Wild Food Consumption Rate Estimates For Rural Alaska Populations

Robert J. Wolfe and Charles J. Utermohle

Technical Paper No. 261

Prepared for the Alaska Department of Environmental Conservation,
Contaminated Sites Program
Wild Food Consumption Rate Estimates, ADN No. 1800086

by the

Alaska Department of Fish and Game,
Division of Subsistence
Juneau, Alaska

June 2000

Abstract

This report presents community-specific wild food consumption rate estimates for rural Alaska populations. The estimates are indirect measures of consumption, based on information on the annual harvest and use of wild resources from household surveys conducted by the Alaska Department of Fish and Game, Division of Subsistence. For about 220 communities, one or more of the consumption rate estimates are reported in the Community Profile Database, a computerized data set summarizing information by community, year, and resource category.

There are at least six statistical measures that may be used as estimates of wild food consumption rates, given certain assumptions:

1. *Mean per capita harvest* -- the amount of wild food harvested in a rural population during a survey year, expressed as a per person measure (g/day).
2. *Mean per capita use (mean user)* -- the amount of wild food used by consumers in a rural population during a survey year, expressed as a per person measure (g/day).
3. *95th percentile per capita use (high end user)* -- the amount of wild food used by the consumer at the 95th percentile rank in a rural population during a survey year, expressed as a per person measure (g/day).
4. *50th percentile per capita use (median user)* -- the amount of wild food used by the person at 50th percentile rank in a rural population during a survey year, expressed as a per person measure (g/day).
5. *100th percentile per capita use (top user)* -- the amount of wild food used by the highest consumer in a rural population during a survey year, expressed as a per person measure (g/day).
6. *95% confidence limit of the mean per capita use* -- a statistical measure of the precision of the *mean per capita use* related to random errors introduced by sampling bias.

The report describes each measure, how values are calculated, and the assumptions underlying the measure when used as an indirect estimate of wild food consumption rates.

Wild food consumption rate estimates may be used in health risk assessments of detected contaminant levels in wild resources. In an assessment, existing information in the Community Profile Database may be consulted for consumption rate estimates, prior to new survey research. At a first level, a researcher identifies a population of consumers, a surveyed community representing the population, the year and resource categories representing the wild foods, and the existing appropriate statistical measures of consumption rates in the Community Profile Database. If necessary, at a second level, individual subsistence harvest project databases may be analyzed to calculate consumption rate estimates for non-standard resource categories. At a third level, when existing information is incomplete or of insufficient detail for a health risk assessment, household surveys may be administered to collect additional information, informed by standard questionnaire frames used in prior surveys. Special issues that may affect particular analysis include human site use factors, harvests consumed by dogs, and wild foods distributed outside a community.

Table of Contents

List of Tables

INTRODUCTION

Wild food contamination is an emerging concern in rural Alaska, especially for Alaska Natives who consume large amounts of wild food annually. About 20% of Alaska's population live in rural areas, close to 123,100 people in 1999 (Alaska Department of Labor 2000; Wolfe 2000). Major cultural groups in rural areas include Tlingit, Haida, and Tsimshian (southeast archipelago); Alutiiq and Aleut (Pacific Gulf coast); Yup'ik and Inupiat (subarctic and arctic coast); Athabaskan (subarctic interior); and Euroamerican (about half the rural population). The rural population resides in about 270 communities, most off the road network with less than 500 people.

Rural Alaskans commonly support themselves through fishing, hunting, and gathering of wild foods combined with small-scale cash employment (Wolfe and Walker 1987). Diets typically contain a mix of wild foods harvested locally and commercial foods purchased from stores. It is estimated that about 43.7 million lbs of wild foods are harvested annually in rural Alaska (Wolfe and Walker 1987). As a statewide average, this comes to about 375 lbs (usable weight) per person annually (about a pound a day per person). Most of the wild food harvested by rural families is composed of fish (about 60% by weight), along with land mammals (20%), marine mammals (14%), birds (2%), shellfish (2%), and plants (2%) (Wolfe 2000). Wild food harvest and use levels vary considerably between populations in Alaska in association with a number of geographic, cultural, and economic factors (Wolfe and Walker 1987). Harvest and use levels increase in communities as a function of distance from urban population centers, the cultural composition of the community's population, and per capita income levels. Harvest levels also differ substantially between communities within a region due to local variation in the species available for harvest.

Recent environmental assessments have detected a range of contaminants in northern ecosystems (Jensen, Adare, and Shearer 1997). Some contaminants derive from local sources, such as mines, military sites, timber mills, oil production sites, and fish processing plants. Others derive from industrial sources from southern latitudes transported to the north via the atmosphere, oceans, and rivers. Because of high wild food consumption levels, rural Alaskans are especially subject to exposure to contaminants that may find their way into natural food chains. Alaska Natives may be most at risk to exposure because their consumption levels are highest, their diets include a broader range of species, and their traditional foods include more parts of the animal (such as organ meats and fats) in comparison with non-Natives. Recent environmental assessments raise questions about the potential levels of contaminants in wild foods, the sources of contaminants, and the potential health effects on consumers of wild foods.

Health risk assessments require information on wild food consumption rates to evaluate exposure to detected contaminants from dietary sources. Ideally, health risk assessments would be directly tied to information on consumption of wild foods in Alaska. For analysis, information on consumption rates would be available by type of wild resource, community, and class of person (age, sex, and pregnancy status). Consumption rates over time also would be useful. As it stands right now, there is no program for directly measuring the annual consumption of wild foods in Alaska. Local studies of this sort in Alaska are few and of limited coverage.

This information gap is a handicap, but not a block, to health assessments. In lieu of direct information, it is possible to estimate consumption rates of wild foods through indirect methods. One potential source of information for developing indirect measures of wild food consumption levels is survey information on wild food harvest levels and use rates by households

at the community level. Household subsistence surveys have been conducted in a number of rural communities by the Alaska Department of Fish and Game and other organizations (Fall 1990; Utermohle 1997). Harvest and use information may be used to develop community-specific wild food consumption rates given certain assumptions. Community-specific estimates of wild foods intake rates can be based on representative harvest survey years for communities near a contaminated site. To date, there has not been a standard methodology for developing community-specific consumption rate estimates from harvest and use information. Development of a standard methodology would provide a useful tool for health risk assessment.

PURPOSE

The purpose of this research report is to provide wild food consumption rate estimates for rural communities in Alaska based on information on the harvest, use, and sharing of fish, wildlife, and plants from household subsistence surveys. The report provides the following information:

(1) Statistical methods for estimating wild food consumption rates, with assumptions and limitations;

(2) Estimates of wild food consumption rates to represent mean, median, "high-end" (95^{th} percentile), and "top" (100^{th} percentile) consumers, for a selection of communities, survey years, and standard resource categories; and

(3) A standard procedure for developing community-specific consumption rates for rural populations, including a generic household survey methodology for collecting information and steps for dealing with missing information.

The goal of the report is to provide more precise information on wild food consumption levels for health risk assessments of potential contaminants of wild resources in rural Alaska.

HARVEST SURVEY INFORMATION

Information on harvest and use of wild foods has been collected through household surveys in rural Alaska populations (Fall 1990). Household surveys are periodically conducted in rural communities by the Division of Subsistence, Alaska Department of Fish and Game and other organizations (Utermohle 1997). Currently, about 450 individual survey years of information are available for about 220 communities. The information is stored by the Division of Subsistence in computerized formats. The general methodology for household subsistence surveys is described in Fall (1990). Information on harvest levels and use rates of wild foods typically is collected using question frames covering "harvest", "use", "giving", and "receiving", each of which is described below. Additional information on household demography is collected for statistical analysis of the harvest and use information.

"Harvest" Questions

The amounts of wild foods harvested annually in a rural population are documented through "harvest" questions (see Fall 1990). Household heads are asked to report the amounts of a specific resource category harvested by members of the household for non-commercial use during the previous 12-month period (the survey period). The general question frame is as follows:

> *What is the number of [resource category, e.g., coho salmon] harvested by members of your household in [previous 12-month period]?*

Depending upon the resource category, the question is modified to improve the precision of reporting. For most resources (such as salmon, moose, or harbor seal), the household reports the number of individually-harvested animals. For some resources (such as herring roe, smelt, clams, and berries), the question is asked in terms "number of gallons", because harvesters commonly remember quantities in terms of the number of 6-gallon plastic buckets filled. For some resources where individual animals vary substantially in size (such as halibut or bowhead whale), the respondent is asked both for number and size ("lbs" or "length") of the harvested animal, so that the quantity of the harvest can be more precisely estimated. By covering all resource categories locally available, the harvest question frame allows for a measure of the amounts of wild resources harvested by surveyed households during the past year.

"Use" Questions

"Use rates" of wild foods in a rural population are documented through a "use" question. Household heads are asked to report whether or not a specific resource category was "used" by members of the household during the previous 12-month period (the survey period). The general question frame is as follows:

> *In [previous 12-month period], was [resource category, e.g., coho salmon] used by members of your household?*

The answer to this question is either "yes" or "no". The question is initially asked for an inclusive class of resources – "salmon", "other fish", "shellfish", "land mammals (game)" "marine mammals", "birds", and "plants". Given a positive response to using the resource class, the question is framed individually for more specific resource categories. Wild resources "purchased" or "eaten outside the home" are excluded from the definition of "use". This question provides information in addition to the "harvest" question above. Many households consume wild resources that are not directly harvested by members of the household. The question allows for a measure of household consumption rates independent of harvest rates.

"Give" and "Receive" Questions

Additional information on the use of wild foods in a rural population can be obtained with questions about sharing by households. Household heads are asked to report whether or not a specific resource category was "given" and/or "received" by members of the household during

the previous 12-month period (the survey period). The two general question frames are as follows:

> *In [previous 12-month period], was [resource category, e.g., coho salmon] given away by members of your household?*

> *In [previous 12-month period], was [resource category, e.g., coho salmon] received by members of your household?*

The answers to these two questions are either "yes" or "no". The questions measure whether or not a household participated in the distribution of specific wild resources during the previous year. Some households report sharing harvests with others, while others do not, so the question allows for households to be categorized in this regard. Similarly, some households report receiving wild resources from others. By asking about resources received, households who consumed but did not harvest a resource can be identified.

Demographic Questions

A demographic profile of a household's members in terms of number, age, and sex can be determined through a set of demographic questions. Household heads are asked to report certain characteristics of their household during the previous 12-month period. The general question frames are as follows:

> *Who were members of this household during [previous 12-month period]? [List]*
>
> *Was the person "male" or "female"?*
>
> *What was the person's relationship to the household head?[i.e., son, daughter, etc.]*
>
> *What is the person's birth date [month, day, year]?*
>
> *What is the person's ethnicity? [i.e., Alaska Native, non-Native]*
>
> *What months did the person reside in the community in [previous 12-month period]?*

The answers depict household members in terms of number, age, sex, relationship to the household head, ethnicity, and months resident in the community. The information is used for estimating the population of the community and calculating per capita harvest and use rates, as described in later sections.

Analysis of Harvest, Use, Sharing, and Demographic Information

Data obtained from household surveys administered by the Division of Subsistence are processed and stored as individual project databases. The project databases contain detailed, disaggregated information that can analyzed at a number of levels, including harvests by community, resource category, and household. Project databases are typically analyzed using the Statistical Package for the Social Sciences (SPSS).

In addition, survey results are reported in the Community Profile Database (CPDB), which is the central repository of subsistence harvest and use information of the Division of

Subsistence, Alaska Department of Fish and Game. The CPDB presents summary information from all comprehensive subsistence surveys administered to systematically-drawn samples of households in rural Alaska populations. The CPDB provides a standard set of measures for each surveyed community. Information in the CPDB is searched using Microsoft Access.

The statistical measures described in the next section can be found in the CPDB for select communities. If not currently in the CPDB, the statistical measures can be calculated from the individual project databases, where available.

CONSUMPTION RATE ESTIMATES

Several indirect, community-specific measures of consumption rates of wild foods can be statistically constructed from household survey information on harvest and use of wild foods. There are two generic types of measures – *per capita harvest* and *per capita use*. *Per capita harvest* is a measure of the amounts of wild foods harvested annually within a community for subsistence use, expressed on a per person basis. *Per capita use* is a measure of the amounts of wild foods used annually within households that reported using a wild food category, expressed on a per person basis. The first measure (per capita harvest) assumes that the annual wild food harvest is being distributed equally among all residents of a community for consumption. The second measure (per capita use) assumes that the annual wild food harvest is being distributed only among persons in households that report using the wild food category.

Within these two generic types are at least six statistical measures which can be used as estimates of wild food consumption rates, as follows:

Per Capita Harvest

1. Mean Per Capita Harvest

Per Capita Use

2. Mean Use (Mean User)
3. 95th Percentile Use (High End User)
4. 50th Percentile Use (Median User)
5. 100th Percentile Use (Top User)
6. 95% Confidence Limit of the Mean Use

The definition, statistical construction, and characteristics of each of these measures are provided in the next sections. To illustrate each statistical measure, Tables 1 and 2 provide estimates of wild food consumption rates for two rural populations – Ouzinkie on Kodiak Island (surveyed in 1997), and Seldovia along Lower Cook Inlet (surveyed in 1993) (see the section, "1st Level Estimates: CPDB Consumption Rates", for the steps used to construct community-specific summaries like those shown in Tables 1 and 2). Ouzinkie is a predominately Alutiiq community (93.6% Alaska Native) of about 208 people (Mishler, Mason, and Vanek 1995). Seldovia is a predominately non-Native community (38.5% Alaska Native) of about 431 people (Stanek, Tomrdle, and Fall 1995).

Mean Per Capita Harvest of Wild Foods

Mean per capita harvest is a statistical measure of the amount of a wild food harvested in a rural population during a survey year, expressed as a per person measure (g/day). It is calculated by dividing the total harvest of a resource category in a community by the community's population:

Total Harvest in Community / Community Population = Mean Per Capita Harvest

For instance, based on household surveys, the mean per capita harvest of coho salmon in Ouzinkie in 1997 was 49.68 lbs, calculated as follows:

10,354 lbs of coho / 208.4 people = 49.68 lbs of coho per person

The mean per capita harvest of coho salmon in Seldovia in 1993 was 15.17 lbs:

6,535 lbs of coho / 430.8 people = 15.17 lbs of coho per person

In this case, the coho harvest at Ouzinkie was about three times larger than the coho harvest at Seldovia.

Population size is shown in fractions of people in the examples above because a community's population commonly is estimated from a sample of households. In the Ouzinkie example, 47 households were surveyed out of 62 households in the community in 1997. The surveyed households contained 158 household members, or 3.36 people per household. Multiplying mean household size by the estimated number of community households produces the estimate of 208.4 people. Similarly, at Seldovia, 65 of 153 households were surveyed in 1993, containing 183 people (2.82 people per household), which is used to estimate the community population at 430.8 people. Like the population estimate, the total harvest of a wild food in a community (such as coho salmon in the above equations) is an estimate expanded from the harvests reported by a sample of surveyed households.

The mean per capita harvests of a relatively complete list of wild foods are shown in Tables 1 and 2. Mean per capita harvest levels are expressed as *grams per day* in Tables 1 and 2. Using coho harvests at Ouzinkie as an example, *lbs per year* are converted to *grams per day* the following way:

(49.68 lbs/yr x 453.59 g/lb) / 365 days/yr = 61.74 g/day

In Tables 1 and 2, mean per capita harvests are shown by resource category. A resource category is a class of wild foods, such as *salmon, harbor seal,* or *chitons* (see the section, "Hierarchical Resource Categories", for additional information on resource categories). For example, the mean per capita harvest of *salmon* was 157.25 g/day at Ouzinkie and 79.86 g/day at Seldovia. The mean per capita harvest of *harbor seal* was 15.42 g/day at Ouzinkie and 1.52

g/day at Seldovia. The mean per capita harvest of *chitons* was 3.57 g/day at Ouzinkie and 2.14 g/day at Seldovia.

The relative contribution by weight of a resource category to the total wild food harvest in a community is shown in an adjacent column in Tables 1 and 2. For instance, by weight the harvest of *salmon* comprised 47% of all wild foods harvested at Ouzinkie in 1997. *Salmon* comprised 35% of the wild foods harvested at Seldovia in 1993.

The measure, *mean per capita harvest*, can be used as a first approximation of wild food consumption rates in a community, given certain assumptions discussed below. There are many reasons to use it as a first approximation of consumption rates of wild foods. First, the estimate is specific to a community. Wild food harvest patterns are known to vary significantly between communities due to geographic, cultural, and economic factors (Wolfe and Walker 1987). The measure is able to capture this primary source of variation in food use patterns. Second, the estimate is based on a relatively reliable source of information – harvest levels by households. Household heads usually are able to report with fair accuracy the amounts of wild resources harvested during a past year by household members. The measure is constructed from this solid data set. Third, because standard household harvest surveys have been administered across a wide range communities, community-specific measures of *mean per capita harvest* are available for a large number of communities. For some communities where use and sharing information has not been collected, *mean per capita harvest* is the only measure of consumption rates available. Its general accessibility as a measure makes it useful as a first approximation of consumption rates.

