FINAL REPORT

SUBSISTENCE FOOD USE IN UNALASKA AND NIKOLSKI

Prepared for

Aleutian Pribilof Islands Association

Prepared by

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August 2003

ACKNOWLEDGMENTS

The Institute for Circumpolar Health Studies thanks the people of Unalaska and Nikolski, Alaska for contributing their time and knowledge for the success of this project. We especially thank Harriet Berekoff of the Qawalangin Tribe in Unalaska and Dora Johnson, President of the Chaluka Corporation in Nikolski for facilitating the survey in their communities. We also wish to thank Wendy Svarney-Hawthorne from the Ounalaskhka Corporation, Harriet Hope of the Unalaska Father Ishamall Gromoff Senior Center and Rick Knecht from the Museum of the Aleutians for their encouragement and kind support of this project in Unalaska. We also wish to thank Pauline and Val Dushkin, William and Mae Evmeloff, Nick Duskin, and Belinda and Fepuali Valelei in Nikolski for their warm support and cups of tea that facilitated the survey in Nikolski. Thank you to Bob Patrick, Project Manager and Michael Brubaker, from the Aleutian Pribilof Islands Association, for their support and coordination to initiate and conduct this study.

This study was made possible by a grant from the Citizens' Monitoring and Technical Assessment Fund as part of the RESOLVE, Inc. grant program. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of Citizens' Monitoring and Technical Assessment Fund as part of the RESOLVE, Inc. grant program.

EXECUTIVE SUMMARY

At the request of community members living in the Aleutian Islands, The Aleutian/Pribilof Islands Association (APIA) submitted the proposal, "Subsistence Food Consumption Survey for Nikolski and Unalaska Villages", to the Citizens' Monitoring and Technical Assessment Fund (CMTAF) as part of the RESOLVE, Inc. grant program. The Institute for Circumpolar Health Studies (ICHS), a research institute of the University of Alaska Anchorage (UAA) was contracted to supervise and assist with the dietary interviews and data analysis. Institutional Review Board was convened at the University of Alaska Anchorage for oversight of participant rights during this study.

Purpose

The purpose of this project was to document established subsistence use patterns for two Tribes represented by APIA; the Nikolski Tribe and the Qawalangin Tribe of Unalaska. The APIA Environmental Program, directed by Bob Patrick works with communities in the Aleutian and Pribilof Islands region to determine the health impacts posed by the nuclear weapons tests conducted at Amchitka Island, which is in close proximity to the villages of Nikolski and Unalaska. The actual amounts of subsistence foods consumed by individuals in each community that are reported in this document is needed to provide a better understanding of food preferences, attitudes and other determinants of the regional Native diet so that possible risk to radiological dosages can be calculated. To obtain subsistence food consumption data, a food frequency questionnaire was developed by the Institute for Circumpolar Health Studies (ICHS) in collaboration with the Alaska Native Health Board through funding from the Agency for Toxic and Substance Disease Registry (ATSDR) via a contract with IDS and ICHS for the Alaska Traditional Diet Project. A preliminary visit was made to Unalaska and Nikolski in the fall of 2002 to have community Elders review the form and to discuss the process of data collection. Incorporating the Elder's comments, data was collected during July of 2003 with permission from both participating communities.

Methodology

Data was collected by a staff member from the ICHS, a registered dietitian, who had lived in Unalaska and knew many of the community members residing in both communities. Several attempts were made to train local individuals to conduct the survey, but ultimately ICHS staff carried the primary role to collect the data, although with tremendous support from many of those who had been trained earlier in the year.

All respondents were presented with a consent form, and the contents of the form were reviewed with each individual. Several individuals declined to sign consent forms for fear that their name would be released to regulatory agencies. Although confidentiality was assured, they were happy to provide the subsistence use information, but remained unchanged as to their decision not to sign the consent form.

