N	Y
<i>Oasigiq</i>																				
300812000																				
	N	Y	N	Y												ind	N	Y	N	Y
	N	Y	N	Y												ind	N	Y	N	Y

Between JANUARY and DECEMBER, 2007...
 ...Did your household use seal oil?..... N Y

...Did your household use black (bowhead) muktuk?..... N Y

...Did your household use or catch any other kind of marine mammals such as RIBBON SEAL or POLAR BEAR?..... N Y

IF YES, enter the name in a blank row and answer the questions in the table above.

MARINE MAMMALS: 12

KIVALINA: 191

HARVESTS: WATERFOWL

HOUSEHOLD ID

Do members of your household USUALLY hunt for waterfowl for subsistence, such as BRANT or CANADA GEESE?.....

N Y

Between JANUARY and DECEMBER, 2007...

...Did members of your household USE or TRY TO CATCH waterfowl?.....

N Y

IF NO, go to the next harvest page.

IF YES, continue on this page...

Please estimate how many waterfowl ALL MEMBERS OF YOUR HOUSEHOLD CAUGHT for subsistence use this year. INCLUDE waterfowl you gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY () DID MEMBERS OF YOUR HOUSEHOLD CATCH?										IN 2007...						
	...USE ?	...TRY TO CATCH ?	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	UNKNOWN	...DID YOUR HH SHARE	...DID OTHERS SHARE		
	(circle)	(circle)	winter	spring	summer	fall	winter									WITH OTHERS?	WITH YOUR HH?		
BRANT <i>Liglinauraq</i> 410402000	N	Y	N	Y												N	Y	N	Y
CANADA GEESE <i>Iqsraqutilik</i> 410404990	N	Y	N	Y												N	Y	N	Y
SNOW GEESE <i>Kanuq</i> 410408000	N	Y	N	Y												N	Y	N	Y
WHITE-FRONTED GEESE <i>Kieiyuk</i> 410410000	N	Y	N	Y												N	Y	N	Y
KING EIDER 410206040	N	Y	N	Y												N	Y	N	Y
COMMON EIDER 410206020	N	Y	N	Y												N	Y	N	Y
NORTHERN PINTAIL <i>Ivuqag, Kuruqag</i> 410220000	N	Y	N	Y												N	Y	N	Y
MALLARD <i>Iragusruqruk</i> 410214000	N	Y	N	Y												N	Y	N	Y
	N	Y	N	Y												N	Y	N	Y
	N	Y	N	Y												N	Y	N	Y
	N	Y	N	Y												N	Y	N	Y
	N	Y	N	Y												N	Y	N	Y

On map, mark where household SEARCHED FOR and CAUGHT waterfowl.

Between JANUARY and DECEMBER, 2007...

...Did your household use or catch any other kind of waterfowl such as OTHER DUCKS, CRANES, or SWANS?.....

N Y

IF YES, enter the name in a blank row and answer the questions in the table above.

BIRDS AND EGGS: 15

KIVALINA: 191

HARVESTS: OTHER BIRDS HOUSEHOLD ID

Do members of your household USUALLY hunt for other birds for subsistence, such as PTARMIGAN or SPRUCE GROUSE?..... N Y

Between JANUARY and DECEMBER, 2007...
 ...Did members of your household USE or TRY TO CATCH other birds?..... N Y

IF NO, go to the next harvest page.
IF YES, continue on this page...