To use *mean per capita harvest* as an estimate of consumption, several assumptions must be made. An assumption is made that wild foods are not exported from or imported into the community (see the section, "Wild Foods Distributed Outside a Community", for a further discussion of this assumption). An assumption is made that wild foods are distributed equally among all residents of a community. An assumption is made that wild foods are consumed equally by each resident of a community. Expressing the measure in terms of *grams per day* suggests that a wild food category is consumed equally across each day of the year. For any particular health risk assessment, each of these assumptions should be carefully examined for their potential effects on analysis. Some of the limitations to using *mean per capita harvest* as an estimate of consumption rates are identified here.

Because it is a mean, *mean per capita harvest* necessarily will be lower or higher than actual levels of consumption of wild foods for segments of a community's population. In general, the amount of food consumed varies by a person's age. Other things being equal, the assumption that foods are consumed equally by all age classes results in a mean value that is a low estimate for adults and a high estimate for children. This limitation might be addressed by adjusting the *mean per capita harvest* by factors to reflect general age-specific consumption rates.

The assumption of equal distribution probably results in a low estimate of consumption for Alaska Native residents and a high estimate for non-Native residents for wild food categories that are almost exclusively used by Alaska Natives (for example, seals, whales, walrus, blackfish, herring, herring eggs, chitons, sea cucumbers, sea urchins, and seaweed, among others). A *mean per capita harvest* will not correctly represent these cultural use patterns, particularly in culturally-mixed communities where Alaska Natives comprise a minority segment of the population. This limitation may be addressed by using *mean per capita use* values, described below.

Consumption levels of "high-end" consumers in a community also will be underestimated by *mean per capita harvests*. Due to a complex of factors (such as personal preference, family tradition, and economic circumstances), some persons in a community

consume little or no wild foods, while others consume greater quantities. *Mean per capita harvest* will underestimate consumption for "high end" consumers and will overestimate consumption for "low end" consumers. The next section discusses approaches for correcting for these factors to improve the precision of statistical measures of consumption rates.

Mean Per Capita Use of Wild Foods

Mean per capita use is a statistical measure of the average amount of a wild food used by consumers in a rural population during a survey year, expressed as a per person measure (g/day). It is figured by allocating the community's harvest of a resource category among households that reported using the resource during a survey year. *Mean per capita use* is calculated by dividing the entire community's *mean per capita harvest* of a resource category by the percentage of households using the resource, as follows:

Community's Mean Per Capita Harvest / Percentage of Community's Households Using the Resource Category = Mean Per Capita Use

In this calculation, the mean per capita use represents an average among all persons residing in households that reported using a resource.

To calculate mean per capita use, households are categorized as "users" and "non-users" of a resource category based on responses to survey questions on whether a wild food was "used" by a surveyed household during the survey period. As indicated above, the "use" question is standard for many subsistence surveys. The frequency of answers to these questions at Ouzinkie and Seldovia are illustrated in Tables 1 and 2. As shown in these examples, some resource categories are used by most households while others were used by smaller percentages of households. For example, for households surveyed in Ouzinkie, 91.5% used sockeye salmon, 55.3% used chum salmon, and only 4.3% used sea lion during the previous 12-month period. For households surveyed in Seldovia, 84.6% used halibut, 47.7% used moose, and only 7.7% used oysters. This indicates that harvests of many wild food categories are not equally distributed for consumption among community households. Consumption may be concentrated within a small segment of the population.

Unlike *mean per capita harvest*, *mean per capita use* does not assume that wild resource harvests are equally distributed for consumption among all community residents. Instead, the measure assumes that the wild food harvest in a community is consumed only by persons living in households that reported using the wild food during a survey year. It assumes that there is no consumption of a wild food by members of households that reported not using the wild food. Because the statistical measure is constructed from both harvest and use information, *mean per capita use* is a more precise measure of mean consumption rates in a community than *mean per capita harvest*, which is constructed solely from harvest information.

The values of *mean per capita use* by resource category are listed for Ouzinkie and Seldovia in Tables 1 and 2. As expected, the *mean per capita use* is higher than the *per capita harvest* for most resource categories. For instance, in Ouzinkie, the *mean per capita use* of black rockfish was 12.39 g/day compared with a *mean per capita harvest* of 4.75 g/day. Only 38.4% of households reported consuming black rockfish, so when the community harvest is allotted among the user segment of the population, a higher estimate of use results. Similarly, in Seldovia the *mean per capita use* of harbor seal (19.68 g/day) was substantially higher than the *mean per*

capita harvest (1.52 g/day) because the seal harvest was consumed by a small subset of the population (7.7% of the community's households).

Mean per capita use is a higher and more precise estimate of consumption than *mean per capita harvest* in cases of wild foods consumed by a subset of community households. At the same time, the values of *mean per capita use* are not substantially different from *mean per capita harvest* in cases of wild food categories which are consumed by a large majority of community households. This is illustrated with salmon. In Ouzinkie, 95.7% of household reported using salmon. Because the community's salmon harvest is allocated among most households in Ouzinkie, the *mean per capita use* (164.31 g/day) is not substantially different from the *mean per capita harvest* (157.25 g/day). Because of the manner in which it is calculated, *mean per capita use* is likely to be a more precise estimate of consumption than *mean per capita use* for resource categories at the lowest taxonomic levels (see section, "Hierarchical Resource Categories", for further discussion of taxonomic levels). As resource categories become more generalized classes moving up the taxonomic hierarchy, the measure of *household use* loses precision, and the measures of *mean use* and *mean harvest* converge in value.

The measure, *mean per capita use*, can be used as a general estimate of wild food consumption rates in a community, given certain assumptions. Like *mean per capita harvest*, its accessibility for a number of communities makes it useful as an approximation of consumption rates. As a measure, it captures differences among household consumption rates related to ethnicity (that is, cultural food patterns). Harvests of wild food categories that are primarily consumed by Alaska Native households are appropriately allocated to the households that actually use them, making the measure a substantial improvement over *mean per capita harvest* for those resource categories. It is a useful measure for lower-order resource categories, but less useful for higher-order resource categories, for reasons discussed above.

There are several assumptions made when using *mean per capita use* as an indicator of consumption rates. An assumption is made that wild foods are not exported from or imported into the community (see the section, "Wild Foods Distributed Outside a Community", for a further discussion of this assumption). An assumption is made that wild foods are distributed equally among all members of households that reported sharing and using a wild resource. An assumption is made that wild foods are consumed equally by each user within households that share resources. Expressing the measure in terms of *grams per day* suggests that a wild food category is consumed equally across each day of the year. As with other types of measures, each assumption should be carefully considered for their potential effects on a health risk assessment. Also, because of the way it is calculated, an assumption is made that the mean household sizes of the consuming household group and non-consuming household group are the same (see the section, "Statistical Effects of Household Size").

There are a number of limitations to using *mean per capita use* as an estimate of consumption rates. Because it is a mean, *mean per capita use* necessarily will be lower or higher than actual levels of consumption of wild foods for segments of a community population. Differences in consumption rates due to a person's age are not captured in the measure. This might be corrected by adjusting the *mean per capita use* by factors to reflect general age-specific consumption rates. Also, consumption levels of "high-end" consumers in a community will be underestimated by *mean per capita use*, as noted above for *per capita harvest*. The next section discusses approaches for estimating consumption rates of high users.

95th Percentile Per Capita Use of Wild Foods (High End User)

The *95th percentile use* is a statistical measure of the amount of a wild food used by the consumer at the 95th percentile rank in a rural population ("high end user") during a survey year, expressed as a per capita measure (g/day). The statistical measure is sensitive to differences in wild food use due to between-household variations in diet breadth and sharing of harvests. The *95th percentile use* is figured by:

1. allocating household harvests of a resource category among three household groups based on reported use and sharing patterns during a survey year,
2. summing a household's use levels across resource categories (this step is taken for higher-order resource categories only),
3. ranking households by quantities used, and
4. identifying the use level of the consumer at the 95th percentile rank.

To calculate the *95th percentile use*, households in a community are categorized into three groups, based on responses to survey questions regarding whether a wild food was "used", "given", or "harvested" during the survey period. These questions are standard in many subsistence surveys (see the section, "Harvest Survey Information"). The frequencies of answers to these questions vary among communities, households, and resource categories, as illustrated in Tables 1 and 2. For example, when asked about *pink salmon*, households in Ouzinkie reported the following pattern: 70.2% used, 57.4% harvested, 31.9% gave, and 31.9% received *pink salmon* during 1997, the survey year. In Seldovia, 27.7% used, 23.1% harvested, 12.3% gave, and 12.3% received *pink salmon* during 1993. As another example, of Ouzinkie households, 55.3% used, 27.7% harvested, 21.3% gave, and 35.0% received *harbor seal* in 1997. For Seldovia households, 7.7% used, 1.5% harvested, 6.2% gave, and 6.2% received *harbor seal* in 1993.

As shown by these examples, within a given community wild foods like pink salmon and harbor seal are used by some households and not used by others. A household may become a "user" by consuming a wild food harvested by one's own household members. Or, a household may become a "user" by consuming wild foods received from other households. Sharing of wild food harvests through noncommercial distribution networks is common in mixed, subsistence-cash socioeconomic systems in rural communities. The extent of sharing of wild food harvests among households varies across resource categories, as demonstrated by the percentages of households *giving* and *receiving* resources in Tables 1 and 2.

For calculating the *95th percentile use*, a wild food harvest is only counted as consumed by members of households that reported using the wild food, either through direct harvests or by receiving wild foods from other households. Use levels are independently calculated for three groups of surveyed households: (1) households that "harvested and did not give" a resource category; (2) households that "harvested and gave" combined with households that "did not harvest and used" a resource category; and (3) households that "did not use" a resource category. The use levels for members of each household group is calculated as follows:

- Group 1. Households That "Harvested and Did Not Give"

  Harvest by Each Household / Household Size = Use Level

- Group 2. Households That "Harvested and Gave" combined with Households that "Did Not Harvest and Used"

  Harvest by the Group of Households / People in the Group of Households = Use Level

- Group 3. Households That "Did Not Use"

  Use Level = 0

Because a Group 1 household stated that it did not "give away" a wild food category, it is assumed that a wild food harvest by the household was consumed only by members of that household. A household's harvest is divided by a household's size to calculate the amount of a resource category used by each member of a Group 1 household. The amounts used by members of Group 1 households commonly will be a value unique to each household in Group 1.

Households that harvested and gave away resources are placed in Group 2. In addition, households who did not harvest but used a resource given to them are placed in Group 2. It is assumed that this group of "user" households comprised a distribution network in which wild foods were given and received for consumption during the survey period. The actual quantities of wild foods distributed between households during a survey year are not known. Household surveys do not ask for this type of information because household heads generally do not keep track (in any strict fashion) of the amounts of foods given and received during a year. Lacking this information, it is assumed that wild food harvests by Group 2 households are shared equally among all members the group. For Group 2 households, the harvests of a resource category are summed and divided by the total number of household members in the group to calculate the amounts of wild foods used by each member of Group 2 households. The use levels of lowest-order resource categories will be the same for all members of Group 2, because of the assumption of equal distribution among user households.

Households are placed in Group 3 if they reported not using a resource category. A household in Group 3 reported that it did not use, harvest, or receive a resource category during the survey year. For this group of households, the amount of use for that resource category is assigned a value of "zero".

To calculate the *95th percentile use* for a lowest-order resource category, the uses of members of Groups 1, 2, and 3 households are rank ordered from the lowest value to the highest value. The community resident occupying the 95th percentile rank is identified. The use level of the 95th percentile represents the *95th percentile use* among community residents. The quantities used by the top five percent of residents in a community are at least at this level.

The values of the *95th percentile use* by resource category are listed for Ouzinkie and Seldovia in Tables 1 and 2. As expected, the *95th percentile use* is higher than the *mean per capita use* for most resource categories. For some resource categories, the *95th percentile use* is substantially higher than the *mean per capita use*. For instance, in Ouzinkie, the *95th percentile use* of *salmon* was 313.36 g/day compared with a *mean per capita use* of 164.31 g/day. Due to factors such as diet breadth and sharing, the use levels of the high end user are almost twice the mean use level. Similarly, in Seldovia the *95th percentile use* of *salmon* was 166.69 g/day, almost twice the amount of the *mean per capita use* of 89.52 g/day. As another example, at Ouzinkie the *95th percentile use* of *marine mammals* (44.44 g/day) was 56% higher than the *mean per capita use* (28.5 g/day). At Seldovia, the *95th percentile use* of *marine mammals* (16.37 g/day) was 49% higher than the *mean per capita use* (10.98 g/day).

For lowest-order resource categories (see the section, "Hierarchical Resource Categories"), variation in the *95th percentile use* measure reflects differences among households due to two factors: using or not using a resource category, and sharing or not sharing a resource category. Households that do not use a resource category will occupy the lower ranks. Households that use a resource category will occupy higher ranks. Among users, higher ranked consumers likely will be members of a household with a comparatively larger harvest that was consumed entirely within the household (that is, the harvest was not shared outside the household). The *95th percentile use* measure allows for the identification of high harvesting households that report consuming the harvest entirely within the household group. Because of the way it is calculated, consumers occupying the middle ranks are likely to be members of households that give and receive resources within a distribution network.

For higher-order resource categories (see the "Hierarchical Resource Categories" section), variation in the *95th percentile use* measure reflects the dietary breadth of wild foods consumed within a household, as well as the use and sharing patterns. "Dietary breadth" is the relative number of different types of wild foods within a resource category consumed by a household. Households that use a comparatively larger number of different types of wild foods have a greater dietary breadth. Among users, higher ranked consumers likely will be members of a household with a comparatively greater dietary breadth. Dietary breadth can be an important factor in health risk assessment, as consumers of a wider range of wild foods may be at greater risk of exposure to contaminants than consumers of a more restricted range of wild foods.

The *95th percentile use* can be used as an estimate of wild food consumption rates for "high end" consumers in a community. In health risk assessment, risk is commonly related to the degree of exposure to contaminants. The *95th percentile use* measure provides a way for quantifying the potential exposure levels of the segment of a community's population at greatest health risk, other things equal – those persons consuming at the *95th percentile* and above. Recommendations regarding the public health commonly are directed toward protecting groups at greatest risk.

The *95th percentile use* is preferable to *mean per capita harvest* and *mean per capita use* as a measure of exposure to contaminants, if one is interested in evaluating health risks to the segment of a population with the greatest exposure to a contaminant. It is sensitive as a measure of exposure for higher-order resource categories, because it captures variation in the dietary patterns in the population related to diet breadth. It is also useful as a measure of exposure for lower-order resource categories, although for these categories its sensitivity is primarily due to variation in sharing patterns. As a measure, it captures differences among household consumption rates due to ethnicity, as harvests are allocated to the households that actually use them.

There are several assumptions made when using the *95th percentile use* as an indicator of consumption rates by high-end users. An assumption is made that wild foods are not exported from or imported into the community (see the section, "Wild Foods Distributed Outside a Community", for a further discussion of this assumption). An assumption is made that wild foods are distributed equally among all members of households that reported sharing and using a wild resource (Group 2 households). Also, expressing the measure in terms of *grams per day* suggests that a wild food category is consumed equally across each day of the year. These assumptions should be carefully considered for their potential effects on a health risk assessment.

There are limitations to using the *95th percentile use* as an estimate of high-end consumption rates. Differences in consumption rates due to a person's age are not captured in the measure. This might be corrected by adjusting by factors to reflect general age-specific

consumption rates within the high-end households. The age and sex composition of members of "high-end" households are available from survey information.

Another limitation is the complexity of calculating the measure. The calculation of the *95th percentile use* for high-order resource categories requires statistical manipulation of data in project databases (database types are discussed in the section, "Analysis of Harvest, Use, Sharing, and Demographic Information"). For standard resource categories in the taxonomic hierarchy of the CPDB, the measure is calculated and easily accessible in the CPDB. However, for other groupings of wild food types, the *95th percentile use* is not available in the CPDB. To avoid going back to the original project data sets, a researcher may choose to perform a preliminary health risk analysis using a more inclusive, standard taxonomic category, or may choose to use a simple sum of the values of lower order taxonomic categories available in the CPDB. In either approach, the estimate of consumption rates will be larger than the actual consumption rates by the 95th percentile user. If health risks are below a threshold of concern using these approaches, there may be no reason to conduct a further analysis using project data sets. However, if health risks are above levels of concern, the researcher may choose to calculate the *95th percentile use* for the non-standard resource category with project data sets to arrive at a more precise estimate of consumption rates.

