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The Harvest and Use of Wild Resources in Dillingham, Alaska, 2021

by
Bronwyn Jones[1],
Cody Larson[2],
and
Reve Tomlin[1]

1. Division of Subsistence, Alaska Department of Fish and Game, Anchorage, AK 99518
2. Bristol Bay Native Association, Dillingham, AK 99576

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Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Measures (fisheries)

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

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance:	
population	Var
sample	var

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by

Bronwyn Jones and Reve Tomlin
Alaska Department of Fish and Game Division of Subsistence, Anchorage

and

Cody Larson
Bristol Bay Native Association, Dillingham

Alaska Department of Fish and Game
Division of Subsistence
333 Raspberry Road
Anchorage, AK 99518

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Bronwyn Jones and Reve Tomlin
Alaska Department of Fish and Game Division of Subsistence
333 Raspberry Road, Anchorage, AK 99518-1565 USA

and

Cody Larson
Bristol Bay Native Association
PO Box 310, Dillingham, AK 99576-0310 USA

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ABSTRACT

This report provides updated information about the harvests and uses of wild resources by the community of Dillingham, Alaska, which is located on Nushagak Bay. The information in this report was collected by research staff of the Alaska Department of Fish and Game (ADF&G) Division of Subsistence and the Bristol Bay Native Association (BBNA) Natural Resources Department. Household surveys were administered for the 2021 study year to estimate harvest amounts and locations; participation rates; demographic, economic, and food security characteristics; and assessments of changes to resource use. As in the past, during the 2021 study year, many residents of this study community relied on subsistence resources for nutrition and to support their way of life. Based on household surveys, an estimated 97% of households used at least one type of wild resource during the study year, and approximately 87% of households harvested at least one type of wild resource. Overall, 380,784 lb, or 199 lb per capita, of wild resources were harvested during the study year. Salmon and large land mammals composed the largest portions of the overall wild resource harvest. Salmon accounted for approximately one-half (52%) of the total wild resource harvest weight in 2021: 198,958 lb, or 104 lb per capita. Large land mammals composed 21% of the total wild resource harvest weight: 81,162 lb, or 42 lb per capita.

This study was a component of a larger project entitled *Pursuing Opportunities for Long-Term Arctic Resilience for Infrastructure and Society* (POLARIS). Researchers from the University of Alaska Fairbanks, University of Alaska Anchorage, Pennsylvania State University, and Michigan Technological University collaborated on the POLARIS project, which was funded by the National Science Foundation (NSF) through the Navigating the New Arctic initiative. POLARIS researchers are investigating how the climate is impacting community well-being specifically through three research focus areas: coastal change, human migration, and food security. This study by ADF&G contributed to the larger project by collecting data about the full range of wild resource harvests and uses, including areas of harvest, in Dillingham to understand—in all its complexity—the importance of the subsistence way of life for community residents. While this report presents only the data collected from the comprehensive household surveys, POLARIS researchers will use these data in future reports and articles, including comparing results from this comprehensive study to earlier studies to understand if climate and environmental change are impacting community well-being and the subsistence way of life. POLARIS researchers have also used results from this research to develop additional surveys concerning changes that have occurred in recent years.

Key words: subsistence, Bristol Bay, Dillingham, Nushagak Bay, wild resources

1. INTRODUCTION

This report summarizes the results of a harvest survey that investigated the subsistence harvests and uses of wild resources by the residents of Dillingham, Alaska. This Bristol Bay community is located at the head of Nushagak Bay and is the major transportation and economic hub for the region (Figure 1-1). The wild resource household survey was administered in this community from February through May 2022 for the 2021 study year. Table 1-1 lists the wild resources used by Dillingham households during the study year.

Project Background

This project was a component of a large interdisciplinary project entitled *Pursuing Opportunities for Long-Term Arctic Resilience for Infrastructure and Society* (POLARIS) funded by the National Science Foundation (NSF). The overarching goal of the POLARIS project is to investigate how interconnected environmental stressors and infrastructure disruptions are affecting coastal Arctic Alaska communities and to identify important assets to help these communities adapt and become more resilient to climate-related changes. The POLARIS research team consisted of members from the University of Alaska Fairbanks, University of Alaska Anchorage, Pennsylvania State University, and the Michigan Technological University. In December 2020, the Alaska Department of Fish and Game (ADF&G) Division of Subsistence and the Bristol Bay Native Association (BBNA) Natural Resources Department were subcontracted by the POLARIS research team to carry out a wild resource household survey in Dillingham. For residents of Dillingham, wild resources are important to and highly valued for subsistence uses. For study year 2021, Division of Subsistence staff, in collaboration with research staff from BBNA, conducted comprehensive household surveys and key respondent interviews in Dillingham to provide updated estimates of harvests and uses of all wild resources.

Regulatory Context

Dillingham is situated in Game Management Unit (GMU) 17C, which includes the Igushik, Snake, Wood, and Nushagak rivers and drainages (Figure 1-1). The western reach of GMU 17C includes a portion of the Togiak National Wildlife Refuge, which is managed by the federal government through the U.S. Fish and Wildlife Service (USFWS). The remaining portions of GMU 17C are made up of Bureau of Land Management-managed lands, state-owned lands, municipal trust lands, and private lands—primarily Alaska Native allotments and village and regional corporation lands—interspersed throughout the unit. Game and fisheries management on state-owned and private lands is under the purview of the State of Alaska through the Alaska boards of Game and Fisheries. Regulations about salmon and nonsalmon fish harvests are first summarized below, followed by information about marine mammals and large game hunting in GMU 17C.

The Alaska Board of Fisheries (BOF) found that all finfish of the Bristol Bay Area support customary and traditional (subsistence) uses (5 AAC 01.336). All five salmon species found in Alaska are available for subsistence harvest, including pink and chum salmon, with the most sought-after being Chinook, sockeye, and coho salmon (Halas and Cunningham 2019). In 1993, the BOF established a range of 157,000–172,171 salmon as the amount reasonably necessary for subsistence uses (ANS[1]) (5 AAC 01.336). In addition to the ANS for salmon, the BOF determined 250,000 usable pounds of finfish other than salmon are reasonably necessary for subsistence uses in the Bristol Bay Area. The 2021 Bristol Bay Area subsistence regulations are found in Title 5, Part 1, Chapter 01, Article 6 of the 2021–2022 edition of *Alaska Fish and Game Laws and Regulations Annotated* published by the State of Alaska (2020).[2] Under state regulations, all Alaska

1. Under AS 16.05.258(a), the board is charged with identifying fish stocks, or portions of stocks, that "are customarily and traditionally taken or used for subsistence" (known as a C&T use finding). If a portion of these stocks having a positive C&T use finding can be harvested consistent with sustained yield principles, the board "shall determine the amount of the harvestable portion that is reasonably necessary for subsistence uses," which is known as the ANS (AS 16.05.258(b)).
2. For Bristol Bay Area finfish subsistence regulations, see 5 AAC 01.300–5 AAC 01.349.



Figure 1-1.–Map of Dillingham study area.

Table 1-1.–Resources used by households, Dillingham, 2021.

Resource	Scientific name
Chum salmon	*Oncorhynchus keta*
Coho salmon	*Oncorhynchus kisutch*
Chinook salmon	*Oncorhynchus tshawytscha*
Pink salmon	*Oncorhynchus gorbuscha*
Sockeye salmon	*Oncorhynchus nerka*
Spawning sockeye salmon	*Oncorhynchus nerka*
Unspecified salmon	*Oncorhynchus spp.*
Pacific herring	*Clupea pallasii*
Pacific herring spawn on kelp	*Clupea pallasii*
Pacific herring roe on hemlock branches	*Clupea pallasii*
Rainbow smelt	*Osmerus mordax*
Pacific (gray) cod	*Gadus macrocephalus*
Starry flounder	*Platichthys stellatus*
Lingcod	*Ophiodon elongatus*
Pacific halibut	*Hippoglossus stenolepis*
Unspecified rockfishes	
Sablefish (black cod)	*Anoplopoma fimbria*
Yellowfin sole	*Limanda aspera*
Burbot	*Lota lota*
Arctic char	*Salvelinus alpinus*
Dolly Varden, freshwater	*Salvelinus malma*
Dolly Varden, saltwater	*Salvelinus malma*
Dolly Varden, Togiak trout	*Salvelinus malma*
Lake trout	*Salvelinus namaycush*
Arctic grayling	*Thymallus arcticus*
Northern pike	*Esox lucius*
Sheefish	*Stenodus leucichthys*
Rainbow trout	*Oncorhynchus mykiss*
Unspecified trouts	
Humpback whitefish	*Coregonus pidschian*
Round whitefish	*Prosopium cylindraceum*
Unspecified whitefishes	
Bison	*Bison bison*
Black bear	*Ursus americanus*
Brown bear	*Ursus arctos*
Caribou	*Rangifer tarandus*
Deer	*Odocoileus hemionus*
Mountain goat	*Oreamnos americanus*
Moose	*Alces alces*
Beaver	*Castor canadensis*
Coyote	*Canis latrans*
Red fox, red phase	*Vulpes vulpes*
Alaska hare	*Lepus othus*
Snowshoe hare	*Lepus americanus*

-continued-

Table 1-1.–Page 2 of 4.

Resource	Scientific name
Unspecified hares	*Lepus spp.*
River otter	*Lontra canadensis*
Lynx	*Lynx canadensis*
Martens	*Martes spp.*
Mink	*Neovison vison*
Muskrat	*Ondatra zibethicus*
Porcupine	*Erethizon dorsatum*
Arctic ground squirrel	*Spermophilus parryii*
Weasels	*Mustela spp.*
Gray wolf	*Canis lupus*
Wolverine	*Gulo gulo*
Harbor seal	*Phoca vitulina*
Ringed seal	*Pusa hispida*
Unspecified seals	
Walrus	*Odobenus rosmarus*
Beluga whale	*Delphinapterus leucas*
Bowhead whale	*Balaena mysticetus*
King eider	*Somateria spectabilis*
Unspecified goldeneyes	*Bucephala spp.*
Mallard	*Anas platyrhynchos*
Unspecified mergansers	*Mergus spp.*
Northern pintail	*Anas acuta*
Black scoter	*Melanitta nigra*
Surf scoter	*Melanitta perspicillata*
Northern shoveler	*Spatula clypeata*
Green-winged teal	*Anas carolinensis*
American wigeon	*Mareca americana*
Unspecified ducks	
Brant	*Branta bernicla*
Cackling goose	*Branta hutchinsii minima*
Unspecified Canada/cackling geese	*Branta spp.*
Emperor goose	*Anser canagicus*
Greater white-fronted goose	*Anser albifrons*
Unspecified geese	*Anser spp.*
Tundra (whistling) swan	*Cygnus columbianus*
Sandhill crane	*Grus canadensis*
Unspecified shorebirds	*Graculavidae spp.*
Unspecified grouses	*Phasianidae spp.*
Unspecified ptarmigans	*Lagopus spp.*
Unspecified duck eggs	

-continued-

Table 1-1.–Page 3 of 4.

Resource	Scientific name
Unspecified gull eggs	
Unspecified murre eggs	*Uria spp.*
Unspecified tern eggs	
Butter clam	*Saxidomus gigantea*
Razor clam	*Siliqua patula*
Unspecified clams	
Unspecified cockles	
Dungeness crab	*Cancer magister*
Blue king crab	*Paralithodes platypus*
Red king crab	*Paralithodes camtschaticus*
Unspecified crabs	
Unspecified mussels	*Mytilus spp.*
Octopus	*Octopus vulgaris*
Shrimps	*Pandalus spp.*
Blueberry	*Vaccinium uliginosum alpinum*
Lowbush cranberry	*Vaccinum vitis-idaea minus*
Highbush cranberry	*Viburnum edule*
Crowberry	*Empetrum nigrum*
Currants	*Ribes spp.*
Huckleberry	*Vaccinium parvifolium*
Raspberry	*Rubus idaeus*
Cloudberry	*Rubus chamaemorus*
Strawberry	*Fragaria virginiana*
Twisted stalk berry (watermelon berry)	*Streptopus amplexifolius*
Other wild berries	
Wild rhubarb	*Polygonum alaskanum*
Wild potato	*Hedysarum alpinum*
Fiddlehead ferns	
Hudson's Bay (Labrador) tea	*Ledum palustre*
Lambsquarter	*Chenopodium album*
Dandelion greens	*Taraxacum officinale*
Sourdock	*Rumex fenestratus*
Spruce tips	*Picea spp.*
Wild celery	*Angelica lucida*
Valerians	*Valeriana spp.*
Wild rose hips	*Rosa acicularis*
Yarrows	*Achillea spp.*
Other wild greens	
Unspecified mushrooms	*Agaricus spp.*
Fireweed	*Epilobium angustifolium*
Stinkweed	*Artemisia tilesii*
Puffballs	
Chaga	*Inonotus Iobliquus*
Unspecified fungus	
Unspecified greens from land	

-continued-

Table 1-1.–Page 4 of 4.

Resource	Scientific name
Sea lovage	*Sigusticum scoticum*
Beach greens	*Honckenya peploides*
Wild chive	*Allium schoenoprasum*
Mousefoods	
Seaweeds/kelps used for fertilizer	
Unspecified seaweeds	
Birch sap	*Betula spp.*

Source ADF&G Division of Subsistence household surveys, 2021.

state residents are eligible to participate in subsistence salmon fishing. Permits are required to harvest salmon for subsistence purposes in the Bristol Bay area and may be obtained online or from an ADF&G office. There is no seasonal or annual limit for salmon harvested in Bristol Bay. Dillingham is located near the Nushagak Commercial Fishing District of the Bristol Bay Area. Since a BOF decision[3] in 2018, there are no closed subsistence salmon fishing periods and salmon may be taken at any time outside of the Nushagak Commercial Fishing District. Within the Nushagak Commercial Fishing District, subsistence fishing period restrictions apply as described in 5 AAC 01.310(b), but the area manager routinely opens subsistence fishing on June 1 through an emergency order; subsistence fishing was opened by emergency order in 2021.[4] Gillnets may be used for subsistence fishing: both drift and set gillnets may be used within the commercial district but outside the commercial fishing district boundary only set gillnets may be used, with length restrictions varying by location as described in 5 AAC 01.320. Additionally, in 2018 the BOF adopted new regulations to allow subsistence fishing for salmon from the shore by dip net in parts of the Wood River and the Igushik, Weary, and Snake rivers upstream of the commercial fishing district (5 AAC 01.310(d) and 5 AAC 01.320(b)(7)).

Parts of the Dillingham region are dually managed by state and federal agencies due to the presence of large areas of federally managed lands such as the Togiak National Wildlife Refuge in GMUs 17A and 17C and the Bureau of Land Management-managed lands in GMU 17C. Federally qualified rural residents in the Bristol Bay Area may subsistence fish for salmon in waters under the jurisdiction of the Federal Subsistence Board in accordance with federal regulations governing subsistence salmon fishing. While there is no separate federal permit, a state permit is required for subsistence fishing in the Nushagak District under the federal regulations. There is no annual limit or fishing period restriction in the Nushagak District for salmon harvests from the federal subsistence fishery, and set gillnets no longer than 150 feet may be used (Federal Subsistence Management Program 2021:41, 43–44). Additional information about the federal subsistence fishery is available by contacting the USFWS Office of Subsistence Management, which is located in Anchorage, Alaska.

For the most part, subsistence fishing for species other than salmon is open year-round in the Bristol Bay Area using gear listed in 5 AAC 01.010(a). There are no seasonal limits established by regulation. The following regulations apply to subsistence fishing for species other than salmon in the Dillingham area: [5]

3. Alaska Department of Fish and Game. 2018. "Alaska Board of Fisheries Meeting Information: Bristol Bay Finfish: November 28–December 3, 2018." Accessed December 2022. http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=11-28-2018&meeting=dillingham
4. Alaska Department of Fish and Game. 2021. "Advisory Announcement, May 28, 2021: Westside Salmon Announcement 1, Emergency Order 1." Accessed July 2023. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1265262496.pdf
5. At a December 2003 meeting, the BOF eliminated a permit requirement for subsistence fishing for rainbow/steelhead trout and Arctic char/Dolly Varden in the Bristol Bay Area. ADF&G had not developed a program for issuing these permits. Summary meeting materials are available online:

- Rainbow trout taken incidentally in other subsistence net fisheries and through the ice are lawfully taken and may be retained for subsistence uses (5 AAC 01.310(g)).
- Subsistence fishing with a line attached to a rod or pole is prohibited except when fishing through the ice (5 AAC 01.320(l)).
- Waters within 300 feet of a stream mouth used by salmon are closed to the subsistence taking of fish (5 AAC 01.325(a)).

Federal subsistence fishing regulations include daily and possession limits for rainbow trout by season (Federal Subsistence Management Program 2021:41, 43). Similar to state subsistence fishing regulations, rainbow trout may be retained for subsistence if caught incidentally in other subsistence net fisheries or through the ice. Additionally, rainbow trout may be harvested by rod and reel or jigging gear.

In May 2003, new federal regulations authorized subsistence fishing for Pacific halibut for federally qualified individuals. A harvest assessment program for the subsistence halibut fishery was implemented in 2004. Subsistence halibut harvest estimates were collected annually for 2003–2012 and then every other year; for harvest data from 2020 see Sill and Koster (2022). Subsistence halibut fishers are required to obtain a Subsistence Halibut Registration Certificate (SHARC) from the Restricted Access Management (RAM) Program office of the National Marine Fisheries Service prior to fishing.[6] There is no hook limit, and no daily or possession retention limits, for federal Pacific halibut fishing in Area 4E offshore from Dillingham (50 CFR 300.65(h)(1–2)).

Under Section 119 of the Marine Mammal Protection Act, the National Oceanic and Atmospheric Administration (NOAA) Fisheries or the USFWS have established agreements with Alaska Native organizations to co-manage marine mammal subsistence hunting opportunities in Alaska.[7] Subsistence hunting for seals, whales, and sea lions is managed under the National Marine Fisheries Service and the USFWS is responsible for the management of polar bears, sea otters, and walruses (Langdon 2016:21).

Harbor seals, spotted seals, and beluga whales reside year-round in Bristol Bay, and are available to harvest for subsistence purposes. Regarding walruses, there are subsistence walrus hunting opportunities in most of Bristol Bay year-round. Although once protected from 1960 to 1995, now there is a fall hunting season at Qayassiq (Round Island) within the Walrus Islands State Game Sanctuary located approximately 65 miles southwest of Dillingham (Weiss and Morrill 2017:1, 32). The subsistence hunting of walruses on Round Island is cooperatively regulated by the USFWS, ADF&G, and the Qayassiq Walrus Commission. For more information about this hunt see 5 AAC 92.06(4).

Large land mammals such as caribou, moose, and brown bears are present and traditionally hunted in the Dillingham region. Resident and nonresident hunting opportunities on state-owned and privately owned lands are managed by ADF&G. Federal agencies, such as the USFWS, have management responsibilities for ensuring subsistence hunting priorities on federal conservation units for federally qualified rural residents. Regulations—including methods and means of take, bag limits, and seasons—are prescribed by the Alaska

Alaska Department of Fish and Game. 2003. "Alaska Board of Fisheries, December 2003, Bristol Bay Finfish: Proposal 29." Accessed February 2023. https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2003_2004/fdec03pb.pdf

Alaska Department of Fish and Game. 2003. "Summary of Actions, Alaska Board of Fisheries, Bristol Bay Finfish, December 9–16, 2003." Accessed February 2023. https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2003_2004/bb1203sum.pdf

6. The subsistence rules were amended in 2005 by regulations published in the Federal Register at 70 FR 16742, April 1, 2005: https://www.federalregister.gov/documents/2005/04/01/05-6507/pacific-halibut-fisheries-subsistence-fishing. Among other things, this amendment provided for obtaining Community Harvest Permits, Ceremonial Permits, and Educational Permits.
7. NOAA Fisheries. n.d. "Laws & Policies, Marine Mammal Protection Act: Co-Management with Alaska Native Organization." Accessed July 2023. https://www.fisheries.noaa.gov/topic/laws-policies/marine-mammal-protection-act

Board of Game (BOG) and the Federal Subsistence Board for state and federal hunts, respectively. All hunters hunting under state or federal regulations must possess an annual State of Alaska hunting license and obtain appropriate harvest tags and registration permits respective of the locations where and regulations under which they choose to hunt. Hunters are also required to report harvests in accordance with permit conditions or report after the close of the season when unable to harvest, which helps wildlife managers track both harvest amounts and hunter effort.

In GMU 17, under state regulations, there are opportunities for Alaska residents to harvest moose in a general season hunt (harvest ticket) or by registration permit.[8] Federally qualified hunters can hunt moose under federal or state regulations. Most Dillingham residents hunt moose under a state registration permit rather than the state general hunt structure or under federal regulations. The season dates and hunt conditions for the general hunt in GMUs 17B and 17C are more restrictive than the registration hunts that occur in the area. The general hunt open season is shorter than the registration hunts and the bag limits include antler restrictions. Registration hunt permits are available in person in Dillingham at the ADF&G office and in Nushagak River villages. Most local residents hunt moose under registration permit RM583, which allows the take of any bull in GMUs 17B and 17C and the season dates are August 20–September 15. In 2021, a total of 765[9] moose registration permits were issued under RM583, of which 450[10] permit holders hunted GMU 17C. In GMU 17A, which is located relatively close to Dillingham, registration hunts provide a fall season of either one bull or one antlerless moose. Additionally, in GMU 17A, two winter hunts are available with a bag limit of two total moose, one of which may be an antlered bull and one may be an antlerless moose; both registration hunts were opened by emergency order from January 8, 2021, to February 7, 2021, and then again on December 21, 2021, to January 20, 2022.[11, 12] There are additional hunts offered in GMUs 17A and 17B for nonresidents, but only Alaska residents may hunt moose in GMU 17C.

During the 2021 study year, by emergency order, there was no open season for caribou in GMU 17 under state regulations due to low caribou abundance of the Mulchatna herd and the Nushagak Peninsula herd.[13] The Mulchatna caribou herd of approximately 13,400 animals ranges across four GMUs throughout Western Alaska, while the Nushagak Peninsula caribou herd is a smaller, more localized herd of approximately 400 animals residing in a small portion of GMUs 17C and 17A.[14] Hunting for the Nushagak Peninsula caribou herd in the region was available by federal permit, but limited: a total of eight caribou permits were issued

8. The Alaska resident registration permits allowed in GMU 17 subunits are as follows: 1) GMU 17A: RM571, RM573, RM575, and RM576; 2) GMUs 17B and 17C: RM583, and 3) GMUs 17B and 17C: RM585 may be announced for either or both subunits.
9. Registration Hunt Summary Statistics, s.v., "2021; [Display Summary] RM583" (by Alaska Department of Fish and Game). Accessed December 2022. https://secure.wildlife.alaska.gov/index.cfm?fuseaction=harvest.regreportform
10. John Landsiedel, ADF&G Wildlife Biologist 3, Dillingham, August 2022, personal communication.
11. Alaska Department of Fish and Game. 2021. "Emergency Order Number: 04-01-21, issued January 5, 2021." Accessed February 2023. https://www.adfg.alaska.gov/static/applications/publicnotification/2021/orders/04-01-21.pdf
12. Alaska Department of Fish and Game. 2021. "Emergency Order Number: 04-14-21, issued December 17, 2021." Accessed February 2023. https://www.adfg.alaska.gov/static/applications/webintra/wcnews/2021/orders/04-14-21.pdf
13. Alaska Department of Fish and Game. 2021. "Emergency Order Number: 04-05-21, issued July 21, 2021." Accessed February 2023. https://www.adfg.alaska.gov/static/applications/webintra/wcnews/2021/orders/04-05-21.pdf
14. Alaska Department of Fish and Game. 2022. "Alaska Board of Game Meeting Information, Central & Southwest Region Meeting: January 21–29, 2022; RC4: Department Reports & Recommendations, Tab 3: Dillingham Area; Tab 3.1 Dillingham Area Overview." Accessed July 2023. http://www.adfg.alaska.gov/index.cfm?adfg=gameboard.meetinginfo&date=01-21-2022&meeting=wasilla

to federally qualified rural residents of Manokotak (4 permits), Aleknagik (2 permits), and Dillingham (2 permits) under hunt FC1702, which was limited to federal lands only.[15]

Brown bear hunting in GMU 17 is open to residents and nonresidents. The brown bear population is widely distributed and abundant in GMU 17.[16] No registration permit or harvest ticket is required. Regulations allow an annual bag limit of two bears per hunter per regulatory year with season dates from August 20–May 31. Nonresidents must purchase a locking-tag and be accompanied by a licensed guide or resident relative within second degree of kindred who is also licensed to hunt in Alaska. The taking of cubs or sows with cubs is prohibited. All harvested brown bears must be brought to an ADF&G office for sealing. Brown bear hides (with claws attached) and skulls from bears harvested in GMU 17 may be sold after sealing. A permit from ADF&G is required prior to sale and skulls and hides will be permanently marked. Additionally, there is a subsistence brown bear hunt available only to Alaska residents, and registration permit RB500 may be obtained in person at the Dillingham ADF&G office. The bag limit and season dates are the same, but the regulations for this registration hunt were adopted to better allow subsistence use of brown bears, including mandatory meat salvaging but no need for sealing a hide or skull unless those are removed from GMU 17 or commercially tanned.

More detailed State of Alaska regulations—including open seasons, permit requirements, and annual limits—for other large land mammal species relevant to the study community can be found in the annually published hunting regulations; the current regulatory year information is available at ADF&G offices or online.[17] Federal regulations and other information about hunting on federal lands can be found in the biennial federal wildlife regulations booklet, which is also available online.[18]

Study Objectives

The purpose of the project was to collect, analyze, and report information about uses of wild resources in 2021 in the community of Dillingham. The project had the following objectives:

- Design a survey instrument to produce updated subsistence harvest information on select resources or resource categories and include food security and health impact assessment questions.
- Conduct household surveys to record the following information:
  - Demographic information.
  - Harvest and use estimates.
  - Information about employment and cash income.
  - Assessments of changes in subsistence harvest and use patterns.
  - Food security assessments.
  - Health impact assessments.
  - Locations of fishing, hunting, and gathering activities in the study year.

15. U.S. Department of the Interior, Federal Subsistence Management Program, "2021 Fall Federal Nushagak Peninsula Caribou Season Opening," news release, July 30, 2021. Accessed December 2022. https://www.doi.gov/subsistence/news/general/2021-fall-federal-nushagak-peninsula-caribou-season-opening
16. Alaska Department of Fish and Game. 2022. "Alaska Board of Game Meeting Information, Central & Southwest Region Meeting: January 21–29, 2022; RC4: Department Reports & Recommendations, Tab 3: Dillingham Area; Tab 3.1 Dillingham Area Overview." Accessed July 2023. http://www.adfg.alaska.gov/index.cfm?adfg=gameboard.meetinginfo&date=01-21-2022&meeting=wasilla
17. Alaska Department of Fish and Game, "Alaska Hunting Regulations: Hunting Regulations Book." Accessed July 12, 2022. http://www.adfg.alaska.gov/index.cfm?adfg=wildliferegulations.hunting
18. U.S. Department of the Interior, Federal Subsistence Management Program, "Wildlife." Accessed September 24, 2022. https://www.doi.gov/subsistence/wildlife

- Conduct a limited number of key respondent interviews (KRIs) to provide ethnographic context for quantitative data.
- Review and interpret study findings.
- Communicate study findings to the community.
- Produce a final report.

Research Methods

Ethical Principles for the Conduct of Research

The project was guided by the research principles outlined in the *Alaska Federation of Natives Guidelines for Research*[19] and by the National Science Foundation, Office of Polar Programs in its *Principles for Conducting Research in the Arctic*,[20] the *Ethical Principles for the Conduct of Research in the North* (ACUNS 2003), as well as the Alaska confidentiality statute (AS 16.05.815). These principles stress community approval of research designs, informed consent, anonymity or confidentiality of study participants, community review of draft study findings, and the provision of study findings to the study community upon completion of the research.