Please estimate how many other birds ALL MEMBERS OF YOUR HOUSEHOLD CAUGHT for subsistence use this year. INCLUDE other birds you gave away, ate fresh, lost to spoilage, or got by helping others. If hunting with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY DID MEMBERS OF YOUR HOUSEHOLD CATCH? <i>(number)</i>	UNITS <i>(ind)</i>	IN 2007...	
	...USE <i>(circle)</i>	...TRY TO CATCH <i>(circle)</i>			...DID YOUR HH SHARE WITH OTHERS? <i>(circle)</i>	...DID OTHERS SHARE WITH YOUR HH? <i>(circle)</i>
	N	Y			N	Y
PTARMIGAN <i>Agalziq</i> 421804000	N	Y			N	Y
SPRUCE GROUSE <i>Napaagtum Agalziq</i> 421802020	N	Y			N	Y
SNOWY OWL <i>Ukpik</i> 422003000	N	Y			N	Y
	N	Y			N	Y
	N	Y			N	Y
	N	Y			N	Y
	N	Y			N	Y
	N	Y			N	Y
	N	Y			N	Y
	N	Y			N	Y
	N	Y			N	Y
	N	Y			N	Y
	N	Y			N	Y
	N	Y			N	Y

Between JANUARY and DECEMBER, 2007...
 ...Did your household use or catch any other kind of other birds?..... N Y
IF YES, enter the name in a blank row and answer the questions in the table above.

HARVESTS: EGGS

HOUSEHOLD ID

Do members of your household USUALLY gather eggs for subsistence, such as MURRE EGGS or GULL EGGS?..... N Y

Between JANUARY and DECEMBER, 2007...
 ...Did members of your household USE or TRY TO GATHER eggs?..... N Y

IF NO, go to the next harvest page.
IF YES, continue on this page...

Please estimate how many eggs ALL MEMBERS OF YOUR HOUSEHOLD GATHERED for subsistence use this year. INCLUDE eggs you gave away, ate fresh, lost to spoilage, or got by helping others. If gathering with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...				IN 2007, HOW MANY DID MEMBERS OF YOUR HOUSEHOLD GATHER? <i>(number)</i>	UNITS <i>(ind, tubs)</i>	IN 2007...			
	...USE ? <i>(circle)</i>		...TRY TO GATHER ? <i>(circle)</i>				...DID YOUR HH SHARE WITH OTHERS? <i>(circle)</i>	...DID OTHERS SHARE WITH YOUR HH? <i>(circle)</i>		
	N	Y	N	Y			N	Y	N	Y
MURRE EGGS	N	Y	N	Y			N	Y	N	Y
431218000										
GULL EGGS <i>Nauyasag</i>	N	Y	N	Y			N	Y	N	Y
431212000										
GOOSE EGGS	N	Y	N	Y			N	Y	N	Y
430499000										
DUCK EGGS	N	Y	N	Y			N	Y	N	Y
430299000										
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y

On map, mark where household GATHERED eggs last year.

Between JANUARY and DECEMBER, 2007...
 ...Did your household use or gather any other kind of eggs such as SWAN EGGS?..... N Y

IF YES, enter the name in a blank row and answer the questions in the table above.

BIRDS AND EGGS: 15

KIVALINA: 191

HARVESTS: BERRIES HOUSEHOLD ID

Do members of your household USUALLY pick berries for subsistence, such as SALMONBERRIES or BLUEBERRIES?..... N Y

Between JANUARY and DECEMBER, 2007...
 ...Did members of your household USE or TRY TO PICK berries?..... N Y

IF NO, go to the next harvest page.
IF YES, continue on this page...