50th Percentile Per Capita Use of Wild Foods (Median User)

The *50th percentile use* is a statistical measure of the amount of a wild food used by the person at the 50th percentile rank in a rural population ("median user") during a survey year, expressed as a per capita measure (g/day). Statistically, half the persons in a population are consuming at levels above the *50th percentile use*, and half of the population is consuming at levels below the *50th percentile use*. In practice, however, because of statistical "ties" in household consumption rates due to the method for apportioning harvests, there may be multiple persons consuming at the median use level in specific cases. The *50th percentile use* is calculated in the same manner as the *95th percentile use*, except that after ranking households, the use level of the consumer at the 50th percentile rank is identified, instead of the 95th percentile (see the section, "95th Percentile Use of Wild Foods (High End Users)", for a description of the method).

The values of the *50th percentile use* by resource category are listed for Ouzinkie and Seldovia in Tables 1 and 2. As shown in these examples, the *50th percentile use* is generally slightly lower than the *mean per capita use* for most resource categories, and for resource categories used by a small percentage of households, the *50th percentile use* is "zero". The *50th percentile use* measure tends to be lower than the *mean per capita use* because of "specialization" of household production and use of wild foods in rural communities. Some households specialize in the harvest of particular wild foods, and the dietary patterns of these households will include a disproportionate share the community's total harvest of a resource category. If a few households in a community consume a significant portion of a wild food harvest, this results in use levels of the median household that are lower than the simple statistical mean reflected in the *mean per capita use*. In addition, the *50th percentile use* is the middle person of all community residents, which will include non-consuming households, while the *mean per capita use* is the average use of only consuming households (those households which reported using a resource category). This also will result in the median being lower than the mean.

The *50th percentile use* can be used as an estimate of wild food consumption rates for persons at the mid-range in a community population. In health risk assessment, risk is commonly related to the degree of exposure to contaminants. The *50th percentile use* measure provides a way for quantifying the potential exposure levels of the middle segment of a community's population. Like the *95th percentile use*, the statistical measure is sensitive to differences in wild food use due

to between-household variations in diet breadth and sharing of harvests (see the section, "95th Percentile Use of Wild Foods", for a discussion of diet breadth). The same assumptions and limitations for the *95th percentile use* measure pertain to the *50th percentile use* measure.

100th Percentile Per Capita Use of Wild Foods (Top User)

The *100th percentile use* is a statistical measure of the amount of a wild food used by the highest consumer in a rural population ("top user") during a survey year, expressed as a per capita measure (g/day). Statistically, all other persons in a population are consuming at levels below the *100th percentile use*. In practice, however, because of statistical "ties" in household consumption rates, there may be multiple persons consuming at the top user level in specific cases. The *100th percentile use* is calculated in the same manner as the *95th percentile use*, except that after ranking households, the use level of the consumer at the 100th percentile rank is identified, instead of the 95th percentile (see the section, "95th Percentile Use of Wild Foods (High End Users)", for a description of the method).

The values of the *100th percentile use* by resource category are listed for Ouzinkie and Seldovia in Tables 1 and 2. As shown in these examples, the *100th percentile use* is higher than the *95th percentile use* for most resource categories. Like the *95th percentile use,* the *100th percentile use* is sensitive to factors of diet breadth and sharing (see the section, "95th Percentile use of Wild Foods", for a discussion of diet breadth). The top user is generally a person in a household with large, unshared harvests and/or a wide breadth of wild foods in the diet.

The *100th percentile use* can be used as an estimate of wild food consumption rates for the highest consumer in a community population. In health risk assessment, risk is commonly related to the degree of exposure to contaminants. The *100th percentile use* measure provides a way for quantifying the potential exposure levels of the highest user segment of a community's population. The same assumptions and limitations for the *95th percentile use* measure pertain to the *100th percentile use* measure.

95% Confidence Limit of the Mean Per Capita Use

The *95% confidence limit of the mean use* is a statistical measure of the precision of the estimate of *mean per capita use* (see the section, "Mean Per Capita Use of Wild Foods"), which may be imprecise due to random errors introduced by sampling bias. Hypothetically, if different household samples had been drawn and surveyed to produce the estimate of mean use, in 95 out of 100 cases the *mean per capita use* will be a value at or lower than the *95% confidence limit of the mean use.* The *95% confidence limit of the mean use* is calculated as follows:

*(Community's Mean Per Capita Harvest / Percentage of Community's Households Using the Resource Category) * (1+ Confidence Interval) = 95% Confidence Limit of the Mean Per Capita Use*

As stated in the section, "Mean Per Capita Use of Wild Foods", while information in the CPBD derives from responses of systematically-drawn household samples, not all community households are typically surveyed. In a census survey design used for small communities, where all households are selected for surveys, some portion of households will be unsurveyed, including households that decline to be surveyed and households that are unavailable during the survey

period. In a random survey design used for larger communities, households not selected in the random draw also will not be surveyed.

Estimates of harvest levels and use rates are developed for unsurveyed households based on the values of surveyed households. Estimates of harvest and use for the population may be subject to imprecision due to the luck of the random draw or due to some other systematic selection bias (such as higher refusal rates for low harvesting households). If high harvesting households are disproportionately missed in the random draw, the estimates will be lower than the population's actual levels of harvest and use. Conversely, if high harvesting households are disproportionately sampled, the estimates will be higher than the population's actual levels.

The precision in the estimate of the *mean per capita use* is statistically a function of the variation between households in harvest levels. Substantial between-household variation in harvests leads to less statistical precision in the estimate because the harvest values of unsurveyed households are more difficult to predict with certainty. Because of specialization in subsistence harvests, substantial between-household variation is typical for rural communities.

The *95th percent confidence limit of the mean use* is a statistic that allows the level of confidence in the mean use estimate to be quantified. As stated above, if different household samples had been drawn and surveyed to estimate mean values, in 95 out of 100 cases the *mean per capita use* will be a value at or lower than the *95% confidence limit of the mean use.* That is, a researcher has statistical confidence that a value greater than the 95% confidence limit would result by the luck of the draw in only 5 out of 100 times.

The *95th percent confidence limit of the mean use* can be used as a "conservative" estimate (that is, most likely a high estimate) of wild food consumption rates by the mean user in a community population. It may be used in particular health risk assessments if there are reasons to doubt the precision of the *mean per capita use* value. If there is reason to suspect that, by the luck of the draw, a survey may have missed a substantial number of the high harvesters of wild foods in the community, then the *95th percent confidence limit of the mean use* may be used instead of the *mean per capita use* value. However, when a household sample is believed to be representative of the population, the *mean per capita use* value in the CPDB is generally assumed to be the best estimate of consumption by the average consumer in a population. Tables 1 and 2 illustrate the values of the *95th percent confidence limit of the mean use* for Ouzinkie and Seldovia. The values are commonly substantially greater than the *mean per capita use* estimates, but generally lower than the *100th percentile use.* The values across resource categories display no consistent relationship with the *95th percentile use*.

PROCEDURES FOR MAKING CONSUMPTION RATE ESTIMATES

This section describes general procedures for making wild food consumption rate estimates for rural Alaska populations. The section describes where to locate information for communities, survey years, and resource categories. The procedure identifies three levels of inquiry which may be taken depending upon the requirements of the health assessment and constraints of time, labor, and budget. At the first level, the researcher locates existing consumption rate estimates in the Community Profile Database (CPDB) of the Alaska Department of Fish and Game. The standard information in the CPDB may be sufficient for the needs of many health risk assessments. At the second level, the researcher calculates consumption rate estimates from information contained in project databases of the Alaska

Department of Fish and Game. While accessible to researchers, this information requires additional labor and cost in analysis to generate consumption rate estimates. Analysis of project databases may be required when the standard wild resource categories in the CPDB are not adequately matched to the categories of a health risk assessment. At the third level, the researcher develops estimates from new information collected through additional household surveys. This step may be necessary when existing information sources do not adequately represent the area, population, and wild resources under assessment.

1st Level Estimates: CPDB Consumption Rates

Several indirect, community-specific measures of consumption rates of wild foods are reported in the Community Profile Database. Information in the CPDB is organized by community, year, and resource category. The database is read using Microsoft Access (current versions 97 or 2000. The CPDB may be downloaded as a file from www.state.ak.us/local/akpages/FISH.GAME/subsist/subhome.htm following instructions contained at the website.

Community-specific consumption rate estimates for individual resource categories may be located in the CPDB by selecting the following sequence of command icons: (1) Browse Database/Print/Export, (2) Select Criteria, (3) Harvest, (4) Resource Level Data, (4) Community (a community may be selected with the drop-down arrow), and (5) Report Display. The final screen of information following this command sequence is illustrated in Table 3 for Ouzinkie. The screen lists the following consumption rate estimates by resource category at Ouzinkie for 1997, the study year:

- Mean per capita harvest (g/day)
- Mean per capita use (g/day)
- 95% upper confidence limit of mean per capita use (g/day)
- 50th percentile per capita use (median user) (g/day)
- 95th percentile per capita use (high end user) (g/day)
- 100th percentile per capita use (top user) (g/day)

Each of these measures has been defined and described in previous sections of this report. The first screen that appears lists values for the wild food category, *All Resources*. By using the select-record arrow, values for other resource categories may be selected.

A researcher may construct a single table of community-specific consumption rate estimates for a number of resource categories, like the tables shown for Ouzinkie and Seldovia in Tables 1 and 2. At the main menu, the researcher selects the following sequence of commands: (1) Quit to Access, (2) Queries, (3) Select the query entitled *DEC_COMPARISONS.QRY*, (4) Design, (5) Type in community name, (6) Query, Run, and (7) File, Save As Export File. The resulting file provides the six consumption rate estimates for all standard resource categories and for all survey years in a community. The researcher may narrow the table to a single survey year at the design query step. Constructing a table for all resource categories is an efficient approach in analysis, as it enables a researcher to clearly identify all the hierarchical components of wild food categories in the surveyed community.

In health risk assessment, the study population is a group of consumers of wild foods. In the CPDB, communities are sampled population units (see the section, "The Community as a Population", for a further discussion of sampling units). Generally, a researcher will want to

locate the community or communities in the CPDB whose members harvest and consume wild foods from the fish stock or wildlife population tested for contaminants. Consultation with experts in rural communities is essential for identifying the human populations that should be considered in a health risk assessment. Affected communities may be those near the collection site of the resource tested for contaminants. However, in some cases other more distant communities may be users of the fish stock or wildlife population being tested. The CPDB does not contain information on the geographic areas used by communities for wild food harvests; however, this information is available for many communities from other sources. Maps of subsistence use areas of most surveyed communities are available from the Alaska Department of Fish and Game, Division of Subsistence.

A researcher may find that information is missing for a community of interest. Many rural communities have never been surveyed for wild food harvests and uses. How to estimate consumption rates for unsurveyed populations is a research question that must be dealt with on a case by case basis. In some cases, consumption rates of a nearby surveyed community may be used to represent consumption rates of an unsurveyed community, if it is assumed that they share similar patterns of wild food harvest and use. Statistically, wild food harvest levels have been shown to be related to factors of geography, income, and cultural composition of communities (Wolfe and Walker 1987). To the extent these factors are similar, neighboring communities may display similar patterns of wild food use. However, neighboring communities may display significant differences in resource harvest patterns to the extent they differ in cultural composition and socioeconomic patterns. Further, as wild foods are harvested from areas near a community, neighboring communities may harvest substantially different wild food types when local ecosystems contain unique types of species.

Given these caveats, Table 4 lists surveyed communities in the CPDB that might be used to represent unsurveyed communities not found in the CPDB. The communities are paired according to similarities of geography, cultural composition, and socioeconomic characteristics, based on the qualitative judgement of the authors. The list is provided to assist a researcher in the initial decision about how to handle missing information. If a surveyed community does not seem appropriate to represent an unsurveyed community, a new survey may be needed for estimating consumption rates, as discussed in the section, "3rd Level Estimates".

Information in the CPDB is organized by survey year. The survey year is found in the upper right corner of the screen of summary information (see Table 3). The consumption rate estimates reflect wild food harvests and uses for that survey year. The CPDB presents consumption rate estimates for more than one year for communities where multiple subsistence surveys have been administered. Information for other years are found by selecting the option, "All Years", instead of "Most Representative", on the screen entitled, "Community Specific Harvest Data". The CPDB selects one year as being the "most representative" of a community's harvest pattern, shown in the box under the study year on the screen (Table 3). This is generally the most recent survey year. Between-year variation in wild food harvests and uses may be substantial for particular species (Wolfe et al. 2000), however, there has been little research on the stability of community-specific wild food consumption rates over time. If one or several survey years are used to estimate consumption rates in a community, an assumption is made that this information represents consumption rates over time in a community. The validity of this assumption must be assessed on a case by case basis with information from other sources.

Along with community and survey year, information in the CPDB is organized by resource category (see the section "Hierarchical Resource Categories" and examples in Tables 1 and 2). The resource category is listed on the screen in the upper left hand corner under the community name (see Table 3). How consumption rate estimates relate to hierarchically arranged resource categories has been discussed previously.

Researchers will want to locate resource categories that most closely approximate the types of wild foods under assessment. In the CPDB, consumption rate estimates have been calculated for a standard set of resource categories. However, for other groupings of wild food types, values do not appear. Calculating values for other groupings of wild foods is relatively simple for the estimate, *mean per capita harvest*, for this is done by a simple sum of individual constituent food categories. However, for other measures of consumption (*mean per capita use; 95th percentile use; 50th percentile use; 100th percentile use*), a simple sum of lower-level resource categories will result in some error in consumption rate estimates. These estimates are calculated from the information in project level databases (see the next section, "2nd Level Estimates"). To avoid analyzing original project data sets, a researcher may choose to perform a preliminary risk assessment using a standard taxonomic category in the CPDB that is more inclusive than the set of resources tested for contaminants. If this approach is adopted, the estimate of consumption rates will be larger than the actual consumption rates for the set of resources being assessed. If health risks are relatively low using the consumption rate estimates for the more inclusive resource category, there may be no reason to conduct a further analysis using project data sets. However, if health risks are above levels of concern, the researcher may choose to go to the next level of inquiry and analyze data from project databases to develop consumption rate estimates for more precise groupings of resource categories.

2nd Level Estimates: Project Database Consumption Rates

As stated in the previous section, consumption rate estimates for standard resource categories in the CPDB may not be adequate for a health risk assessment. The calculation of consumption rates for *mean per capita use; 95th percentile use; 50th percentile use; 100th percentile use* for non-standard resource categories requires the statistical manipulation of data in project databases. Information in project databases may be analyzed by community, household, and resource category to generate consumption rate estimates for different combinations of resource categories. Consumption rate estimates may be calculated using the formulas for each measure provided in previous sections.

Project databases of harvest and use information from household subsistence surveys are maintained at the southcentral office of the Division of Subsistence, Alaska Department of Fish and Game, located in Anchorage. Project databases are available on request for research purposes. Researchers must agree to follow the confidentiality standards of the Division of Subsistence to protect the privacy of surveyed households. Project databases are formatted for analysis using the Statistical Package for the Social Sciences (SPSS). Select variables may be converted to different formats for analysis with other statistical programs in some cases.

3rd Level Estimates: Additional Household Surveys

Household surveys may used to collect additional information when the community-specific information in the CPDB or project databases is incomplete or of insufficient detail for a health assessment. Household subsistence survey methodologies are described in Fall (1990). Examples of household surveys for collecting harvest and use information are available on request from the Alaska Department of Fish and Game, Division of Subsistence. Local municipal and/or tribal governments should be consulted for project approval prior to a survey project. Survey questions may be refined following these consultative steps. Surveys should be conducted in ways to protect the privacy and welfare of respondents.

Key respondent interviews are a preferred methodology for collecting certain types of information, such as human site use factors, customary patterns of preparation of wild foods (such as disposition of organ meats), the portion of wild foods fed to dogs, and wild foods traded outside of communities. For certain health assessments, information from key respondents is useful for refining consumption rate estimates for particular types of wild foods. General patterns described by key respondents can be cross-checked for accuracy with survey questions administered to a larger household sample. These issues are discussed in the "Special Topics" section.

SPECIAL TOPICS

Hierarchical Resource Categories

The Division of Subsistence uses a standard hierarchical taxonomy of resource categories for collecting, analyzing, and summarizing harvest and use information. The hierarchical system is listed in Table 7 and is described in Utermohle (1997:105-109). Examples of statistical measures by resource category are illustrated in Tables 1 and 2.

A resource category is a class of wild foods. A "lowest-order" resource category is a class of wild food at the bottom of the hierarchical taxonomy. For instance, resource categories at the lowest order include *pink salmon*, *black rockfish*, and *octopus* in Tables 1 and 2. A "higher-order" resource category is a taxonomic class containing more than one resource category, such as *salmon*, which potentially includes up to six types of salmon (*chum salmon, coho salmon, chinook salmon, pink salmon, sockeye salmon*, and *unknown salmon*).