The Food Frequency form include 150 Alaska food items which were grouped into categories of (1) salmon, (2) fish, (3) seafood and shellfish, (4) sea mammals, (5) land mammals, (6) wild birds, (7) bird eggs, (8) plants and (9) berries. Respondents were asked if they ate the items year round or seasonal frequency. If seasonal, respondents were asked to specify which months the item was available and consumed. Respondents were then asked how often they ate an item by providing a the number of times you eat a portion, and then if it were by day, week, month or year, followed by a question on the size of the portion. A standardized 3 ounce plastic model of a portion of chicken was used to determine portion amounts. At the end of the survey, individuals were asked if there were other foods they ate, but were not listed on the survey form. Three foods were identified during this process: seal flippers, dandelion greens and "pogee" (greeling or rockfish). Each survey took from 30 minutes to well over an hour depending upon the age of the respondent, the informative stories told to help the researcher understand, and the size of the tea pot.

Sampling Plan

Food frequencies were conducted on a purposeful non-random age-stratified sample of residents living in Unalaska and Nikolski to define the consumption patterns of food in these communities. An age stratified sampling matrix was established to guarantee information from persons of all age categories. Respondents included both Tribal members and non-Tribal members, but all indicated that they were users of local food subsistence resources.

Table 1. Sampling Goals for Subsistence Foods Consumption Survey in Unalaska and Nikolski

UNALASKA Total Population N = 250	*GOAL* *Men*	OBTAINED Men	*GOAL* *Women*	OBTAINED Women
Age 15-19	*2*	**1**	*2*	**2**
Age 20-24	*3*	**0**	*2*	**3**
Age 25-34	*13*	**2**	*10*	**7**
Age 35-44	*15*	**10**	*12*	**5**
Age 45-54	*10*	**10**	*10*	**4**
Age 55-59	*2*	**6**	*2*	**2**
Age 60+	*2*	**4**	*2*	**6**
TOTAL	*47*	**33**	*40*	**29**
NIKOLSKI Total Population N = 38				
Age 15-19	*1*	**1**	*1*	
Age 20-24	*1*		*1*	**1**
Age 25-34	*1*		*1*	
Age 35-44	*2*		*2*	**3**
Age 45-54	*2*	**1**	*2*	
Age 55-59	*1*	**2**	*1*	**1**
Age 60+	*2*	**2**	*2*	**2**
TOTAL	*10*	**6**	*10*	**7**

Based on the 2000 Census, this survey hoped to obtain useable data from 25% of the Native population over the age of 15 living in Unalaska and 50% of the Native population over the age of 15 living in Nikolski. A sampling plan was developed to sample 30% of the population to achieve that goal. A total of 62 surveys were obtained in Unalaska representing approximately 24.8% of the targeted population, and 13 surveys were obtained in Nikolski representing approximately 34.2% of the targeted population

More demographic data will be forthcoming once the survey forms are processed through Cardiff, a visual reading program that tabulates data into a spreadsheet matrix. Once data are processed, data can be analyzed using SPSS or other analysis software to determine mean age, ethnic distributions, which will be helpful in looking at exposure risks by age groups and location.

Findings

Community members were very receptive to assist with this study. Many expressed that the survey should have been done 30 years ago when they developed rashes after the Amchitna testing, and when seeing malformed fish and crabs was very common. Many Elders wished to participate and although statistical testing hasn't been done, this age group was possibly over sampled. However, it was the positive responses from the Elders concerning the need for this study that encouraged many younger individuals to be so honest and forthright. ICHS was pleased that the majority of women sampled were of childbearing age, of which exposure to unsafe foods could produce adverse affects both for the mother and the fetus. Elders were very interested in the findings and asked periodically for preliminary results. This interest gave the researcher the opportunity to understand or clarify observations and responses.

Sixty-two individuals from Unalaska and thirteen individuals in Nikolski participated in this study. Qualitative data indicates that food intake of both communities showed a heavy reliance upon local food resources. Qualitative comments received during the survey also indicated the high level of concern over the safety of the foods obtained. Many in both communities indicated that they were not using available shellfish; mussels and invertebrates since they "knew" those were contaminated. Therefore, individuals may be selecting only those items they feel have the least risk of contamination, even when supplies of other items are available. The types of contamination in local food resources deserve further studies to help community members make informed choices about harvesting patterns.