Please estimate how many berries ALL MEMBERS OF YOUR HOUSEHOLD PICKED for subsistence use this year. INCLUDE berries you gave away, ate fresh, lost to spoilage, or got by helping others. If picking with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...		IN 2007, HOW MANY DID MEMBERS OF YOUR HOUSEHOLD PICK? <i>(number)</i>	UNITS <i>(gals)</i>	IN 2007...			
	...USE <i>(circle)</i>	...TRY TO PICK <i>(circle)</i>			...DID YOUR HH SHARE WITH OTHERS? <i>(circle)</i>	...DID OTHERS SHARE WITH YOUR HH? <i>(circle)</i>		
	N	Y			N	Y	N	Y
SALMONBERRIES <i>Aq̄pik</i> 601022002	N	Y			N	Y	N	Y
BLUEBERRIES <i>Oalūaq</i> 121002003	N	Y			N	Y	N	Y
CRANBERRIES <i>Kik̄m̄ñ̄naq</i> 601004002	N	Y			N	Y	N	Y
BLACKBERRIES <i>Paunḡaq</i> 601007002	N	Y			N	Y	N	Y
RASPBERRIES 601020002	N	Y			N	Y	N	Y
	N	Y			N	Y	N	Y
	N	Y			N	Y	N	Y
	N	Y			N	Y	N	Y
	N	Y			N	Y	N	Y
	N	Y			N	Y	N	Y
	N	Y			N	Y	N	Y
	N	Y			N	Y	N	Y
	N	Y			N	Y	N	Y
	N	Y			N	Y	N	Y

Between JANUARY and DECEMBER, 2007...
 ... Did your household use or pick any other kind of berries such as JUNIPER BERRIES?..... N Y
IF YES, enter the name in a blank row and answer the questions in the table above.

HARVESTS: GREENS OR ROOTS

HOUSEHOLD ID

Do members of your household USUALLY pick greens or roots for subsistence, such as WILLOW LEAVES or STINKWEED?..... N Y

Between JANUARY and DECEMBER, 2007...
 ...Did members of your household USE or TRY TO PICK greens or roots?..... N Y

IF NO, go to the next harvest page.
IF YES, continue on this page...

Please estimate how many greens or roots ALL MEMBERS OF YOUR HOUSEHOLD PICKED for subsistence use this year. INCLUDE greens or roots you gave away, ate fresh, lost to spoilage, or got by helping others. If picking with others, report ONLY YOUR SHARE of the catch.

	IN 2007 DID MEMBERS OF YOUR HH...				IN 2007, HOW MANY DID MEMBERS OF YOUR HOUSEHOLD PICK? <i>(number)</i>	UNITS <i>(gals)</i>	IN 2007...			
	...USE <i>(circle)</i> ?		...TRY TO PICK <i>(circle)</i> ?				...DID YOUR HH SHARE WITH OTHERS? <i>(circle)</i>	...DID OTHERS SHARE WITH YOUR HH? <i>(circle)</i>		
	N	Y	N	Y			N	Y	N	Y
WILLOW LEAVES <i>Sura</i> 602048002	N	Y	N	Y			N	Y	N	Y
STINKWEED <i>Sarqitq</i> 602044002	N	Y	N	Y			N	Y	N	Y
SOURDOCK <i>Quaqaq</i> 602028002	N	Y	N	Y			N	Y	N	Y
ESKIMO TEA <i>Tilaqutiq</i> 602018000	N	Y	N	Y			N	Y	N	Y
WILD CELERY <i>Ikuusiq</i> 602032002	N	Y	N	Y			N	Y	N	Y
WILD RHUBARB <i>Qusrimmaq, Qupuliq</i> 602006002	N	Y	N	Y			N	Y	N	Y
SEA LOVAGE <i>Tukkaayuk</i> 602048002	N	Y	N	Y			N	Y	N	Y
ESKIMO POTATO <i>Masru</i> 604004002	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y
	N	Y	N	Y			N	Y	N	Y

On map, mark where household PICKED berries, greens, and roots last year.

Between JANUARY and DECEMBER, 2007...
 ... Did your household use or pick any other kind of greens or roots such as BEACH GREENS?..... N Y
IF YES, enter the name in a blank row and answer the questions in the table above.

PLANTS: 17

KIVALINA: 191

JOBS FOR EACH PERSON IN THE HOUSEHOLD, 16 YEARS OLD AND OLDER HOUSEHOLD ID

Between JANUARY and DECEMBER, 2007...
 ...Did any members of your household earn money from a JOB or from SELF EMPLOYMENT?..... N Y

For each member of this household born before 1992, please list EACH JOB held between JANUARY and DECEMBER, 2007.
 For household members who did not have a job, write: "RETIRED," "UNEMPLOYED," "STUDENT," "HOMEMAKER," etc.
 There should be at least ONE ROW for each member of this household born BEFORE 1992.