The highest order resource category, a*ll resources*, includes all types of wild food harvested in a community during a survey year. Under a*ll resources* are the categories *fish, land mammals, marine mammals, birds and eggs, marine invertebrates,* and *vegetation*. Each of these resource categories has lower order constituents.

Mean per capita harvest values of lower order categories can be summed to produce mean per capita harvest values of higher order categories. As an example, the sum of the mean per capita harvests of *fish, land mammals, marine mammals, birds and eggs, marine invertebrates,* and *vegetation* is equivalent to the mean per capita harvest of *all resources*. The sum of the mean per capita harvests of *chum salmon, coho salmon, chinook salmon, pink salmon, sockeye salmon,* and *unknown salmon* is equivalent to the mean per capita harvest of *salmon*. When aggregating, a researcher must be attentive to the structure of the resource hierarchy. A researcher should only add discrete, non-overlapping resource categories to avoid the error of double-counting harvests. For instance, for Ouzinkie in Table 1, *non-salmon fish* is the aggregate of the categories *herring, bass, cod, flounder, greenling, halibut, rockfish, sablefish (black cod), sculpin, char, and trout*. Adding any lower order fish categories in addition to this set will produce an error. The hierarchical structure of resource categories in the CPDB is evident by the resource code and indentations (see Table 7).

The Community as a Population

In the subsistence survey research of the Division of Subsistence, a community is treated as a population of producers and consumers. Alaska's population is divided into about 270 communities in the Community Profile Database of the Division of Subsistence. In most cases, a community is a named place with a local government (municipal, tribal, or both). Community residents are the persons living within boundaries identified for the named place. In some cases

(such as logging camps and stretches of rural highway), a community is a census-designated place with no organized government at the local level. The communities in the CPDB in most cases can be matched with places or aggregates of places enumerated by the Alaska Department of Labor and reported in the annual *Alaska Population Overview*.

Harvest and use patterns are described at the community level in the CPDB. Subsistence research has found that wild food harvest and use patterns commonly vary by community. Subsistence users typically harvest wild foods from traditional use areas surrounding their communities. The types of species harvested are directly linked to the types of wild species available in the traditional use areas of a community. Typically less than a half dozen core resources provide the bulk of the wild foods harvested in a community. A range of other wild foods supplement these staples.

While food patterns commonly differ by community, research has shown that wild food harvest patterns of neighboring communities may be similar, depending on shared cultural, ecological, and economic conditions. Factors related to the overall volume of the wild food harvest include the percentage of Alaska Natives in the community, the per capita income of the population, whether a community is connected by roads, and the geographic region of the community (Wolfe and Walker 1987). Using these factors, the size of the harvest can be predicted for unsurveyed communities. In particular cases it is reasonable to use the food patterns documented for a neighboring community to reflect the food patterns of an unsurveyed community, as shown in Table 4.

Human Site Use Factors

When point source contamination is being assessed for health risks, questions are raised as to which communities harvest wild foods affected by the point source and how much of a community's harvest of a food category is from contaminated stocks or wildlife populations. Potentially-affected communities are identified by a concordance of community use areas with the range of fish stock or wildlife population affected by the contaminated site. The proportion of a wild food from contaminated stocks/populations may be identified with "site use factors" developed from key respondents or household surveys.

In rural communities, most wild foods are harvested in customary use areas contiguous to the community. Use area maps have been collected through key respondent interviews and/or household surveys in a number of rural communities (see Fall 1990 for a description of the mapping methodology). Use area maps can be obtained on request from the Division of Subsistence. The general question frame used to document the subsistence use areas of a community is as follows:

> *Draw a line around the areas you have used for harvesting [resource category, e.g., moose] during [time period].*

The respondent draws a line (a bounded polygon) on clear acetate overlays of USGS topographic maps. In analysis, the use area polygons of individual respondents for resource categories are aggregated and the outer boundary drawn to represent the use area of a community. Maps depicting community use areas are a basic source of information for identifying which communities harvest wild foods from particular sites. In more complex analyses, the percentage of respondents using each area can be calculated from the number of overlapping polygons,

providing a measure of the "intensity" of use within a community use area (however, intensity of use can be calculated more simply through household survey questions, as described below).

Household surveys can be used to collect more detailed information on the proportion of households harvesting resources from particular areas in a general community use area. A set of use area questions can be included in a standard harvest survey. The respondent is shown a local area map divided into a number of discrete areas (generally drainages, coastal stretches, bays, and so forth). Considering the map of discrete areas, the respondent is asked the following general question frame:

> *Indicate which areas you have used for harvesting [resource category, e.g., salmon] during [time period].*

The respondent's answers are either "yes" or "no" for each area, listed in a tabular matrix on the survey sheet. In analysis, the percentage of households using an area is calculated, a value commonly referred to as the "intensity of use" of an area. Respondents generally have little trouble answering this type of question. When analyzed, the information commonly depicts a core area used by a substantial portion of community households, surrounded by outlying areas used by a smaller percentage of households. Where available, the percentages of households using areas can be used as site use factors in particular health risk assessments for a community. Consumption rates for particular resource categories may be distributed across use areas in proportion to the use factors.

Neither of the two methods discussed above provide direct measures of the proportion of wild foods coming from a particular area. A more direct measure of this might be achieved by asking respondents the following question frame, in reference to discrete areas depicted on a map:

> *How much of your household's harvest of [resource category, e.g., salmon] has come from [area] during [time period]? [Answer in a percentage]*

> *How much of the community's harvest of [resource category, e.g., salmon] has come from [area] during [time period]? [Answer in a percentage]*

The respondent answers with a percentage for each area, which should add up to 100% if all use areas are shown. To date, this type of question frame has not been used in subsistence surveys, so its performance is yet to be tested.

Finally, site-specific harvest information is available for salmon, moose, deer, and caribou through permit and harvest ticket systems administered by the Alaska Department of Fish and Game. For salmon, the percentage of salmon harvested by fishing district can be calculated. For moose, deer, and caribou, the percentage of animals harvested by community and uniform coding unit (usually a drainage) can be calculated. Harvest quantities in rural areas are frequently under-represented in the permit and harvest ticket databases because of incomplete harvest returns. However, the proportion of a community's reported harvest of salmon, moose, deer, and caribou in each geographic area may be estimated, if one assumes that the harvest returns represent of cross section of all users in a community. These percentages might be used as site use factors for these species.

Wild Foods Consumed by Dogs

Historically, a substantial portion of the annual subsistence harvests was fed to working dog teams in Alaska. In general, subsistence harvests to feed dog teams have declined to much lower levels in most rural areas since the widespread adoption of snowmachines after the mid 1960s (Andersen 1992). By the late 20th century, most dogs in rural areas were kept as pets, fed with byproducts and scraps from subsistence harvests, rather than with directed harvests. One may assume that this proportion of the harvest is covered in the factor converting harvests from round weight to edible weights (see section, "Edible Weights and Wastage").

Substantial numbers of working dog teams continue to be used in some rural communities, particularly in the Yukon drainage. For certain communities in the CPDB which had substantial numbers of working dog teams during the survey year, a factor should be applied to consumption rate estimates for fish to remove that portion consumed by dogs. Table 6 provides estimates of the percentages of a community's harvest of chinook, chum, coho, and other fish that were fed to dogs in 1999 for nine Yukon River communities in the CPDB where this is an issue. The percentages in these tables may be used to adjust consumption rates of these fish categories to remove the portion fed to dogs in these places. The harvests of other communities in the CPDB do not need adjustments. Information on the amounts of subsistence salmon fed to dogs has been collected in the annual catch records for communities in the Yukon and Kuskokwim drainages. This set of information is available on request from the Alaska Department of Fish and Game. From this data set, five-year averages may be calculated to adjust salmon harvests for particular Yukon and Kuskokwim drainage communities.

Wild Foods Distributed Outside a Community

Most wild food harvests documented through household surveys are consumed locally by members of the surveyed community. However, some portion of wild food harvests are distributed outside the local community through noncommercial distribution networks (Langdon and Worl 1981). Similarly, some wild foods consumed in rural communities originate from other rural areas. Wild foods are distributed along networks of kin and friends. Some wild resources are distributed along customary trade networks. Sale of subsistence products at commercial levels is prohibited by state and federal regulation.

The quantities of wild foods distributed outside of communities have not been documented by subsistence surveys. Qualitative information from key respondents suggests it is a relatively small proportion of the annual harvest in a community. For health risk assessment, the assumption that all wild food harvests are consumed locally may result in some overestimation of consumption rates of local products. However, total consumption estimates may be fairly close, as there probably is a balanced reciprocity of exchanges between rural families over time. The outflow and inflow of wild foods between rural families may be relatively equivalent over the long term. The exceptions to this are certain specialty items which are harvested in large part for customary trade. Notable examples include subsistence herring roe harvests at Sitka and hooligan harvests at Haines. A large part of the annual harvest of herring roe and hooligan oil is traded outside the community. In these special cases, a factor may be applied to consumption rates to remove the amount distributed outside the community, estimated from information from key respondents from affected communities. The Division of Subsistence estimates that at least half of the Sitka herring roe harvest and the Haines hooligan harvest is distributed outside the community. The percentile consumption rate estimates in the CPDB have been adjusted to remove half of the harvest of herring roe for Sitka and hooligan oil for Haines.

Edible Weights and Wastage

Measures of wild food harvests and use in the CPDB are expressed in terms of "usable weights" (also called "edible weights"), which is the amount of product brought into the kitchen for use. It is a dressed weight of a wet product, prior to drying, salting, or other type of additional processing. Usable weight (edible weight) is comparable to fresh cuts of meat and fish purchased at a grocery store and brought into the kitchen for use. Harvests are converted to weight using standardized conversion factors. For fish, the weights represent a cleaned, gutted, and headed product. For birds, it means gutted, skinned, or plucked. For land mammals and marine mammals, it means gutted without hides, forelegs, heads, and large bones. It does include some meat-on-bones which are brought into the kitchen, such as rib sections. The meat-on-bones of fish, birds, land mammals, and marine mammals commonly go into the stew pot. These cuts are eaten almost to their entirety, except for the few remaining bones. It is also common for fish and meat to be dried on the bones. The consumer eats the dried product off the bones, which are discarded. Or the dried product is added to stews, after which the bones are discarded. Marine mammal fat is commonly processed into oil with little loss of weight. Oils usually are consumed in their entirety.

Usable weight in most cases may be used as an estimate of consumed product, without additional statistical adjustment. Some factor to remove the weight of unconsumed bones might be applied, but it would not be very much for fish or birds, as these bones are comparatively light weight, and even for land and marine mammals would not be much, as most large bones are discarded at butchering. The usable weight for fish, which does not include heads, may somewhat underestimate the weight of fish in areas where families use the head. The same is true for moose, as moose head soup is common in portions of interior Alaska. Which internal organs are consumed varies by area and family, depending upon local customs and personal preferences. Usable weight is intended to be a general estimate of the quantity of usable food product within a community, although the amounts actually available for use will be higher or lower in specific cases.

In addition, some portion of a subsistence harvest may not be consumed because of spoilage. Wet conditions may compromise the drying process for fish, so that certain years some significant portion of a fish harvest may not be consumed. However, this is the exceptional year. In general, families work hard to avoid spoilage and unused wild foods. In Alaska Native traditions, there are strong proscription against waste. Unused wild products are commonly fed to dogs kept as pets, who in addition to bear protection, serve an important role in culturally appropriate waste disposal of excess wild foods.

Statistical Effects of Household Size

When comparing indirect measures of consumption for a community, such as Ouzinkie or Seldovia in Tables 1 and 2, the estimate of *mean per capita use* in some instances is greater than the *95th percentile use* or the *100th percentile use*. This apparent anomaly results from different statistical routes for calculating measures. *Mean per capita use* is simply the quotient of the community's mean per capita harvest divided by the percentage of households using the resource category (see the section, "Mean Per Capita Use of Wild Foods"). This simple statistical quotient assumes that mean household sizes are equivalent for households that consumed the resource category and households that did not consume the resource category. By contrast, the *95th percentile use* and the *100th percentile use* are calculated by apportioning harvests among surveyed households based on harvest, use, and sharing patterns and ranking households by use

levels (see the section, "95th Percentile Use of Wild Foods"). This statistical procedure does not assume equivalent household sizes among consuming and non-consuming household groups. The statistical procedure for calculating *95th percentile use* and the *100th percentile use* is more precise than that for *mean per capita use* in instances where the mean household sizes of consuming and non-consuming households differ. The apparent anomaly of the *mean per capita use* greater than the *95th percentile use* results from the statistical effect of differing mean household sizes between consuming and non-consuming household groups. In these instances, the estimates of consumption of the *95th percentile use* and the *100th percentile use* are more precise than the *mean per capita use*.

For example, for moose in Seldovia (Table 2), the *mean per capita use* is estimated at 46.11 g/day, while the *50th percentile use*, *95th percentile use*, and *100th percentile use* are all estimated at 43.29 g/day. In this instance, only 9.2% of Seldovia's households harvested moose in 1993 (an estimated 14 of 153 households). Moose meat was widely distributed (all harvesting households reported giving moose to other households), so that the set of consuming households comprised 47.7% of Seldovia's households (73 of 153 households). For calculating *mean per capita use*, the mean per capita harvest for the community is simply divided by the percent of households using moose (22 g/day / .477 = 46.11 g/day). In this method, it is assumed that consuming households contained about 205.5 persons (that is, .477 x 430.75 persons), while non-consuming households contained about 225.2 persons (that is, .523 x 430.75 persons), with each household group containing about 2.82 persons per household. However, in fact, households that reported using moose in 1993 were larger (2.99 persons per household) than households that reported not using moose (2.64 persons per household). There were 218.91 persons in consuming households (not 205.5 persons). In calculating estimates of percentile use, the amount of moose apportioned among members of consuming households is estimated at 43.29 g/day (9,477.6 g/day available for Seldovia's population / 218.91 consumers = 43.29 g/day). As moose was widely distributed in the community, reaching the middle consumer, the 43.29 g/day is the estimate of the *50th percentile use*. Because the survey provided no additional information with which to distinguish among consumers of moose meat, the 43.29 g/day is also the estimate for the *95th percentile use* and *100th percentile use*. As shown in this case, the estimate for *mean per capita use* is somewhat greater than the other three estimates, due to the statistical effects of household size. As stated above, the estimates of percentile use are more precise than the estimate of *mean per capita use* in these instances.

SUMMARY

Several indirect measures of wild food consumption rates specific to rural Alaska populations may be constructed, based on information on the annual harvest and use of wild resources from household surveys conducted by the Alaska Department of Fish and Game, Division of Subsistence. For about 220 communities, one or more of the consumption rate estimates are reported in the Community Profile Database, a computerized data set summarizing information by community, year, and resource category.

There are at least six statistical measures that may be used as estimates of wild food consumption rates, given certain assumptions:

1. *Mean per capita harvest* -- the amount of wild food harvested in a rural population during a survey year, expressed as a per person measure (g/day).

2. *Mean per capita use (mean user)* -- the amount of wild food used by consumers in a rural population during a survey year, expressed as a per person measure (g/day).
3. *95th percentile per capita use (high end user)* -- the amount of wild food used by the consumer at the 95th percentile rank in a rural population during a survey year, expressed as a per person measure (g/day).
4. *50th percentile per capita use (median user)* -- the amount of wild food used by the person at 50th percentile rank in a rural population during a survey year, expressed as a per person measure (g/day).
5. *100th percentile per capita use (top user)* -- the amount of wild food used by the highest consumer in a rural population during a survey year, expressed as a per person measure (g/day).
6. *95% confidence limit of the mean per capita use* -- a statistical measure of the precision of the *mean per capita use* related to random errors introduced by sampling bias.

Characteristics of each of the measures are summarized in the following table (Table 8). All are indirect measures of consumption, expressed as g/day of wild foods for a surveyed year. All differentiate among communities, which is a primary source of variation in wild food consumption rates in rural areas. Except for *mean per capita harvest*, the measures also differentiate among types of households in a community. None of the measures differentiates among consumers by age or sex, although they may be adjusted by some standard factors for this purpose.

Table 8.