Preliminary data was entered by number of portions per year into a Microsoft Excel spreadsheet and the data totals and average portions per year were calculated using the spreadsheet statistical functions. For example, if an individual reported eating red salmon 1 per week, and indicated that they ate 2 portions each time they ate red salmon, the data was entered as 1 x 52 weeks x 2 portions equaling 104 portions per year of red salmon for that individual. The survey form asked about the form of the item when it was eaten, such as, "Was the item eaten raw, salted, dried, or cooked?" Consumption rates for each mode of food preparation was entered on the data collection form. For this preliminary report, all forms were aggregated into total portions per year. As the risk-benefits model is developed, it may important to examine method of

preparation in determining specific exposure. In theory, cooking methods such as "boiling salmon in water" may influence total contaminant amounts, and the resulting exposure may be different than fish prepared by "air-dried, salted", for example. To our knowledge, the effect of cooking methods on contaminant load has not been thoroughly researched.

As funds become available, ICHS hopes to scan the survey sheets and conduct a more thorough analysis of the reported subsistence consumption data to be able to compare food preparation styles and well as consumption of many of the items eaten less frequently

Per person, individuals in Nikolski reported more consumption of locally harvested fish and meat, than individuals reported in Unalaska. Persons living in Unalaska have access to three grocery stores, and perhaps do not have to depend upon harvested food supplies for day-to-day survival. Nikolski has one small village store. Although the store was very well stocked during the summer survey visit, the store manager reported that it is difficult to maintain store inventory many times during the year due to frequent fog and stormy weather which delays delivery of store supplies. Therefore, many in Nikolski reported that they continue to depend upon locally harvested fish and meat items as they have done for centuries. Several community members in Nikolski mentioned that they ordered foods from one of the mail-order food suppliers, but were faced with similar problems of weather in getting food deliveries, since the items were delivered via the mail that is delivered by a small plane. During the survey visit, community members reported that there was over 6,000 pounds of mail in Unalaska/Dutch Harbor that was waiting for delivery. Summer fog had prevented the regular delivery of mail, which was scheduled to come three times per week.

The following chart present the most frequently reported fish and meat items:

Table 2. Top 10 fish and Meat Items Reported on Food Frequency Survey, Summer 2003

Nikolski	Unalaska	Combined Average Total
1. Halibut,	1. Red Salmon	1. Red Salmon
2. Silver Salmon,	2. Silver Salmon	2. Halibut
3. Red Salmon,	3. Halibut	3. Silver Salmon
4. Pink Salmon,	4. King Salmon	4. Pink Salmon
5. Geese, all types	5. Pink Salmon	5. King Salmon
6. Dolly Varden/Trout,	6. Moose	6. Seal Oil
7. Seal Oil	7. King Crab	7. Cod
8. Pintail Duck	8. Cod	8. Moose
9. Cod	9. Seal Oil	9. King Crab
10. Reindeer	10. Reindeer	10. Reindeer

In both communities, Elders reported wide use of local fish and meat resources, although many were past the ages of being active fishermen and hunters. Sharing a harvest with Elders remains a community practice in both Unalaska and Nikolski.

Chart 2 listed the items with the largest reported consumption, and indicates that Nikolski and Unalaska had seven items in common: Halibut, Silver Salmon, Red Salmon, Pink Salmon, Cod, Reindeer and Seal oil. There were several differences in the "top-ten" food items reported: Nikolski reported frequent intake of Geese, Dolly Varden/Trout and Pintail Duck, where as Unalaska reported King Salmon, Moose and King Crab.

Chart 3 below provides data by item and reported average amount consumed by community. Nikolski reported greater use of local items such as badarkis, mussels, octopus and migrating waterfowl. Reported average portions were generally less in Unalaska than Nikolski except for King Salmon, Moose and King Crab. More berries such as blueberries, high bush salmonberries and Crowberries (also called black berries and Mossberries) were reported in Unalaska than Nikolski. Elders told me that few berries grew on hills around the village of Nikolski. The antioxidant effect of a diet rich in berries deserves further study. Both communities reported similar average portions consumed of sea lion meat and combined seal meat, although Northern fur seal was reported more often in Unalaska than in Nikolski, perhaps owing to the many family ties that exist between Unalaska and the Pribilof Islands of St. Paul, St. George, where fur seals are harvested.