We ask about jobs and income because we are trying to understand all parts of the community economy. Many people use wages from jobs to support subsistence activities. If one person has more than one job, list each job on a separate line. (One person may have several lines.)

WORK SCHEDULE...

	WHO HAD THIS JOB?	WHAT KIND OF WORK DID HE/SHE DO IN THIS JOB?			FOR WHOM DID HE/SHE WORK IN THIS JOB?					IN 2007, WHAT MONTHS DID HE OR SHE WORK IN THIS JOB?					WORK SCHEDULE...					IN 2007, HOW MUCH DID HE/SHE EARN IN THIS JOB?					
		person	job title	SOC	employer	SIC	circle each month worked					circle one					gross income								
1ST JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	1	6	910100000									SCHEDULE													
2ND JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	2	6	910100000									SCHEDULE													
3RD JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	3	6	910100000									SCHEDULE													
4TH JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	4	6	910100000									SCHEDULE													
5TH JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	5	6	910100000									SCHEDULE													
6TH JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	6	6	910100000									SCHEDULE													
7TH JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	7	6	910100000									SCHEDULE													
8TH JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	8	6	910100000									SCHEDULE													
9TH JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	9	6	910100000									SCHEDULE													
10TH JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	10	6	910100000									SCHEDULE													
11TH JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	11	6	910100000									SCHEDULE													
12TH JOB							J	F	M	A	M	J	J	A	S	O	N	D	FT	PT	SF	OC	SP	\$	/YR
	12	6	910100000									SCHEDULE													

If a person is SELF-EMPLOYED (selling carvings, crafts, bread, etc), list that as a separate job. Enter "sewer," "carver," "baker," etc. as JOB TITLE. Work schedule usually will be "ON CALL." For gross income from self employment ("profit"), enter revenue MINUS expenses.

If a person is UNEMPLOYED, specify retired, unemployed, disabled, student, or homemaker as the JOB TITLE. TRAPPING for barter or sale IS a job.

WORK SCHEDULE
 1 - Fulltime (35+ hours/week)
 2 - Parttime (<35 hours/week)
 3 - Shift (2 wks on/2 off, etc.)
 4 - Irregular, on call
 5 - Shift - part time
 0 - Retired, Unemployed, etc.

GROSS INCOME is the same as TAXABLE INCOME on a W-2 form.

FOOD SECURITY HOUSEHOLD ID

The questions on this page have been asked all over the United States to find out if Americans have enough to eat. We would like to know if people in Kivalina have enough to eat. I am going to read you FIVE statements that Americans have made about their food situation. Please tell me whether EACH statement was true for your household LAST YEAR, that is, between JANUARY and DECEMBER, 2007.

Think about all your household's food, both subsistence and store-bought...
STATEMENT 1. We WORRIED that our household would not have ENOUGH FOOD. HH2

Last year, was this ever true for your household?.....

N	Y	?	
---	---	---	--

 If YES ...in which months did this happen?.....

J	F	M	A	M	J	J	A	S	O	N	D
---	---	---	---	---	---	---	---	---	---	---	---

 ...did this happen because...
 ...You couldn't get SUBSISTENCE foods,
 ...You couldn't get STORE-BOUGHT foods, or
 ...You couldn't get BOTH KINDS of food?.....

SUB	STOR	BOTH	
-----	------	------	--

STATEMENT 2. We could not get the food we needed to eat HEALTHY MEALS. HH4

Last year, was this ever true for your household?.....

N	Y	?	
---	---	---	--

 If YES ...in which months did this happen?.....