Summary of Characteristics of Six Consumption Rate Estimates	Mean per Capita Harvest	Mean Per Capita Use	50th Percentile Per Capita Use	95th Percentile Per Capita Use	100th Percentile Per Capita Use	95% Upper Confidence Limit of Per Capita Use
Indirect measure of consumption	yes	yes	yes	yes	yes	yes
Unit of measure	g/day	g/day	g/day	g/day	g/day	g/day
Represents a surveyed year	yes	yes	yes	yes	yes	yes
Represents a surveyed community	yes	yes	yes	yes	yes	yes
Primary measurement	mean harvest	mean user	median user	high user	top user	mean user
Differentiates communities	yes	yes	yes	yes	yes	yes
Differentiates types of households	no	yes	yes	yes	yes	yes
Differentiates by age and sex	no	no	no	no	no	no
Assumptions about wild foods: Harvests consumed locally	yes	yes	yes	yes	yes	yes
Foods equally distributed among all community members	yes	no	no	no	no	no
Foods equally distributed among all consumers in a community	no	yes	no	no	no	yes
Foods equally distributed among users who share in a community	no	no	yes	yes	yes	no

Wild food consumption rate estimates may be used in health risk assessments of detected contaminant levels in wild resources. In an assessment, existing information in State databases may be consulted for consumption rate estimates, prior to new survey research. The measure, *mean per capita harvest*, is available for all surveyed communities in the Community Profile Database. Its general availability makes it a useful first approximation of wild food consumption rates in a rural population. However, it is an underestimate of actual wild food consumption rates for segments of the population, including Alaska Native consumers using traditional food products and high consumers in a population. The other measures of *per capita use* differentiate among consumers and non-consumers in a population. While more precise, measures of *per capita use* are available only for communities for which information on harvest and sharing of wild foods has been collected.

The procedures for making wild food consumption rate estimates may follow at least three steps. At a first level, researcher identifies a population of consumers, a surveyed community representing the population, the year and resource categories representing the wild foods, and the existing appropriate statistical measures of consumption rates in the Community Profile Database. For many health assessment purposes, this may be sufficient. At a second level, subsistence harvest project databases of the Alaska Department of Fish and Game may be analyzed to calculate consumption rate estimates for non-standard resource categories. Finally, at a third level, when existing information is incomplete or of insufficient detail for a health risk assessment, household surveys may be administered to collect additional information, informed by standard questionnaire frames used in prior surveys. In any assessment, researchers should evaluate any effects of the assumptions underlying the measures, and special issues such as human site use factors, harvests consumed by dogs, and wild foods distributed outside a community.

REFERENCES

Alaska Department of Labor
2000 Alaska Population Overview: 1999 Estimates. Alaska Department of Labor, Juneau.

Andersen, David B.
1992 The Use of Dog Teams and the Use of Subsistence-Caught Fish for Feeding Sled Dogs in the Yukon River Drainage, Alaska. Technical Paper No. 210, Alaska Department of Fish and Game, Division of Subsistence, Juneau.

Fall, James A.
1990 The Division of Subsistence of the Alaska Department of Fish and Game: An Overview of Its Research Program and Findings: 1980-1990. Arctic Anthropology 27(2):68-92.

Jensen, J., K. Adare, and R. Shearer
1997 Canadian Arctic Contaminants Assessment Report. Department of Indian Affairs and Northern Development, Ottawa.

Langdon, Steve and Rosita Worl
1981 Distribution and Exchange of Subsistence Resources in Alaska. Technical Paper No. 55, Alaska Department of Fish and Game, Division of Subsistence, Juneau.

Mishler, Craig, Rachel Mason, and Vicki Vanek
1995 Ouzinkie. In James A. Fall and Charles J. Utermohle (eds), An Investigation of the Sociocultural Consequences of Outer Continental Shelf Development in Alaska, Volume IV Kodiak Island, pp. XII-1+. Technical Report No. 160, OCS Study MMS 95-012, U.S. Minerals Management Service, Cooperative Agreement 14-35-0001-30622. Alaska Department of Fish and Game, Division of Subsistence, Anchorage.

Stanek, Ronald T., Lisa Tomrdle, and James A. Fall
1995 Seldovia. In James A. Fall and Charles J. Utermohle (eds), An Investigation of the Sociocultural Consequences of Outer Continental Shelf Development in Alaska, Volume III Lower Cook Inlet, pp. VII-1+. Technical Report No. 160, OCS Study MMS 95-012, U.S. Minerals Management Service, Cooperative Agreement 14-35-0001-30622. Alaska Department of Fish and Game, Division of Subsistence, Anchorage.

Utermohle, Charles
1997 Community Profile Database Technical Documentation, Microsoft Access 7.0 Version. Alaska Department of Fish and Game, Division of Subsistence, Juneau.

Wolfe, Robert J.
2000 Subsistence in Alaska: A Year 2000 Update. Alaska Department of Fish and Game, Division of Subsistence, Juneau.

Wolfe, Robert J. and Robert J. Walker
1987 *Subsistence Economies in Alaska: Productivity, Geography, and Development Impacts*. Arctic Anthropology 24(2):56-81.

Wolfe, Robert J., Cheryl Scott, Sverre Pedersen, and Richard Caulfield
2000 Subsistence Harvest Variability in Alaska Native Communities. MMS 14-35-001-300661. Alaska Department of Fish and Game, Division of Subsistence and the University of Alaska, Fairbanks, Department of Alaska Native and Rural Development.

Table 1. Wild Food Harvest and Use, Ouzinkie, Kodiak Island, 1997

	Percentage of Households				Wild Food Harvest (g/day)		Wild Food Use (g/day)				
Resource Category	Using	Harvesting	Giving	Receiving	Mean Per Capita Harvest	Percentage Contribution to Total Harvest	Mean Use (Mean User)	95% Upper Confidence Limit of the Mean	50th Percentile Use (Median)	95th Percentile Use (High End)	100th Percentile Use (Top)
All Resources	100	100	91.5	93.6	328.01	1.000	328.01	367.37	309.59	586.32	799.83
Fish	100	87.2	76.6	85.1	238.54	0.720	238.53	269.54	234.2	469.77	767.12
Salmon	95.7	80.9	59.6	66	157.25	0.470	164.31	188.96	163.04	313.36	434.16
Chum Salmon	55.3	42.6	23.4	17	13.57	0.040	24.53	31.16	1.79	50.47	107.55
Coho Salmon	91.5	72.3	46.8	48.9	61.74	0.180	67.47	78.26	73.45	91.91	236.36
Chinook Salmon	55.3	34	17	34	8.39	0.020	15.16	20.47	1.6	32.15	85.74
Pink Salmon	70.2	57.4	31.9	31.9	14.94	0.040	21.27	25.95	16.83	24.46	109.45
Sockeye Salmon	91.5	72.3	44.7	48.9	54.88	0.160	59.97	72.57	64.48	103.8	222.44
Unknown Salmon	4.3	4.3	2.1	0	3.74	0.010	86.98	172.23	0	1.39	117.17
Non-Salmon Fish	97.9	80.9	70.2	63.8	81.29	0.240	83.02	96.31	61.41	217.55	582.91
Herring	27.7	14.9	4.3	17	7.08	0.020	25.57	39.12	0	24.85	217.47
Bass	2.1	2.1	0	0	0.01	0.000	0.59	1.17	0	0	1.24
Sea Bass	2.1	2.1	0	0	0.01	0.000	0.59	1.17	0	0	1.24
Cod	66	53.2	31.9	27.7	8.61	0.020	13.04	17.22	8.66	11.27	206.99
Pacific Cod (gray)	63.8	53.2	31.9	23.4	8.59	0.020	13.45	17.9	8.66	11.26	206.99
Walleye Pollock (whiting)	4.3	2.1	0	2.1	0.04	0.000	0.86	1.72	0	0	2.6
Flounder	4.3	4.3	2.1	0	0.24	0.001	5.49	9.38	0	4.47	4.97
Starry Flounder	4.3	4.3	2.1	0	0.24	0.001	5.49	9.38	0	4.47	4.97
Greenling	19.1	12.8	4.3	10.6	3.43	0.010	17.95	27.47	0	13.26	120.02
Lingcod	12.8	8.5	4.3	8.5	3.31	0.010	25.82	44.16	0	13.26	120.02
Unknown Greenling	6.4	4.3	0	2.1	0.14	0.000	2.13	3.73	0	0	3.72
Halibut	95.7	68.1	57.4	48.9	44.65	0.130	46.65	54.58	46.8	103.77	128.21
Rockfish	61.7	42.6	23.4	25.5	6.47	0.010	10.49	13.32	5.32	16.56	53.85
Black Rockfish	38.3	25.5	17	19.1	4.75	0.010	12.39	16.23	0	11.15	53.85
Red Rockfish	27.7	19.1	6.4	8.5	1.58	0.005	5.69	8.26	0	5.32	8.28
Unknown Rockfish	2.1	2.1	0	0	0.16	0.000	7.69	15.3	0	0	8.28
Sablefish (black cod)	21.3	12.8	4.3	10.6	0.56	0.002	2.62	3.75	0	2.14	9.63
Sculpin	6.4	4.3	0	2.1	0.05	0.000	0.77	1.31	0	0.53	1.86

Table 1. Wild Food Harvest and Use, Ouzinkie, Kodiak Island, 1997

	Percentage of Households				Wild Food Harvest (g/day)		Wild Food Use (g/day)				
Resource Category	Using	Harvesting	Giving	Receiving	Mean Per Capita Harvest	Percentage Contribution to Total Harvest	Mean Use (Mean User)	95% Upper Confidence Limit of the Mean	50th Percentile Use (Median)	95th Percentile Use (High End)	100th Percentile Use (Top)
Unknown Sculpin	6.4	4.3	0	2.1	0.05	0.000	0.77	1.31	0	0.53	1.86
Char	51.1	40.4	21.3	12.8	5.17	0.010	10.11	12.54	0.86	17.39	21.74
Dolly Varden	51.1	40.4	21.3	12.8	5.17	0.010	10.11	12.54	0.86	17.39	21.74
Trout	25.5	17	6.4	10.6	5.00	0.010	19.59	32.32	0	34.83	83.36
Rainbow Trout	12.8	10.6	4.3	2.1	3.26	0.010	25.43	43.49	0	32.25	32.25
Steelhead	21.3	12.8	2.1	10.6	1.74	0.005	8.16	13.47	0	3.43	57.26
Land Mammals	87.2	48.9	40.4	66	35.58	0.100	40.8	52.63	39.74	54.63	65.73
Large Land Mammals	87.2	46.8	40.4	66	34.19	0.100	39.2	48.22	36.26	49.16	53.68
Deer	80.9	46.8	40.4	51.1	28.88	0.080	35.69	44.26	36.26	36.26	53.68
Elk	44.7	6.4	10.6	38.3	5.31	0.010	11.87	18.51	0	12.9	12.9
Small Land Mammals	19.1	12.8	6.4	8.5	1.38	0.004	7.22	10.61	0	5.46	16.56
Hare	19.1	12.8	6.4	8.5	1.38	0.004	7.22	10.61	0	5.46	16.56
Snowshoe Hare	19.1	12.8	6.4	8.5	1.38	0.004	7.22	10.61	0	5.46	16.56
Marine Mammals	59.6	27.7	21.3	42.6	16.99	0.050	28.5	37.9	21.84	44.44	52.19
Seal	55.3	27.7	21.3	34	15.42	0.040	27.88	36.81	21.84	34.79	52.19
Harbor Seal	55.3	27.7	21.3	34	15.42	0.040	27.88	36.81	21.84	34.79	52.19
Steller Sea Lion	4.3	2.1	2.1	2.1	1.58	0.005	36.7	73.03	0	22.59	22.59
Birds and Eggs	85.1	66	46.8	48.9	15.42	0.040	18.12	21.74	12.52	35.24	48.05
Migratory Birds	76.6	55.3	44.7	44.7	13.82	0.040	18.04	21.82	11.72	33.75	48.05
Ducks	76.6	55.3	44.7	44.7	13.67	0.040	17.84	21.41	11.72	32.58	48.05
Bufflehead	40.4	34	17	10.6	0.73	0.002	1.81	2.35	0	2.32	4.97
Eider	8.5	6.4	0	2.1	0.22	0.001	2.63	4.55	0	1.98	4.77
Common Eider	2.1	2.1	0	0	0.01	0.000	0.59	1.17	0	0	0.68
Unknown Eider	4.3	4.3	0	0	0.20	0.001	4.62	8.23	0	1.98	4.77
Gadwall	2.1	2.1	2.1	0	0.02	0.000	1.18	2.35	0	0	1.32
Goldeneye	63.8	46.8	34	34	2.88	0.009	4.51	5.51	4.23	4.47	13.25
Unknown Goldeneye	63.8	46.8	34	34	2.88	0.009	4.51	5.51	4.23	4.47	13.25
Harlequin	46.8	31.9	19.1	14.9	0.78	0.002	1.67	2.2	0	2.48	4.14

Table 1. Wild Food Harvest and Use, Ouzinkie, Kodiak Island, 1997

	Percentage of Households				Wild Food Harvest (g/day)		Wild Food Use (g/day)				
Resource Category	Using	Harvesting	Giving	Receiving	Mean Per Capita Harvest	Percentage Contribution to Total Harvest	Mean Use (Mean User)	95% Upper Confidence Limit of the Mean	50th Percentile Use (Median)	95th Percentile Use (High End)	100th Percentile Use (Top)
Mallard	59.6	44.7	25.5	27.7	2.72	0.008	4.56	5.57	2.79	4.61	16.77
Merganser	17	12.8	10.6	4.3	0.16	0.000	0.95	1.34	0	1.11	1.67
Common Merganser	17	12.8	10.6	4.3	0.16	0.000	0.95	1.34	0	1.11	1.67
Oldsquaw	14.9	10.6	8.5	6.4	0.25	0.001	1.66	2.63	0	1.93	1.93
Northern Pintail	29.8	27.7	21.3	10.6	0.96	0.003	3.21	4.17	0	3.18	3.18
Scaup	36.2	27.7	12.8	14.9	1.11	0.003	3.05	3.94	0	6.71	7.45
Unknown Scaup	36.2	27.7	12.8	14.9	1.11	0.003	3.05	3.94	0	6.71	7.45
Scoter	59.6	44.7	25.5	27.7	3.70	0.010	6.21	7.82	2.79	9.41	14.91
Black Scoter	53.2	42.6	23.4	23.4	1.95	0.006	3.66	4.62	1.11	3.81	11.18
Surf Scoter	19.1	17	14.9	4.3	0.61	0.002	3.18	4.39	0	3.03	3.03
White-winged Scoter	44.7	34	17	19.1	1.14	0.003	2.55	3.22	0	3.72	6.71
Teal	19.1	19.1	4.3	2.1	0.10	0.000	0.52	0.69	0	0.55	0.79
Green-Winged Teal	19.1	19.1	4.3	2.1	0.10	0.000	0.52	0.69	0	0.55	0.79
Wigeon	2.1	2.1	2.1	0	0.02	0.000	1.18	2.35	0	0	1.44
American Wigeon	2.1	2.1	2.1	0	0.02	0.000	1.18	2.35	0	0	1.44
Geese	4.3	2.1	4.3	2.1	0.10	0.000	2.31	4.6	0	0	3.72
Brant	2.1	2.1	2.1	0	0.10	0.000	4.73	9.42	0	0	3.72
Seabirds & Loons	4.3	4.3	2.1	4.3	0.06	0.000	1.44	2.58	0	0.55	1.86
Auklet	4.3	4.3	2.1	4.3	0.06	0.000	1.44	2.58	0	0.55	1.86
Parakeet Auklet	4.3	4.3	2.1	4.3	0.06	0.000	1.44	2.58	0	0.55	1.86
Other Birds	8.5	4.3	2.1	4.3	0.12	0.000	1.46	2.77	0	1.44	1.44
Upland Game Birds	8.5	4.3	2.1	4.3	0.12	0.000	1.46	2.77	0	1.44	1.44
Ptarmigan	8.5	4.3	2.1	4.3	0.12	0.000	1.46	2.77	0	1.44	1.44
Unknown Ptarmigan	8.5	4.3	2.1	4.3	0.12	0.000	1.46	2.77	0	1.44	1.44
Bird Eggs	53.2	42.6	19.1	23.4	1.48	0.005	2.77	3.75	0.55	7.59	8.94
Geese Eggs	4.3	4.3	0	0	0.07	0.000	1.73	3.05	0	0	4.47
Unknown Geese Eggs	4.3	4.3	0	0	0.07	0.000	1.73	3.05	0	0	4.47
Seabird & Loon Eggs	51.1	40.4	19.1	23.4	1.40	0.004	2.74	3.73	0.55	7.59	8.94