Project Planning and Approvals

This project was carried out as a partnership between the BBNA and the ADF&G Division of Subsistence. Cody Larson, Subsistence Fisheries Scientist with BBNA, and Bronwyn Jones, Subsistence Resource Specialist 3 with the Division of Subsistence, co-led this project (Table 1-2). Jones and Larson worked together to coordinate with the POLARIS research team, train the survey team, carry out the surveys and KRIs, and review the project results. BBNA took the lead on community and tribal consultation and coordination, creating and managing the household list, and fieldwork logistics. The Division of Subsistence took the lead designing the survey (Appendix A) and planning key respondent interviews, analyzing data, and writing and distributing the results of the project in a technical report.

Prior to the start of this project, researchers from the POLARIS team traveled to Dillingham to introduce the POLARIS project at a public meeting. This meeting was intended to provide community residents the opportunity to ask questions or express concerns about the project. The meeting was held on February 27, 2020, and a total of 25 community members attended the meeting, which was led by Davin Holen, Gabriel Dunham, and Todd Radenbaugh from the University of Alaska Fairbanks. However, project startup was delayed because of the COVID-19 pandemic and researchers were unable to schedule the community-based research to collect wild resource harvest information for Dillingham for the 2020 study year, pushing the project's progress back until spring 2022, with a new study year of 2021. Prior to planning fieldwork, Larson consulted with the tribal and municipal governments to inform them about ADF&G's and BBNA's involvement and the scope of the project. Letters of support were provided by the City of Dillingham and the Curyung Tribal Council (Appendix B).

19. Alaska Federation of Natives. 2013. "Alaska Federation of Natives Guidelines for Research." Alaska Native Knowledge Network. Accessed July 10, 2022. http://www.ankn.uaf.edu/IKS/afnguide.html
20. National Science Foundation Interagency Social Science Task Force. 2018. "Principles for Conducting Research in the Arctic." Accessed July 10, 2022. https://www.nsf.gov/geo/opp/arctic/conduct.jsp

Table 1-2.–Project staff.

Task	Name	Organization
Southern Regional Program Manager	Robin Dublin	ADF&G Division of Subsistence
Principal Investigator	Bronwyn Jones	ADF&G Division of Subsistence
Administrative support	Tamsen Coursey-Willis	ADF&G Division of Subsistence
Administrative support	Pamela Amundson	ADF&G Division of Subsistence
Administrative support	Stephanie Wilson	ADF&G Division of Subsistence
Data Management Lead	David Koster	ADF&G Division of Subsistence
Programmer	Margaret Cunningham	ADF&G Division of Subsistence
Data entry	Lavinia Harris	ADF&G Division of Subsistence
	Devin Anderson	ADF&G Division of Subsistence
	Halia Valdez	ADF&G Division of Subsistence
	Reve Tomlin	ADF&G Division of Subsistence
Data cleaning/validation	Reve Tomlin	ADF&G Division of Subsistence
Data analysis	David Koster	ADF&G Division of Subsistence
	Reve Tomlin	ADF&G Division of Subsistence
	Margaret Cunningham	ADF&G Division of Subsistence
Cartography	Gayle Neufeld	ADF&G Division of Subsistence
Cartography	Margaret Cunningham	ADF&G Division of Subsistence
Editorial Review Lead	Mary Lamb	ADF&G Division of Subsistence
Field Research Co-Lead	Bronwyn Jones	ADF&G Division of Subsistence
Field Research Co-Lead	Cody Larson	Bristol Bay Native Association
Groundtruthing support	Renee Roque	Bristol Bay Native Association
Survey field staff	Theodore Krieg	Bristol Bay Native Association
Survey field staff	Lisa Hutchinson-Scarbrough	ADF&G Division of Subsistence
Survey field staff	Heidi Kritz	Bristol Bay Native Association
Survey field staff	Chance Wilcox	ADF&G Division of Subsistence
Survey field staff	Jacqueline Keating	ADF&G Division of Subsistence

Systematic Household Surveys

The primary method for collecting subsistence harvest and use information in this project was a systematic household survey. After coordinating with the POLARIS team, BBNA, and the Curyung Tribal Council, ADF&G finalized the survey instrument in January 2022. A key goal was to structure the survey instrument to collect demographic, resource harvest and use, and economic data that are comparable with information collected in previous household surveys in Dillingham and with data in the Community Subsistence Information System (CSIS21). The survey also included a module that addressed food security and a module that included questions asking households whether they got enough resources or used a different amount of resources than in recent previous years. The POLARIS team designed additional questions for inclusion in the survey to collect data related to nutrition and alternative food sources (health impact assessments), as well as community migration and quality of life. These additional questions were included to inform topics that are outside of the scope of work subcontracted to ADF&G and BBNA. The raw data collected from these questions were provided to the POLARIS team for analysis and thus are not included in this report. Appendix A is an example of the survey instrument used in this project.

For this study, the sampling goal was to survey 20% of the year-round households in Dillingham using a simple random sample. Dillingham is a large hub community with a total of approximately 670 households residing in a mixture of housing types. In order to establish a household list, the BBNA team, led by Larson, deployed several methods of developing a comprehensive list of residences that were occupied in late January–February 2022. The first attempts included retrieving a list of active electrical meters from the electric/telephone cooperative, and the location of heating fuel tanks serviced by the two heating fuel delivery providers. None of these sources were comprehensive because the companies relied heavily on their truck drivers and service technicians for tracking active electrical meters and active fuel tank locations. The team then worked with the City of Dillingham, which maintains a database of physical addresses that is accessible to the public. Additionally, there is a database of taxable property owners that can be linked to the physical address data; however, the taxable property information was not useful because many of the landowners do not occupy the property. The property ownership list also does not track non-taxable land, such as Alaska Native allotments; city, state, and federal parcels; and non-profits like assisted living facilities and churches. In addition, many of the parcels categorized as commercial properties include some type of residence as well.

Next, BBNA and Curyung Tribal Council staff conducted a desktop study using the baseline physical address locations provided by the City of Dillingham. The initial review was focused on eliminating non-residence (commercial, empty lot, churches, etc.) addresses from the list. It also added structures that did not have physical addresses, including many multiple-unit properties. The Bristol Bay Housing Authority assisted in identifying newly constructed housing projects funded through U.S. Department of Housing and Urban Development (HUD) and the U.S. Department of Agriculture. The Bristol Bay Housing Authority also assisted in identifying unoccupied housing units in the larger low-income housing tax-credit apartments and elderly resident apartments. Several property managers of large rental units assisted in identifying vacant/unoccupied spaces. The Bristol Bay Area Health Corporation identified year-round residences of people living on campus at the Kanakanak Hospital housing compound. BBNA staff opportunistically supplemented the address list with direct phone numbers, employment information, or additional contact details.

Once the initial review was completed, BBNA staff used geographic information system (GIS) software and the updated physical address database to physically visit and verify occupancy or vacancy. These efforts were undertaken in an attempt to include all dwelling units, in acknowledgement of the range of socio-economic factors that determine the types of buildings used as housing in Dillingham. The final review established an estimated count of 816 occupied households to be surveyed (Table 1-3). In addition to being

21. ADF&G Community Subsistence Information System: http://www.adfg.alaska.gov/sb/CSIS/ (hereinafter cited as CSIS).

Table 1-3.–Estimated households and sample achievement, Dillingham, 2021.

Sample information	Community Dillingham
Number of dwelling units	816
Survey goal	20%
Households surveyed	155
Households failed to be contacted	58
Households declined to be surveyed	23
Households vacant, moved, or occupied by nonresident	155
New households	6
Total households attempted to be surveyed	236
Refusal rate	12.9%
Final estimate of permanent households	667
Percentage of total households surveyed	23.2%
Survey weighting factor	4.30
Sampled population	445
Estimated population	1,914.9

Source ADF&G Division of Subsistence household surveys, 2022.

Table 1-4.–Survey duration, Dillingham, 2021.

Community	Interview length (in minutes)		
	Average	Minimum	Maximum
Dillingham	51	9	155

Source ADF&G Division of Subsistence household surveys, 2022.

present in early 2022, a household member needed to be a resident in the community for all 12 months during the study year 2021 in order to be considered eligible.

During the survey effort, researchers applied a residency disposition for each dwelling in order to come up with a 20% sample that could be derived from the final count of eligible households. The residency disposition categories included:

- Contains residents who are eligible to participate in the survey based on length of residency (survey attempted).
- Vacant (no survey attempted).
- Not a dwelling (commercial building or no dwelling exists) (no survey attempted).
- Nonresident occupancy (contains household members that are ineligible to participate in the survey based on timing or length of residency) (no survey attempted).

The revised estimate of eligible households to be surveyed after residency dispositions were applied was 667. Eligible households that were contacted were assigned a sampling disposition "surveyed" or "declined to participate"; the refusal rate was 13%. If researchers were initially unsuccessful at contacting a household, two more attempts to survey the household were made. When a reasonable effort was made to survey the household and no contact could be made, this household was assigned a "no contact" sampling disposition (58 households). There were 155 Dillingham households surveyed, or 23%. On average, surveys lasted approximately 51 minutes, which included the standard survey form and a mapping component, which is discussed below (Table 1-4).

Household Survey Implementation

As previously mentioned, Larson (BBNA) led a groundtruthing effort to generate a comprehensive list of year-round Dillingham households (Table 1-2). Two additional BBNA staff members assisted Larson: Heidi Kritz and Renee Roque. For the 2021 study year survey effort, Jones (ADF&G) arrived in Dillingham on February 21, 2022, to hold the survey training with BBNA staff and begin conducting household surveys in the community. The training occurred on Tuesday, February 22, 2022, and was co-led by Jones and Larson. In attendance were two additional BBNA staff: Theodore Krieg and Kritz. Jones remained in the community to assist BBNA staff with surveys until March 2. From March 2–March 20, surveys continued with Larson leading the effort in Dillingham with assistance from Kritz and Krieg. Jacqueline Keating (ADF&G) traveled to Dillingham to take over leading the survey effort from March 21–26 while Larson was out of town. Jones returned to Dillingham on April 1 and led the survey effort until April 10 with assistance from Lisa Hutchinson-Scarbrough (ADF&G) and Chance Wilcox (ADF&G). Larson finished the remaining surveys from April 12–May 5.

Mapping Locations of Subsistence Hunting, Fishing, and Gathering Activities

During in-person household surveys, the researchers asked respondents to indicate the locations of their fishing, hunting, and gathering activities during the study year. Map data provide a visual depiction of general harvest and use locations from the harvest surveys. These data can aid in identifying important search areas, quantifying areas used, and also comparing changes in the search and harvest areas for wild food resources over time. Points were generally used to mark harvest locations and polygons were used to indicate harvest effort areas, such as areas searched while hunting moose. Points were also used to designate harvest effort locations, as when fishing from a riverbank. Lines were drawn to depict when the harvesting activity did not occur at a specific point; for example, lines were used to depict courses taken while driftnetting.

Harvest locations and fishing, hunting, and gathering areas were documented on iPads[22] using the Collector application (ESRI, or Environmental Systems Research Institute) customized for Division of Subsistence data collection needs. The feature—point, polygon, or line—was drawn on a U.S. Geological Survey topographic relief map downloaded on the iPad. The iPad allowed the user to zoom in and out to the appropriate scale, and the ability to document search and harvest activity locations wherever they occurred in the state of Alaska. Once a feature was accepted, the researcher added attributes that noted the species searched for, method of access to the area, month(s) of use of the area, and amount harvested if successful.

While in the field, once a survey was complete, researchers conducted a quality control exercise by matching the map data to the survey form to ensure all map data had been documented. Once data collection was complete, the data were uploaded through ArcGIS Online to the ESRI cloud server for storage. Once the data were uploaded, researchers verified that the household data were successfully recorded on the server.

Key Respondent Interviews

Key respondent interviews provided important qualitative context for the quantitative data and also information for the seasonal round section in the next chapter and the community comments and concerns included in the final report chapter. Key respondent interviews were semi-structured and directed by project goals to explore topics related to subsistence activities. Time and staffing constraints prohibited researchers from conducting multiple ethnographic interviews: two KRIs were conducted and each interview focused on topics about which the respective participants were most knowledgeable. Researchers reviewed key respondent interviews and surveyor interview notes in preparation for this report. Key respondents were informed that, to maintain anonymity, their names would not be included in this report.

22. Product names are given because they are established standards for the State of Alaska or for scientific completeness; they do not constitute product endorsement.

Data Analysis and Review

Survey Data Entry and Analysis

Surveys were coded for data entry by select Division of Subsistence field research staff or Information Management staff and reviewed by the Principal Investigator for consistency. Responses were coded following standardized conventions used by the Division of Subsistence to facilitate data entry. Information Management (IM) staff within the Division of Subsistence set up database structures within Microsoft SQL Server at ADF&G in Anchorage to hold the survey data. The database structures included rules, constraints, and referential integrity to ensure that data were entered completely and accurately. Data entry screens built in Microsoft Access were available on a secured internet network. Daily incremental backups of the database occurred, and transaction logs were backed up hourly. Full backups of the database occurred twice weekly. This process ensured that no more than one hour of data entry would be lost in the unlikely event of a catastrophic failure. All survey data were entered twice, and each set was compared in order to minimize data entry errors.

Once data were entered and confirmed, information was processed with the use of R statistical software version 4.2.2. Initial processing included the performance of standardized logic checks of the data. Logic checks are often needed in complex data sets where rules, constraints, and referential integrity do not capture all of the possible inconsistencies that may appear. Harvest data collected as numbers of animals, or in gallons or buckets, were converted to pounds usable weight using standard factors (see Appendix C for conversion factors[23]).

Division of Subsistence staff also used R for analyzing the survey information. Analyses included review of raw data frequencies, cross tabulations, table generation, estimation of population parameters, and calculation of confidence intervals for the estimates. Instances of missing information were evaluated to ensure these cases were sporadic, random, and uniformly distributed among all surveys and questions. There was no indication that response bias may be present based on a review of the instances of missing information, and each instance was dealt with on a case-by-case basis according to standardized practices. For data elements where a non-zero mean could be derived, missing data were replaced with the mean of valid responses. In cases where mean values resolved to zero, but a non-zero amount was implied by a missing data code, then a minimal substitution was applied. Division researchers documented all adjustments in R code.

Harvest estimates and responses to all questions, except income and categorical responses, were calculated by using the principle that a sample mean can be used as an unbiased estimator of the population mean (Cochran 1977). For analysis the sample mean was the arithmetic mean, or average, of households that agreed to participate and the population was the total number of occupied and eligible households present in the community during the study period. These calculations are standard methods for extrapolating sampled data. As an example, the formula for harvest expansion is:

$$\hat{X} = N\bar{y} \tag{1}$$

$$\bar{y} = \frac{\sum_{i=1}^{n} x_i}{n} \tag{2}$$

where:

N = total number of households in a community,

$\bar{y}$ = the mean harvest (amount of resources or pounds) of returned surveys,

n = the number of returned surveys,

x_i = the reported harvest (amount of resources or pounds) of household i, and

$\hat{X}$ = the total estimated harvest (amount of resources or pounds).

23. For an overview of statewide conversion factors and their sources, see "Resource Conversion Factors," ADF&G Division of Subsistence, CSIS: http://www.adfg.alaska.gov/sb/CSIS/index.cfm?ADFG=main.conversionFactorSelRes

In addition to community estimates, 95% confidence intervals were calculated to evaluate the relative precision of the mean. The confidence interval is depicted either as a percentage or a range of values. Confidence intervals were calculated using raw, unexpanded data. This metric represents a confidence level of 95% that the true population mean falls within the calculated range (Goldsman and Goldsman 2021). A wide confidence interval implies less confidence in the estimate. For interpretation, a confidence interval range where the lower bound falls below the sum of reported values implies that no statistically significant difference exists between the reported and estimated values, thus the true population value may be represented by the sample. Additionally, a confidence interval where the lower bound falls below zero implies that the estimate does not have a statistically significant difference from zero, indicating a sample was too small to be representative of the community. Because the sample was taken from a finite population of households, confidence intervals were calculated using finite population correction as formulated below (Cochran 1977):

$$\mathrm{CI\%}(\pm) = \frac{t_{a/2} \times \frac{s}{\sqrt{n}} \times \sqrt{\frac{N-n}{N-1}}}{\bar{y}} \tag{3}$$

where:

$t_{\frac{a}{2},\mathrm{n}-1}$ = student's two-tailed t critical value for a=0.95 and n–1 degrees of freedom,

s = sample standard deviation,

n = the number of returned surveys,

N = total number of households in the community, and

$\bar{y}$ = sample mean.

Estimates for jobs and income were calculated using a Monte Carlo method referred to as bootstrapping (Efron and Tibshirani 1993). This method was used to account for confounding features of the data stemming from the complexity of interrelated variables and random missing elements, as well as small amounts of data. Small populations result in many unique records where it is not possible to identify a mean or median for estimation, so similar records must be used instead. These "similar" records were derived through resampling with replacement. The assumption made was that the jobs and income present in the sample will be reasonably representative of the whole community and therefore uncontacted households will have similar makeup and characteristics.

The bootstrap method resamples surveyed households, with replacement 1,000 times. An estimate was developed for each separate resample using a set of rules regarding missing data. To begin, known annual income amounts were divided by the number of months. Missing income from a job was replaced with the median of jobs having the same standard occupational classification (SOC) code. If no estimate could be obtained, then a median from the same industry was applied. A similar approach was used for missing information about job schedules and months by using the mean rather than the median. Once missing value replacements were made, the mean income was calculated and applied to the community to develop an estimate. For individuals spanning the ages of 16 and 65 who did not provide an employment status, an additional expansion was calculated and applied using the proportion of valid responses for employed adults. Once the estimates were created for each resample, the average of all 1,000 resamples was used as the estimate. This approach was used to estimate the number of jobs, total income, number of employed people, and the number of employed households. Ninety-five percent confidence intervals for income estimates by source were computed by selecting appropriate quantiles from the 1,000 resamples, using an approach adapted from Efron and Tibshirani (1993):

$$l = \sum_{i=1}^{(\hat{\theta}_i - \theta) < 0} 1 \tag{4}$$

$$\bar{\theta} = \frac{\sum_{i=1}^{N} \hat{\theta}_i}{N} \tag{5}$$

$$\hat{z}_0 = \frac{l}{N} \tag{6}$$

$$t_2 = \sum_{i}^{N} (\hat{\theta}_i - \theta)^2 \tag{7}$$

$$t_3 = \sum_{i}^{N} (\hat{\theta}_i - \theta)^3 \tag{8}$$

$$\hat{\alpha} = \frac{t_3}{(6 \times t_2)^{1.5}} \tag{9}$$

$$\alpha_1 = NORMAL\left(\hat{z}_0 + \frac{\hat{z}_0 - 1.96}{(1 - \hat{\alpha} \times (\hat{z}_0 - 1.96)}\right) \tag{10}$$

$$\alpha_2 = NORMAL\left(\hat{z}_0 + \frac{\hat{z}_0 + 1.96}{(1 - \hat{\alpha} \times (\hat{z}_0 + 1.96)}\right) \tag{11}$$

$$CI(-) = \hat{\theta}_{N \times \alpha_1} \tag{12}$$

$$CI(+) = \hat{\theta}_{N \times \alpha_2} \tag{13}$$

where:

$\hat{\theta}_i$ = the ith resample estimate,

θ = the estimate of the income,

i = index of resamples ordered from smallest to largest estimate,

N = number of resamples taken (at least 1,000),

$CI(-) = \hat{\theta}_{N \times \alpha_2}$ = the estimate at in the sorted list of estimated resamples, and the lower bound of the 95% confidence interval,

$CI(+) = \hat{\theta}_{N \times \alpha_2}$ = the estimate at in the sorted list of estimated resamples, and the upper bound of the 95% confidence interval, and

NORMAL( ) = the normal cumulative distribution function (CDF), which returns a value corresponding to the position of the parameter within the normal distribution.

The corrected final data from the household survey will be added to the Division of Subsistence CSIS. The CSIS is a publicly accessible database maintained by the Division of Subsistence and includes community-level study findings.

Population Estimates and Other Demographic Information

As noted above, a goal of the research was to collect demographic information for all year-round households in each study community. For this study, "year-round" was defined as being domiciled in the community when the surveys took place and for all 12 months during the study year 2021. Because not all households were interviewed, the population estimate was calculated by multiplying the average household size of interviewed households by the estimated number of eligible year-round households, as identified by Division of Subsistence and BBNA researchers in consultation with community officials and other knowledgeable respondents.

There may be several reasons for the differences among the population estimate for Dillingham generated from the division's surveys and other demographic data developed by the 2020 federal census and the U.S. Census Bureau's American Community Survey (U.S. Census Bureau 2021) and the Alaska Department of Labor and Workforce Development (ADLWD n.d.). Sampling of households, survey timing, or eligibility criteria for inclusion in the survey may explain differences in the population estimates. For example, for Dillingham, two reasons for differences may relate to varying sample sizes and factors for expansion, and the season of data collection. Differing population estimates may also relate to the criteria agencies used to determine "full-time" residency and eligibility in the particular study. Population estimates are discussed in the section "Population Estimates and Demographic Information" in the next report chapter.

Food Security Analysis

A "food security" section of the survey used a modified version of a standard national questionnaire to assess whether or not the household had enough food to eat, whether from subsistence sources or from market sources. The protocol used in this survey was a modified version of the 12-month food security scale questionnaire developed by the U.S. Department of Agriculture (USDA). This questionnaire is administered nationwide each year as part of the annual Current Population Survey (CPS). In 2021, approximately 98,800 U.S. households were interviewed, including 1,203 in Alaska (Coleman-Jensen et al. 2022). From CPS data, the USDA prepares an annual report on food security in the United States.

Food security protocols have been extensively reviewed (Coates 2004; Webb et al. 2006; Wunderlich and Norwood 2006) and have been used around the world, including in northern Burkina Faso (Frongillo and Nanama 2006), Bangladesh (Coates et al. 2006), Bolivia and the Philippines (Melgar-Quinonez et al. 2006), and Brazil (Pérez-Escamilla et al. 2004). Although there have been efforts to develop a universal food security measurement protocol (Swindale and Bilinsky 2006), researchers often modify the protocol slightly to respond to community social, cultural, and economic circumstances, as was done here.

For household surveys administered by the Division of Subsistence, the national food security protocol was modified by the addition of several questions designed to determine whether food insecurities, if any, were related to subsistence foods or store-bought foods. Additionally, the wording of some questions was changed slightly. As in Brazil (Pérez-Escamilla et al. 2004), the USDA term "balanced meals" was difficult to interpret for indigenous Alaska populations, and was replaced with the term "the kinds of food we wanted to eat" to reflect unique dietary and cultural circumstances in rural Alaska. Further, starting in 2015, the Division of Subsistence added a filter question to reduce the number of questions asked of food secure households. Households agreeing with the statement "We had enough of the kinds of foods we wanted to eat" were considered food secure and were not asked about increasingly severe instances of food insecurity. The surveys conducted in Dillingham continued to use that filtering process.

Map Data Entry and Analysis

As discussed above, maps were generated based on data collected using the ESRI Collector application on an iPad. All data were entered on the iPad in the field during surveys. Once all data were uploaded to the ESRI cloud server, data were downloaded and stored on the ADF&G network. After verification that all data had been synced, the data were removed from the ESRI cloud server.

To create community-level maps, spatial data were sorted by resource and examined for accuracy. For the purposes of presenting study results, household data were aggregated using the dissolve tool to the community level for confidentiality. For most resources, the individual resource data were dissolved to the category level: salmon, nonsalmon fish, small land mammals, marine mammals, and marine invertebrates. For birds and bird eggs, data were dissolved into subcategories: migratory birds (e.g., ducks, geese, swans, cranes, shorebirds); ptarmigan and grouse; and bird eggs. Similarly, for vegetation resources, data were dissolved into subcategories: berries; greens, mushrooms, and seaweeds; and wood. For large land mammals, data were dissolved to the species level. For confidentiality, data are published only if collected from a minimum of three households; for this project, the minimum household threshold was satisfied for all the spatial data collected and dissolved to the category, subcategory, or species level described.

ADF&G IM staff created search and harvest location maps for each resource category or subcategory, or for individual species, in ArcGIS 10.8.1 using a standard template for reports. To ensure confidentiality, the maps produced for the report do not distinguish between overall search areas and specific harvest locations.

While the maps highlight a broad range of search areas and harvest locations, some areas are highly used and overlap. These maps should be considered a minimum of the areas used by Dillingham residents for their subsistence activities; the data were derived from a percentage of community households that participated in the survey and are not expanded to represent unsurveyed households. The maps are also a representation of use areas only in 2021. As a result, they do not represent the use areas of unsurveyed households or use of areas in years other than 2021 by surveyed households and cannot be interpreted to depict all use areas through time by Dillingham residents. Maps were reviewed at a community review meeting on January 4, 2023, to ensure accuracy and offer the community an opportunity to discuss whether any spatial data were sensitive or needed to be confidential, although no concerns were raised.

Community Review Meetings

On January 4, 2023, Jones, Larson, and Wilcox presented preliminary survey findings and associated search and harvest area maps at a meeting in Dillingham. The purpose of the community review meeting was to provide an opportunity for community members to comment on the findings of the study and for researchers to capture concerns that were not documented during the survey, but that community members felt were important. The tribal administrator and council members were informed of the review meeting. BBNA staff hung flyers and informed residents of the meeting; in addition, public service announcements were broadcast on the local radio station. A total of nine community members attended the community review meeting.

An additional community meeting was held by Larson and POLARIS team members on February 1, 2023, at the University of Alaska Fairbanks–Bristol Bay campus. A total of 18 community members attended the meeting, which also previewed the survey results. Community responses from both meetings were helpful in validating the survey data.

Final Report Organization

This report summarizes the results of systematic household surveys, complemented by mapping, key respondent interviews, and resident feedback provided at a community review meeting. Chapter 2 includes tables and figures that report findings on demographic characteristics, employment characteristics, individual participation in harvesting and processing of wild resources, and characteristics of resource harvests and uses—including the sharing of wild foods—and food security. The chapter also includes information documented by researchers during survey administration and KRIs, as well as comments on survey forms written by respondents, to provide a description of Dillingham's seasonal round, complement quantitative data regarding specific resources, and summarize local comments and concerns by residents. Chapter 3 identifies harvest and use trends over time and current and historical harvest areas. Table 1-5 shows select study findings that will be referenced in later discussions of survey results. Table 1-6 identifies the previous years for which harvest surveys were conducted in Dillingham. A draft report was provided to BBNA, the Curyung Tribal Council, and POLARIS for review and comment. After receipt of comments, the report was finalized. A short summary of research findings was provided as free public handouts at the Dillingham ADF&G office, BBNA office, and the Curyung Tribal Council office (Appendix D).

Table 1-5.–Select study findings, Dillingham, 2021.

Category	Community Dillingham
Demography	
Population	1,914.9
Percentage of population that is Alaska Native	64.9%
Percentage of household heads born in Alaska	59.4%
Average length of residency of household heads (year)	53.9
Cash economy	
Average number of months employed for all adults	9.1
Percentage of employed adults working year-round	54.2%
Percentage of income from sources other than employment	17.4%
Average household income[a]	$131,061
Per capita income[a]	$45,650
Resource harvest and use	
Per capita harvest, pounds usable weight	198.8
Average household harvest, pounds usable weight	570.8
Number of resources used by 50% or more households	6.0
Average number of resources used per household	14.5
Average number of resources attempted to be harvested per household	10.0
Average number of resources harvested per household	9.6
Average number of resources received per household	7.4
Average number of resources given away per household	7.5
Percentage of total harvest taken by top 25% ranked households	70.9%
Percentage of households that harvested 70% of harvest	23.9%
Per capita harvest by lowest ranked 50% of households	32.2
Percentage of total harvest taken by lowest ranked 50% of harvesting households	6.7%
Average number of resources used by lowest ranked 50% of households	9.0
Average number of resources used by top 25% ranked households	23.9

Source ADF&G Division of Subsistence household surveys, 2022.
a. Includes income from sources other than employment.