Food sharing between family members living in different locations is a cultural tradition that continues in the two Aleutian communities of Unalaska and Nikolski. Food items such as moose and reindeer were reported in Unalaska, even though; these items are not available locally. When asked, Elders also explained that Unalaska had more dependable flights so families in St. Paul, St. George and Anchorage could send seal meat from the Pribilofs or moose meat from the Interior with a high degree of certainly of a safe arrival in Unalaska. Many in Unalaska reported receiving reindeer meat from Atka. Nikolski harvested using reindeer harvested from the Island, as well as reported receiving reindeer meat from Atka. Many of the teenagers in Nikolski are working at the Halibut processing plant in Atka, and this many contribute to the high intake of Halibut in community, although, during the survey visit, several individuals distributed halibut in the community from their catches just off the front reef in Nikolski.

As subsistence foods are sent to Unalaska and Nikolski from other locations, it would be logical to anticipate that foods gathered in and around Unalaska and Nikolski are also shared with family and Elders living in other locations as well, although this hypothesis was not assessed on this survey. If local subsistence foods are found to contain significant levels of contaminants, the impact of eating those foods may involve individuals beyond those living in the two village communities of Unalaska and Nikolski.

Table 3. Comparison of Average Yearly Intake of 3 oz. Fish and Meat Portions, 1 Tablespoon Oil Portions and 1 Cup Plant/Berry Portions from Reported Food Frequency Data

	Nikolski N=13	Unalaska N=62	Both Locations N=75
Halibut (includes cooked and dried)	304.0	57.5	100.2
Silver Salmon (includes cooked, raw or smoked, dried)	256.8	66.4	99.4
Red Salmon (includes cooked, raw, or smoked, dried)	232.9	92.3	116.7
Pink Salmon (includes cooked, raw or smoked, dried)	174.2	26.2	51.8
Geese (includes Geese, Aleutian geese, Canadian geese, Black Brandt geese)	84.9	6.4	20.0
Dolly Varden/Trout	82.5	5.1	18.5
Seal Oil (includes Seal oil, Harbor/Hair Seal oil, Northern Fur Seal oil)	61.2	18.6	26.0
Pintail Duck	55.8	1.4	10.9
Cod	48.5	19.6	24.6
Reindeer Meat	35.5	18.1	21.1
Putschke	30.5	6.9	11.0
Badarki	23.1	0.9	4.7
Mussels	23.1	0.4	5.1
Black Duck	22.0	1.0	4.7
Pitruske	21.8	10.4	12.4
Teal	19.4	1.3	4.4
Sea Lion meat	17.8	10.7	12.0
Scoter Duck	14.2	0.5	2.9
Seal Lion Oil	12.9	2.5	4.3
King Salmon	12.8	28.9	27.5
Gull Eggs	12.6	1.3	3.2
High Bush Salmonberries	10.5	35.3	31.0
Moose	9.8	25.8	23.0
Blueberries	9.1	43.0	37.1
Octopus	8.0	4.8	5.3
Crowberries (also called Blackberries and Mossberries)	7.3	10.4	9.9
Sea Bass	5.8	8.6	8.1
Harbor Seal Meat	4.5	3.3	3.5
Sea Urchin	4.0	4.7	4.6
King Crab	2.2	25.3	21.3
Northern Fur Seal Meat	1.8	7.8	6.8
Low Bush Salmonberries	1.5	4.5	4.0
Shrimp	0.5	5.3	4.5
Snow Crab	0.1	3.3	2.7
Clams	0.0	6.0	4.9
Chum Salmon (includes cooked, raw or smoked, dried)	0.0	3.4	2.8

Future Qualitative Data

Qualitative data have not been analyzed for context and frequency of responses. These data will help to understand the cognitive processes involved in selecting and not selecting foods from this region, although the foods may be readily available. The high level of concern expressed to the researcher over the safety of local foods was significant, and these data deserve an in-depth analysis.

Future Quantitative Analysis

These food frequency data are very rich and deserve a full examination that would be possible using Cardiff and then statistical analysis using Statistical Package for Social Sciences (SPSS, Version 11.0, Chicago, Il, 2003) or similar statistical software. Analysis of Variance (ANOVA) will be used to calculate true differences between communities, gender and age. Due to the differences in sample sizes, average portion intake may mislead the reader and these first blush conclusions may not hold under higher scrutiny.