Table 1. Wild Food Harvest and Use, Ouzinkie, Kodiak Island, 1997

	Percentage of Households				Wild Food Harvest (g/day)		Wild Food Use (g/day)				
Resource Category	Using	Harvesting	Giving	Receiving	Mean Per Capita Harvest	Percentage Contribution to Total Harvest	Mean Use (Mean User)	95% Upper Confidence Limit of the Mean	50th Percentile Use (Median)	95th Percentile Use (High End)	100th Percentile Use (Top)
Gull Eggs	51.1	40.4	19.1	23.4	1.28	0.004	2.5	3.3	0.55	6.47	8.94
Herring Gull Eggs	8.5	8.5	6.4	4.3	0.42	0.001	4.97	8.15	0	4.93	4.93
Unknown Gull Eggs	51.1	40.4	19.1	23.4	0.85	0.003	1.65	2.06	0.55	1.86	8.94
Kittiwake Eggs	4.3	4.3	2.1	2.1	0.06	0.000	1.44	2.45	0	1.11	1.11
Puffin Eggs	4.3	4.3	0	0	0.05	0.000	1.15	1.96	0	0.83	0.89
Unknown Puffin Eggs	4.3	4.3	0	0	0.05	0.000	1.15	1.96	0	0.83	0.89
Tern Eggs	2.1	2.1	2.1	2.1	0.01	0.000	0.59	1.17	0	0	0.37
Marine Invertebrates	61.7	53.2	29.8	34	9.27	0.020	15.02	19.23	6.62	31.11	62.34
Chitons (bidarkis, gumboots)	55.3	51.1	17	17	3.57	0.010	6.44	8.31	2.48	7.45	24.85
Black (small) Chitons	55.3	51.1	17	17	3.57	0.010	6.44	8.31	2.48	7.45	24.85
Clams	17	12.8	8.5	6.4	2.21	0.007	13.01	19.25	0	15.87	37.28
Butter Clams	12.8	10.6	6.4	4.3	1.45	0.004	11.35	16.69	0	9.66	37.28
Pacific Littleneck Clams	10.6	8.5	4.3	2.1	0.76	0.002	7.15	11.22	0	6.21	9.32
Crabs	27.7	10.6	12.8	19.1	1.08	0.003	3.9	6.16	0	5.19	5.19
Dungeness Crab	6.4	4.3	4.3	2.1	0.09	0.000	1.35	2.33	0	0.47	4.47
King Crab	14.9	2.1	4.3	12.8	0.04	0.000	0.25	0.49	0	0.21	0.21
Unknown King Crab	14.9	2.1	4.3	12.8	0.04	0.000	0.25	0.49	0	0.21	0.21
Tanner Crab	14.9	6.4	10.6	8.5	0.96	0.003	6.42	10.91	0	4.72	4.72
Tanner Crab, Bairdi	14.9	6.4	10.6	8.5	0.96	0.003	6.42	10.91	0	4.72	4.72
Limpets	4.3	4.3	0	0	0.05	0.000	1.15	2.06	0	0.77	0.93
Octopus	25.5	17	14.9	10.6	2.06	0.006	8.08	11.64	0	6.59	6.59
Sea Cucumber	4.3	2.1	0	2.1	0.04	0.000	0.86	1.72	0	0	2.48
Sea Urchin	19.1	17	6.4	6.4	0.19	0.001	0.97	1.45	0	0.77	3.1
Unknown Sea Urchin	19.1	17	6.4	6.4	0.19	0.001	0.97	1.45	0	0.77	3.1
Shrimp	2.1	2.1	0	0	0.07	0.000	3.55	7.06	0	1.55	1.55
Vegetation	100	100	57.4	25.5	12.23	0.030	12.22	13.57	13.19	23.13	33.13
Berries	100	97.9	55.3	21.3	10.48	0.030	10.47	11.62	13.19	13.19	33.13
Plants/Greens/Mushrooms	44.7	44.7	10.6	10.6	1.69	0.005	3.78	4.76	0	5.12	12.42

Table 1. Wild Food Harvest and Use, Ouzinkie, Kodiak Island, 1997

	Percentage of Households				Wild Food Harvest (g/day)		Wild Food Use (g/day)				
Resource Category	Using	Harvesting	Giving	Receiving	Mean Per Capita Harvest	Percentage Contribution to Total Harvest	Mean Use (Mean User)	95% Upper Confidence Limit of the Mean	50th Percentile Use (Median)	95th Percentile Use (High End)	100th Percentile Use (Top)
Seaweed/Kelp	2.1	2.1	0	0	0.06	0.000	2.95	5.88	0	0	4.97
Unknown Seaweed	2.1	2.1	0	0	0.06	0.000	2.95	5.88	0	0	4.97

Table 2. Wild Food Harvest and Use, Seldovia, Lower Cook Inlet, 1993

	Percentage of Households				Wild Food Harvest (g/day)		Wild Food Use (g/day)				
Resource Category	Using	Harvesting	Giving	Receiving	Mean Per Capita Harvest	Percentage Contribution to Total Harvest	Mean Use (Mean)	95% Upper Confidence Limit of the Mean	50th Percentile Use (Median)	95th Percentile Use (High End)	100th Percentile Use (Top)
All Resources	95.4	95.4	78.5	86.2	228.10	1.000	239.09	296.48	203.37	614.23	691.37
Fish	90.8	84.6	66.2	76.9	134.05	0.580	147.63	191.92	108.13	356.99	577.03
Salmon	89.2	73.8	53.8	66.2	79.86	0.350	89.52	129.81	63.7	166.69	411.87
Chum Salmon	18.5	13.8	9.2	4.6	9.13	0.040	49.37	98.74	0	45.74	62.55
Coho Salmon	60	50.8	21.5	21.5	18.85	0.080	31.41	46.5	5.59	55.92	140.73
Chinook Salmon	81.5	64.6	38.5	49.2	33.09	0.140	40.6	54	40.13	58.03	134.98
Pink Salmon	27.7	23.1	13.8	12.3	9.05	0.030	32.66	51.93	0	61.2	98.92
Sockeye Salmon	56.9	36.9	12.3	33.8	9.63	0.040	16.92	25.38	5.53	25.72	141.64
Landlocked Salmon	1.5	1.5	0	0	0.10	0.000	6.62	16.23	0	0	4.66
Non-Salmon Fish	86.2	63.1	50.8	60	54.21	0.230	62.88	80.49	36.12	163.5	280.94
Herring	9.2	1.5	1.5	7.7	1.19	0.005	12.96	32.02	0	0	54.37
Smelt	7.7	1.5	3.1	6.2	0.22	0.001	2.9	7.14	0	2.37	2.37
Eulachon (Hooligan)	7.7	1.5	3.1	6.2	0.22	0.001	2.9	7.11	0	2.37	2.37
Cod	26.2	18.5	13.8	9.2	5.65	0.020	21.58	34.74	0	16.73	54.67
Pacific Cod (gray)	26.2	18.5	13.8	9.2	5.65	0.020	21.58	34.74	0	16.73	54.67
Greenling	23.1	13.8	4.6	9.2	2.01	0.009	8.71	15.25	0	9.94	99.41
Lingcod	18.5	9.2	4.6	9.2	1.91	0.008	10.34	19.55	0	9.94	99.41
Unknown Greenling	4.6	4.6	0	0	0.10	0.000	2.16	4.51	0	0	6.21
Halibut	84.6	56.9	44.6	50.8	37.63	0.160	44.47	57.82	29.47	99.16	141.08
Rockfish	40	27.7	7.7	15.4	3.39	0.010	8.48	12.63	0	15.53	49.7
Black Rockfish	10.8	10.8	1.5	0	0.93	0.004	8.62	16.13	0	6.21	16.77
Red Rockfish	30.8	18.5	4.6	15.4	2.10	0.009	6.81	10.36	0	14.91	49.7
Unknown Rockfish	3.1	3.1	1.5	0	0.36	0.002	11.62	23.83	0	0	19.94
Sablefish (black cod)	29.2	13.8	9.2	20	2.11	0.009	7.23	11.64	0	23.11	48.15
Char	32.3	26.2	12.3	10.8	1.76	0.008	5.46	7.86	0	8.69	20.87
Dolly Varden	32.3	26.2	12.3	10.8	1.76	0.008	5.46	7.86	0	8.69	20.87
Trout	9.2	6.2	3.1	3.1	0.22	0.001	2.43	4.76	0	0.86	10.43
Rainbow Trout	6.2	4.6	1.5	1.5	0.22	0.001	3.6	7.21	0	0.86	10.43

Table 2. Wild Food Harvest and Use, Seldovia, Lower Cook Inlet, 1993

	Percentage of Households				Wild Food Harvest (g/day)		Wild Food Use (g/day)				
Resource Category	Using	Harvesting	Giving	Receiving	Mean Per Capita Harvest	Percentage Contribution to Total Harvest	Mean Use (Mean)	95% Upper Confidence Limit of the Mean	50th Percentile Use (Median)	95th Percentile Use (High End)	100th Percentile Use (Top)
Steelhead	3.1	1.5	1.5	1.5	0.01	0.000	0.4	1	0	0	0.43
Land Mammals	60	15.4	27.7	50.8	29.32	0.120	48.85	85.99	43.29	78.45	117.4
Large Land Mammals	58.5	12.3	26.2	50.8	29.07	0.120	49.68	83.97	43.29	74.72	117.4
Caribou	20	1.5	4.6	18.5	3.06	0.010	15.28	36.99	0	11.41	11.41
Deer	20	4.6	6.2	13.8	3.52	0.010	17.58	32.53	0	11.01	53.68
Goat	4.6	1.5	4.6	3.1	0.50	0.002	10.8	27.01	0	9	9
Moose	47.7	9.2	15.4	41.5	22.00	0.090	46.11	72.39	43.29	43.29	43.29
Small Land Mammals	4.6	4.6	3.1	0	0.25	0.001	5.4	11.07	0	3.72	7.45
Porcupine	3.1	3.1	3.1	0	0.16	0.001	5.21	11.15	0	0	3.72
Squirrel	1.5	1.5	0	0	0.09	0.000	5.79	14.38	0	0	7.45
Tree Squirrel	1.5	1.5	0	0	0.09	0.000	5.79	14.38	0	0	7.45
Marine Mammals	13.8	4.6	9.2	9.2	1.52	0.007	10.98	21.97	0	16.37	16.37
Seal	10.8	1.5	6.2	9.2	1.52	0.007	14.03	35.79	0	16.37	16.37
Harbor Seal	7.7	1.5	6.2	6.2	1.52	0.007	19.68	50.2	0	16.37	16.37
Birds and Eggs	33.8	26.2	9.2	15.4	1.59	0.007	4.7	6.82	0	9.53	16.4
Migratory Birds	26.2	18.5	7.7	12.3	0.88	0.004	3.36	5.08	0	3.39	16.4
Ducks	26.2	18.5	7.7	12.3	0.85	0.004	3.22	4.83	0	3.39	13.42
Goldeneye	9.2	6.2	3.1	6.2	0.30	0.001	3.24	6.41	0	2.36	5.96
Mallard	23.1	16.9	3.1	9.2	0.48	0.002	2.09	3.1	0	1.73	7.45
Oldsquaw	1.5	1.5	1.5	0	0.02	0.000	1.65	3.99	0	0	0.82
Teal	1.5	1.5	0	0	0.01	0.000	0.82	2.04	0	0	0.99
Unknown Ducks	3.1	1.5	0	1.5	0.02	0.000	0.8	2.04	0	0	1.37
Geese	1.5	1.5	0	0	0.04	0.000	2.48	6.33	0	0	2.98
Brant	1.5	1.5	0	0	0.04	0.000	2.48	6.33	0	0	2.98
Other Birds	16.9	15.4	4.6	4.6	0.71	0.003	4.19	6.45	0	5.21	7.17
Upland Game Birds	16.9	15.4	4.6	4.6	0.71	0.003	4.19	6.45	0	5.21	7.17
Grouse	10.8	10.8	3.1	3.1	0.27	0.001	2.53	4.05	0	1.73	4.63
Ptarmigan	12.3	10.8	3.1	3.1	0.43	0.002	3.53	6.08	0	5.21	5.43

Table 2. Wild Food Harvest and Use, Seldovia, Lower Cook Inlet, 1993

	Percentage of Households				Wild Food Harvest (g/day)		Wild Food Use (g/day)				
Resource Category	Using	Harvesting	Giving	Receiving	Mean Per Capita Harvest	Percentage Contribution to Total Harvest	Mean Use (Mean)	95% Upper Confidence Limit of the Mean	50th Percentile Use (Median)	95th Percentile Use (High End)	100th Percentile Use (Top)
Marine Invertebrates	90.8	78.5	63.1	70.8	42.20	0.180	46.47	61.81	48.33	75.7	145.77
Chitons (bidarkis, gumboots)	26.2	24.6	15.4	9.2	2.14	0.009	8.15	12.64	0	6.59	24.85
Black (small) Chitons	26.2	24.6	15.4	9.2	2.14	0.009	8.15	12.64	0	6.59	24.85
Clams	83.1	76.9	49.2	43.1	31.88	0.130	38.35	51.39	36.01	53.19	139.8
Butter Clams	78.5	72.3	47.7	30.8	22.51	0.090	28.66	39.27	34.25	34.25	37.28
Pacific Littleneck Clams	66.2	61.5	30.8	24.6	8.39	0.030	12.67	17.61	9.32	17.18	74.56
Razor Clams	18.5	9.2	4.6	15.4	0.98	0.004	5.3	8.8	0	1.75	27.96
Cockles	9.2	9.2	4.6	0	0.53	0.002	5.8	12.42	0	1.44	18.64
Crabs	61.5	15.4	27.7	53.8	5.24	0.020	8.52	14.32	6.84	18.77	22.36
Dungeness Crab	21.5	4.6	1.5	20	0.26	0.001	1.21	2.81	0	0.43	8.69
King Crab	12.3	3.1	4.6	10.8	0.20	0.001	1.61	3.33	0	0.91	4.48
Unknown King Crab	12.3	3.1	4.6	10.8	0.20	0.001	1.61	3.33	0	0.91	4.48
Tanner Crab	52.3	15.4	26.2	43.1	4.77	0.020	9.12	15.78	6.84	18.77	22.36
Unknown Tanner Crab	52.3	15.4	26.2	43.1	4.77	0.020	9.12	15.78	6.84	18.77	22.36
Mussels	18.5	16.9	6.2	3.1	0.46	0.002	2.48	3.92	0	2.17	7.76
Octopus	29.2	13.8	9.2	20	1.48	0.006	5.06	10.28	0	3.31	40.58
Oyster	7.7	6.2	4.6	6.2	0.26	0.001	3.38	6.1	0	2.71	3.72
Shrimp	9.2	6.2	1.5	6.2	0.19	0.001	2.02	3.6	0	1.24	6.21
Snails	4.6	3.1	1.5	1.5	0.02	0.000	0.54	1.08	0	0	1.86
Vegetation	95.4	93.8	53.8	30.8	19.41	0.080	20.34	24.41	19.83	37.28	44.68
Berries	93.8	89.2	47.7	23.1	15.43	0.060	16.45	19.74	19.83	19.83	37.28
Plants/Greens/Mushrooms	40	40	15.4	7.7	3.09	0.010	7.73	11.68	0	13.96	13.96
Seaweed/Kelp	18.5	16.9	6.2	4.6	0.89	0.004	4.83	8.27	0	6.62	24.85
Bull Kelp	18.5	16.9	6.2	4.6	0.89	0.004	4.83	8.27	0	6.62	24.85

Table 3. Example of Table of
Consumption Rate Estimates
In the Community Profile Database

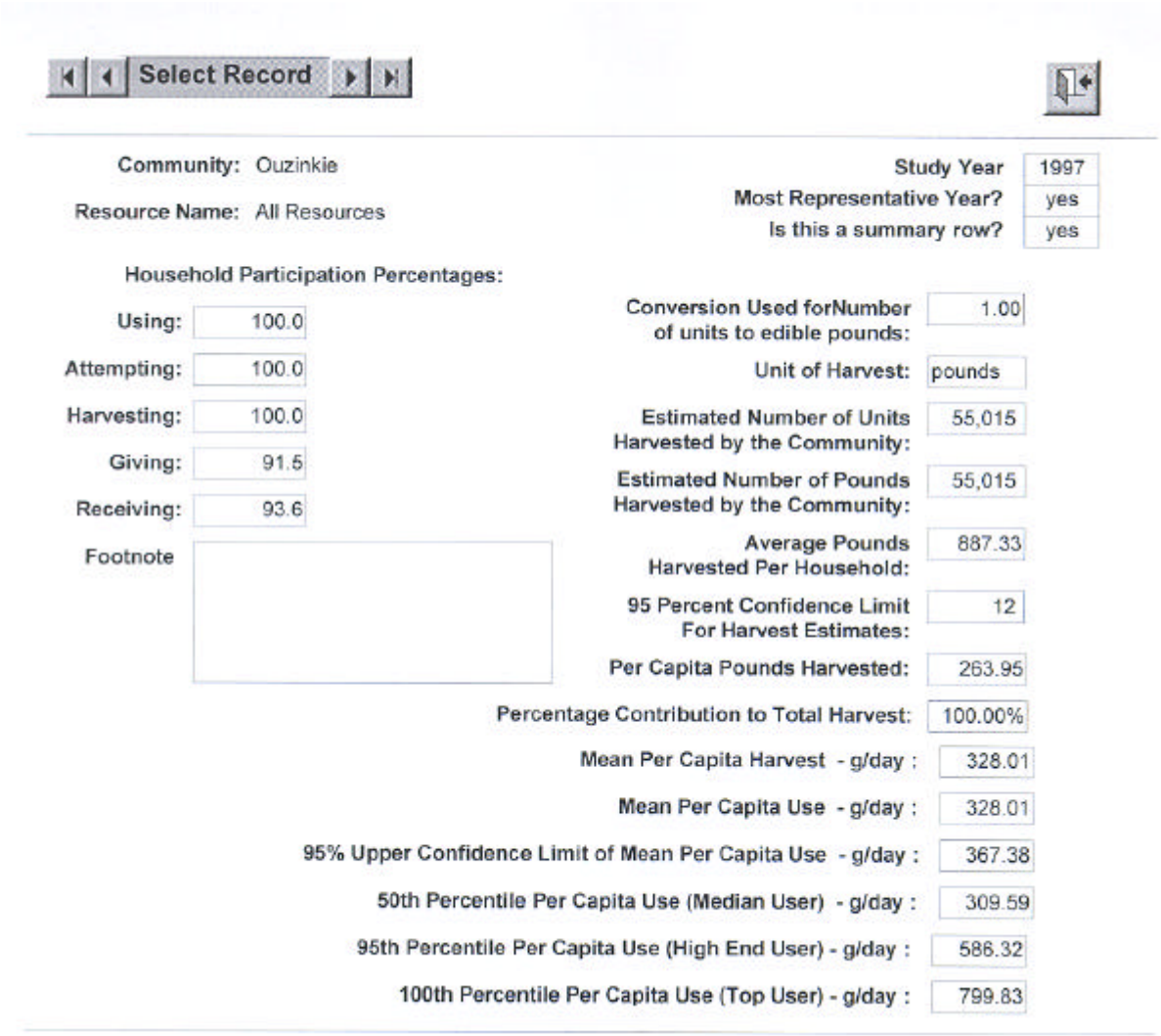

Table 4. Alaska Communities by Region and Nearby Surveyed Population in the Community Profile Database