Table 1-6.–Previous studies, Dillingham.

Community	1984	1995	1996	1997	1998	2000	2001	2002
Dillingham	All	MM	MM	MM	MM	MM	MM LLM	MM

-continued-

Table 1-6.–Continued.

Community	2003	2004	2005	2006	2007	2008	2010
Dillingham	MM	MM	MM	MM	MM	MM	All

Source ADF&G Division of Subsistence Community Subsistence Information System: http://www.adfg.alaska.gov/sb/CSIS/
Note The key for the table is:
All = "comprehensive" baseline survey of all resources used for subsistence purposes.
LLM = large land mammals.
MM = marine mammals.

2. DILLINGHAM

Community Background

The community of Dillingham is located in Southwest Alaska approximately 330 air miles from Anchorage (Figure 1-1). Dillingham is situated at the confluence of the Wood and Nushagak rivers, which flow into Nushagak Bay, an inlet of Bristol Bay (Evans et al. 2013). The Nushagak River empties into Nushagak Bay after flowing 242 miles from its origin in the Nushagak Hills. The Wood River flows 20 miles from the outlet of Lake Aleknagik to meet the Nushagak River at Dillingham (Fall et al. 1986). Dillingham is south of the Wood-Tikchik State Park, the largest state park in the United States (Evans et al. 2013).

The topography of the land is characterized by low coastal plains, rolling hills, and rugged mountains (Fall et al. 1986). Tundra vegetation covers the plains and upland regions, while boreal forests appear at lower elevations along the shores of lakes and rivers. Summers in this region tend to be short and warm, with heavy fog in July and August, while winters are cold and long, often with heavy snowfall and high winds (Halas and Cunningham 2019).

The Dillingham area is the traditional homeland of the *Yup'ik* peoples. Historically, three distinct Yup'ik groups occupied territory based on their use of the land and resources (Halas and Cunningham 2019). The *Tuyuryarmiut* people lived along the Togiak River, while the *Kiatagmiut* lived inland (Fall et al. 1986). The *Aglurmiut* people's territory extended along the coast from where Dillingham is today, on Nushagak Bay, to the upper portion of the Alaska Peninsula. Their primary subsistence activities focused on salmon, but they also harvested other types of fish, game, and marine mammals (Fall et al. 1986). They used several subsistence methods or gear depending on location and water conditions—gillnetting, dipnetting, fish spears, and basket traps, among others—to catch Chinook, sockeye, and coho salmon during summer months. Seals were hunted from kayaks in the spring and subsistence pursuits were focused on hunting caribou and beavers starting in the fall through winter (Fall et al. 1986).

European exploration of this region of Alaska began in the late 1770s, and Russian fur traders arrived by the 1790s. The first fur trading station of Bristol Bay was established near the mouth of the Nushagak River in 1818 and served as a center for Russian missionaries from the Russian Orthodox Church by the early 1840s; at that time, the community was known as Nushagak (Fall et al. 1986:16). The local regional economy shifted from trapping to commercial salmon fishing after the United States purchased Alaska from the Russians in 1867—the first cannery was built in 1884 (Evans et al. 2013; Fall et al. 1986:18). Canneries quickly multiplied and thrived, and fishers came from all over the world to profit from the abundant salmon runs. At its peak in 1920, Bristol Bay had 25 active canneries. However, this led to overfishing, and commercial fishing was restricted in the 1930s, leading to a steep decline in the number of canneries. Only six were in operation by 1939 (Fall et al. 1986).

Several factors made it difficult for Alaska Native residents to gain entry to this early commercial fishing industry. According to Fall et al. (1986:19), "Cannery operators brought in Chinese laborers, whom they believed were better, more reliable workers than the local population." This fishery began "to provide a livelihood for local resident natives," but faced significant competition by nonresidents[1] and scrutiny by fisheries managers (U.S. Fish and Wildlife Service Management Agents 1983:12, 8–9). This exacerbated local residents' experiences with being overlooked from both the fishing and canning aspects of the industry. When World War II created a labor shortage in the fishing industry, more salmon processing jobs became available to Alaska Native residents; however, in-migration of seasonal commercial fishers was spurred through religious community affiliations and later by ex-military members who had been stationed in the state during World War II (U.S. Fish and Wildlife Service Management Agents 1983:4). It was not until the

1. It was not until 1938 that Congress amended a law stating that anyone operating a set net for commercial purposes must be a U.S. citizen and have continuously resided in the Bristol Bay watershed for at least two years (U.S. Congress 1938:208).

1960s that local Nushagak fishermen made up a substantial portion of the commercial fishing industry in Bristol Bay (Fall et al. 1986).

Beginning in the late 1800s, the ebb and flow of commercial operations in the lower Nushagak River region, as well as the influenza epidemic of 1918–1919, caused varied concentrations of settlement spanning several miles along the stretch of river where present-day Dillingham is situated. A mixture of names was used to identify these areas of habitation, and by the 1900s there were two primary settlements located approximately four river miles apart along the Nushagak River at Snag Point: Chogiung[2] village to the northeast, and Kanakanak village near Bradford Point to the southwest (VanStone 1971:94–102). Of note, the name "Dillingham" was first introduced when mail was delivered to the office of U.S. Deputy Marshall Russell S. Bates[3] in 1904 at Bradford Point, near Kanakanak village (Branson 2007:112; Orth 1971rep.:272; VanStone 1971:98). The name "Dillingham" was used to honor U.S. Senator Paul Dillingham of Vermont, who had toured elsewhere in Alaska the prior year. The name Dillingham was also applied to land where the current Kanakanak Hospital is located, which was first surveyed as the Dillingham U.S. School Reserve in 1909 (Warner 1910). In 1913, a hospital was relocated from a Moravian mission in Carmel (or Kanulik[4]) to one of the school buildings in Kanakanak village.[5] In 1919, an orphanage was constructed at the hospital after villages in the region were abandoned and large numbers of residents died from illness (Schroeder et al. 1987:339). The influenza epidemic of 1918–1919 contributed to the broader Nushagak Bay area's population concentrating near present-day Dillingham.

After the influenza epidemic, English place names became more prevalent in the area, and Chogiung village became increasingly referred to as Snag Point. However, in official records, use of the name "Dillingham" slowly transitioned from the Kanakanak village area and shifted upriver toward Snag Point, likely initially when mail delivery relocated in 1913 to the trading post built by Otto Larson.[6] As another example of this slow transition in naming, the Dillingham U.S. Jail was located at "Kanakanak (Old Dillingham)" as described in the 1930 U.S. Census[7] but then, in 1940, the U.S. Census[8] recorded the Snag Point Federal Jail; further, after May 1934, E. Coke Hill, a federal judge for the fourth division of the Alaska territory, had suggested moving the headquarters of the U.S. commissioner and deputy marshal from "Old Dillingham" to Snag Point (Naske 1985:328–329). By 1940, a year-round road had been constructed between the settlements of Kanakanak (near Bradford Point) and Snag Point (Mertie 1938). In 1947, the Snag Point

2. Chogiung, also spelled Choggiung in historical records, derived its name from "Curyung," a Yup'ik word that loosely translated as the point where the clean and muddy waters meet.* * Choggiung Limited. 2018. "Welcome to Choggiung Limited." Accessed April 2024. https://www.choggiung.com/
3. Record of Appointment of Postmasters, 1832-1971; Microfilm publication M841, 145 rolls; NAID: 596306 and 17027522; Records of the Post Office Department, 1773-1971, Record Group 28; The National Archives in Washington, D.C.
4. Historical community located on the eastern shore of the Wood River south of Grassy Island (Orth 1971rep.:187).
5. Tricia Brown. "Memories of Kanakanak Hospital and Orphanage." LitSite Alaska/University of Alaska Anchorage. Accessed August 2023. http://www.litsitealaska.org/index.cfm?section=digital-archives&page=Industry&cat=Healthcare&viewpost=2&contentid=2612
6. Record of Appointment of Postmasters, 1832-1971; Microfilm publication M841, 145 rolls; NAID: 596306 and 17027522; Records of the Post Office Department, 1773-1971, Record Group 28; The National Archives in Washington, D.C.
7. United States of America, Bureau of the Census. Fifteenth Census of the United States, 1930. Washington, D.C.: National Archives and Records Administration, 1930. T626, 2,667 rolls. Judicial District: Third. Enumeration District 3-22.
8. United States of America, Bureau of the Census. Sixteenth Census of the United States, 1940. Washington, D.C.: National Archives and Records Administration, 1940. T627, 4,643 rolls. Judicial District: Third. Enumeration District 3-34.

area was first surveyed as the Dillingham townsite; however, it was not until 1963 that Dillingham was incorporated as a first-class city.[9] The municipality now spans 36 square miles that encompass all of the historical neighboring settlements.[10]

Contemporarily, Dillingham serves as a hub for the Bristol Bay region. The city has a paved runway with multiple daily flights to and from Anchorage. Dillingham is only accessed by plane and by boat, or snowmachine in winter from nearby communities (Evans et al. 2013). After the Alaska Native Claims Settlement Act passed in 1971, regional and village corporations were formed—Bristol Bay Native Corporation and Choggiung Limited—that hold title to lands in the Bristol Bay and Dillingham areas. The federally recognized tribe of the Dillingham area is the Curyung Tribal Council. Local facilities and infrastructure include a hospital, school district, library, volunteer fire department, police department, and post office. Dillingham also hosts a campus of the University of Alaska Fairbanks, which offers degree programs ranging from technical certificates to graduate degrees (Evans et al. 2013). Commercial fishing continues to be an important part of the economy, with two salmon processors—Peter Pan Seafood and OBI Seafoods—in operation in study year 2021. Dillingham maintains a relatively robust population and provides many services for the surrounding area.

Seasonal Round

The residents of Dillingham harvest wild food resources throughout the year. Like many rural Alaska communities, certain species are targeted in different seasons, creating a cyclical harvest pattern. These patterns are defined by seasonal resource availability, laws, regulations, other economic activities, and land access. The annual cycle of resource availability is relatively predictable and generally allows for the reliable and sustained provision of wild foods for the community.

Many Dillingham residents are highly mobile, traveling around the Nushagak and Kvichak bays, the local river systems, and the Wood–Tikchik lakes to harvest resources. Residents use motorized vehicles—such as boats, highway vehicles, snowmachines, planes, and all-terrain vehicles (ATVs)—to access their hunting, fishing, and gathering areas. As depicted in figures 2-1 and 2-2, resource search and harvest areas documented during the 2021 study year were spread out across Bristol Bay and throughout other areas of the state. Though the search and harvest areas were extensive, the majority of locations where Dillingham residents harvested wild foods were relatively close to the community in the study year.

Residents typically consider the beginning of the seasonal round to be in the early spring; as daylight increases, hunting for ptarmigan and hares, ice fishing, and trapping small land mammals come to an end as the snow melts and winter ice clears from local streams and lakes. Some Dillingham residents target migratory waterfowl as birds travel through the area in spring and stop to rest on the tidal flats and tundra areas that surround the community. Seal and beluga whale hunting occurs in late April and May and continues through September.

During summer months, beginning in early June and extending through September, many Dillingham residents who are not commercial fishing are busy with subsistence salmon fishing in the marine waters and freshwater systems near the community. Chinook salmon is the first species to arrive, and community residents use gillnets to harvest this species. The first Chinook salmon harvested is traditionally gifted and shared with family and friends in celebration of the beginning of the harvest. Sockeye salmon, which arrive soon after Chinook salmon, are harvested with gillnets or dip nets; the same gear is used for targeting chum salmon, which arrive at about the same time as sockeye salmon. Coho salmon arrive in late July and throughout August. Pink salmon, which in even years are more abundant, are harvested at the same time as

9. City of Dillingham. "The Official Site of Dillingham, Alaska: History and Facts." Accessed January 2023. https://www.dillinghamak.us/community/page/history-and-facts
10. City of Dillingham. "The Official Site of Dillingham, Alaska: History and Facts." Accessed January 2023. https://www.dillinghamak.us/community/page/history-and-facts

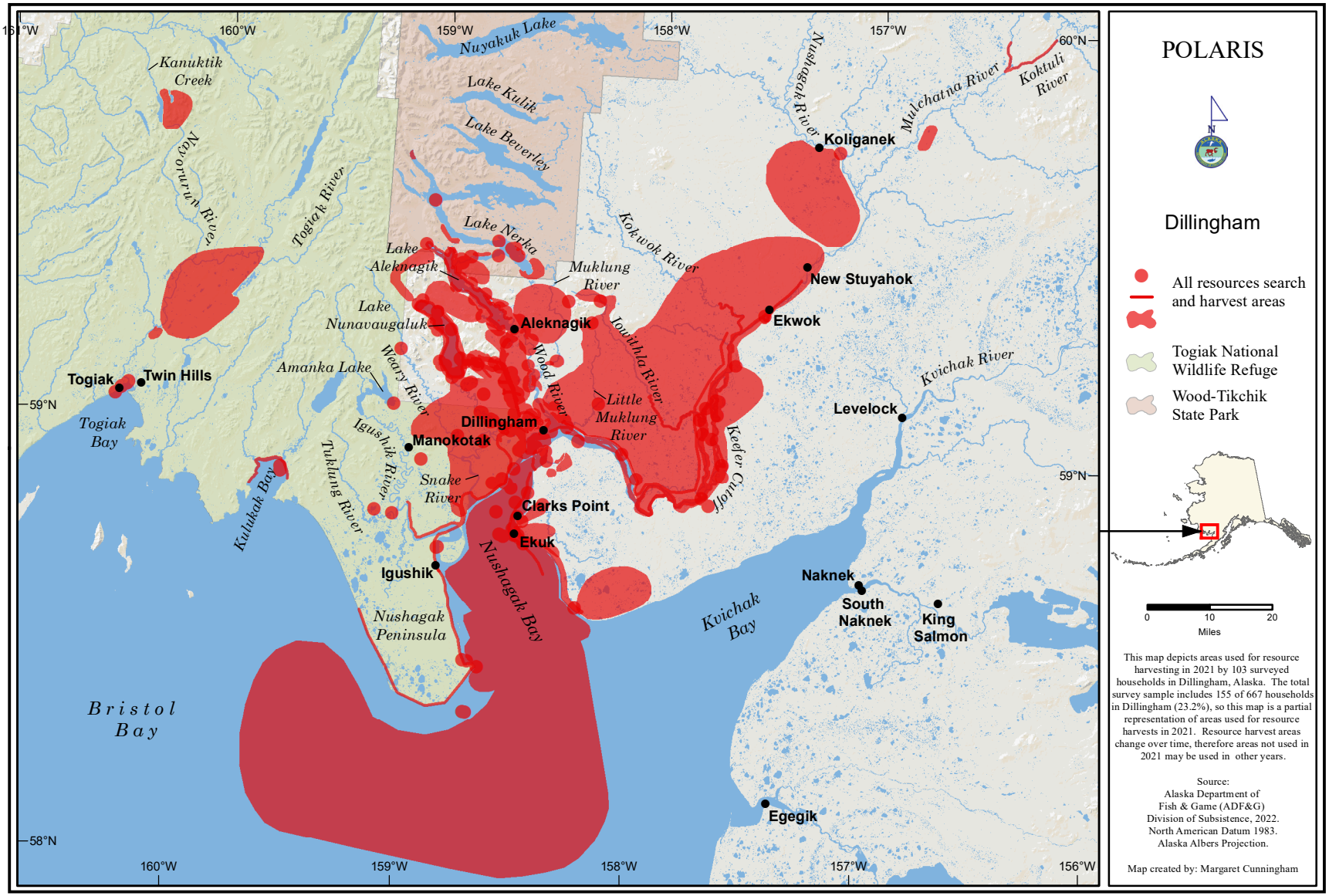


Figure 2-1.–Wild resources search and harvest areas, Dillingham, 2021.

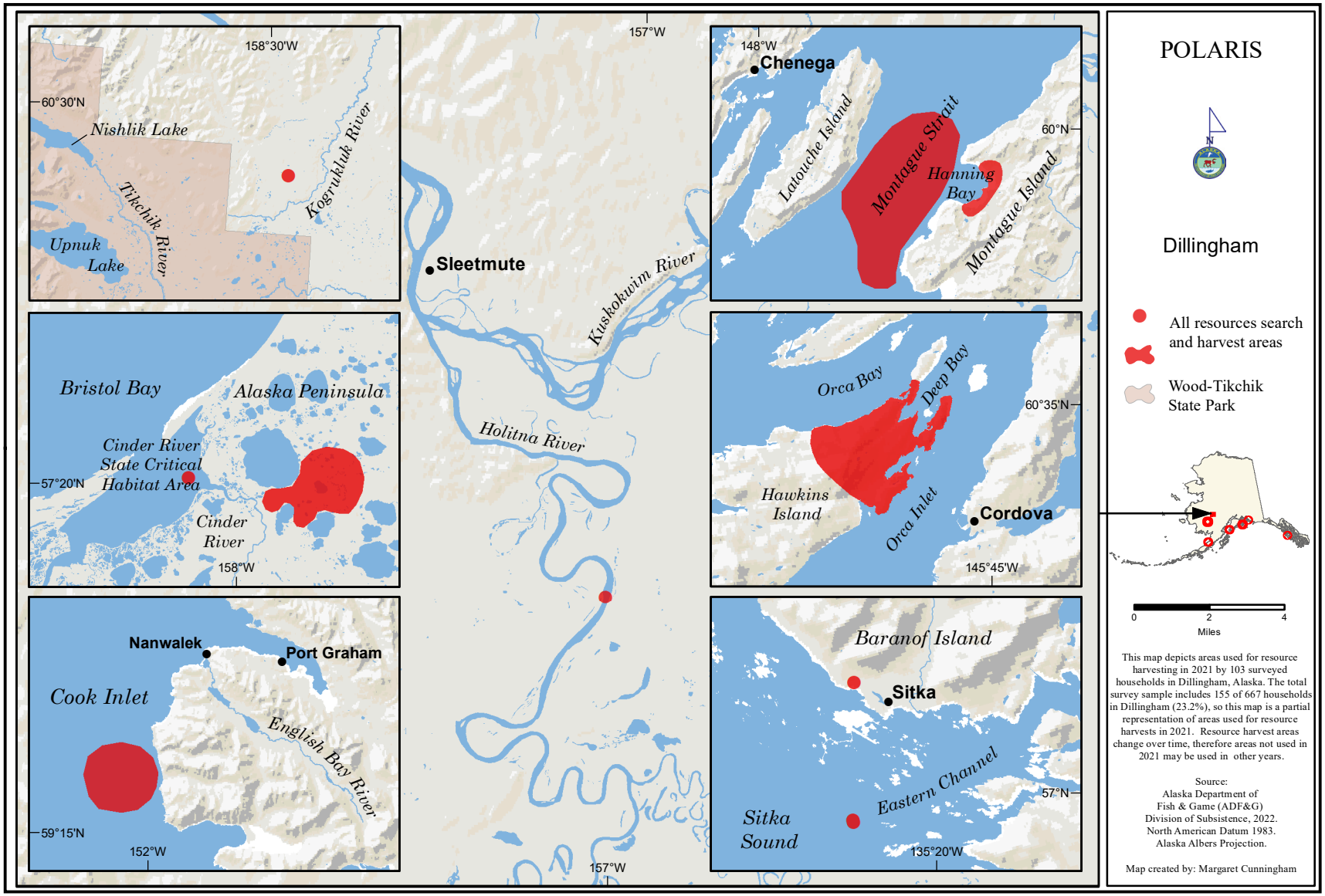


Figure 2-2.–Wild resources search and harvest areas (statewide), Dillingham, 2021.

coho salmon. Some Dillingham residents commercial fish during the salmon runs and remove salmon from their commercial harvest for home use to obtain sufficient amounts for their households.[11] Many residents also fish for salmon in the Wood River just northeast of the community with rod and reel gear, as well as in Lake Aleknagik, during mid- to late summer.

Harvesting vegetation, particularly berries in the summer and early fall, is an important activity for Dillingham residents. Berries begin to ripen in late July. Cloudberries (locally known as salmonberries) are often the first of the summer berries to become abundant. Many Dillingham households pick salmonberries, huckleberries, crowberries (known locally as blackberries), blueberries, and lowbush cranberries.

In the fall, hunting for large land mammals and upland game bird species such as ptarmigan and grouse begins in mid-August and extends into the winter. Often, upland game birds are opportunistically harvested during large land mammal hunting trips. Overlap in harvest activities occurs during moose hunting season on the Nushagak River, when hunters also use rod and reel to catch coho salmon for camp meals. Migratory birds are also hunted to supplement moose camp provisions. Large amounts of lowbush cranberries may be picked during this time. In late September and October, spawning sockeye salmon, or "spawnouts," are harvested in Lake Aleknagik and other surrounding lakes. Also, throughout September and October, Dillingham residents set gillnets at Dillingham beaches and use dip nets in Amau Creek for rainbow smelt.

In the winter, typically throughout January and February, short days and colder temperatures limit the extent of resource harvest activities. Residents take advantage of snow conditions to harvest firewood, which, especially due to high heating fuel costs, has become more commonly used in recent years for heating homes. By the end of March, long days and warming weather conditions provide opportunity for jigging through the ice for nonsalmon fish such as northern pike, Arctic char, rainbow trout, Arctic grayling, and rainbow smelt. A new annual cycle begins with the arrival of spring once again.

Population Estimates and Demographic Information

This study found an estimated population for Dillingham in 2021 of 1,915 individuals in 667 households (Table 2-1). This is less than the 2020 U.S. Census Bureau count of 2,249 individuals in 821 households, but closer to the American Community Survey (ACS) five-year (2017–2021) average estimate of 2,133 individuals in 707 households (Figure 2-3). This study estimated that approximately 65% of the population of Dillingham self-identified as Alaska Native, which is slightly less than the 67% identified by the 2020 census and 70% estimated average by the ACS. Reasons these estimates differ may relate to different criteria used by the agencies to determine full-time residency. The criteria employed in this study required occupancy in the community during the entire study year and self-identification as a full-time resident.

The overall population of Dillingham has increased over time (Figure 2-4). As the fishing industry grew and regional infrastructure developed, the community experienced steady growth from a population of approximately 900 in 1970 to approximately 1,500 in 1980. The population increased again by approximately 500 people in the next decade, to 2,017 residents in 1990, followed by the population reaching its peak at 2,466 residents in 2000. Population estimates began to decrease slightly following the 2000 federal census; in 2010 the population was 2,329 according to the census. This study's estimate of 1,915 Dillingham residents in 2021 is closer to the census from 1990. The overall population trend is also reflected by the enrollment of students in the public Dillingham City School District. The enrollment for K–12 students steadily decreased from 567 students in the 2000–2001 school year to 424 students in 2021–2022, or a 25% reduction in enrollment.[12]

11. According to 5 AAC 39.010, a person who is commercial fishing may retain salmon taken from a commercial catch for personal use.

12. Data Center, s.v. "Statistics and Reports; Enrollment Totals (as of October 1 of each year); District Enrollment Totals for all Alaska Public School Districts; Select Year [2000-2001 or 2021-2022]" (by Alaska Department of Education and Early Development). Accessed July 19, 2023. https://education.alaska.gov/data-center

Table 2-1.–Population estimates, Dillingham, 2010 and 2021.

	Census (2020)	5-year American Community Survey (2017–2021)		This study (2021)	
		Estimate	Range[a]	Estimate	Range[b]
Total population					
Households	821	707.0	617 – 797	667.0	
Population	2,249	2,133.0	1,950 – 2,316	1,914.9	1,753 – 2,076
Alaska Native					
Population	1,514	1,494.0	1,352 – 1,636	1,242.1	1,115 – 1,369
Percentage	67.3%	70.0%	63.4% – 76.7%	64.9%	58.2% – 71.5%

Sources U.S. Census Bureau (n.d.) for 2020 decennial census data and for American Community Survey (ACS) five-year average estimates for 2017–2021; ADF&G Division of Subsistence household surveys, 2022, for 2021 estimates.

Note Division of Subsistence household survey eligibility requirements differ from those used by ACS.

a. ACS data range is the reported margin of error.

b. No range of households is estimated for division surveys.

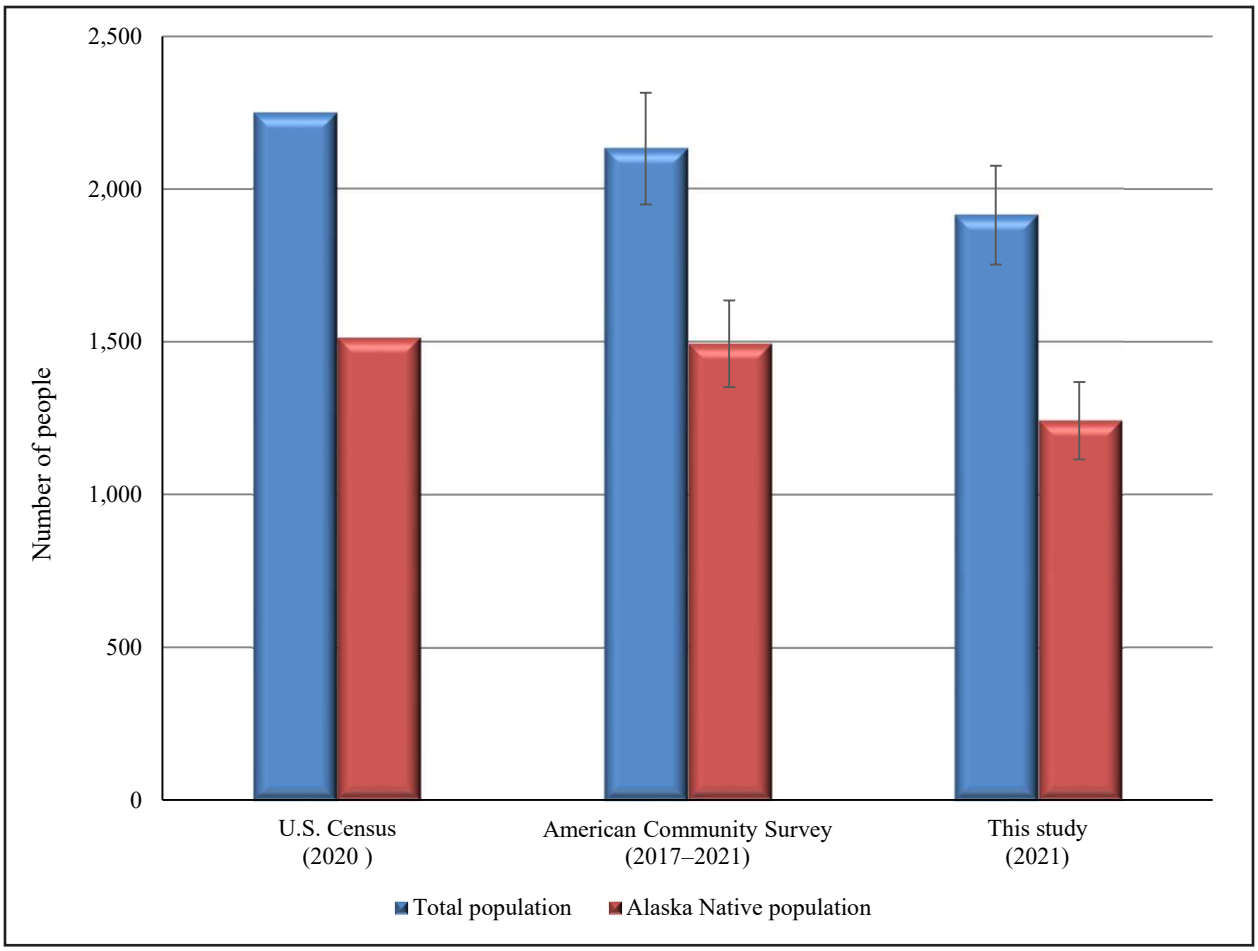


Figure 2-3.–Alaska Native and overall population estimates, Dillingham, 2010 and 2021.