J	F	M	A	M	J	J	A	S	O	N	D
---	---	---	---	---	---	---	---	---	---	---	---

 ...did this happen because...
 ...You couldn't get SUBSISTENCE foods,
 ...You couldn't get STORE-BOUGHT foods, or
 ...You couldn't get BOTH KINDS of food?.....

SUB	STOR	BOTH	
-----	------	------	--

STATEMENT 3. The food we had JUST DID NOT LAST, and we could not get more. HH3

Last year, was this ever true for your household?.....

N	Y	?	
---	---	---	--

 If YES, in which months did this happen?.....

J	F	M	A	M	J	J	A	S	O	N	D
---	---	---	---	---	---	---	---	---	---	---	---

Now, think just about your household's SUBSISTENCE food...
STATEMENT 4. The SUBSISTENCE food we had just did not last, and we could not get more.

Last year, was this ever true for your household?.....

N	Y	?	
---	---	---	--

 If YES, in which months did this happen?.....

J	F	M	A	M	J	J	A	S	O	N	D
---	---	---	---	---	---	---	---	---	---	---	---

Now, think just about your household's STORE-BOUGHT food...
STATEMENT 5. The STORE-BOUGHT food we had just did not last, and we could not get more.

Last year, was this ever true for your household?.....

N	Y	?	
---	---	---	--

 If YES, in which months did this happen?.....

J	F	M	A	M	J	J	A	S	O	N	D
---	---	---	---	---	---	---	---	---	---	---	---

If NO statement above WAS TRUE for this household, go to the next page.
If ANY statement above WAS TRUE for this household, continue on this page...

Last year, did you or other adults in your household ever CUT THE SIZE OF YOUR MEALS OR SKIP MEALS because you could not get the food you needed?.....

N	Y	?	
---	---	---	--

AD1
 If YES, in which months did this happen?.....

J	F	M	A	M	J	J	A	S	O	N	D
---	---	---	---	---	---	---	---	---	---	---	---

Last year, did you or other adults in your household ever EAT LESS THAN YOU FELT YOU SHOULD because you could not get the food you needed?.....

N	Y	?	
---	---	---	--

AD2

Last year, were you ever HUNGRY BUT DID NOT EAT because there was not enough food?.....

N	Y	?	
---	---	---	--

AD3

Last year, did you LOSE WEIGHT because there was not enough food?.....

N	Y	?	
---	---	---	--

AD4

Last year, did you or other adults in your household ever NOT EAT FOR A WHOLE DAY because there was not enough food?.....

N	Y	?	
---	---	---	--

AD5

If YES, in which months did this happen?.....

J	F	M	A	M	J	J	A	S	O	N	D
---	---	---	---	---	---	---	---	---	---	---	---

AD5a

FOOD SECURITY: 201 **KIVALINA: 191**

ASSESSMENTS HOUSEHOLD ID

On this page, I have listed several different kinds of subsistence foods, like SALMON, LAND ANIMALS, and BIRDS...
 For each kind of subsistence food, I am going to ask you to compare your household's harvest LAST YEAR with your harvests in the past.
 Then I am going to ask whether your household GOT ENOUGH of that kind of subsistence food LAST YEAR.

SALMON 110000000

Between JANUARY and DECEMBER, 2007...

...Did your household harvest LESS, MORE, or about the SAME amount of salmon as in the past?..... X L S M

If the household does not usually harvest salmon, then circle the "X".

...Did your household GET ENOUGH salmon?..... N Y

If NO ...what KIND of salmon did you need?.....

...why did your household NOT get enough?.....

1	
2	

OTHER FISH 120000000

Between JANUARY and DECEMBER, 2007...

...Did your household harvest LESS, MORE, or about the SAME amount of other fish as in the past?..... X L S M

If the household does not usually harvest other fish, then circle the "X".

...Did your household GET ENOUGH other fish?..... N Y

If NO ...what KIND of other fish did you need?.....

...why did your household NOT get enough?.....