Community		Surveyed Population	
Southeast Region			
16	Angoon	16	Angoon
467	Annette	226	Metlakatla
460	Beecher Pass	460	Beecher Pass
375	Coffman Cove	375	Coffman Cove
773	Covenant Life CDP	151	Haines
106	Craig	106	Craig
120	Edna Bay	120	Edna Bay
125	Elfin Cove	125	Elfin Cove
422	Game Creek CDP	446	Whitestone Logging Camp
150	Gustavus	150	Gustavus
151	Haines	151	Haines
157	Hollis	157	Hollis
160	Hoonah	160	Hoonah
166	Hydaburg	166	Hydaburg
167	Hyder	167	Hyder
176	Kake	176	Kake
181	Kasaan	181	Kasaan
186	Ketchikan	301	Saxman
192	Klawock	192	Klawock
193	Klukwan	193	Klukwan
430	Lutak CDP	151	Haines
226	Metlakatla	226	Metlakatla
227	Meyers Chuck	227	Meyers Chuck
434	Mosquito Lake CDP	151	Haines
267	Pelican	267	Pelican
270	Petersburg	270	Petersburg
276	Point Baker	276	Point Baker
279	Port Alexander	279	Port Alexander
461	Port Protection	461	Port Protection
301	Saxman	301	Saxman
313	Sitka	313	Sitka
314	Skagway	314	Skagway
342	Tenakee Springs	342	Tenakee Springs
344	Thorne Bay	344	Thorne Bay
376	Whale Pass	376	Whale Pass
446	Whitestone Logging Carr	446	Whitestone Logging Camp
372	Wrangell	372	Wrangell
373	Yakutat	373	Yakutat
Southcentral Region			
2	Akhiok	2	Akhiok
9	Alexander Creek	315	Skwentna
13	Anchor Point	475	North Fork Road
74	Cantwell	74	Cantwell
78	Chase	78	Chase
82	Chenega Bay	82	Chenega Bay
84	Chickaloon	84	Chickaloon
402	Chiniak	402	Chiniak
89	Chisana	89	Chisana
90	Chistochina	90	Chistochina
91	Chitina	91	Chitina
95	Clam Gulch	184	Kenai
99	Cohoe	184	Kenai
296	Salamatof CDP	184	Kenai
298	San Juan Bay	298	San Juan Bay
304	Seldovia	304	Seldovia
305	Seward	369	Whittier
308	Sheep Mountain	308	Sheep Mountain
315	Skwentna	315	Skwentna
316	Slana	316	Slana
453	Slana Homestead North	453	Slana Homestead North
454	Slana Homestead South	454	Slana Homestead South
102	Cooper Landing	184	Kenai
103	Copper Center	103	Copper Center
772	Copperville	103	Copper Center
104	Cordova	104	Cordova
413	Crown Point	162	Hope
112	Denali Highway	74	Cantwell
119	East Glenn Highway	119	East Glenn Highway
418	Eyak	104	Cordova
420	Fox River	136	Fritz Creek CDP
136	Fritz Creek CDP	136	Fritz Creek CDP
140	Gakona	140	Gakona
145	Glennallen	145	Glennallen
463	Gold Creek	463	Gold Creek
423	Grouse Creek Group	369	Whittier
149	Gulkana	149	Gulkana
152	Halibut Cove	304	Seldovia
424	Happy Valley	475	North Fork Road
159	Homer	159	Homer
162	Hope	162	Hope
462	Hurricane-Broad Pass	462	Hurricane-Broad Pass
173	Jakolof Bay CDP	304	Seldovia
175	Kachemak City	136	Fritz Creek CDP
178	Kalifonsky CDP	184	Kenai
180	Karluk	180	Karluk
183	Kasilof	184	Kenai
184	Kenai	184	Kenai
185	Kenny Lake	185	Kenny Lake
196	Kodiak City	196	Kodiak City
197	Kodiak Coast Guard Statio	197	Kodiak Coast Guard Static
38	Kodiak Road	38	Kodiak Road
208	Lake Louise	208	Lake Louise
210	Larsen Bay	210	Larsen Bay
215	Lower Tonsina	215	Lower Tonsina
219	Matanuska Glacier	219	Matanuska Glacier
431	McCarthy	431	McCarthy
220	McCarthy Road	220	McCarthy Road
231	Moose Pass	162	Hope
235	Nabesna Road	235	Nabesna Road
129	Nanwalek (English Bay)	129	Nanwalek (English Bay)
246	Nikiski	184	Kenai
436	Nikolaevsk	436	Nikolaevsk
249	Ninilchik	249	Ninilchik
475	North Fork Road	475	North Fork Road
255	North Wrangell Mountain	255	North Wrangell Mountain
260	Old Harbor	260	Old Harbor
263	Ouzinkie	263	Ouzinkie
470	Parks Highway South	470	Parks Highway South
452	Paxson	452	Paxson
265	Paxson-Sourdough	265	Paxson-Sourdough
271	Petersville Road	271	Petersville Road
282	Port Graham	282	Port Graham
284	Port Lions	284	Port Lions
442	Primrose	162	Hope
443	Ridgeway	184	Kenai
269	Perryville	269	Perryville
272	Pilot Point	272	Pilot Point
771	Pilot Point/Ugashik	771	Pilot Point/Ugashik
280	Port Alsworth	280	Port Alsworth
283	Port Heiden	283	Port Heiden
287	Portage Creek	113	Dillingham
323	Saint George	323	Saint George
326	Saint Paul	326	Saint Paul
299	Sand Point	299	Sand Point

Table 4. Alaska Communities by Region and Nearby Surveyed Population in the Community Profile Database

Community		Surveyed Population	
318	Soldotna	184	Kenai
455	Sourdough	455	Sourdough
321	South Wrangell Mountain	321	South Wrangell Mountains
328	Sterling	184	Kenai
332	Sutton	119	East Glenn Highway
334	Talkeetna	334	Talkeetna
338	Tatitlek	338	Tatitlek
339	Tazlina	339	Tazlina
348	Tonsina	348	Tonsina
349	Trapper Creek	349	Trapper Creek
355	Tyonek	355	Tyonek
362	Valdez	362	Valdez
456	West Glenn Highway	456	West Glenn Highway
369	Whittier	369	Whittier
447	Women's Bay	196	Kodiak City
Southwest Region			
1	Adak Station	358	Unalaska
5	Akutan	5	Akutan
8	Aleknagik	8	Aleknagik
20	Atka	20	Atka
86	Chignik Bay	86	Chignik Bay
87	Chignik Lagoon	87	Chignik Lagoon
88	Chignik Lake	88	Chignik Lake
96	Clark's Point	96	Clark's Point
113	Dillingham	113	Dillingham
122	Egegik	122	Egegik
124	Ekwok	124	Ekwok
132	False Pass	132	False Pass
168	Igiugig	168	Igiugig
170	Iliamna	170	Iliamna
172	Ivanof Bay	172	Ivanof Bay
188	King Cove	188	King Cove
189	King Salmon	189	King Salmon
198	Kokhanok	198	Kokhanok
200	Koliganek	200	Koliganek
211	Levelock	211	Levelock
217	Manokotak	217	Manokotak
236	Naknek	236	Naknek
240	Nelson Lagoon	240	Nelson Lagoon
242	New Stuyahok	242	New Stuyahok
243	Newhalen	243	Newhalen
248	Nikolski	248	Nikolski
252	Nondalton	252	Nondalton
266	Pedro Bay	266	Pedro Bay
325	Saint Michael	327	Stebbins
302	Scammon Bay	352	Tununak
317	Sleetmute	3	Akiachak
327	Stebbins	327	Stebbins
330	Stony River	3	Akiachak
347	Toksook Bay	352	Tununak
350	Tuluksak	3	Akiachak
351	Tuntutuliak	352	Tununak
352	Tununak	352	Tununak
359	Upper Kalskag	3	Akiachak
Arctic Region			
11	Ambler	250	Noatak
12	Anaktuvuk Pass	257	Nuiqsut
21	Atqasuk	257	Nuiqsut
55	Barrow	55	Barrow
69	Brevig Mission	69	Brevig Mission
70	Buckland	110	Deering
320	South Naknek	320	South Naknek
345	Togiak	345	Togiak
353	Twin Hills	353	Twin Hills
356	Ugashik	356	Ugashik
358	Unalaska	358	Unalaska
Western Region			
3	Akiachak	3	Akiachak
4	Akiak	206	Kwethluk
6	Alakanuk	6	Alakanuk
17	Aniak	3	Akiachak
22	Atmautluak	259	Nunapitchuk
59	Bethel	3	Akiachak
80	Chefornak	352	Tununak
83	Chevak	352	Tununak
92	Chuathbaluk	3	Akiachak
107	Crooked Creek	3	Akiachak
121	Eek	290	Quinhagak
128	Emmonak	128	Emmonak
147	Goodnews Bay	290	Quinhagak
161	Hooper Bay	352	Tununak
182	Kasigluk	259	Nunapitchuk
190	Kipnuk	352	Tununak
201	Kongiganak	352	Tununak
202	Kotlik	202	Kotlik
206	Kwethluk	206	Kwethluk
207	Kwigillingok	352	Tununak
214	Lower Kalskag	3	Akiachak
218	Marshall (Fortuna Ledge)	233	Mountain Village
224	Mekoryuk	352	Tununak
233	Mountain Village	233	Mountain Village
237	Napakiak	206	Kwethluk
238	Napaskiak	206	Kwethluk
244	Newtok	352	Tununak
245	Nightmute	352	Tununak
309	Nunam Iqua (Sheldon Poir	309	Nunam Iqua (Sheldon Poi
259	Nunapitchuk	259	Nunapitchuk
262	Oscarville	206	Kwethluk
273	Pilot Station	233	Mountain Village
274	Pitka's Point	233	Mountain Village
275	Platinum	290	Quinhagak
290	Quinhagak	290	Quinhagak
292	Red Devil	3	Akiachak
295	Russian Mission	233	Mountain Village
324	Saint Marys (Andreafsky)	233	Mountain Village
56	Beaver	56	Beaver
468	Bettles	60	Bettles/Evansville
60	Bettles/Evansville	60	Bettles/Evansville
64	Birch Creek	56	Beaver
471	Canyon Village	329	Stevens Village
77	Chalkyitsik	134	Fort Yukon
85	Chicken	346	Tok
93	Circle	56	Beaver
115	Dot Lake	115	Dot Lake
416	Dry Creek	115	Dot Lake
118	Eagle	134	Fort Yukon
459	Eagle Village	134	Fort Yukon
417	Evansville	60	Bettles/Evansville
419	Ferry	419	Ferry
134	Fort Yukon	134	Fort Yukon
141	Galena	141	Galena
148	Grayling	141	Galena
154	Healy	154	Healy

Table 4. Alaska Communities by Region and Nearby Surveyed Population in the Community Profile Database

Community		Surveyed Population	
110	Deering	110	Deering
114	Diomede	365	Wales
126	Elim	146	Golovin
142	Gambell	300	Savoonga
146	Golovin	146	Golovin
177	Kaktovik	177	Kaktovik
187	Kiana	110	Deering
191	Kivalina	191	Kivalina
195	Kobuk	250	Noatak
203	Kotzebue	203	Kotzebue
204	Koyuk	146	Golovin
250	Noatak	250	Noatak
251	Nome	146	Golovin
253	Noorvik	203	Kotzebue
257	Nuiqsut	257	Nuiqsut
277	Point Hope	278	Point Lay
278	Point Lay	278	Point Lay
300	Savoonga	365	Wales
303	Selawik	203	Kotzebue
307	Shaktoolik	146	Golovin
311	Shishmaref	311	Shishmaref
312	Shungnak	250	Noatak
341	Teller	69	Brevig Mission
357	Unalakleet	146	Golovin
364	Wainwright	364	Wainwright
365	Wales	365	Wales
367	White Mountain	146	Golovin
Interior Region			
7	Alatna	10	Allakaket/Alatna
464	Alcan	256	Northway
465	Allakaket	10	Allakaket/Alatna
10	Allakaket/Alatna	10	Allakaket/Alatna
15	Anderson	15	Anderson
18	Anvik	141	Galena
19	Arctic Village	134	Fort Yukon
155	Healy Lake	343	Tetlin
158	Holy Cross	141	Galena
164	Hughes	164	Hughes
165	Huslia	165	Huslia
179	Kaltag	141	Galena
205	Koyukuk	141	Galena
209	Lake Minchumina	209	Lake Minchumina
428	Lignite	154	Healy
212	Lime Village	247	Nikolai
216	Manley Hot Springs	141	Galena
221	McGrath	221	McGrath
222	McKinley Park Village	222	McKinley Park Village
721	Mendeltna	721	Mendeltna
225	Mentasta	225	Mentasta
451	Mentasta Pass	451	Mentasta Pass
228	Minto	228	Minto
241	Nenana	141	Galena
247	Nikolai	247	Nikolai
256	Northway	256	Northway
437	Northway Junction	256	Northway
438	Northway Village	256	Northway
258	Nulato	141	Galena
291	Rampart	329	Stevens Village
294	Ruby	141	Galena
306	Shageluk	141	Galena
329	Stevens Village	329	Stevens Village
333	Takotna	247	Nikolai
335	Tanacross	335	Tanacross
336	Tanana	336	Tanana
340	Telida	247	Nikolai
343	Tetlin	343	Tetlin
346	Tok	346	Tok
360	Usibelli Mine	154	Healy
363	Venetie	134	Fort Yukon
371	Wiseman	60	Bettles/Evansville

Table 5. Community Data Sets by Region With Percentile Use Values Calculated in the Community Profile Database as of 7/2000

Community	Years
Southeast Region	
Angoon	1996
Coffman Cove	1998
Edna Bay	1998
Game Creek CDP	1996
Haines	1996
Hollis	1998
Hoonah	1996
Hydaburg	1997
Kake	1996
Kasaan	1998
Klawock	1997
Klukwan	1996
Naukati Bay	1998
Point Baker	1996
Port Protection	1996
Sitka	1996
Thorne Bay	1998
Whale Pass	1998
Whitestone Logging Camp	1996
Southcentral Region	
Akhiok	1986, 1989, 1992
Chenega Bay	1984, 1985, 1989, 1990, 1991, 1992, 1993, 1997
Cordova	1985, 1988, 1991, 1992, 1993, 1997
Fritz Creek CDP	1998
Karluk	1986
Kenai	1991, 1992, 1993
Kodiak City	1991, 1992, 1993
Kodiak Coast Guard Station	1991
Kodiak Road	1992
Larsen Bay	1986, 1989, 1990, 1991, 1992, 1993, 1997
Nanwalek	1987, 1989, 1990, 1991, 1992, 1993, 1997
Nikolaevsk	1998
Ninilchik	1998
North Fork Road	1998
Old Harbor	1986, 1989, 1991, 1997
Ouzinkie	1986, 1989, 1990, 1991, 1992, 1993, 1997
Port Graham	1987, 1989, 1990, 1991, 1992, 1993, 1997
Port Lions	1986, 1989, 1993
Seldovia	1991, 1992, 1993
Tatitlek	1987, 1988, 1989, 1990, 1991, 1993, 1997
Valdez	1991, 1992, 1993
Voznesenka	1998
Southwest Region	
Chignik Bay	1989, 1991
Chignik Lagoon	1989
Chignik Lake	1989, 1991
Ivanof Bay	1989
Perryville	1989
Western Region	
Akiachak	1998
Arctic Region	
Kaktovik	1992
Kivalina	1992
Kotzebue	1991
Nuiqsut	1993