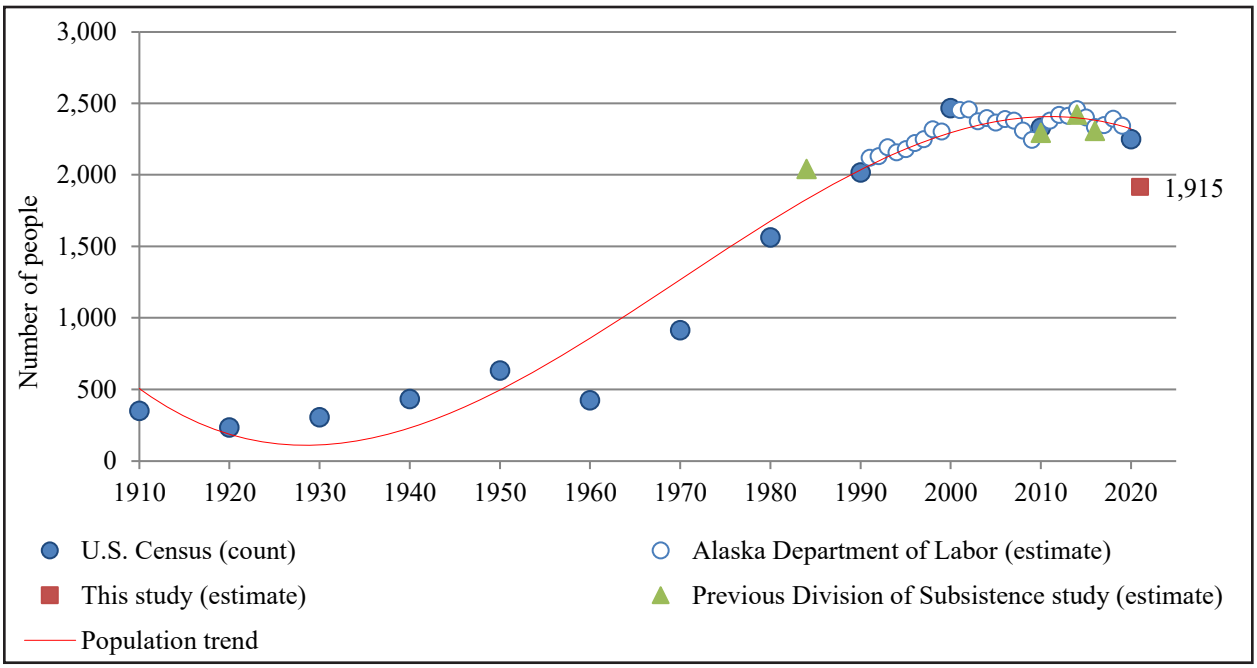


Figure 2-4.–Historical population estimates, Dillingham, 1910–2021.

The 2021 study estimated the average age of Dillingham residents to be 36 years old with the youngest individual being less than 1 year old and the oldest individual being 86 years old (Table 2-2). In Dillingham, the ratio of females (1,011) to males (904) was relatively even, as was the age distribution of Dillingham residents (Table 2-3; Figure 2-5). The population can be characterized by strong representations of both female and male cohorts between the age ranges of 5–9 and 10–14 and also in the 55–59 and 60–64 age ranges. Conversely, there were seven age cohorts for which the ratio of females versus males was unevenly distributed by a difference of 17 or more people.

The survey estimated 31% of household heads' parents were living in Dillingham at the time of their birth, and 50% of Dillingham's total population had parents living in Dillingham when they were born (Table 2-4; Table 2-5). This indicates that during the past several decades, a portion of people born in Dillingham have chosen to remain in the community to raise their own families. Further, considering a higher proportion (36%) of household heads were born in another state compared to the total population (25%), this likely also demonstrates that during recent periods of community growth, household heads migrated to Dillingham after being born in another state. Other common birthplaces for the total population included Togiak (4%) and Anchorage (3%).

Of the 667 eligible households identified in Dillingham, this study surveyed 155 households, representing 23% of total households (Table 2-2). The mean household size was three individuals, with a minimum of one individual and a maximum of eight individuals residing in a household. The mean length of residency was 23 years for the general population, and 54 years for household heads. The longest duration of residency for the total population was 86 years as of the 2021 study year.

Income and Cash Employment

In 2021, the mean household earned income in Dillingham was $108,289 (Table 2-6). Earned income represented about 83% of the overall community income, and other sources of income represented the remaining 17% of community income. Other income included sources such as dividends from the Alaska Permanent Fund or Alaska Native corporations, rental income, child support, and unemployment, among others. Approximately 663 households received a form of other income, with the mean household other income totaling $22,772. The estimated total mean household income, including both earned and other

Table 2-2.–Sample and demographic characteristics, Dillingham, 2021.

Characteristics	Community Dillingham
Sampled households	155
Eligible households	667
Percentage sampled	23.2%
Sampled population	445
Estimated community population	1,914.9
Household size	
Mean	2.9
Minimum	1
Maximum	8
Age	
Mean	35.9
Minimum[a]	0
Maximum	86
Median	35
Length of residency	
Total population	
Mean	22.8
Minimum	1
Maximum	87
Heads of household	
Mean	53.9
Minimum	1
Maximum	86
Alaska Native	
Estimated households[b]	
Number	434.6
Percentage	65.2%
Estimated population	
Number	1,242.1
Percentage	64.9%

Source ADF&G Division of Subsistence household surveys, 2022.

a. A minimum age of 0 (zero) is used for infants who are less than 1 year of age.

b. The estimated number of households in which at least one head of household is Alaska Native.

Table 2-3.–Population profile, Dillingham, 2021.

	Male			Female			Total		
Age	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage	Number	Percentage	Cumulative percentage
0–4	25.8	2.9%	2.9%	73.2	7.2%	7.2%	99.0	5.2%	5.2%
5–9	99.0	11.0%	13.8%	86.1	8.5%	15.7%	185.0	9.7%	14.8%
10–14	107.6	11.9%	25.7%	103.3	10.2%	26.0%	210.9	11.0%	25.8%
15–19	60.2	6.7%	32.4%	73.2	7.2%	33.2%	133.4	7.0%	32.8%
20–24	51.6	5.7%	38.1%	21.5	2.1%	35.3%	73.2	3.8%	36.6%
25–29	51.6	5.7%	43.8%	81.8	8.1%	43.4%	133.4	7.0%	43.6%
30–34	47.3	5.2%	49.0%	64.5	6.4%	49.8%	111.9	5.8%	49.4%
35–39	73.2	8.1%	57.1%	60.2	6.0%	55.7%	133.4	7.0%	56.4%
40–44	47.3	5.2%	62.4%	73.2	7.2%	63.0%	120.5	6.3%	62.7%
45–49	51.6	5.7%	68.1%	47.3	4.7%	67.7%	99.0	5.2%	67.9%
50–54	30.1	3.3%	71.4%	47.3	4.7%	72.3%	77.5	4.0%	71.9%
55–59	77.5	8.6%	80.0%	68.9	6.8%	79.1%	146.3	7.6%	79.6%
60–64	68.9	7.6%	87.6%	55.9	5.5%	84.7%	124.8	6.5%	86.1%
65–69	43.0	4.8%	92.4%	68.9	6.8%	91.5%	111.9	5.8%	91.9%
70–74	30.1	3.3%	95.7%	38.7	3.8%	95.3%	68.9	3.6%	95.5%
75–79	8.6	1.0%	96.7%	12.9	1.3%	96.6%	21.5	1.1%	96.6%
80–84	8.6	1.0%	97.6%	17.2	1.7%	98.3%	25.8	1.3%	98.0%
85–89	17.2	1.9%	99.5%	8.6	0.9%	99.1%	25.8	1.3%	99.3%
90–94	0.0	0.0%	99.5%	0.0	0.0%	99.1%	0.0	0.0%	99.3%
95–99	0.0	0.0%	99.5%	0.0	0.0%	99.1%	0.0	0.0%	99.3%
100–104	0.0	0.0%	99.5%	0.0	0.0%	99.1%	0.0	0.0%	99.3%
Missing	4.3	0.5%	100.0%	8.6	0.9%	100.0%	12.9	0.7%	100.0%
Total	**903.7**	**100.0%**	**100.0%**	**1,011.3**	**100.0%**	**100.0%**	**1,914.9**	**100.0%**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2022.

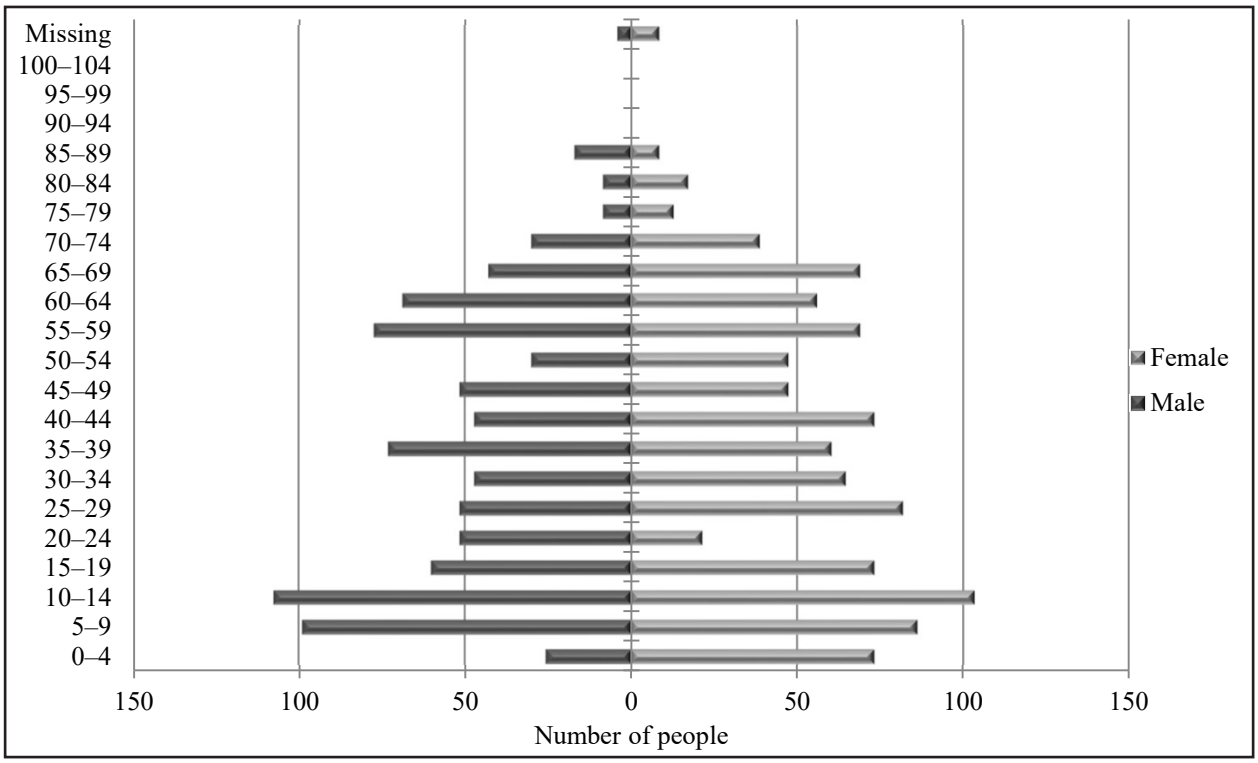


Figure 2-5.–Population profile, Dillingham, 2021.

Table 2-4.–Birthplaces of household heads, Dillingham, 2021.

Birthplace	Percentage
Akiachak	0.4%
Aleknagik	0.4%
Anchorage	2.4%
Utqiagvik (Barrow)	0.8%
Bethel	0.8%
Clarks Point	3.2%
Cordova	0.4%
Dillingham	31.3%
Ekwok	0.8%
Goodnews Bay	0.4%
Iliamna	0.4%
Juneau	0.4%
Kokhanok	0.4%
Koliganek	1.2%
Manokotak	2.0%
Naknek	0.8%
Nelson Lagoon	0.4%
New Stuyahok	2.8%
Nome	0.4%
Palmer	0.4%
Pilot Point	0.4%
Platinum	0.4%
Portage Creek	0.4%
Soldotna	0.4%
South Naknek	0.4%
Togiak	2.4%
Wasilla	0.4%
Nushagak	1.6%
Ekuk	1.2%
Igushik	0.4%
Mulchatna/Tikchik River	0.4%
Douglas	0.4%
Other Alaska	0.4%
Other U.S.	36.1%
Foreign	4.0%
Outside Alaska	0.4%

Source ADF&G Division of Subsistence household surveys, 2022.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table 2-5.–Birthplaces of population, Dillingham, 2021.

Birthplace	Percentage
Akiachak	0.2%
Aleknagik	0.2%
Allakaket/Alatna	0.4%
Anchorage	2.7%
Utqiagvik (Barrow)	0.4%
Bethel	0.4%
Clarks Point	2.0%
Cordova	0.2%
Dillingham	49.7%
Ekwok	0.4%
Goodnews Bay	0.2%
Iliamna	0.2%
Juneau	0.4%
Kokhanok	1.3%
Koliganek	1.3%
Manokotak	1.3%
Naknek	0.4%
Nelson Lagoon	0.2%
New Stuyahok	1.6%
Nome	0.2%
Palmer	0.7%
Pilot Point	0.2%
Platinum	0.2%
Portage Creek	0.2%
Soldotna	0.2%
South Naknek	0.2%
Togiak	3.6%
Wasilla	0.2%
Nushagak	0.9%
Ekuk	0.9%
Igushik	0.2%
Mulchatna/Tikchik River	0.2%
Douglas	0.2%
Other Alaska	0.2%
Other U.S.	24.7%
Foreign	2.2%
Outside Alaska	0.2%
Missing	0.2%

Source ADF&G Division of Subsistence household surveys, 2022.
Note "Birthplace" means the place of residence of the parents of the individual when the individual was born.

Table 2-6.–Estimated earned and other income, Dillingham, 2021.

Income source	Number of employed adults	Number of households	Total for community	-/+ 95% CI	Mean per household	Percentage of total community income
Earned income						
Services	470.0	383.7	$25,872,681	$20,967,364 – $32,131,587	$38,790	29.6%
Agriculture, forestry, and fishing	379.2	258.5	$13,527,020	$9,214,895 – $18,328,136	$20,280	15.5%
Local government, including tribal	201.6	175.4	$10,245,848	$7,321,710 – $13,961,030	$15,361	11.7%
Transportation, communication, and utilities	103.4	94.8	$6,676,239	$3,616,717 – $12,330,036	$10,009	7.6%
Industry not specified	130.0	94.8	$5,695,218	$3,312,360 – $8,846,053	$8,539	6.5%
State government	51.6	51.6	$3,102,572	$1,568,369 – $5,020,516	$4,652	3.5%
Federal government	34.2	30.0	$2,793,776	$759,045 – $5,489,284	$4,189	3.2%
Construction	47.7	38.8	$2,753,784	$859,856 – $6,609,518	$4,129	3.2%
Retail trade	81.6	68.6	$1,512,354	$549,763 – $2,672,489	$2,267	1.7%
Manufacturing	21.4	21.4	$49,364	$2,953 – $162,950	$74	0.1%
Earned income subtotal	**1,216.1**	**607.0**	**$72,228,854**	**$64,254,405 – $83,111,318**	**$108,289**	**82.6%**
Other income						
Pension/retirement		119.5	$3,165,183	$1,805,012 – $4,802,400	$4,745	3.6%
Social Security		167.5	$2,103,241	$1,417,193 – $3,085,460	$3,153	2.4%
Alaska Permanent Fund dividend		619.8	$1,952,202	$1,751,490 – $2,170,880	$2,927	2.2%
Rental income		82.0	$1,446,863	$527,061 – $3,325,986	$2,169	1.7%
Other		176.3	$1,330,713	$724,123 – $2,524,248	$1,995	1.5%
Native corp. dividend		426.2	$1,232,283	$936,090 – $1,607,254	$1,848	1.4%
Economic impact payment (stimulus check)		559.6	$1,167,347	$972,949 – $1,401,530	$1,750	1.3%
Energy assistance		391.5	$721,099	$611,792 – $830,971	$1,081	0.8%
Disability		29.9	$291,298	$16,253 – $688,941	$437	0.3%
Meeting honoraria		25.9	$267,364	$4,331 – $804,847	$401	0.3%
Child support		51.9	$266,722	$102,960 – $575,122	$400	0.3%
Food Stamps		94.5	$254,997	$114,576 – $486,166	$382	0.3%
Unemployment		42.7	$204,670	$19,000 – $479,692	$307	0.2%
Adult Public Assistance (OAA, APD)		26.0	$165,689	$2,727 – $633,426	$248	0.2%
Workers' compensation/insurance		21.7	$140,208	$17,526 – $667,000	$210	0.2%
Equipment leasing		21.8	$131,892	$17,442 – $854,458	$198	0.2%
Veterans assistance		21.7	$91,299	$19,139 – $419,636	$137	0.1%
Foster care		26.1	$70,652	$16,063 – $259,589	$106	0.1%
Supplemental Security Income (SSI)		21.8	$60,835	$2,447 – $290,973	$91	0.1%
Fishing permit revenues		21.8	$58,686	$15,269 – $268,842	$88	0.1%
Dividend/interest		21.4	$25,743	$14,411 – $108,987	$39	0.0%
Women, Infants, and Children (WIC)		21.4	$15,410	$4,320 – $32,934	$23	0.0%
Fuel vouchers		21.5	$13,334	$7,094 – $35,573	$20	0.0%
Longevity bonus		25.9	$7,948	$2,194 – $20,010	$12	0.0%
TANF (Temporary Assist. for Needy Families)		17.3	$3,088	$657 – $9,877	$5	0.0%
Other income subtotal		**662.8**	**$15,188,764**	**$12,839,304 – $17,839,971**	**$22,772**	**17.4%**
Community income total			**$87,417,618**	**$79,185,759 – $98,135,754**	**$131,061**	**100.0%**

Source ADF&G Division of Subsistence household surveys, 2022.

Table 2-7.–Comparison of household median income estimates, Dillingham, 2021.

Data source	Median[a]	Range[b,c]
2021 Division of Subsistence estimate	$101,000	$83,692 – $123,667
2017–2021 ACS (Dillingham)	$82,604	$73,805 - $91,406
2017–2021 ACS (All Alaska)	$80,287	$79,174 - $81,400

Sources ADF&G Division of Subsistence household surveys, 2022, for 2021 estimate; U.S. Census Bureau for American Community Survey (ACS) five-year average estimates for 2017–2021.

a. Division of Subsistence 2021 estimate does not include categories of income excluded by the 2017–2021 ACS median estimate, including food stamps, housing assistance, and one-time payments.

b. Range is a 95% confidence interval of the estimated median.

c. ACS data range is the reported margin of error.

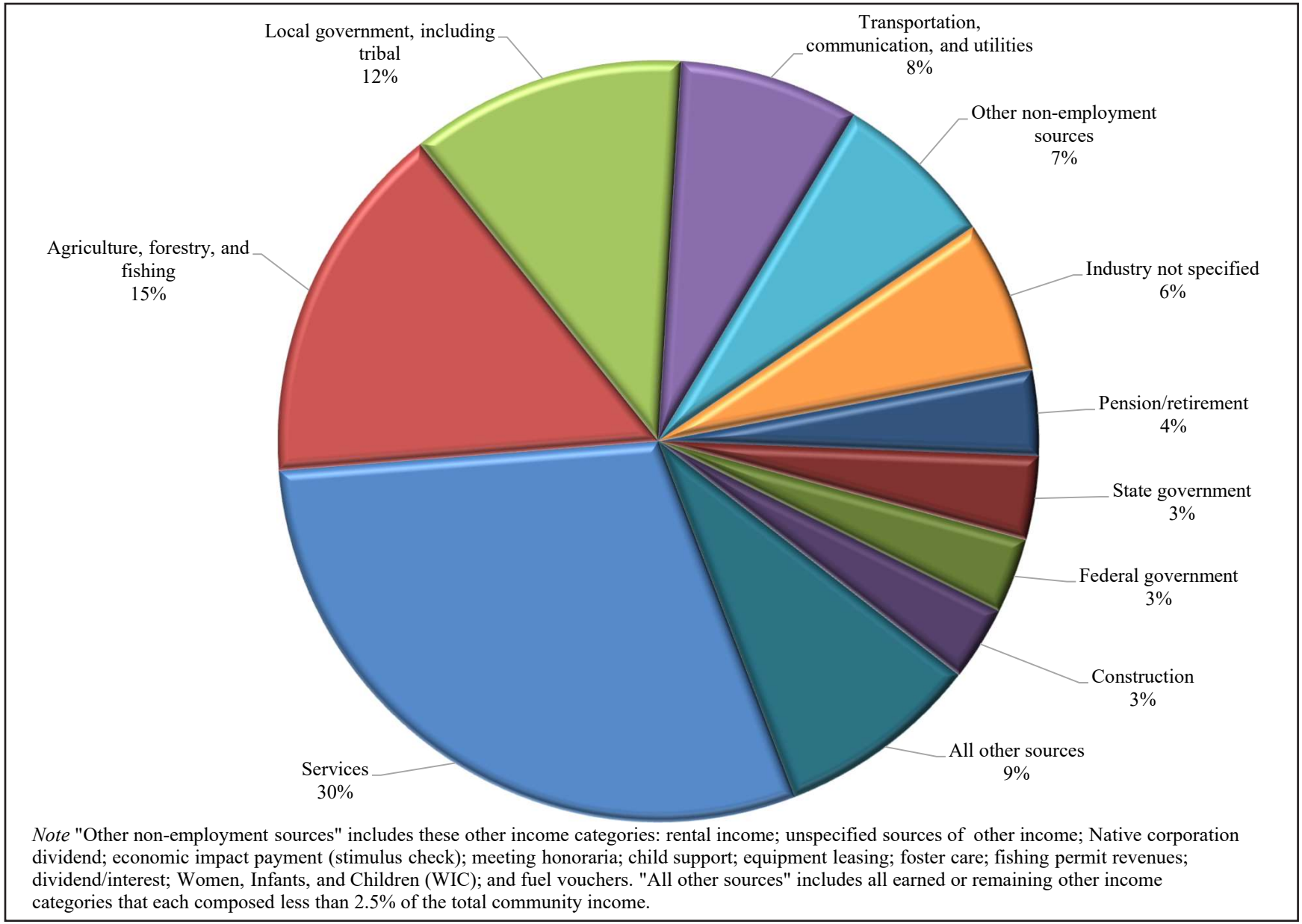
income, was $131,061. The per capita income in 2021 in Dillingham was $45,650 (Table 1-5). The estimated median income for Dillingham households was $101,000 based on household surveys, which is higher than both the ACS 2017–2021 average median income estimate of $82,604 for Dillingham households and the 2017–2021 average median household income for the state of Alaska as a whole ($80,287) (Table 2-7).

Nearly one-third (30%) of total community income came from wages in the services sector; the agriculture, forestry, and fishing (primarily commercial fishing) industry contributed the next highest proportion (15%) (Figure 2-6). Local government, including tribal, contributed 12% to the total income, and state and federal government both contributed much less by comparison: just 3% each. Transportation, communication, and utilities-related jobs contributed 8% and construction jobs contributed 3% to the total income. Pension/ retirement was the highest contributing source of other income, which totaled 4% of total community income. Smaller amounts of earned income and other non-employment sources combined made up the remaining 22% of the total community income (Table 2-6).

Overall, service jobs contributed the largest percentage (32%) of jobs for the community of Dillingham, and these jobs employed 63% of employed households in 2021 (Table 2-8). Executive, administrative, and managerial occupations composed the greatest percentage of wage earnings within this category (7% of overall jobs in the community and these jobs employed 16% of households). Agriculture, forestry, and fishing (primarily commercial fishing) represented 24% of jobs for the community of Dillingham, and these jobs employed 43% of employed households during the study year. Local government, including tribal, contributed the third largest percentage of jobs (14%) for the community of Dillingham, and these jobs employed 29% of households during the study year.

Within the other income category, pensions or retirement made up the greatest percentage of the total community income (4%), followed by Social Security (2%), Alaska Permanent Fund dividends (2%), rental income (2%), and the remaining types of other income sources each contributed 1.5% or less to total community income (Table 2-6).

In 2021, there were approximately 1,216 employed adults (working age 16 and older) in Dillingham, representing 89% of all adults, and 91% of households had at least one employed household member (Table 2-9). There were approximately 1,581 jobs worked by Dillingham residents during the study year. Employed adults in Dillingham worked an average of 10 months. The maximum number of jobs held by employed adults was four. In 2021, out of 1,216 employed adults, 771 individuals (63% of employed adults) worked full-time schedules, 12% worked part time, and 35% worked on-call (occasional) schedules (Table 2-10).



Note "Other non-employment sources" includes these other income categories: rental income; unspecified sources of other income; Native corporation dividend; economic impact payment (stimulus check); meeting honoraria; child support; equipment leasing; foster care; fishing permit revenues; dividend/interest; Women, Infants, and Children (WIC); and fuel vouchers. "All other sources" includes all earned or remaining other income categories that each composed less than 2.5% of the total community income.

Figure 2-6.–Top income sources, Dillingham, 2021.

Table 2-8.–Employment by industry, Dillingham, 2021.