1	
2	

LAND ANIMALS 200000000

Between JANUARY and DECEMBER, 2007...

...Did your household harvest LESS, MORE, or about the SAME amount of land animals as in the past?..... X L S M

If the household does not usually harvest land animals, then circle the "X".

...Did your household GET ENOUGH land animals?..... N Y

If NO ...what KIND of land animals did you need?.....

...why did your household NOT get enough?.....

1	
2	

MARINE MAMMALS 300000000

Between JANUARY and DECEMBER, 2007...

...Did your household harvest LESS, MORE, or about the SAME amount of marine mammals as in the past?..... X L S M

If the household does not usually harvest marine mammals, then circle the "X".

...Did your household GET ENOUGH marine mammals?..... N Y

If NO ...what KIND of marine mammals did you need?.....

...why did your household NOT get enough?.....

1	
2	

BIRDS 400000000

Between JANUARY and DECEMBER, 2007...

...Did your household harvest LESS, MORE, or about the SAME amount of birds as in the past?..... X L S M

If the household does not usually harvest birds, then circle the "X".

...Did your household GET ENOUGH birds?..... N Y

If NO ...what KIND of birds did you need?.....

...why did your household NOT get enough?.....

1	
2	

BERRIES, GREENS OR ROOTS 600000000

Between JANUARY and DECEMBER, 2007...

...Did your household harvest LESS, MORE, or about the SAME amount of berries, greens or roots as in the past?... X L S M

If the household does not usually harvest berries, greens or roots, then circle the "X".

...Did your household GET ENOUGH berries, greens or roots?..... N Y

If NO ...what KIND of berries, greens or roots did you need?.....

...why did your household NOT get enough?.....

1	
2	

Native Village of Kotzebue Kotzebue IRA

August 2007

Native Village of Kotzebue Documenting Village Subsistence – Exploring Approaches

Knowledge of Language

Knowledge of Family Tree

Sharing

Humility

Respect for Others

Love for Children

Cooperation

Hard Work

Respect for Elders

Respect for Nature

Avoid Conflict

Family Roles

Humor

Spirituality

Domestic Skills

Hunter Success

Responsibility to Tribe

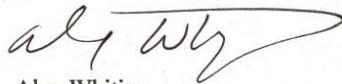
The Native Village of Kotzebue has been interested in documenting their members' annual harvest since the early 1990's. Various efforts were attempted until 2001 when a new manager, Alex Whiting – Environmental Specialist, of the effort was identified. It was decided at that time to develop a protocol and methodology that would be defensible and repeatable.

Because it is not practical or feasible to interview all member households, approximately 500, the first step was to organize member households into three categories, high, medium and low harvesters. This was ostensibly done to create a more accurate statistical representation of the harvest. The categories were created using what the Executive Director, Environmental Specialist, and Traditional Resource Manager, all with a high level of knowledge of local harvest patterns, believed would constitute these categories. A simple form was created and using a list of all household members in the community and surrounding countryside a survey was carried out. Practically all households were contacted and using the results a list of households falling in each of the categories was created.

Statistical formula's for extrapolating from representative information collected for each category was obtained from biometricians at ADF&G. At the same time the approach/methodology was reviewed by the biometricians for legitimacy and efficacy. The next step was to decide on what specie's, or groupings (e.g., ducks), to cover. The final list was decided on based on usefulness of information for intensive management purposes.

The survey instrument was created, and an attempt was made for three years to interview at least 30 households from each category, selecting them using a random process. It was decided that three years in a row of surveys would be sufficient for representing an average harvest. The formulas were applied to the results and then all three years worth of information was compiled into a final report by the Environmental Specialist, with ADF&G Subsistence Specialist, Jim Magdanz, acting as a paid consultant during his own personal time.

The Final report was submitted to the Administration and the Council for their approval which was given August 2007 and then the Final Report was released for public availability. At this point it has not been decided when to repeat the effort.



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Environmental Specialist

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