Table 6. Percentages of Fish Harvests Fed to Dogs by Community and Survey Year in the Community Profile Database

	Year	Chinook	Summer Chum	Fall Chum	Coho	Other Fish
Allakaket/Alatna	1982	0%	50%	50%	50%	50%
Minto	1984	0%	50%	50%	50%	50%
Fort Yukon	1987	0%	75%	75%	75%	25%
Huslia	1983	0%	75%	75%	75%	75%
Galena	1985	0%	75%	75%	75%	75%
Stevens Village	1984	0%	80%	80%	80%	80%
Beaver	1985	0%	80%	80%	80%	80%
Hughes	1982	0%	80%	80%	80%	80%
Tanana	1987	0%	80%	80%	80%	80%

Table 7. Hierarchical Resource Categories in the CPDB

Code	Resource Name
0	All Resources
100000000	Fish
110000000	Salmon
111000000	Chum Salmon
111010000	Summer Chum
111020000	Fall Chum
112000000	Coho Salmon
113000000	Chinook Salmon
114000000	Pink Salmon
115000000	Sockeye Salmon
116000000	Landlocked Salmon
117000000	Spawnouts
117020000	Spawning Coho
117040000	Spawning Pink
117050000	Spawning Sockeye
117090000	Unknown Salmon Spawnouts
118000000	Salmon Roe
119000000	Unknown Salmon
120000000	Non-Salmon Fish
120200000	Herring
120302000	Herring Roe Unspecified
120304000	Herring Sac Roe
120306000	Herring Spawn on Kelp
120400000	Smelt
120402000	Capelin (grunion)
120404000	Eulachon (hooligan, candlefish)
120406000	Rainbow Smelt
120408000	Surf Smelt
120499000	Unknown Smelt
120600000	Bass
120602000	Sea Bass
120699000	Unknown Bass
120800000	Blenny
121000000	Cod
121002000	Arctic Cod
121004000	Pacific Cod (gray)
121006000	Pacific (Silver) Hake
121008000	Pacific Tom Cod
121010000	Saffron Cod
121012000	Walleye Pollock (whiting)
121099000	Unknown Cod
121200000	Eel
121400000	Flounder
121402000	Arrow Tooth Flounder (turbot)
121404000	Greenland Halibut (greenland turbot)
121406000	Starry Flounder
121499000	Unknown Flounder
121600000	Greenling
121602000	Atka Mackerel
121604000	Kelp Greenling
121606000	Lingcod
121608000	Rock Greenling
121699000	Unknown Greenling
121700000	Greenling Roe
121800000	Halibut
122000000	Lamprey
122200000	Perch
122202000	Sea Perch
122299000	Unknown Perch
122400000	Prowfish
122600000	Rockfish
122602000	Black Rockfish
122604000	Red Rockfish
122699000	Unknown Rockfish
122800000	Sablefish (black cod)
123000000	Sculpin
123002000	Buffalo Sculpin
123004000	Bullhead Sculpin
123006000	Irish Lord
123006020	Red Irish Lord
123006990	Unknown Irish Lord
123008000	Yellow Sculpin
123099000	Unknown Sculpin
123200000	Shark
123202000	Dogfish
123204000	Salmon Shark
123299000	Unknown Shark
123400000	Skates
123600000	Sole
123602000	Rex Sole
123604000	Rock Sole
123606000	Yellowfin Sole
123699000	Unknown Sole
123800000	Stickleback (needlefish)
124000000	Tuna/Mackerel
124002000	Blue Fin
124004000	Mackerel
124099000	Unknown Tuna/Mackerel
124200000	Wolffish
124400000	Wrymouth
124402000	Dwarf Wrymouth
124404000	Giant Wrymouth
124499000	Unknown Wrymouth
124600000	Blackfish
124800000	Burbot
125000000	Char
125002000	Arctic Char
125004000	Brook Trout

125006000 Dolly Varden
125008000 Dolly Varden-Fingerling
125010000 Lake Trout
125099000 Unknown Char
125200000 Grayling
125400000 Pike
125402000 Pike (large)
125404000 Pike (small, pickle)
125499000 Unknown Pike
125600000 Sheefish
125800000 Sturgeon
125802000 Green Sturgeon
125804000 White Sturgeon
125899000 Unknown Sturgeon
126000000 Sucker
126200000 Trout
126202000 Cutthroat Trout
126204000 Rainbow Trout
126206000 Steelhead
126299000 Unknown Trout
126400000 Whitefish
126402000 Alaska Whitefish
126404000 Broad Whitefish
126406000 Cisco
126406020 Arctic Cisco
126406040 Bering Cisco
126406060 Least Cisco
126406990 Unknown Cisco
126408000 Humpback Whitefish
126410000 Lake Whitefish
126412000 Round Whitefish
126499000 Unknown Whitefish
126600000 Mahi Mahi
126800000 Swordfish
129900000 Unknown Non-Salmon Fish
200000000 Land Mammals
210000000 Large Land Mammals
210400000 Bison
210600000 Black Bear
210800000 Brown Bear
211000000 Caribou
211200000 Deer
211400000 Elk
211600000 Goat
211800000 Moose
212000000 Muskox
212200000 Sheep, Dall
219900000 Unknown Large Land Mammal
220000000 Small Land Mammals/Furbearers
220200000 Beaver
220400000 Coyote
220800000 Fox
220802000 Arctic Fox
220804000 Red Fox
220804020 Red Fox - Cross Phase
220804040 Red Fox - Red Phase
220899000 Unknown Fox
221000000 Hare
221002000 Arctic Hare
221004000 Snowshoe Hare
221099000 Unknown Hare
221200000 Land Otter
221400000 Lemming
221600000 Lynx
221800000 Marmot
222000000 Marten
222200000 Mink
222400000 Muskrat
222600000 Porcupine
222800000 Squirrel
222802000 Parka Squirrel (ground)
222804000 Tree Squirrel
222899000 Unknown Squirrel
223000000 Weasel
223200000 Wolf
223400000 Wolverine
229900000 Unknown Small Land Mammals/Furbearers
230000000 Feral Animals
230200000 Bison - Feral
230400000 Cattle - Feral
230600000 Rabbit - Feral
230800000 Reindeer - Feral
231000000 Sheep - Feral
300000000 Marine Mammals
300200000 Dolphin
300202000 Bottle Nose Dolphin
300299000 Unknown Dolphin
300400000 Polar Bear
300600000 Porpoise
300602000 Dall Porpoise
300604000 Harbor Porpoise
300699000 Unknown Porpoise
300800000 Seal
300802000 Bearded Seal
300802020 Young Bearded Seal
300804000 Fur Seal
300804020 Fur Seal (communal)
300804040 Fur Seal (other)
300806000 Harbor Seal
300806020 Harbor Seal (freshwater)
300806040 Harbor Seal (saltwater)
300808000 Ribbon Seal
300810000 Ringed Seal
300812000 Spotted Seal
300899000 Unknown Seal
300899200 Unknown Seal Oil
301000000 Sea Otter
301200000 Steller Sea Lion

301400000 Walrus
301600000 Whale
301602000 Belukha
301604000 Black Fin Whale
301606000 Bowhead
301608000 Blue Whale
301610000 Bryde Whale
301612000 False Killer Whale
301614000 Fin Whale
301616000 Gray Whale
301618000 Humpback Whale
301620000 Killer Whale
301622000 Minke (bottlenose)
301624000 Pilot Whale
301626000 Right Whale
301628000 Sei Whale
301630000 Sperm Whale
301699000 Unknown Whale
309900000 Unknown Marine Mammals
400000000 Birds and Eggs
410000000 Migratory Birds
410200000 Ducks
410202000 Bufflehead
410204000 Canvasback
410206000 Eider
410206020 Common Eider
410206040 King Eider
410206060 Spectacled Eider
410206080 Steller Eider
410206990 Unknown Eider
410208000 Gadwall
410210000 Goldeneye
410210020 Barrows Goldeneye
410210040 Common Goldeneye
410210990 Unknown Goldeneye
410212000 Harlequin
410214000 Mallard
410216000 Merganser
410216020 Common Merganser
410216040 Red-Breasted Merganser
410216990 Unknown Merganser
410218000 Oldsquaw
410220000 Pintail
410222000 Redhead Duck
410224000 Ringneck Duck
410226000 Scaup
410226020 Greater Scaup
410226040 Lesser Scaup
410226990 Unknown Scaup
410228000 Scoter
410228020 Black Scoter
410228040 Surf Scoter
410228060 White-winged Scoter
410228990 Unknown Scoter
410230000 Shoveler
410232000 Teal
410232020 Baikal Teal
410232040 European Teal
410232060 Green Winged Teal
410232990 Unknown Teal
410234000 Tufted Duck
410236000 Wigeon
410236020 American Wigeon
410236040 Eurasian Wigeon
410236990 Unknown Wigeon
410299000 Unknown Ducks
410400000 Geese
410402000 Brant
410404000 Canada Geese
410404020 Aleutian Canada Geese
410404040 Cacklers
410404060 Dusky Canada Geese
410404080 Lesser Canada Geese (taverner/ parvipes)
410404100 Vancouver Canada Geese
410404990 Unknown Canada Geese
410406000 Emperor Geese
410408000 Snow Geese
410410000 White-fronted Geese
410499000 Unknown Geese
410600000 Swan
410602000 Trumpeter Swan
410604000 Tundra Swan (whistling)
410606000 Whooper Swan
410699000 Unknown Swan
410800000 Crane
410802000 Sandhill Crane
410899000 Unknown Crane
411000000 Shorebirds
411002000 Common Snipe
411004000 Oystercatcher
411006000 Plover
411006020 Golden Plover
411006040 Semipalmated Plover
411006990 Unknown Plover
411008000 Sandpiper
411008020 Least Sandpiper
411008040 Rock Sandpiper
411008990 Unknown Sandpiper
411010000 Turnstone
411010020 Black Turnstone
411010040 Ruddy Turnstone
411010990 Unknown Turnstone
411099000 Unknown Shorebirds
411200000 Seabirds & Loons
411202000 Auklet
411202020 Cassin Auklet
411202040 Crested Auklet
411202060 Least Auklet

411202080 Parakeet Auklet
411202100 Whiskered Auklet
411202990 Unknown Auklet
411204000 Cormorants
411204020 Double-Crested Cormorant
411204040 Pelagic Cormorant
411204060 Red-Faced Cormorant
411204990 Unknown Cormorant
411206000 Fulmar
411206020 Northern Fulmar
411206990 Unknown Fulmar
411208000 Grebe
411208020 Horned Grebe
411208040 Red Necked Grebe
411208990 Unknown Grebe
411210000 Guillemots
411210020 Black Guillemot
411210040 Pigeon Guillemot
411210990 Unknown Guillemot
411212000 Gulls
411212020 Glaucous Gull
411212040 Glaucous-Winged Gull
411212060 Herring Gull
411212080 Mew Gull
411212100 Sabines Gull
411212990 Unknown Gull
411214000 Kittiwakes
411214020 Black Legged Kittiwake
411214040 Red Legged Kittiwake
411214990 Unknown Kittiwake
411216000 Loons
411216020 Arctic (Pacific) Loon
411216040 Common Loon
411216060 Red-Throated Loon
411216080 Yellow-Billed Loon
411216990 Unknown Loon
411218000 Murre
411218020 Common Murre
411218040 Thick-Billed Murre
411218990 Unknown Murre
411220000 Murrelet
411220020 Ancient Murrelet
411220040 Kittlitz Murrelet
411220060 Marbled Murrelet
411220990 Unknown Murrelet
411222000 Puffins
411222020 Horned Puffin
411222040 Tufted Puffin
411222990 Unknown Puffin
411224000 Shearwater
411224020 Shorttailed Shearwater
411224040 Sooty Shearwater
411224990 Unknown Shearwater
411226000 Tern
411226020 Aleutian Tern
411226040 Arctic Tern
411226990 Unknown Tern
411299000 Unknown Seabirds
411400000 Heron
411402000 Great Blue Heron
411499000 Unknown Heron
411600000 Songbirds
411602000 Rosy Finch
411699000 Unknown Songbirds
417700000 Unknown Migratory Birds
420000000 Other Birds
421800000 Upland Game Birds
421802000 Grouse
421804000 Ptarmigan
421804020 Rock Ptarmigan
421804040 Willow Ptarmigan
421804990 Unknown Ptarmigan
421899000 Unknown Upland Game Birds
422000000 Owl
422002000 Snowy Owl
422099000 Unknown Owl
428800000 Unknown Other Birds
430000000 Bird Eggs
430200000 Duck Eggs
430206000 Eider Eggs
430206020 Common Eider Eggs
430206990 Unknown Eider Eggs
430214000 Mallard Duck Eggs
430218000 Oldsquaw Eggs
430220000 Pintail Eggs
430232000 Teal Eggs
430232060 Green-Winged Teal Eggs
430299000 Unknown Duck Eggs
430400000 Geese Eggs
430402000 Brant Eggs
430404000 Canada Geese Eggs
430404040 Cackler Eggs
430600000 Swan Eggs
430604000 Tundra Swan Eggs
430800000 Crane Eggs
430802000 Sandhill Crane Eggs
431000000 Shorebird Eggs
431002000 Common Snipe Eggs
431004000 Oystercatcher Eggs
431006000 Plover Eggs
431200000 Seabird & Loon Eggs
431202000 Auklet Eggs
431202060 Least Auklet Eggs
431204000 Cormorant Eggs
431204040 Pelagic Cormorant Eggs
431204060 Red-Faced Cormorant Eggs
431206000 Fulmar Eggs
431210000 Guillemots Eggs

431212000 Gull Eggs
431212020 Glaucous Gull Eggs
431212040 Glaucous Winged Gull Eggs
431212060 Herring Gull Eggs
431212080 Mew Gull Eggs
431212100 Sabines Gull Eggs
431212990 Unknown Gull Eggs
431214000 Kittiwake Eggs
431216000 Loon Eggs
431216020 Arctic (Pacific) Loon Eggs
431216040 Common Loon Eggs
431218000 Murre Eggs
431218020 Common Murre Eggs
431218040 Thick-Billed Murre Eggs
431220000 Murrelet Eggs
431220020 Ancient Murrelet Eggs
431222000 Puffin Eggs
431222040 Tufted Puffin Eggs
431226000 Tern Eggs
431226040 Arctic Tern Eggs
431299000 Unknown Seabird Eggs
431800000 Upland Game Bird Eggs
439900000 Unknown Eggs
500000000 Marine Invertebrates
500200000 Abalone
500400000 Chitons (bidarkis, gumboots)
500404000 Red (large) Chitons
500408000 Black (small) Chitons
500499000 Unknown Chitons
500600000 Clams
500602000 Butter Clams
500604000 Freshwater Clams
500606000 Horse Clams (Gaper)
500608000 Pacific Littleneck Clams (Steamers)
500610000 Pinkneck Clams
500612000 Razor Clams
500614000 Softshell Clams
500699000 Unknown Clams
500800000 Cockles
500802000 Basket Cockles
500804000 Heart Cockles
500899000 Unknown Cockles
501000000 Crabs
501002000 Box Crab
501004000 Dungeness Crab
501006000 Hair Crab
501008000 King Crab
501008020 Blue King Crab
501008040 Brown King Crab
501008080 Red King Crab
501008990 Unknown King Crab
501010000 Korean Horse Hair Crab
501012000 Tanner Crab
501012020 Tanner Crab, Bairdi
501012040 Tanner Crab, Opillio
501012990 Unknown Tanner Crab
501099000 Unknown Crab
501200000 Geoducks
501400000 Giant Scale Worm
501600000 Jingles
501602000 Rock Jingles
501699000 Unknown Jingles
501800000 Limpets
502000000 Mussels
502002000 Blue Mussels
502004000 Brown Mussels
502099000 Unknown Mussels
502200000 Octopus
502400000 Oyster
502402000 Rock Oyster
502499000 Unknown Oyster
502600000 Scallops
502800000 Sea Anemone
503000000 Sea Cucumber
503200000 Sea Urchin
503400000 Shrimp
503600000 Snails
503800000 Squid
504000000 Whelk
509900000 Unknown Marine Invertebrates
600000000 Vegetation
601000000 Berries
602000000 Plants/Greens/Mushrooms
603000000 Seaweed/Kelp
603002000 Black Seaweed
603004000 Bull Kelp
603006000 Red Seaweed
603008000 Sea Ribbons
603099000 Unknown Seaweed
604000000 Wood