Industry	Jobs	Employed households	Employed individuals	Percentage of wage earnings
Estimated total number	**1,581.4**	**607.0**	**1,216.1**	
Federal government	**2.2%**	**4.9%**	**2.8%**	**3.9%**
Executive, administrative, and managerial	0.3%	0.7%	0.3%	0.8%
Natural scientists and mathematicians	0.3%	0.7%	0.4%	0.4%
Social scientists, social workers, religious workers, and lawyers	0.3%	0.7%	0.3%	0.2%
Technologists and technicians, except health	0.3%	0.7%	0.4%	0.1%
Administrative support occupations, including clerical	0.3%	0.7%	0.3%	0.4%
Service occupations	0.3%	0.7%	0.4%	0.5%
Transportation and material moving occupations	0.3%	0.7%	0.3%	0.8%
Occupation not specified	0.3%	0.7%	0.4%	0.6%
State government	**3.3%**	**8.5%**	**4.2%**	**4.3%**
Executive, administrative, and managerial	0.5%	1.4%	0.7%	0.5%
Natural scientists and mathematicians	0.3%	0.7%	0.4%	0.7%
Teachers, librarians, and counselors	0.3%	0.7%	0.3%	0.3%
Registered nurses, pharmacists, dietitians, therapists, and physicians	0.3%	0.7%	0.4%	0.4%
Administrative support occupations, including clerical	1.1%	2.8%	1.4%	1.1%
Service occupations	0.3%	0.7%	0.4%	0.4%
Construction and extractive occupations	0.3%	0.7%	0.4%	0.5%
Occupation not specified	0.3%	0.7%	0.3%	0.4%
Local government, including tribal	**14.1%**	**28.9%**	**16.6%**	**14.2%**
Executive, administrative, and managerial	1.9%	5.0%	2.5%	2.9%
Teachers, librarians, and counselors	4.9%	11.3%	6.4%	5.3%
Writers, artists, entertainers, and athletes	1.1%	2.9%	1.4%	0.1%
Technologists and technicians, except health	0.3%	0.7%	0.4%	0.4%
Administrative support occupations, including clerical	2.7%	7.1%	3.5%	3.1%
Service occupations	1.1%	2.9%	1.4%	1.2%
Transportation and material moving occupations	0.5%	1.4%	0.7%	0.5%
Handlers, equipment cleaners, helpers, and laborers	0.8%	2.1%	1.0%	0.2%
Occupation not specified	0.8%	2.1%	1.1%	0.6%
Agriculture, forestry, and fishing	**24.3%**	**42.6%**	**31.2%**	**18.7%**
Executive, administrative, and managerial	0.3%	0.7%	0.3%	0.8%
Agricultural, forestry, and fishing occupations	23.7%	41.9%	30.5%	17.8%
Transportation and material moving occupations	0.3%	0.7%	0.4%	0.1%
Construction	**3.0%**	**6.4%**	**3.9%**	**3.8%**
Executive, administrative, and managerial	0.3%	0.7%	0.4%	0.7%
Construction and extractive occupations	1.9%	4.2%	2.5%	2.2%
Transportation and material moving occupations	0.5%	1.4%	0.7%	0.3%
Handlers, equipment cleaners, helpers, and laborers	0.3%	0.7%	0.4%	0.7%
Manufacturing	**1.4%**	**3.5%**	**1.8%**	**0.1%**
Writers, artists, entertainers, and athletes	1.1%	2.8%	1.4%	0.0%
Precision production occupations	0.3%	0.7%	0.4%	0.1%
Transportation, communication, and utilities	**6.8%**	**15.6%**	**8.5%**	**9.2%**
Executive, administrative, and managerial	0.5%	1.4%	0.7%	1.0%
Technologists and technicians, except health	0.8%	2.2%	1.1%	0.9%
Administrative support occupations, including clerical	0.5%	1.4%	0.7%	0.8%
Mechanics and repairers	0.5%	1.4%	0.7%	0.9%
Construction and extractive occupations	0.3%	0.8%	0.4%	0.4%
Precision production occupations	0.6%	1.4%	0.7%	1.1%
Transportation and material moving occupations	3.5%	7.0%	4.2%	4.1%

-continued-

Table 2-8.–Page 2 of 2.

Industry	Jobs	Employed households	Employed individuals	Percentage of wage earnings
Retail trade	**5.2%**	**11.3%**	**6.7%**	**2.1%**
Executive, administrative, and managerial	1.1%	2.8%	1.4%	0.6%
Marketing and sales occupations	2.2%	5.7%	2.8%	0.8%
Service occupations	1.4%	3.6%	1.8%	0.2%
Mechanics and repairers	0.3%	0.7%	0.4%	0.3%
Handlers, equipment cleaners, helpers, and laborers	0.3%	0.7%	0.4%	0.1%
Services	**31.6%**	**63.2%**	**38.6%**	**35.8%**
Executive, administrative, and managerial	7.1%	15.6%	9.2%	10.3%
Social scientists, social workers, religious workers, and lawyers	1.9%	4.9%	2.5%	1.8%
Teachers, librarians, and counselors	1.3%	3.5%	1.7%	1.5%
Health diagnosing and treating practitioners	0.3%	0.7%	0.3%	0.5%
Registered nurses, pharmacists, dietitians, therapists, and physicians	3.0%	7.2%	3.9%	6.0%
Health technologists and technician	1.6%	4.3%	2.1%	1.8%
Technologists and technicians, except health	0.3%	0.7%	0.4%	0.5%
Administrative support occupations, including clerical	6.3%	15.0%	8.2%	7.3%
Service occupations	5.2%	12.8%	6.4%	2.0%
Agricultural, forestry, and fishing occupations	0.5%	1.4%	0.7%	0.3%
Mechanics and repairers	1.4%	3.5%	1.8%	1.7%
Construction and extractive occupations	0.5%	1.4%	0.7%	0.4%
Transportation and material moving occupations	0.5%	1.4%	0.7%	0.5%
Handlers, equipment cleaners, helpers, and laborers	0.8%	2.1%	1.0%	0.4%
Occupation not specified	0.8%	2.1%	1.1%	0.7%
Industry not specified	**8.2%**	**15.6%**	**10.7%**	**7.9%**
Executive, administrative, and managerial	0.3%	0.7%	0.4%	0.3%
Occupation not specified	7.9%	14.9%	10.3%	7.6%

Source ADF&G Division of Subsistence household surveys, 2022.

Table 2-9.–Employment characteristics, Dillingham, 2021.

Characteristic	Community Dillingham
All adults	
Number	1,360.4
Mean weeks employed	39.4
Employed adults	
Number	1,216.1
Percentage	89.4%
Jobs	
Number	1,581.4
Mean	1.3
Minimum	1
Maximum	4
Months employed	
Mean	10.2
Minimum	1
Maximum	12
Percentage employed year-round	54.2%
Mean weeks employed	44.1
Households	
Number	667.0
Employed	
Number	607.0
Percentage	91.0%
Jobs per employed household	
Mean	2.6
Minimum	1
Maximum	7
Employed adults	
Mean	
Employed households	2.0
Total households	1.8
Minimum	1
Maximum	5
Mean person-weeks of employment	88.3

Source ADF&G Division of Subsistence household surveys, 2022.

Table 2-10.–Job schedules, Dillingham, 2021.

	Jobs		Employed adults		Employed households	
Schedule	Number	Percentage	Number	Percentage	Number	Percentage
Full time	801.3	50.7%	771.0	63.4%	503.9	83.0%
Part time	150.3	9.5%	141.5	11.6%	115.9	19.1%
Shift - full time	10.0	0.6%	10.0	0.8%	10.0	1.7%
On-call, varies	477.9	30.2%	422.4	34.7%	284.3	46.8%
Schedule not reported	143.1	9.0%	143.1	11.8%	107.8	17.8%

Source ADF&G Division of Subsistence household surveys, 2022.

Note Respondents who had more than one job in the study year could provide multiple responses, so the percentages may sum to more than 100%.

Food Security

Survey respondents were asked a set of questions intended to assess their household's food security, defined as, "access by all people at all times to enough food for an active, healthy life" (Coleman-Jensen et al. 2020). The food security questions were modeled after those developed by the U.S. Department of Agriculture (USDA) but modified by ADF&G to account for differences in access to subsistence and store-bought foods. Based on their responses to these questions, households were broadly categorized as being food secure or food insecure following a USDA protocol (Bickel et al. 2000). Food secure households were broken down further into two subcategories—high or marginal food security. Food insecure households were divided into two subcategories—low food security or very low food security.

Households in the high food security category did not report any food access problems or limitations. Households in the marginal food security category reported one or two instances of food access problems or limitations—typically anxiety over food sufficiency or a shortage of particular foods in the house—but gave little or no indication of changes in diets or food intake. Households in the low food security category reported reduced quality, variety, or desirability of their diet, but they, too, gave little indication of reduced food intake. Households classified as having very low food security were those that reported multiple instances of disrupted eating patterns and reduced food intake (Coleman-Jensen et al. 2020).

Table 2-11 shows by percentage of sampled Dillingham households the assessments results regarding eating desired types of food during the study year. According to study results, 63% of households had enough of the kinds of food desired; 35% had enough food, but not the desired kinds; and 1% sometimes, or often, did not have enough food. Core questions and responses from Dillingham households who responded that they did not have enough of the kinds of food they wanted to eat are summarized in Figure 2-7. For this study, additional questions asked were designed to determine whether food insecurities, if any, were related to subsistence foods or store-bought foods. Based on responses from the surveyed households, an estimated 14% of Dillingham households said that their subsistence foods did not last, and 13% of households said that their store-bought foods did not last during the study year.

In 2021, 19% of households lacked resources to get food. Of the households that stated lack of resources was the reason they could not get food, researchers noted that many survey respondents indicated this was a result of not being able to purchase what they wanted at the store because the store was not consistently fully stocked with groceries during the study year. An estimated 6% of Dillingham households worried about having enough food and 6% of households indicated that their food did not last and that they could not get more. According to survey respondents, some Dillingham households experienced more serious food insecure conditions: 3% had cut the size of meals or skipped meals, 4% indicated that they ate less than they felt they should, less than 1% of households said its members were hungry but did not eat, and less than 1% of households reported weight loss due to a lack of food; however, no respondents reported that members of the household did not eat for a whole day.

Food security results for Dillingham, the state of Alaska, and the United States are summarized in Figure 2-8. Overall, 95% of Dillingham households fell in the high or marginal food secure subcategories. This is 8%–9% higher than the state and national averages of 87% and 86%, respectively, suggesting greater levels of food security in Dillingham than in the state as a whole or on the national level. In 2021, 4% of Dillingham households experienced low food security and 1% experienced very low food security. These percentages are lower than the state and national averages.

Table 2-11.–Household's assessments of food security conditions, Dillingham, 2021.

Statement	Percentage of households
Had enough of the kinds of food desired	62.6%
Had enough food, but not the desired kind	34.8%
Somestimes, or often, did not have enough food	1.3%
Missing/no response	1.3%

Source ADF&G Division of Subsistence household surveys, 2022.

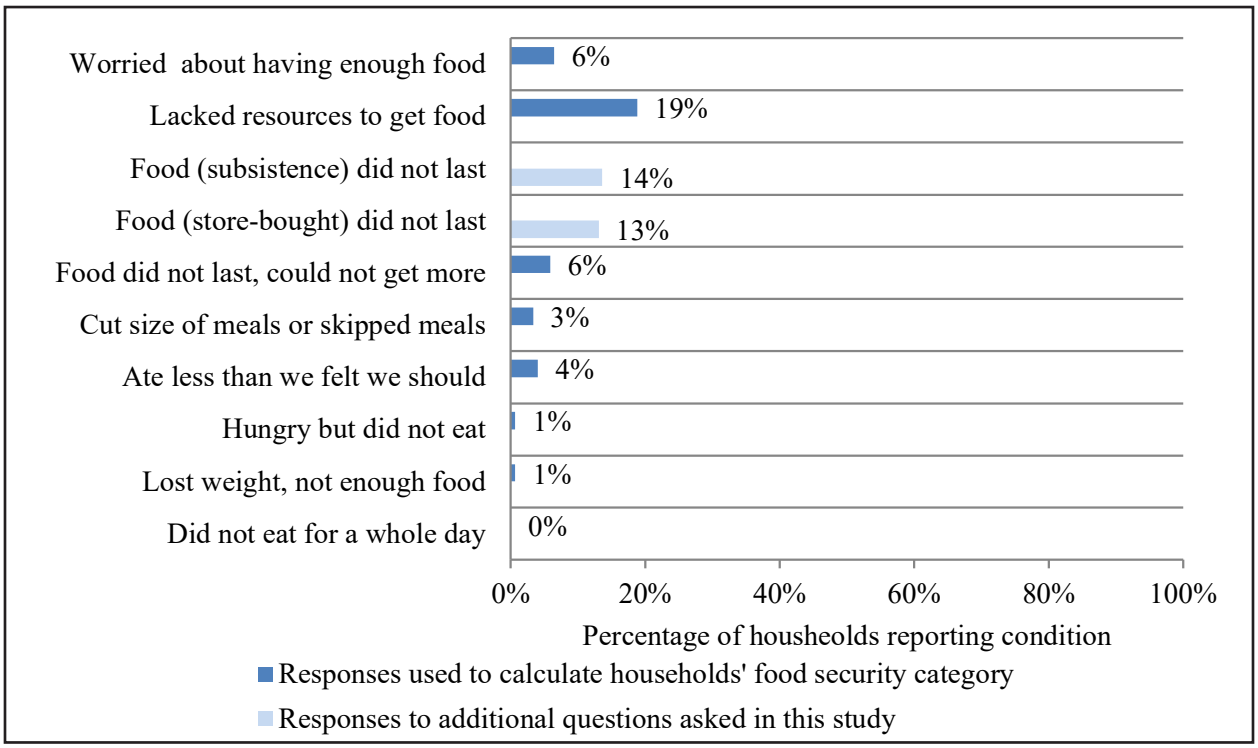


Figure 2-7.–Responses to questions about food insecure conditions, Dillingham, 2021.

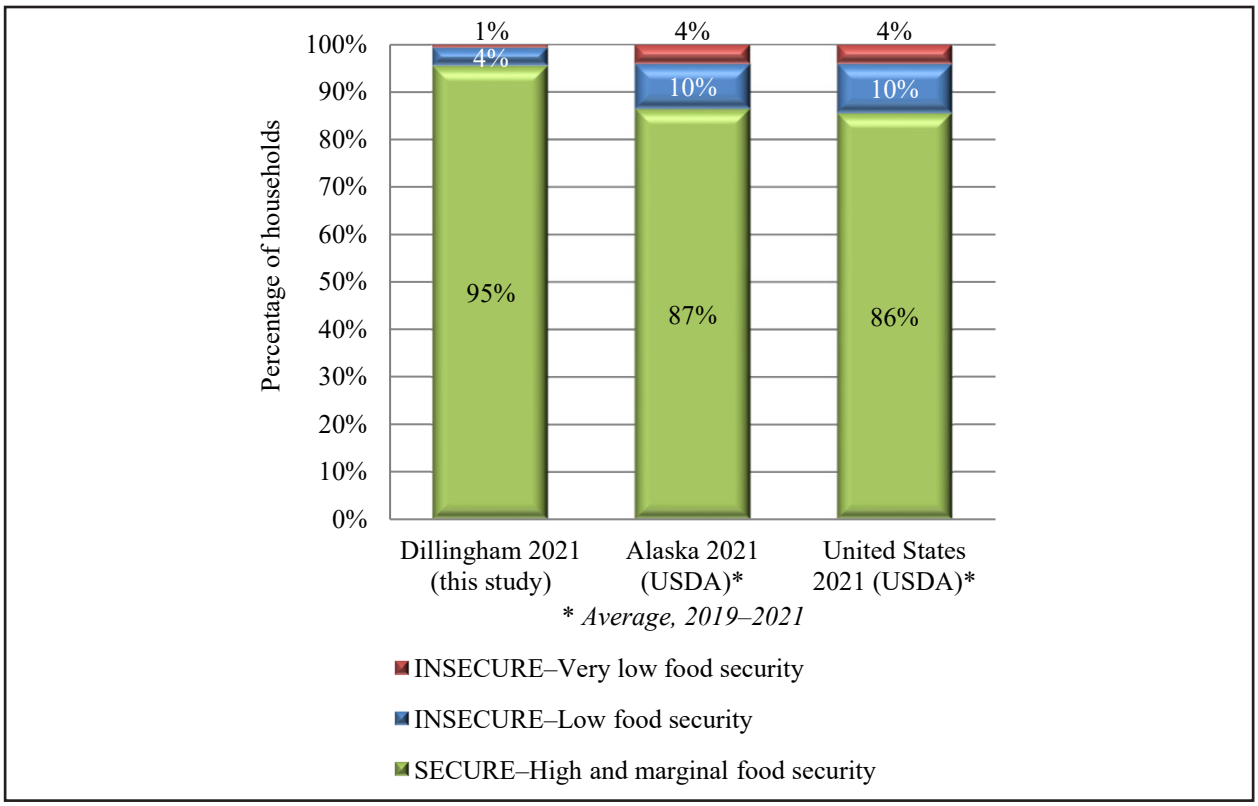


Figure 2-8.–Comparison of food security categories, Dillingham, Alaska, and United States, 2021.

Figure 2-9 portrays the mean number of food insecure conditions per household by food security category by month. Figure 2-10 shows which months households reported foods not lasting. According to study results, food insecure conditions for Dillingham households with high and marginal food security remained constant at very low levels throughout the year (Figure 2-9). Unsurprisingly, households with low food security experienced a greater number of food insecure conditions throughout the year than those households termed food secure, while very low food security households experienced the greatest number of food insecure conditions. Households with low food security experienced some food insecure conditions during the summer months (June and July), while the highest instances of food insecure conditions occurred from November through February. By comparison, very low food security households experienced insecure conditions consistently through the entire year.

Figure 2-10 shows that, overall, more households experienced store-bought foods not lasting throughout the year than experienced subsistence foods not lasting. Looking at store-bought foods alone, approximately 10% of households experienced a shortage beginning in January and shortages existed throughout the study year; however, the largest percentage of households experiencing a shortage of store-bought foods occurred in November and December, when 11% of households reported issues accessing store-bought foods. Several survey respondents cited supply chain shortages and a lack of groceries stocked in the Dillingham stores as the reason for their store-bought foods not lasting. Dillingham households experienced the greatest shortages of subsistence foods in March and December, when 8% of households reported subsistence foods not lasting, followed by February and November when 7% of households said that subsistence foods did not last. This likely results from the community's heavy reliance on salmon resources for subsistence, contributing to lower rates of food security during the winter and spring months before salmon are available again.

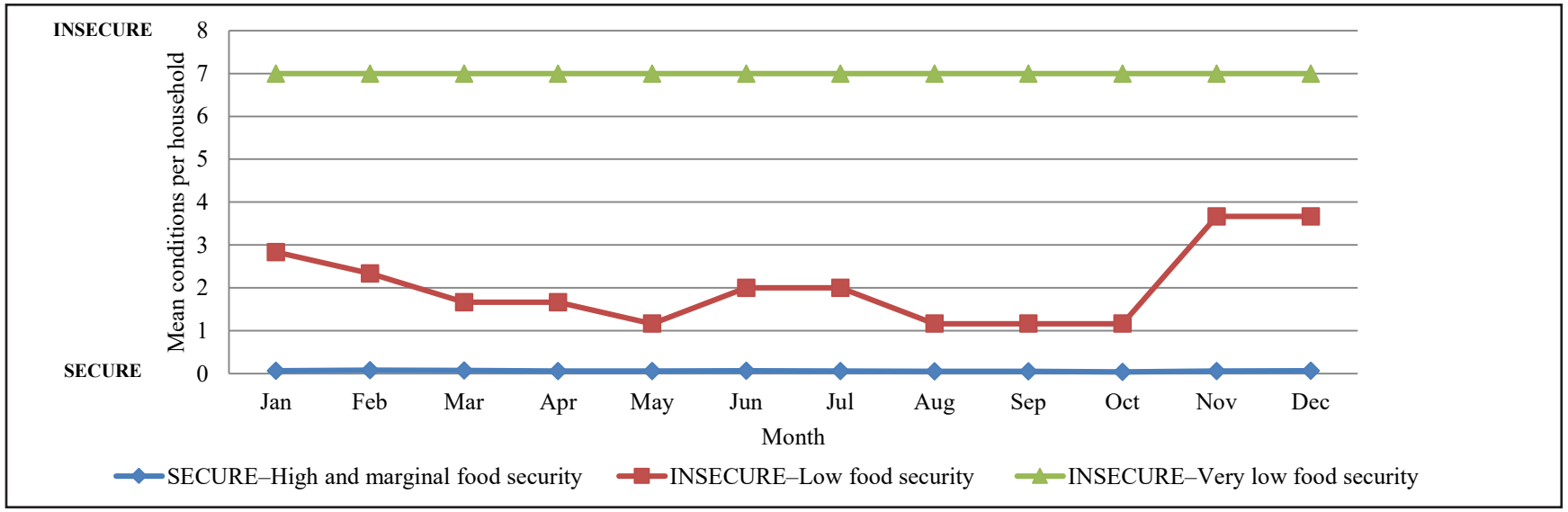


Figure 2-9.–Mean number of food insecure conditions by month and by household food security category, Dillingham, 2021.

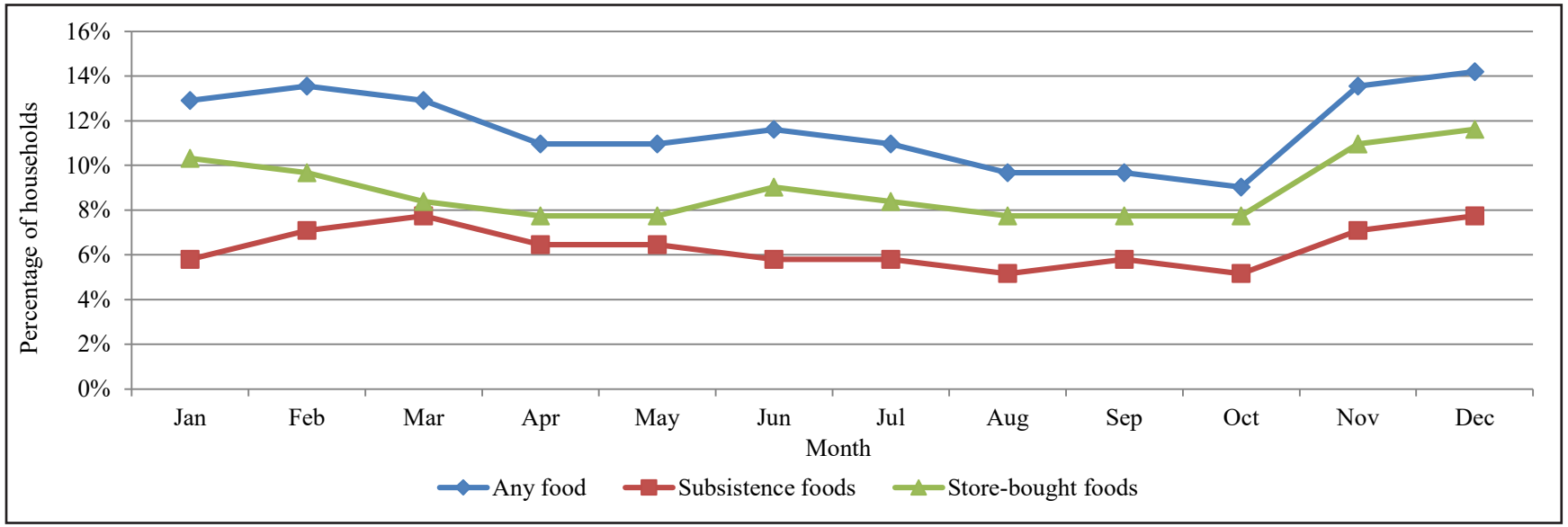


Figure 2-10.–Comparison of months when food did not last, Dillingham, 2021.

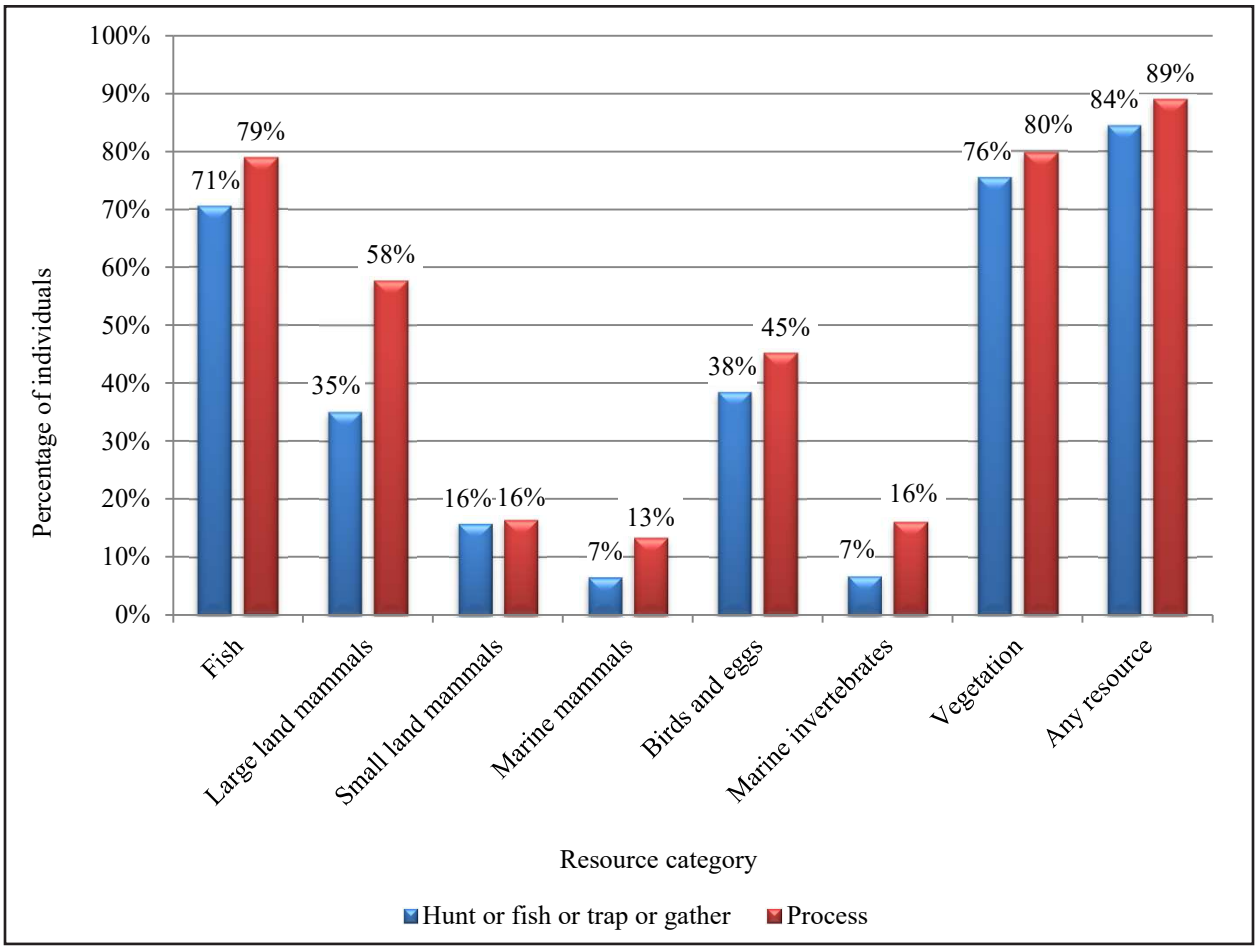


Figure 2-11.–Individual participation in subsistence harvesting and processing activities, Dillingham, 2021.

Summary of Harvest and Use Patterns

Individual Participation in the Harvesting and Processing of Wild Resources

Figure 2-11 depicts the expanded levels of individual participation in the harvest and processing of wild resources by all Dillingham residents in 2021. The majority of residents (84%) participated in the harvest of at least one wild resource and more residents (89%) helped to process a wild resource. The pattern of more people processing than harvesting persisted for every resource category except small land mammals. The same proportion of individuals (16%) harvested and processed small land mammals and furbearers. Large land mammals is the resource category for which the largest disparity existed between the proportion of people harvesting and processing resources: 35% of individuals hunted large land mammals but 58% processed these resources. The majority of Dillingham residents gathered vegetation (76%) and fished (71%), and more than one-third (38%) of individuals hunted birds or collected eggs. As mentioned previously, a higher proportion of individuals processed vegetation (80%), fish (79%), and birds or bird eggs (45%). An estimated 7% of residents harvested marine invertebrates but 16% processed these resources. Harvest areas for both marine invertebrates and large land mammals generally occur a farther distance from the community compared to other wild resources, which may explain the larger disparity between the proportion of people harvesting and processing these resources.

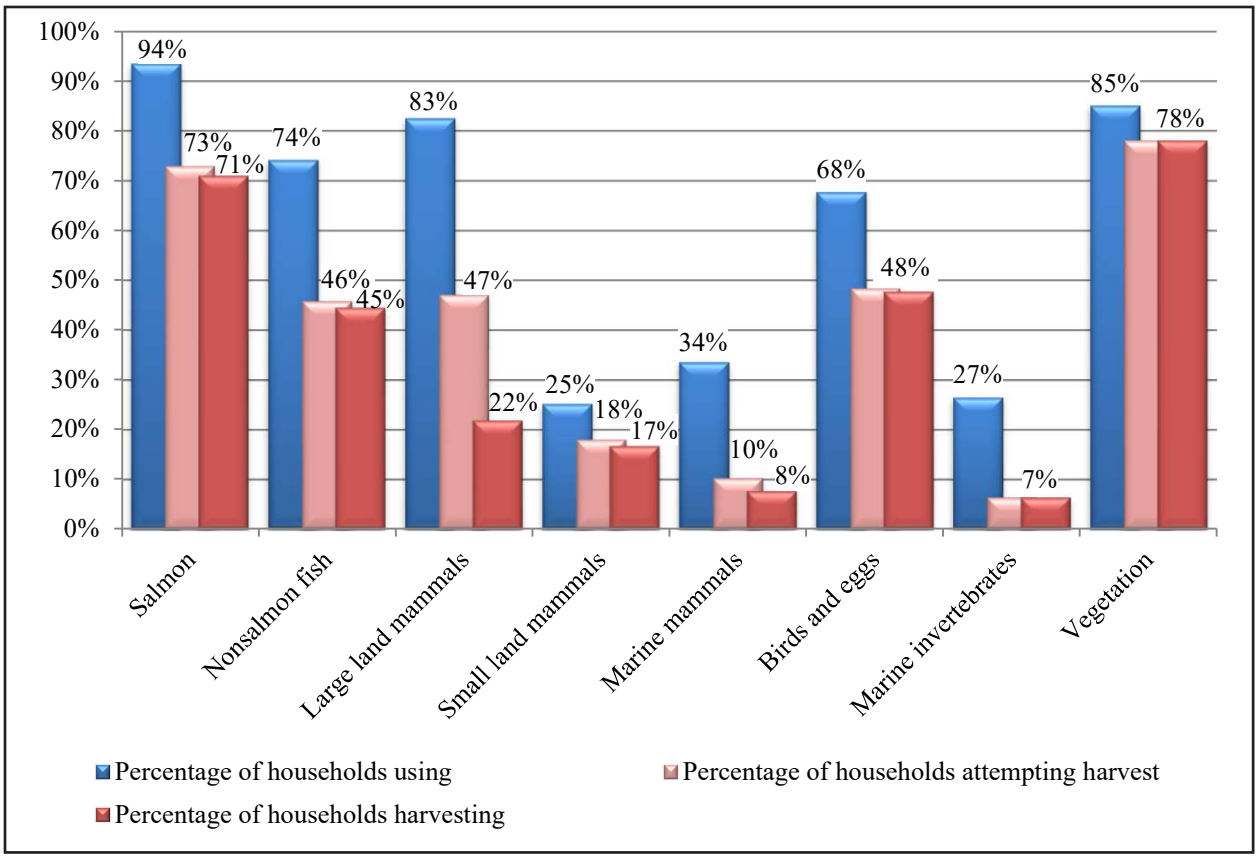


Figure 2-12.–Percentage of households using, attempting to harvest, and harvesting wild resources, by resource category, Dillingham, 2021.

Harvest and Use of Wild Resources at the Household Level

Figure 2-12 shows by resource category the percentages of households that used, attempted to harvest, and harvested wild foods. During the study year, for five out of eight resource categories, more than 65% of households used the resources. Salmon was used by 94% of households. Following the use of salmon was use of vegetation (85%), large land mammals (83%), nonsalmon fish (74%), and birds and bird eggs (68%). Approximately one-third or fewer households used the remaining resource categories: marine mammals (34%), marine invertebrates (27%), and small land mammals (25%). For all resource categories, a higher percentage of households used resources than attempted to harvest or successfully harvested resources.

The greatest percentage of households harvested vegetation (78%), followed by salmon (71%), birds and eggs (48%), nonsalmon fish (46%), large land mammals (22%), small land mammals (17%), marine mammals (8%), and marine invertebrates (7%). Vegetation and marine invertebrates were the resource categories for which the percentages of households attempting to harvest and successfully harvesting were the same. Households pursuing large land mammals were the least successful compared to all other resource categories: 47% of households hunted but about half as many (22% of Dillingham households) harvested these resources. There were high harvest success rates for each of the remaining resource categories: the disparity between the proportion of households that attempted to harvest and the proportion that did harvest was less than 3%.

Table 2-12 summarizes resource harvest and use characteristics for Dillingham in 2021 at the household level. The average harvest was 571 lb usable weight per household. During the study year, community households harvested an average of 10 kinds of resources and used an average of 14 kinds of resources. The maximum number of resources used by any household was 61. In addition, households gave away an

Table 2-12.–Resource harvest and use characteristics, Dillingham, 2021.

Characteristic	
Mean number of resources used per household	**14.4**
Minimum	0
Maximum	61
95% confidence interval (±)	10.0%
Median	12
Mean number of resources attempted to harvest per household	**10.0**
Minimum	0
Maximum	52
95% confidence interval (±)	12.5%
Median	8
Mean number of resources harvested per household	**9.5**
Minimum	0
Maximum	50
95% confidence interval (±)	12.8%
Median	8
Mean number of resources received per household	**7.4**
Minimum	0
Maximum	41
95% confidence interval (±)	13.1%
Median	6
Mean number of resources given away per household	**7.5**
Minimum	0
Maximum	49
95% confidence interval (±)	14.7%
Median	5
Household harvest (pounds)	
Minimum	0
Maximum	5,191
Mean	570.9
Median	305
Total harvest weight (lb)	380,783.7
Community per capita harvest (lb)	198.8
Percentage using any resource	97.4%
Percentage attempting to harvest any resource	89.0%
Percentage harvesting any resource	87.1%
Percentage receiving any resource	91.0%
Percentage giving away any resource	83.9%
Number of households in sample	155
Number of resources asked about and identified voluntarily by respondents	153

Source ADF&G Division of Subsistence household surveys, 2022.

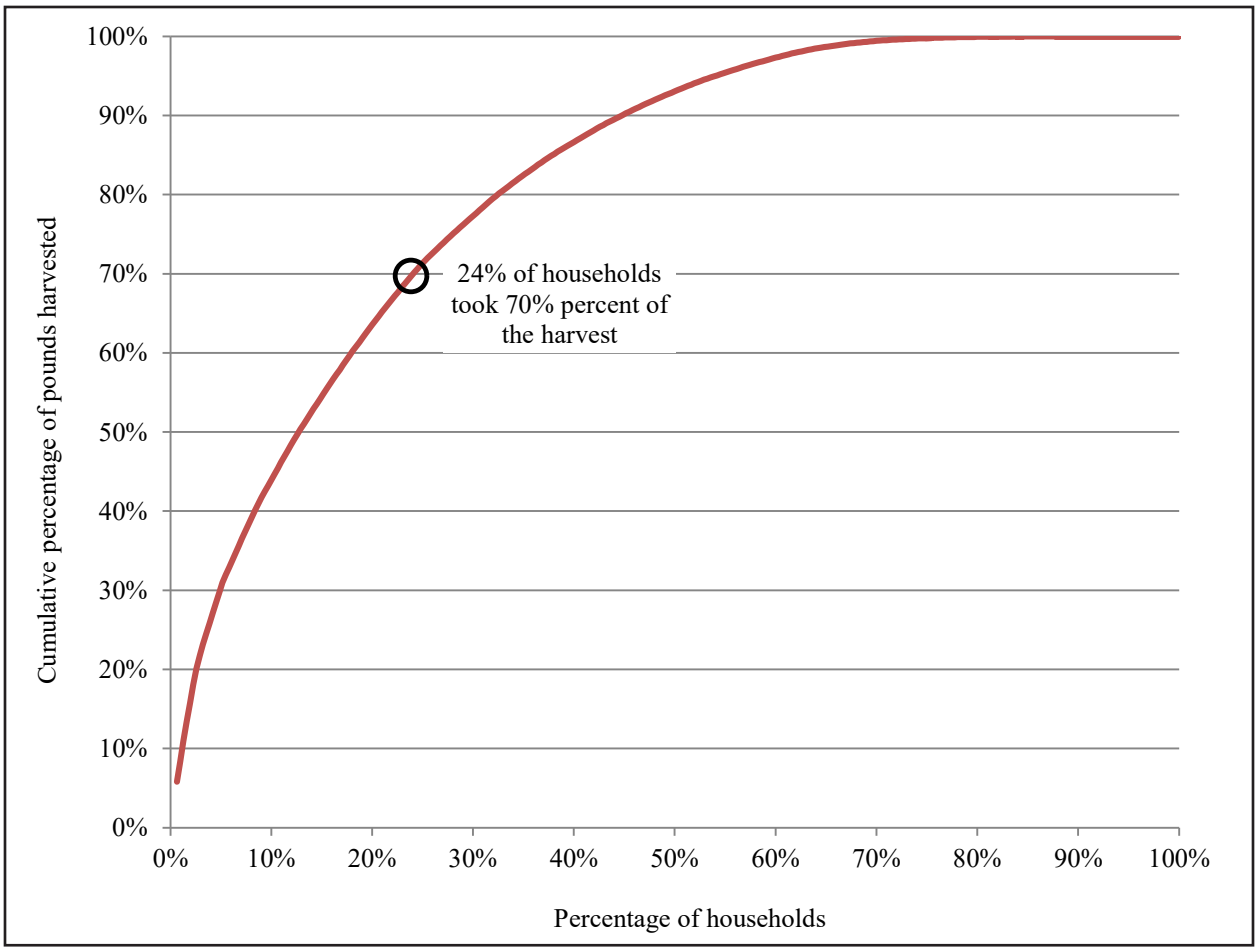


Figure 2-13.–Household specialization, Dillingham, 2021.

average of eight kinds of resources and received an average of seven kinds of resources. During the study year, Dillingham households used in excess of 110 kinds of wild resources and harvested nearly as many—at least 100—wild resources (Table 1-1; Table 2-13).

Sharing of Wild Resources

Household Specialization in Resource Harvesting

Previous studies (Wolfe 1987; Wolfe et al. 2010) have shown that in most rural Alaska communities, a relatively small portion of households produces most of the community's fish and wildlife harvests, which they share with other households. A study of 3,265 households in 66 rural Alaska communities found that about 33% of the households accounted for 76% of subsistence harvests (Wolfe et al. 2010). Although overall the set of very productive households was diverse, factors that were associated with higher levels of subsistence harvests included larger households with a pool of adult male labor, higher wage income, involvement in commercial fishing, and community location.

As shown in Figure 2-13, in the 2021 study year in Dillingham, about 70% of the harvests of wild resources as estimated in pounds usable weight were harvested by 24% of the community's households, consistent with earlier studies. Further analysis of the study findings, beyond the scope of this report, might identify characteristics of the highly productive households in Dillingham.

Harvest Quantities and Composition

Table 2-13 reports estimated wild resource harvests and uses by Dillingham residents in 2021 and is organized first by general category and then by species. All edible resources are reported in pounds usable weight (see Appendix C for conversion factors[13]). The harvest category includes resources harvested by any member of the surveyed household during the study year. The use category includes all resources taken, given away, or used by a household, and resources acquired from other harvesters, either as gifts, by barter or trade, through hunting partnerships, or as meat given by hunting guides and non-local hunters. Purchased foods are not included, but resources such as seaweeds/kelps used for fertilizer are included because they are an important part of the subsistence way of life. Differences between harvest and use percentages reflect sharing among households, which results in a wider distribution of wild foods.

The total harvest by Dillingham residents in 2021 was 380,784 lb, or 199 lb per capita (Table 2-13). Salmon composed 52% of the total harvest weight followed by large land mammals (21%), nonsalmon fish (10%), vegetation (7%), marine mammals (6%), and birds and eggs (4%) (Figure 2-14). Additionally, small land mammals and marine invertebrates each contributed 1% or less to the total harvest weight. The community harvest, by wild resource category and in order of most to least harvest weight, comprised salmon (198,958 lb total; 104 lb per capita), large land mammals (81,162 lb total; 42 lb per capita), nonsalmon fish (36,493 lb total; 19 lb per capita), vegetation (25,905 lb total; 14 lb per capita), marine mammals (21,955 lb total; 12 lb per capita), birds and eggs (13,429 lb total; 7 lb per capita), small land mammals (1,836 lb total; 1 lb per capita), and marine invertebrates (1,046 lb total; less than 1 lb per capita) (Table 2-13).

Use and Harvest Characteristics by Resource Category

Almost all (97%) Dillingham households used wild resources; as noted earlier, 89% of households attempted to harvest, and 87% successfully harvested, at least one wild resource in 2021 (Table 2-13). Table 2-13 also reports estimates of sharing of each resource by the percentage of households that received each resource and the percentage of households that gave away each resource. Considering all resources combined, sharing clearly was an important activity for Dillingham residents: 91% of Dillingham households received at least one wild resource in 2021, and 84% of households gave away at least one resource.

Species from the large land mammals resource category, primarily moose, were received the most frequently by Dillingham households in 2021. An estimated 74% of community households received large land mammals and 51% of Dillingham households gave away some large land mammals in 2021. Large land mammals such as moose are usually harvested by more than one household working together, and the meat is divided among the participants; therefore, wide sharing of these resources is expected. Salmon were received by 70% of households and given away by 72% of households. Nonsalmon fish were received by 57% of households and these resources were given away by 48% of households. A total of 54% of households received vegetation and 57% gave away vegetation. Birds and eggs were received by 49% of households, while 39% of households shared birds and eggs. A smaller percentage of Dillingham households received and gave away marine mammals (31% and 17%, respectively), marine invertebrates (22% and 12%, respectively), and small land mammals (11% and 8%, respectively).

13. Resources that are not eaten, such as firewood and some furbearers, are included in the table but are assigned a conversion factor of zero.

Table 2-13.–Estimated use and harvest of fish, game, and vegetation resources, Dillingham, 2021.

	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95%
Resource	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	confidence interval (±) harvest
All resources	**97.4**	**89.0**	**87.1**	**91.0**	**83.9**	**380,783.7**	**570.9**	**198.8**	**380,783.7**	**lb**	**570.9**	**20.4**
Salmon	**93.5**	**72.9**	**71.0**	**69.7**	**72.3**	**198,958.2**	**298.3**	**103.9**	**48,699.1**	**ind**	**73.0**	**22.5**
Chum salmon	32.3	27.7	27.7	9.0	13.5	6,602.3	9.9	3.4	1,674.3	ind	2.5	41.5
Coho salmon	58.7	46.5	45.2	31.0	32.3	36,161.7	54.2	18.9	7,749.7	ind	11.6	30.1
Chinook salmon	74.8	60.0	56.1	39.4	50.3	36,427.7	54.6	19.0	5,378.8	ind	8.1	27.2
Pink salmon	7.1	5.8	5.8	1.3	3.2	1,130.1	1.7	0.6	469.1	ind	0.7	73.4
Sockeye salmon	88.4	65.8	65.2	57.4	61.9	114,650.3	171.9	59.9	32,304.1	ind	48.4	26.2
Spawning sockeye salmon	16.8	9.7	9.0	8.4	8.4	3,986.1	6.0	2.1	1,123.1	ind	1.7	63.7
Unspecified salmon	0.6	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Nonsalmon fish	**74.2**	**45.8**	**44.5**	**56.8**	**48.4**	**36,492.7**	**54.7**	**19.1**	**36,492.7**	**lb**	**54.7**	**52.0**
Pacific herring	9.7	1.9	1.9	9.0	3.9	7,849.1	11.8	4.1	1,308.2	gal	2.0	171.4
Pacific herring spawn on kelp	26.5	0.6	0.0	26.5	11.6	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe on hemlock branches	1.9	0.0	0.0	1.9	1.3	0.0	0.0	0.0	0.0	gal	0.0	0.0
Rainbow smelt	49.0	29.7	28.4	31.6	27.1	17,953.5	26.9	9.4	2,992.2	gal	4.5	69.8
Pacific (gray) cod	12.9	6.5	6.5	8.4	6.5	1,173.9	1.8	0.6	366.9	ind	0.6	76.3
Starry flounder	1.9	1.9	1.9	0.0	0.0	103.3	0.2	0.1	34.4	ind	0.1	100.8
Lingcod	0.6	0.6	0.6	0.0	0.0	17.2	0.0	0.0	4.3	ind	0.0	173.1
Pacific halibut	28.4	7.1	5.8	24.5	12.9	2,564.7	3.8	1.3	2,564.7	lb	3.8	61.9
Unspecified rockfishes	2.6	2.6	2.6	1.9	1.9	223.8	0.3	0.1	111.9	ind	0.2	92.5
Sablefish (black cod)	0.6	0.0	0.0	0.6	0.6	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unspecified Irish lords	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Yellowfin sole	0.6	0.6	0.6	0.0	0.0	21.5	0.0	0.0	21.5	ind	0.0	173.1
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Burbot	1.3	0.6	0.6	0.6	1.3	43.0	0.1	0.0	43.0	ind	0.1	173.1
Arctic char	18.7	15.5	15.5	4.5	7.1	716.9	1.1	0.4	512.1	ind	0.8	47.5
Dolly Varden, freshwater	3.2	2.6	2.6	0.6	1.9	222.9	0.3	0.1	159.2	ind	0.2	93.4
Dolly Varden, saltwater	5.8	4.5	4.5	1.3	0.6	265.1	0.4	0.1	189.3	ind	0.3	64.1
Dolly Varden, Togiak trout	7.1	0.6	0.6	7.1	3.9	48.2	0.1	0.0	34.4	ind	0.1	173.1
Lake trout	3.2	2.6	2.6	0.6	1.9	325.3	0.5	0.2	120.5	ind	0.2	111.4
Arctic grayling	4.5	4.5	3.9	0.6	0.6	69.3	0.1	0.0	99.0	ind	0.1	74.6
Northern pike	29.7	20.6	20.0	14.8	16.1	4,424.8	6.6	2.3	1,580.3	ind	2.4	43.7
Sheefish	0.6	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Longnose sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rainbow trout	12.3	10.3	9.0	3.9	3.9	225.9	0.3	0.1	322.7	ind	0.5	57.8
Unspecified trouts	0.6	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Table 2-13.–Page 2 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence interval (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Nonsalmon fish, continued												
Humpback whitefish	8.4	2.6	2.6	7.1	4.5	158.1	0.2	0.1	90.4	ind	0.1	95.8
Round whitefish	5.8	2.6	2.6	3.2	3.2	86.1	0.1	0.0	86.1	ind	0.1	88.3
Unspecified whitefishes	3.9	0.0	0.0	3.9	1.9	0.0	0.0	0.0	0.0	ind	0.0	0.0
Large land mammals	**82.6**	**47.1**	**21.9**	**73.5**	**51.0**	**81,161.6**	**121.7**	**42.4**	**190.6**	**ind**	**0.3**	**28.6**
Bison	1.3	0.6	0.6	0.6	0.6	450.0	0.7	0.2	1.0	ind	0.0	–
Black bear	1.3	0.0	0.0	1.3	1.3	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brown bear	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	4.3	ind	0.0	173.1
Caribou	12.3	0.0	0.0	12.3	5.2	0.0	0.0	0.0	0.0	ind	0.0	0.0
Deer	5.2	3.2	2.6	3.2	3.2	929.5	1.4	0.5	21.5	ind	0.0	90.8
Mountain goat	1.9	1.9	1.9	0.0	1.9	624.0	0.9	0.3	17.2	ind	0.0	122.0
Moose	79.4	45.2	20.0	69.7	48.4	79,158.1	118.7	41.3	146.6	ind	0.2	28.8
Small land mammals	**25.2**	**18.1**	**16.8**	**11.0**	**8.4**	**1,835.5**	**2.8**	**1.0**	**951.5**	**ind**	**1.4**	**75.4**
Beaver	5.8	3.2	3.2	2.6	2.6	516.4	0.8	0.3	77.5	ind	0.1	128.7
Coyote	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	12.9	ind	0.0	128.7
Red fox, cross phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red fox, red phase	5.2	5.2	4.5	0.6	0.0	0.0	0.0	0.0	146.3	ind	0.2	65.5
Alaska hare	0.6	0.6	0.6	0.0	0.6	6.5	0.0	0.0	4.3	ind	0.0	173.1
Snowshoe hare	7.7	6.5	6.5	1.9	1.3	400.2	0.6	0.2	301.2	ind	0.5	78.9
Unspecified hares	0.6	0.6	0.6	0.0	0.0	23.0	0.0	0.0	4.3	ind	0.0	173.1
River otter	2.6	2.6	2.6	0.0	0.6	25.8	0.0	0.0	38.7	ind	0.1	173.1
Lynx	4.5	3.9	3.9	1.3	1.3	51.6	0.1	0.0	51.8	ind	0.1	129.1
Martens	3.2	3.2	3.2	0.0	0.0	0.0	0.0	0.0	103.3	ind	0.2	89.9
Mink	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	12.9	ind	0.0	128.7
Muskrat	0.6	0.6	0.6	0.0	0.6	0.0	0.0	0.0	4.3	ind	0.0	173.1
Porcupine	16.1	10.3	9.7	7.7	6.5	796.9	1.2	0.4	129.4	ind	0.2	84.7
Arctic ground squirrel	0.6	0.6	0.6	0.0	0.0	12.9	0.0	0.0	25.8	ind	0.0	173.1
Red squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Weasels	1.3	1.3	1.3	0.0	0.0	2.2	0.0	0.0	8.6	ind	0.0	173.1
Gray wolf	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	4.3	ind	0.0	173.1
Wolverine	1.9	1.9	1.9	0.0	0.6	0.0	0.0	0.0	25.8	ind	0.0	122.0
Marine mammals	**33.5**	**10.3**	**7.7**	**31.0**	**17.4**	**21,955.1**	**32.9**	**11.5**	**103.3**	**ind**	**0.2**	**64.5**
Bearded seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Harbor seal	16.1	7.1	5.2	12.9	8.4	4,096.7	6.1	2.1	73.2	ind	0.1	73.0
Ringed seal	1.9	1.3	1.3	1.3	1.9	490.6	0.7	0.3	8.6	ind	0.0	122.0

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Table 2-13.–Page 3 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence interval (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Marine mammals, continued												
Unspecified seals	13.5	1.3	0.6	13.5	5.8	241.0	0.4	0.1	4.3	ind	0.0	173.1
Steller sea lion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Walrus	1.3	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Beluga whale	18.1	4.5	2.6	17.4	10.3	17,126.8	25.7	8.9	17.2	ind	0.0	74.5
Bowhead whale	0.6	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	**67.7**	**48.4**	**47.7**	**49.0**	**39.4**	**13,429.3**	**20.1**	**7.0**	**13,994.3**	**ind**	**21.0**	**35.9**
Bufflehead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
King eider	1.3	1.3	1.3	0.0	1.3	116.2	0.2	0.1	51.6	ind	0.1	123.7
Unspecified eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unspecified goldeneyes	1.3	1.3	1.3	0.0	0.0	60.1	0.1	0.0	47.3	ind	0.1	158.0
Harlequin duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	17.4	13.5	12.9	6.5	11.0	879.9	1.3	0.5	546.5	ind	0.8	50.9
Unspecified mergansers	1.3	1.3	1.3	0.0	0.6	22.5	0.0	0.0	12.9	ind	0.0	115.4
Northern pintail	12.9	10.3	10.3	3.2	5.8	619.5	0.9	0.3	525.0	ind	0.8	62.4
Unspecified scaups	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Black scoter	0.6	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Surf scoter	0.6	0.6	0.6	0.0	0.6	25.1	0.0	0.0	17.2	ind	0.0	173.1
Northern shoveler	0.6	0.6	0.6	0.0	0.6	18.5	0.0	0.0	21.5	ind	0.0	173.1
Green-winged teal	8.4	5.8	5.8	3.2	2.6	107.2	0.2	0.1	228.1	ind	0.3	71.5
American wigeon	1.3	1.3	1.3	0.0	0.6	58.7	0.1	0.0	55.9	ind	0.1	138.8
Unspecified ducks	9.0	4.5	3.9	5.8	5.2	305.4	0.5	0.2	391.6	ind	0.6	90.7
Brant	0.6	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Cackling goose	0.6	0.6	0.6	0.0	0.0	86.5	0.1	0.0	25.8	ind	0.0	173.1
Unspecified Canada/cackling geese	14.2	10.3	9.7	7.1	5.8	2,321.9	3.5	1.2	693.1	ind	1.0	67.9
Emperor goose	0.6	0.6	0.6	0.0	0.6	53.0	0.1	0.0	17.2	ind	0.0	173.1
Snow goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Greater white-fronted goose	9.7	7.1	7.1	3.2	5.8	1,806.3	2.7	0.9	568.0	ind	0.9	70.8
Unspecified geese	8.4	4.5	3.9	5.2	3.9	557.7	0.8	0.3	232.4	ind	0.3	99.3
Trumpeter swan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Tundra (whistling) swan	1.3	1.3	1.3	0.0	1.3	133.4	0.2	0.1	12.9	ind	0.0	128.7
Sandhill crane	5.2	3.2	3.2	2.6	2.6	185.9	0.3	0.1	34.4	ind	0.1	80.0
Unspecified shorebirds	0.6	0.6	0.6	0.0	0.0	1.3	0.0	0.0	25.8	ind	0.0	173.1
Unspecified grouses	43.2	34.8	34.8	18.7	23.2	3,055.4	4.6	1.6	3,357.6	ind	5.0	27.6

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Table 2-13.–Page 4 of 5.

Resource	Percentage of households					Harvest weight (lb)			Harvest amount[a]			95% confidence interval (±) harvest
	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Unspecified ptarmigans	35.5	25.8	25.2	16.8	17.4	2,160.4	3.2	1.1	2,805.7	ind	4.2	36.8
Unspecified duck eggs	5.8	5.8	5.8	0.6	0.6	147.2	0.2	0.1	981.1	ind	1.5	108.3
Unspecified goose eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unspecified swan eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unspecified shorebird eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unspecified gull eggs	38.7	17.4	17.4	28.4	21.3	705.2	1.1	0.4	3,295.1	ind	4.9	50.6
Unspecified murre eggs	5.2	0.0	0.0	5.2	2.6	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unspecified tern eggs	1.3	1.3	1.3	0.0	0.6	2.0	0.0	0.0	47.3	ind	0.1	122.5
Unspecified ptarmigan eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine invertebrates	**26.5**	**6.5**	**6.5**	**21.9**	**12.3**	**1,046.1**	**1.6**	**0.5**	**1,046.1**	**lb**	**1.6**	**71.1**
Butter clam	1.9	1.3	1.3	0.6	1.9	28.4	0.0	0.0	9.5	gal	0.0	122.5
Razor clam	5.8	1.3	1.3	4.5	3.9	73.2	0.1	0.0	24.4	gal	0.0	132.0
Unspecified clams	2.6	0.6	0.6	1.9	0.0	64.5	0.1	0.0	21.5	gal	0.0	173.1
Unspecified cockles	16.8	3.2	3.2	14.8	7.7	774.6	1.2	0.4	258.2	gal	0.4	88.1
Dungeness crab	0.6	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Blue king crab	0.6	0.6	0.6	0.0	0.0	99.0	0.1	0.1	43.0	ind	0.1	173.1
Red king crab	0.6	0.0	0.0	0.6	0.6	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unspecified crabs	1.9	0.0	0.0	1.9	1.3	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unspecified mussels	1.3	0.6	0.6	0.6	1.3	6.5	0.0	0.0	4.3	gal	0.0	173.1
Octopus	0.6	0.0	0.0	0.6	0.6	0.0	0.0	0.0	0.0	ind	0.0	0.0
Shrimps	3.9	0.0	0.0	3.9	1.3	0.0	0.0	0.0	0.0	lb	0.0	0.0
Vegetation	**85.2**	**78.1**	**78.1**	**54.2**	**56.8**	**25,905.3**	**38.8**	**13.5**	**8,406.7**	**gal**	**12.6**	**19.0**
Blueberry	69.0	60.6	60.6	26.5	38.1	5,407.0	8.1	2.8	1,351.8	gal	2.0	22.2
Lowbush cranberry	46.5	40.6	40.6	16.8	23.9	3,204.8	4.8	1.7	801.2	gal	1.2	30.4
Highbush cranberry	25.8	23.9	23.9	8.4	17.4	1,265.8	1.9	0.7	316.4	gal	0.5	34.5
Crowberry	43.9	38.1	38.1	16.1	22.6	2,837.0	4.3	1.5	709.2	gal	1.1	29.3
Currants	2.6	2.6	2.6	0.0	1.3	120.5	0.2	0.1	30.1	gal	0.0	95.1
Huckleberry	45.2	40.6	40.6	13.5	21.9	4,020.3	6.0	2.1	1,005.1	gal	1.5	24.2
Raspberry	20.6	18.1	18.1	7.1	11.0	1,583.6	2.4	0.8	395.9	gal	0.6	63.1
Cloudberry	61.9	52.3	51.0	29.0	34.8	5,674.9	8.5	3.0	1,418.7	gal	2.1	26.4
Strawberry	0.6	0.6	0.6	0.0	0.6	51.6	0.1	0.0	12.9	gal	0.0	173.1
Twisted stalk berry (watermelon berry)	2.6	2.6	2.6	0.0	1.3	43.0	0.1	0.0	10.8	gal	0.0	90.8
Other wild berries	1.9	1.9	1.9	0.0	0.0	19.4	0.0	0.0	4.8	gal	0.0	110.0

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Table 2-13.–Page 5 of 5.

Resource	Percentage of households: Use %	Attempt %	Harvest %	Receive %	Give %	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	95% confidence interval (±) harvest
Vegetation, continued												
Wild rhubarb	2.6	2.6	2.6	0.6	1.3	124.8	0.2	0.1	124.8	gal	0.2	149.8
Wild potato	0.6	0.6	0.6	0.6	0.6	4.3	0.0	0.0	1.1	gal	0.0	173.1
Fiddlehead ferns	31.0	27.1	27.1	5.2	11.6	262.0	0.4	0.1	262.0	gal	0.4	31.4
Hudson's Bay (Labrador) tea	15.5	12.9	12.9	3.2	7.7	110.2	0.2	0.1	110.2	gal	0.2	53.8
Lambsquarter	0.6	0.6	0.6	0.0	0.6	8.6	0.0	0.0	8.6	gal	0.0	173.1
Dandelion greens	0.6	0.6	0.6	0.0	0.6	8.6	0.0	0.0	8.6	gal	0.0	173.1
Sourdock	9.0	7.7	7.7	1.9	3.9	279.7	0.4	0.1	279.7	gal	0.4	78.5
Spruce tips	1.3	1.3	1.3	0.0	0.6	17.2	0.0	0.0	17.2	gal	0.0	122.0
Wild celery	11.0	7.1	7.1	5.2	3.9	69.9	0.1	0.0	69.9	gal	0.1	69.1
Valerians	0.6	0.6	0.6	0.0	0.6	1.1	0.0	0.0	1.1	gal	0.0	173.1
Wild rose hips	1.3	1.3	1.3	0.0	1.3	17.2	0.0	0.0	4.3	gal	0.0	122.0
Yarrows	3.2	3.2	3.2	0.0	1.3	30.1	0.0	0.0	30.1	gal	0.0	83.0
Other wild greens	5.8	5.8	5.8	0.0	1.3	36.3	0.1	0.0	36.3	gal	0.1	70.4
Unspecified mushrooms	5.2	5.2	5.2	1.3	1.3	34.4	0.1	0.0	34.4	gal	0.1	78.5
Fireweed	9.0	7.1	7.1	3.9	5.2	176.4	0.3	0.1	176.4	gal	0.3	90.8
Stinkweed	18.7	15.5	15.5	4.5	9.7	327.0	0.5	0.2	327.0	gal	0.5	48.5
Puffballs	1.3	1.3	1.3	0.0	0.6	4.9	0.0	0.0	4.9	gal	0.0	154.3
Chaga	1.9	1.9	1.9	1.3	1.3	21.5	0.0	0.0	21.5	gal	0.0	103.2
Unspecified fungus	0.6	0.6	0.6	0.0	0.6	8.6	0.0	0.0	8.6	gal	0.0	173.1
Unspecified greens from land	0.6	0.6	0.6	0.0	0.0	1.1	0.0	0.0	1.1	gal	0.0	173.1
Sea lovage	0.6	0.6	0.6	0.6	0.6	4.3	0.0	0.0	4.3	gal	0.0	173.1
Beach greens	7.1	5.8	5.8	2.6	3.2	123.7	0.2	0.1	123.7	gal	0.2	79.0
Wild chive	0.6	0.6	0.6	0.0	0.0	4.3	0.0	0.0	4.3	gal	0.0	173.1
Mousefoods	0.6	0.6	0.6	0.0	0.0	1.1	0.0	0.0	1.1	gal	0.0	173.1
Seaweeds/kelps used for fertilizer	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	645.5	gal	1.0	173.1
Unspecified seaweeds	1.3	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Birch sap	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0	43.0	gal	0.1	173.1

Source ADF&G Division of Subsistence household surveys, 2022.

Note Species that are not typically eaten show a non-zero harvest amount with a zero harvest weight. Harvest weight is not calculated for species harvested but not eaten.

Note For bison, "–" indicates that the confidence interval was not applicable becase the harvest amount was not expanded.

a. Summary rows that include incompatible units of measure depict the estimate in pounds (lb).

Figure 2-14.–Composition of harvest in pounds usable weight, by resource category, Dillingham, 2021.

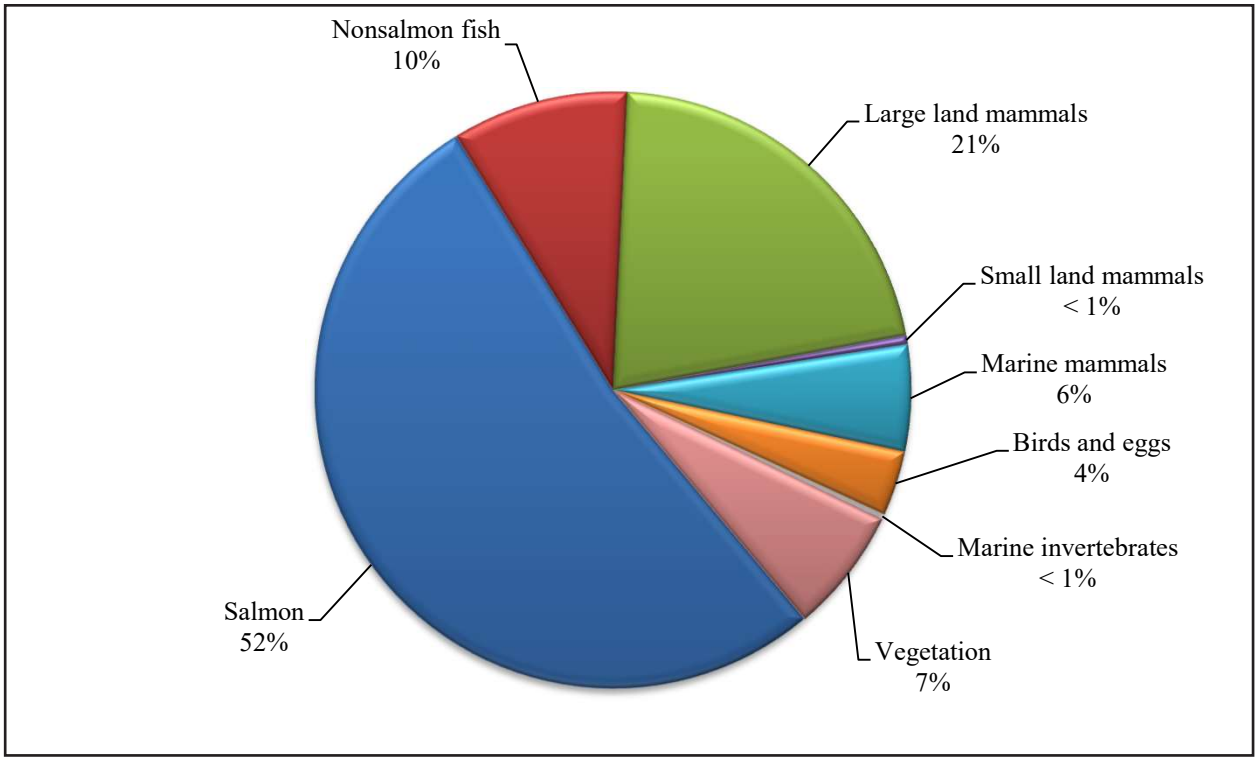
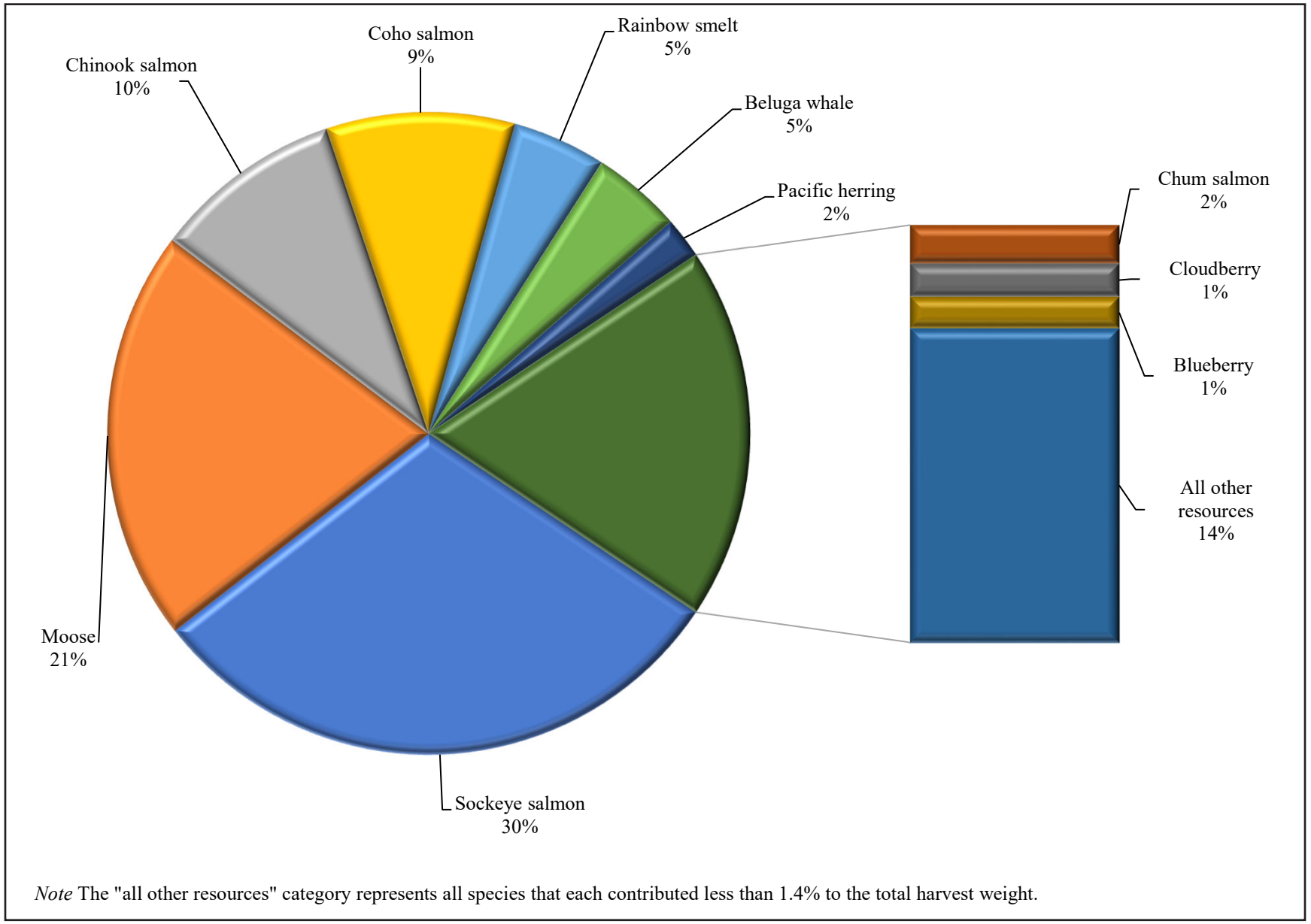


Table 2-14.–Top ranked resources used by households, Dillingham, 2021.

Rank	Resource	Percentage of households using
1.	Sockeye salmon	88.4%
2.	Moose	79.4%
3.	Chinook salmon	74.8%
4.	Blueberry	69.0%
5.	Cloudberry	61.9%
6.	Coho salmon	58.7%
7.	Rainbow smelt	49.0%
8.	Lowbush cranberry	46.5%
9.	Huckleberry	45.2%
10.	Crowberry	43.9%

Source ADF&G Division of Subsistence household surveys, 2022.

Table 2-14 lists the top ranked resources used by households and Figure 2-15 shows the species with the highest harvests during the 2021 study year. Sockeye salmon were used by 88% of households in the community, followed by moose (79%), Chinook salmon (75%), blueberries (69%), and cloudberries (62%) (Table 2-14). Following those five resources, coho salmon were used by 59% of Dillingham households; this resource was followed by the use of rainbow smelt (49%), lowbush cranberries (47%), huckleberries (45%), and crowberries (44%). Importantly, the proportion of households using a resource is not always directly proportional to the top resources harvested by pounds usable weight. For instance, blueberries only contributed 1% to the overall harvest weight even though this resource was used by more than two-thirds of households (Figure 2-15; Table 2-14). This suggests that although certain resources may weigh less or



Note The "all other resources" category represents all species that each contributed less than 1.4% to the total harvest weight.

Figure 2-15.–Top resources harvested by percentage of total harvest, in pounds usable weight, Dillingham, 2021.

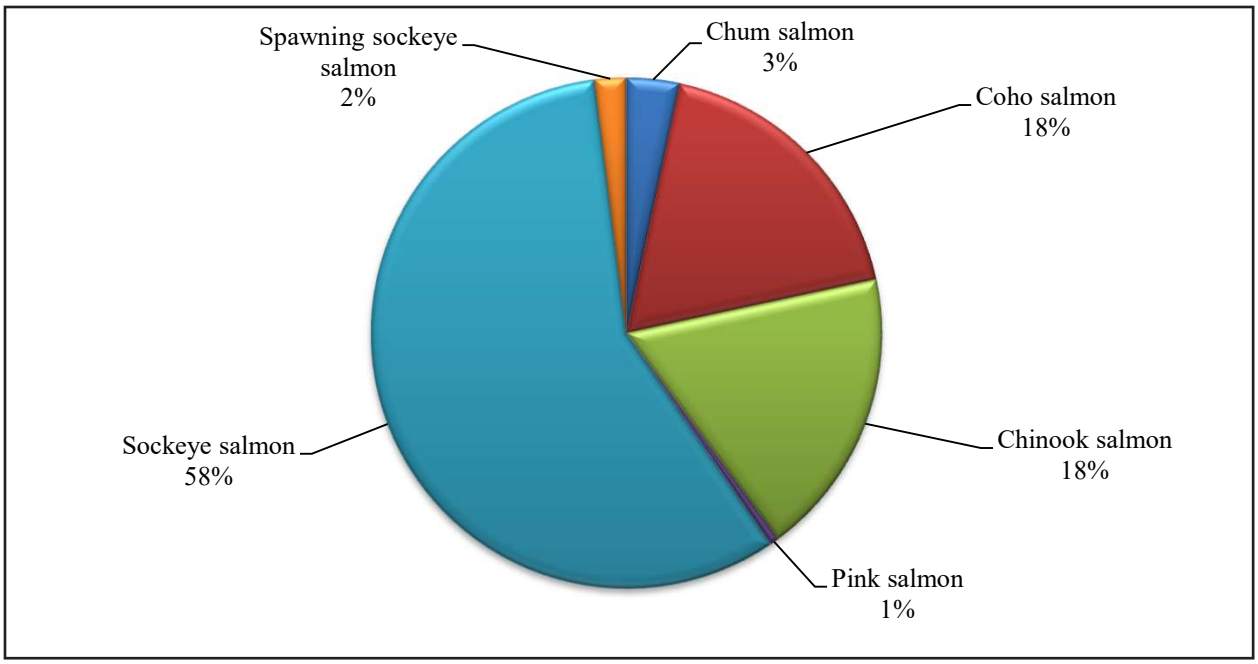


Figure 2-16.–Composition of salmon harvest in pounds usable weight, Dillingham, 2021.

be harvested in smaller amounts than other resources, their use is important to households. Conversely, the species harvested in greater amounts may not be used by a wide component of the community: for instance, harvests of beluga whale and Pacific herring composed 5% and 2% of the total harvest, respectively, but were used by fewer households than other resources, such as blueberries and cloudberries, that composed an even smaller percentage of the harvest. Sometimes the species harvested in the greatest amount by weight are the same as the most used species: sockeye salmon made up the greatest percentage of the harvest in pounds usable weight (30%), followed by moose (21%), and Chinook salmon (10%).

Salmon

In 2021, the community of Dillingham harvested a total of 198,958 lb of salmon, or 104 lb per capita—which was more than one-half (52%) of the total wild resources per capita harvest (Table 2-13; Figure 2-14). Of the total salmon harvest weight, 58% was sockeye salmon, followed by Chinook salmon (18%), coho salmon (18%), chum salmon (3%), spawning sockeye salmon (2%), and pink salmon (1%) (Figure 2-16).

In 2021, sockeye salmon were harvested by the highest proportion of Dillingham households with 65% of households harvesting this resource (Table 2-13). Additionally, 88% of households used sockeye salmon, making it the most widely used wild resource during the study year. In 2021, Dillingham residents harvested 114,650 lb of sockeye salmon (60 lb per capita). Chinook salmon were harvested by 56% of households and used by 75% of Dillingham households in 2021. The total Chinook salmon harvest in 2021 was 36,428 lb (19 lb per capita). Coho salmon were used by 59% of Dillingham households in 2021 and slightly less than one-half (47%) of households attempted to harvest coho salmon; most fishing households were successful, and, overall, 45% of Dillingham households harvested coho salmon. The total coho salmon harvest was 36,162 lb (19 lb per capita).

In conjunction with contributing very small proportions to the total salmon harvest weight in 2021, the remaining salmon resources were harvested and used by fewer households. Chum salmon were used by 32% of Dillingham households in 2021, and 28% of households attempted to and successfully harvested chum salmon. The total chum salmon harvest was 6,602 lb (3 lb per capita). The total spawning sockeye salmon harvest was 3,986 lb (2 lb per capita). Spawning sockeye salmon were used by 17% of Dillingham

Table 2-15.–Estimated harvest of salmon by gear type and resource, Dillingham, 2021.

			Subsistence methods													
	Removed from commercial catch		Driftnet		Setnet		Dip net		Other		Subsistence gear, any method		Rod and reel		Total	
Resource	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Salmon	**6,560.3**	**29,774.7**	**1,170.5**	**4,688.8**	**39,182.5**	**156,920.2**	**1,411.5**	**6,146.0**	**8.6**	**37.0**	**41,773.1**	**167,791.9**	**365.8**	**1,391.6**	**48,699.1**	**198,958.2**
Chum salmon	47.7	188.2	21.5	84.8	1,600.8	6,312.3	0.0	0.0	4.3	17.0	1,626.6	6,414.1	0.0	0.0	1,674.3	6,602.3
Coho salmon	1,269.0	5,921.6	86.1	401.6	5,495.2	25,641.9	873.6	4,076.2	4.3	20.1	6,459.1	30,139.8	21.5	100.4	7,749.7	36,161.7
Chinook salmon	1,577.4	10,682.9	133.4	903.4	3,590.5	24,316.7	55.9	378.9	0.0	0.0	3,779.9	25,599.0	21.5	145.7	5,378.8	36,427.7
Pink salmon	25.8	62.2	0.0	0.0	426.0	1,026.4	17.2	41.5	0.0	0.0	443.2	1,067.9	0.0	0.0	469.1	1,130.1
Sockeye salmon	3,640.3	12,919.8	929.5	3,298.9	27,213.6	96,583.6	391.6	1,389.8	0.0	0.0	28,534.7	101,272.3	129.1	458.2	32,304.1	114,650.3
Spawning sockeye salmon	0.0	0.0	0.0	0.0	856.3	3,039.2	73.2	259.6	0.0	0.0	929.5	3,298.9	193.6	687.3	1,123.1	3,986.1
Unspecified salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2022.
Note The harvested number of salmon is represented as individual fish harvested.

Table 2-16.–Estimated percentages of salmon harvested in pounds usable weight by gear type, resource, and total salmon harvest, Dillingham, 2021.

				Subsistence methods													
		Removed from commercial catch		Driftnet		Setnet		Dip net		Other		Subsistence gear, any method		Rod and reel		Total	
Resource	Percentage base	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
	Gear type	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Salmon	**Resource**	**13.5%**	**15.0%**	**2.4%**	**2.4%**	**80.5%**	**78.9%**	**2.9%**	**3.1%**	**0.0%**	**0.0%**	**85.8%**	**84.3%**	**0.8%**	**0.7%**	**100.0%**	**100.0%**
	Total	**13.5%**	**15.0%**	**2.4%**	**2.4%**	**80.5%**	**78.9%**	**2.9%**	**3.1%**	**0.0%**	**0.0%**	**85.8%**	**84.3%**	**0.8%**	**0.7%**	**100.0%**	**100.0%**
	Gear type	0.7%	0.6%	1.8%	1.8%	4.1%	4.0%	0.0%	0.0%	50.0%	45.8%	3.9%	3.8%	0.0%	0.0%	3.3%	3.4%
Chum salmon	Resource	2.9%	2.9%	1.3%	1.3%	95.6%	95.6%	0.0%	0.0%	0.3%	0.3%	97.1%	97.1%	0.0%	0.0%	100.0%	100.0%
	Total	0.1%	0.1%	0.0%	0.0%	3.3%	3.2%	0.0%	0.0%	0.0%	0.0%	3.3%	3.2%	0.0%	0.0%	3.3%	3.4%
	Gear type	19.3%	19.9%	7.4%	8.6%	14.0%	16.3%	61.9%	66.3%	50.0%	54.2%	15.5%	18.0%	5.9%	7.2%	18.2%	15.9%
Coho salmon	Resource	16.4%	16.4%	1.1%	1.1%	70.9%	70.9%	11.3%	11.3%	0.1%	0.1%	83.3%	83.3%	0.3%	0.3%	100.0%	100.0%
	Total	2.6%	3.0%	0.2%	0.2%	11.3%	12.9%	1.8%	2.0%	0.0%	0.0%	13.3%	15.1%	0.0%	0.1%	18.2%	15.9%
	Gear type	24.0%	35.9%	11.4%	19.3%	9.2%	15.5%	4.0%	6.2%	0.0%	0.0%	9.0%	15.3%	5.9%	10.5%	18.3%	11.0%
Chinook salmon	Resource	29.3%	29.3%	2.5%	2.5%	66.8%	66.8%	1.0%	1.0%	0.0%	0.0%	70.3%	70.3%	0.4%	0.4%	100.0%	100.0%
	Total	3.2%	5.4%	0.3%	0.5%	7.4%	12.2%	0.1%	0.2%	0.0%	0.0%	7.8%	12.9%	0.0%	0.1%	18.3%	11.0%
	Gear type	0.4%	0.2%	0.0%	0.0%	1.1%	0.7%	1.2%	0.7%	0.0%	0.0%	1.1%	0.6%	0.0%	0.0%	0.6%	1.0%
Pink salmon	Resource	5.5%	5.5%	0.0%	0.0%	90.8%	90.8%	3.7%	3.7%	0.0%	0.0%	94.5%	94.5%	0.0%	0.0%	100.0%	100.0%
	Total	0.1%	0.0%	0.0%	0.0%	0.9%	0.5%	0.0%	0.0%	0.0%	0.0%	0.9%	0.5%	0.0%	0.0%	0.6%	1.0%
	Gear type	55.5%	43.4%	79.4%	70.4%	69.5%	61.5%	27.7%	22.6%	0.0%	0.0%	68.3%	60.4%	35.3%	32.9%	57.6%	66.3%
Sockeye salmon	Resource	11.3%	11.3%	2.9%	2.9%	84.2%	84.2%	1.2%	1.2%	0.0%	0.0%	88.3%	88.3%	0.4%	0.4%	100.0%	100.0%
	Total	7.5%	6.5%	1.9%	1.7%	55.9%	48.5%	0.8%	0.7%	0.0%	0.0%	58.6%	50.9%	0.3%	0.2%	57.6%	66.3%
	Gear type	0.0%	0.0%	0.0%	0.0%	2.2%	1.9%	5.2%	4.2%	0.0%	0.0%	2.2%	2.0%	52.9%	49.4%	2.0%	2.3%
Spawning sockeye salmon	Resource	0.0%	0.0%	0.0%	0.0%	76.2%	76.2%	6.5%	6.5%	0.0%	0.0%	82.8%	82.8%	17.2%	17.2%	100.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	1.8%	1.5%	0.2%	0.1%	0.0%	0.0%	1.9%	1.7%	0.4%	0.3%	2.0%	2.3%
	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unspecified salmon	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source ADF&G Division of Subsistence household surveys, 2022.
Note The harvested number of salmon is represented as individual fish harvested.

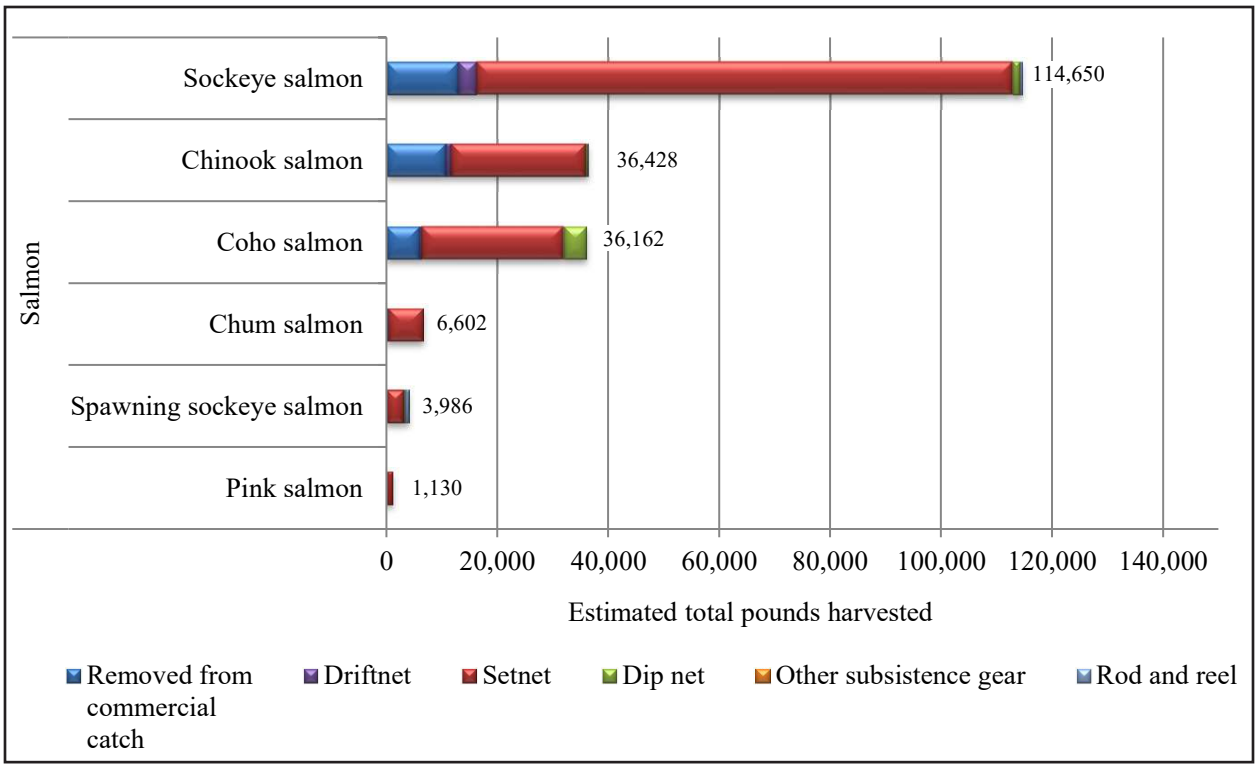


Figure 2-17.–Estimated harvest of salmon in pounds usable weight by gear type and resource, Dillingham, 2021.

households in 2021, and approximately 10% of households attempted to harvest this resource and 9% of community households successfully harvested spawning sockeye salmon. The total pink salmon harvest was 1,130 lb (less than 1 lb per capita). Pink salmon were used by 7% of Dillingham households in 2021, and approximately 6% of households attempted to and successfully harvested pink salmon.

Sharing of salmon was common in this community in 2021: all five species of Pacific salmon available in Alaska were received and given away by Dillingham households, but much of the sharing was focused on the main harvested species. Most households that harvested sockeye salmon (65%), Chinook salmon (56%), spawning sockeye salmon (9%), and pink salmon (6%) shared those resources, as indicated by nearly the same proportion of households having given away sockeye salmon (62%), Chinook salmon (50%), spawning sockeye salmon (8%), and pink salmon (3%). Similarly, the most households (57%) received sockeye salmon, and Chinook salmon were received by 39% of households while 31% of households received coho salmon.

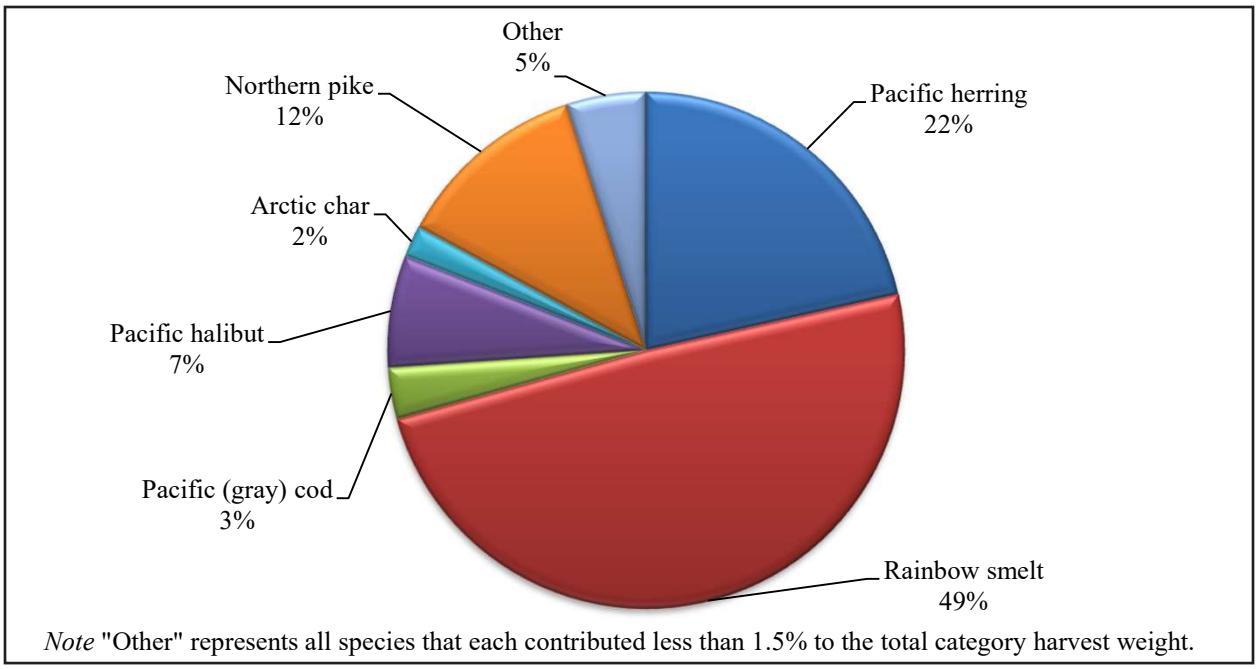
In 2021, the majority of salmon (39,183 fish, or 156,920 lb) were harvested using subsistence set gillnets: 81% of all individual salmon were harvested by this method (Table 2-15; Table 2-16). An estimated 6,560 salmon (29,775 lb) were removed from commercial harvests for home use, 1,412 salmon (6,146 lb) were harvested using subsistence dip nets, 1,171 salmon (4,689 lb) were harvested using subsistence drift gillnets, and 366 salmon (1,392 lb) were taken using rod and reel (Table 2-15). Figure 2-17 is a visual representation of the salmon harvest weight harvested by gear type and species. Overall, 84% of the salmon harvest weight was caught by a subsistence method, 15% was removed from commercial catches, and less than 1% was harvested by rod and reel (Table 2-16). Parsing the subsistence methods, an estimated 79% of the salmon harvest weight was caught using set gillnets in the subsistence fishery, 3% of the salmon harvest weight was harvested using subsistence dip nets, and 2% was taken using subsistence driftnets.



Figure 2-18.–Fishing and harvest locations of salmon, Dillingham, 2021.

This research also considered the harvest of each salmon species by gear type. As noted, sockeye salmon dominated the 2021 salmon harvest: the sockeye salmon harvest by set gillnet accounted for 56% of the total individual fish harvest, or 49% of the total salmon harvest weight. For every harvested salmon resource, the majority of the harvest weight (67%–96%) came from subsistence setnets. Rod and reel was a commonly used gear type though accounted for a small portion of the total harvest; only chum and pink salmon were not harvested by rod and reel. Spawning sockeye salmon contributed most (49%) to the rod and reel harvest weight, followed by sockeye salmon (33%) and Chinook salmon (11%). An estimated 17% of the spawning sockeye salmon harvest came from rod and reel gear; by comparison, for all other resources harvested by rod and reel, this gear type contributed less than 1% to the harvest weight, indicating rod and reel is more important as a harvest method for spawning sockeye salmon than all other resources. With the exception of chum salmon, all salmon resources were harvested by subsistence dip net; however, the majority of the dip net harvest weight was coho salmon (66%), followed by sockeye salmon (23%). An estimated 3% of the Chinook salmon and sockeye salmon harvests each came from subsistence driftnets, but more—29% and 11%, respectively—came from commercial removals. Sockeye salmon (43%), Chinook salmon (36%), and coho salmon (20%) composed almost the entire salmon harvest weight removed from commercial catches.

In the 2021 study year, salmon fishing and harvest areas spanned a great distance throughout the region (Figure 2-18). Near the community of Dillingham, salmon were harvested along Kanakanak, Snag Point, and Scandinavian beaches, along the shores of and within Wood River, Nushagak River, and Nushagak Bay. Farther from Dillingham, salmon were harvested near the community of Aleknagik, and within the Wood–Tikchik State Park—in Lake Aleknagik and Lake Nerka. Salmon were also harvested a distance away from Dillingham, near the communities of: Clarks Point, Ekuk, Igushik, Ekwok, Togiak, and on the Alaska Peninsula near the Cinder River.



Note "Other" represents all species that each contributed less than 1.5% to the total category harvest weight.

Figure 2-19.–Composition of nonsalmon fish harvest in pounds usable weight, Dillingham, 2021.

Nonsalmon Fish

Nonsalmon fish was the third most harvested resource category in Dillingham in 2021, accounting for approximately 10% of the overall harvest of wild resources (Figure 2-14). A total of approximately 36,493 lb of nonsalmon fish were harvested in Dillingham during the study year, equating to a per capita harvest of 19 lb (Table 2-13). Nearly three-quarters (74%) of Dillingham households used at least one species of nonsalmon fish during the 2021 study year. The nonsalmon fish harvest included a variety of species: rainbow smelt (49% of the total nonsalmon fish harvest weight), followed by Pacific herring (22%), northern pike (12%), Pacific halibut (7%), Pacific (gray) cod (3%), and Arctic char (2%) (Figure 2-19; Table 2-13). Approximately one dozen other nonsalmon fish species composed the remaining 5% of the nonsalmon fish harvest.

A variety of nonsalmon fish species were used, harvested, and shared by Dillingham residents during the study year. A top harvested and used resource, rainbow smelt composed 5% of the total wild resource harvest with a harvest of 17,954 lb, or approximately 9 lb per capita (Table 2-14; Figure 2-15; Table 2-13). Rainbow smelt were used by almost one-half (49%) of Dillingham households and harvested by 28% of households during the study year. Smelt was also the most widely shared nonsalmon fish resource: 32% of households received this resource, and 27% gave away smelt. Pacific herring were only used by 10% of households and only harvested by 2% of Dillingham households during the study year; however, this small percentage of households harvested large quantities of herring: 7,849 lb (4 lb per capita). The total northern pike harvest in 2021 was 4,425 lb, or 2 lb per capita. Northern pike were used by 30% of Dillingham households and harvested by 20% of households during the study year. In 2021, the total harvest of Pacific halibut was 2,565 lb (1 lb per capita). Pacific halibut were used by 28% of households, harvested by 6%, given away by 13%, and received by 25% of households; the relatively high rate of use compared to the proportion of households that harvested, shared, and received Pacific halibut suggests Dillingham households may have received this resource from households in other communities or that one household in Dillingham harvested a large halibut and shared it with many households. The remaining harvested nonsalmon fish resources each contributed less than 1 lb per capita: Pacific (gray) cod (1,174 lb), Arctic char (717 lb), and lake trout (325 lb). Another dozen nonsalmon fish resources were harvested from both fresh and salt water—including Dolly Varden, whitefishes, rockfishes, and others—but no harvests of these resources exceeded

a total harvest weight of 300 lb. Though there was no reported harvest, 27% of Dillingham households received and used herring spawn on kelp, and 12% further shared the resource during the study year. Survey respondents indicated that herring spawn on kelp came from the Togiak subsistence fishery.

In 2021, the majority of nonsalmon fish (22,000 lb) were harvested using subsistence set gillnets: 60% of the nonsalmon fish harvest weight was caught by this method (Table 2-17; Table 2-18). An estimated 6,333 lb of nonsalmon fish were caught using hook under ice (17% of overall nonsalmon fish harvest weight), 6,133 lb were taken with rod and reel (17%), 1,089 lb were removed from commercial catches for home use (3%), 387 lb were harvested with a net under ice (1%), and 551 lb were harvested using other subsistence methods (2% of all the nonsalmon fish harvest) (Table 2-17; Table 2-18).

Figure 2-20 is a visual representation of the nonsalmon fish harvest weight by gear type and species. The entire harvest by net under ice comprised rainbow smelt. However, the majority of rainbow smelt (75% of the harvest weight) were harvested using setnets followed by 20% of the harvest weight being caught by jigging a lure under the ice that was attached to a stick (an activity locally referred to as *manaq* or *iqsak*) (Table 2-18). A small proportion of the rainbow smelt harvest weight was caught by other methods: 2% by net under ice, 2% by rod and reel used in open water, and less than 1% by unspecified subsistence methods. Nearly all of the Pacific herring harvest came from subsistence setnets (Table 2-17). Regarding northern pike, almost the same number of fish (approximately 700) were caught by hook under ice as by rod and reel in open water: 46% and 44% of the pike harvest weight, respectively (Table 2-17; Table 2-18). Subsistence setnet was the only other method used to harvest northern pike (10% of harvest weight) (Table 2-18). Similar to northern pike, Arctic char were mostly harvested by hook under ice (20% of harvest weight) and rod and reel (78%), and a small proportion (2%) of the harvest was caught by setnet. There were five species of nonsalmon fish retained from commercial catches, and Pacific cod composed the bulk of the harvest weight (47%) obtained by this method. An estimated 9% of the Pacific halibut harvest was removed from commercial catches and 10% was harvested using the other subsistence method of longline/skate, but the bulk of the harvest weight (81%) was caught using rod and reel. Dillingham residents qualify to participate in the federal subsistence Pacific halibut fishery, which allows the use of longlines/skates, as well as hook and line gear. Some of the rod and reel harvest of Pacific halibut may have been obtained under the federal subsistence fishery, and some of the harvest might have been obtained under state sport fishing regulations.

In the 2021 study year, nonsalmon fishing and harvest areas spanned a great distance throughout the region and the entire state (figures 2-21 and 2-22). Near the community of Dillingham, nonsalmon fish were harvested along the local beaches, the shores of and within Wood and Nushagak rivers, and within Nushagak Bay near the communities of Clarks Point and Ekuk (Figure 2-21). Nonsalmon fish were harvested in the southern portion of Nushagak Bay, in an area wrapping around the Nushagak Peninsula, and near the communities of Togiak and Twin Hills. North from Dillingham, nonsalmon fish were harvested near the community of Aleknagik and in Lake Nunavaugaluk, and within the Wood–Tikchik State Park—in Aleknagik and Nerka lakes. Nonsalmon fish were also harvested outside of the Bristol Bay region: within Cook Inlet near the community of Nanwalek, in Montague Strait near the community of Chenega, in the eastern channel of Sitka Sound, and in the Holitna River near the community of Sleetmute (Figure 2-22).

Table 2-17.–Estimated harvest of nonsalmon fish by gear type and resource, Dillingham, 2021.

		Removed from commercial catch		Subsistence methods													
				Setnet		Net under ice		Hook under ice		Other		Subsistence gear, any method		Rod and reel		Total	
Resource	Unit[a]	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Nonsalmon fish			**1,088.7**		**22,000.3**		**387.3**		**6,332.6**		**550.8**		**29,271.0**		**6,133.0**		**36,492.7**
Pacific herring	gal	0.0	0.0	1,303.9	7,823.3	0.0	0.0	0.0	0.0	4.3	25.8	1,308.2	7,849.1	0.0	0.0	1,308.2	7,849.1
Pacific herring spawn on kelp	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific herring roe on hemlock branches	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow smelt	gal	0.0	0.0	2,247.4	13,484.2	64.5	387.3	598.6	3,591.5	21.5	129.1	2,932.0	17,592.0	60.2	361.5	2,992.2	17,953.5
Pacific (gray) cod	ind	160.3	512.9	0.0	0.0	0.0	0.0	0.0	0.0	43.0	137.7	43.0	137.7	163.5	523.3	366.9	1,173.9
Starry flounder	ind	21.5	64.5	12.9	38.7	0.0	0.0	0.0	0.0	0.0	0.0	12.9	38.7	0.0	0.0	34.4	103.3
Lingcod	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	17.2	4.3	17.2
Pacific halibut	lb	236.7	236.7	0.0	0.0	0.0	0.0	0.0	0.0	258.2	258.2	258.2	258.2	2,069.9	2,069.9	2,564.7	2,564.7
Unspecified rockfishes	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	111.9	223.8	111.9	223.8
Sablefish (black cod)	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unspecified Irish lords	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellowfin sole	ind	21.5	21.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.5	21.5
Alaska blackfish	gal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	ind	0.0	0.0	0.0	0.0	0.0	0.0	43.0	43.0	0.0	0.0	43.0	43.0	0.0	0.0	43.0	43.0
Arctic char	ind	0.0	0.0	8.6	12.0	0.0	0.0	103.3	144.6	0.0	0.0	111.9	156.6	400.2	560.3	512.1	716.9
Dolly Varden, freshwater	ind	0.0	0.0	0.0	0.0	0.0	0.0	133.4	186.8	0.0	0.0	133.4	186.8	25.8	36.1	159.2	222.9
Dolly Varden, saltwater	ind	180.7	253.0	8.6	12.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	12.0	0.0	0.0	189.3	265.1
Dolly Varden, Togiak trout	ind	0.0	0.0	34.4	48.2	0.0	0.0	0.0	0.0	0.0	0.0	34.4	48.2	0.0	0.0	34.4	48.2
Lake trout	ind	0.0	0.0	8.6	23.2	0.0	0.0	103.3	278.8	0.0	0.0	111.9	302.1	8.6	23.2	120.5	325.3
Arctic grayling	ind	0.0	0.0	17.2	12.0	0.0	0.0	0.0	0.0	0.0	0.0	17.2	12.0	81.8	57.2	99.0	69.3
Northern pike	ind	0.0	0.0	155.9	436.6	0.0	0.0	722.9	2,024.2	0.0	0.0	878.9	2,460.8	701.4	1,964.0	1,580.3	4,424.8
Sheefish	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Longnose sucker	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow trout	ind	0.0	0.0	17.2	12.0	0.0	0.0	60.2	42.2	0.0	0.0	77.5	54.2	245.3	171.7	322.7	225.9
Unspecified trouts	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback whitefish	ind	0.0	0.0	38.7	67.8	0.0	0.0	0.0	0.0	0.0	0.0	38.7	67.8	51.6	90.4	90.4	158.1
Round whitefish	ind	0.0	0.0	30.1	30.1	0.0	0.0	21.5	21.5	0.0	0.0	51.6	51.6	34.4	34.4	86.1	86.1
Unspecified whitefishes	ind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source ADF&G Division of Subsistence household surveys, 2022.

Note Amounts were omitted for the nonsalmon fish totals due to incompatible units of measure.

Note Other subsistence method for Pacific halibut and (gray) cod was longline/skate (by one household); gear type unknown for rainbow smelt and Pacific herring.

Note Under federal regulations, rod and reel is legal gear for subsistence harvests of Pacific halibut taken by residents of eligible rural communities and members of eligible tribes who have a Subsistence Halibut Registration Certificate (SHARC).

a. The harvested number of each resource is measured by the unit in which the resource harvest information was collected; the unit of measurement is provided for each resource.

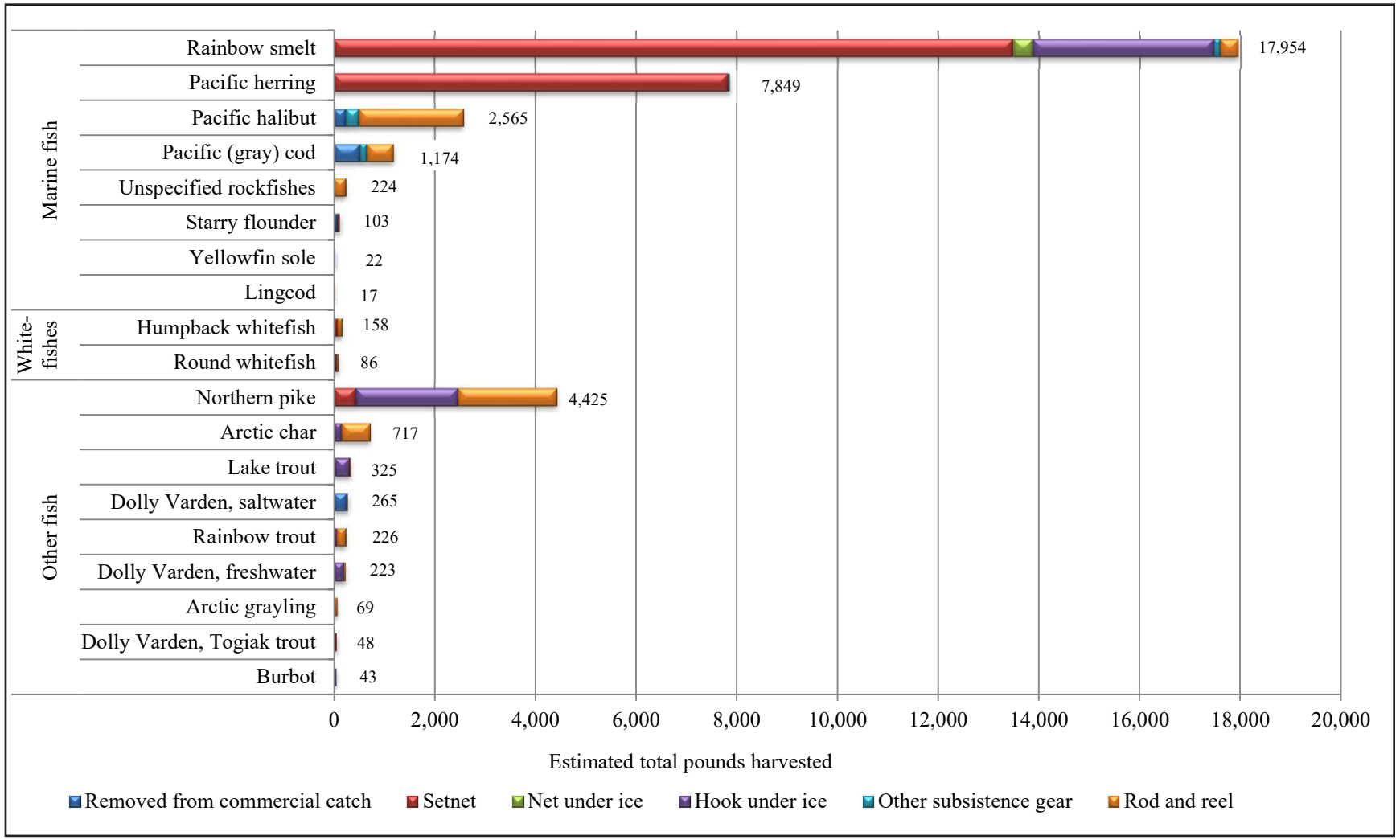


Figure 2-20.–Estimated harvest of nonsalmon fish in pounds usable weight by gear type and resource, Dillingham, 2021.

Table 2-18.–Estimated percentages of nonsalmon fish harvested in pounds usable weight by gear type, resource, and total nonsalmon fish harvest, Dillingham, 2021.

Resource	Percentage base	Removed from commercial catch	Subsistence methods						
			Setnet	Net under ice	Hook under ice	Other	Subsistence gear, any method	Rod and reel	Total
Nonsalmon fish	**Gear type**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Resource	**3.0%**	**60.3%**	**1.1%**	**17.4%**	**1.5%**	**80.2%**	**16.8%**	**100.0%**
	Total	**3.0%**	**60.3%**	**1.1%**	**17.4%**	**1.5%**	**80.2%**	**16.8%**	**100.0%**
Pacific herring	Gear type	0.0%	35.6%	0.0%	0.0%	4.7%	26.8%	0.0%	12.3%
	Resource	0.0%	99.7%	0.0%	0.0%	0.3%	100.0%	0.0%	100.0%
	Total	0.0%	21.4%	0.0%	0.0%	0.1%	21.5%	0.0%	12.3%
Pacific herring spawn on kelp	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pacific herring roe on hemlock branches	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rainbow smelt	Gear type	0.0%	61.3%	100.0%	56.7%	23.4%	60.1%	5.9%	28.1%
	Resource	0.0%	75.1%	2.2%	20.0%	0.7%	98.0%	2.0%	100.0%
	Total	0.0%	37.0%	1.1%	9.8%	0.4%	48.2%	1.0%	28.1%
Pacific (gray) cod	Gear type	47.1%	0.0%	0.0%	0.0%	25.0%	0.5%	8.5%	3.4%
	Resource	43.7%	0.0%	0.0%	0.0%	11.7%	11.7%	44.6%	100.0%
	Total	1.4%	0.0%	0.0%	0.0%	0.4%	0.4%	1.4%	3.4%
Starry flounder	Gear type	5.9%	0.2%	0.0%	0.0%	0.0%	0.1%	0.0%	0.3%
	Resource	62.5%	37.5%	0.0%	0.0%	0.0%	37.5%	0.0%	100.0%
	Total	0.2%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.3%
Lingcod	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Pacific halibut	Gear type	21.7%	0.0%	0.0%	0.0%	46.9%	0.9%	33.7%	24.1%
	Resource	9.2%	0.0%	0.0%	0.0%	10.1%	10.1%	80.7%	100.0%
	Total	0.6%	0.0%	0.0%	0.0%	0.7%	0.7%	5.7%	24.1%
Unspecified rockfishes	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.6%	1.1%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	1.1%
Sablefish (black cod)	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

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Table 2-18.–Page 2 of 3.

Resource	Percentage base	Removed from commercial catch	Subsistence methods						
			Setnet	Net under ice	Hook under ice	Other	Subsistence gear, any method	Rod and reel	Total
Unspecified Irish lords	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Yellowfin sole	Gear type	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
	Resource	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Total	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Alaska blackfish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Burbot	Gear type	0.0%	0.0%	0.0%	0.7%	0.0%	0.1%	0.0%	0.4%
	Resource	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.4%
Arctic char	Gear type	0.0%	0.1%	0.0%	2.3%	0.0%	0.5%	9.1%	4.8%
	Resource	0.0%	1.7%	0.0%	20.2%	0.0%	21.8%	78.2%	100.0%
	Total	0.0%	0.0%	0.0%	0.4%	0.0%	0.4%	1.5%	4.8%
Dolly Varden, freshwater	Gear type	0.0%	0.0%	0.0%	2.9%	0.0%	0.6%	0.6%	1.5%
	Resource	0.0%	0.0%	0.0%	83.8%	0.0%	83.8%	16.2%	100.0%
	Total	0.0%	0.0%	0.0%	0.5%	0.0%	0.5%	0.1%	1.5%
Dolly Varden, saltwater	Gear type	23.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%
	Resource	95.5%	4.5%	0.0%	0.0%	0.0%	4.5%	0.0%	100.0%
	Total	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%
Dolly Varden, Togiak trout	Gear type	0.0%	0.2%	0.0%	0.0%	0.0%	0.2%	0.0%	0.3%
	Resource	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
	Total	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.3%
Lake trout	Gear type	0.0%	0.1%	0.0%	4.4%	0.0%	1.0%	0.4%	1.1%
	Resource	0.0%	7.1%	0.0%	85.7%	0.0%	92.9%	7.1%	100.0%
	Total	0.0%	0.1%	0.0%	0.8%	0.0%	0.8%	0.1%	1.1%
Arctic grayling	Gear type	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.9%	0.9%
	Resource	0.0%	17.4%	0.0%	0.0%	0.0%	17.4%	82.6%	100.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.9%
Northern pike	Gear type	0.0%	2.0%	0.0%	32.0%	0.0%	8.4%	32.0%	14.9%
	Resource	0.0%	9.9%	0.0%	45.7%	0.0%	55.6%	44.4%	100.0%
	Total	0.0%	1.2%	0.0%	5.5%	0.0%	6.7%	5.4%	14.9%

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Table 2-18.–Page 3 of 3.

Resource	Percentage base	Removed from commercial catch	Subsistence methods						
			Setnet	Net under ice	Hook under ice	Other	Subsistence gear, any method	Rod and reel	Total
Sheefish	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Longnose sucker	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rainbow trout	Gear type	0.0%	0.1%	0.0%	0.7%	0.0%	0.2%	2.8%	3.0%
	Resource	0.0%	5.3%	0.0%	18.7%	0.0%	24.0%	76.0%	100.0%
	Total	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.5%	3.0%
Unspecified trouts	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Humpback whitefish	Gear type	0.0%	0.3%	0.0%	0.0%	0.0%	0.2%	1.5%	0.8%
	Resource	0.0%	42.9%	0.0%	0.0%	0.0%	42.9%	57.1%	100.0%
	Total	0.0%	0.2%	0.0%	0.0%	0.0%	0.2%	0.2%	0.8%
Round whitefish	Gear type	0.0%	0.1%	0.0%	0.3%	0.0%	0.2%	0.6%	0.8%
	Resource	0.0%	35.0%	0.0%	25.0%	0.0%	60.0%	40.0%	100.0%
	Total	0.0%	0.1%	0.0%	0.1%	0.0%	0.1%	0.1%	0.8%
Unspecified whitefishes	Gear type	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Resource	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source ADF&G Division of Subsistence household surveys, 2022.

Note Other subsistence method for Pacific halibut and (gray) cod was longline/skate; gear type unknown for rainbow smelt and Pacific herring.

Note Under federal regulations, rod and reel is legal gear for subsistence harvests of Pacific halibut taken by residents of eligible rural communities and members of eligible tribes who have a Subsistence Halibut Registration Certificate (SHARC).

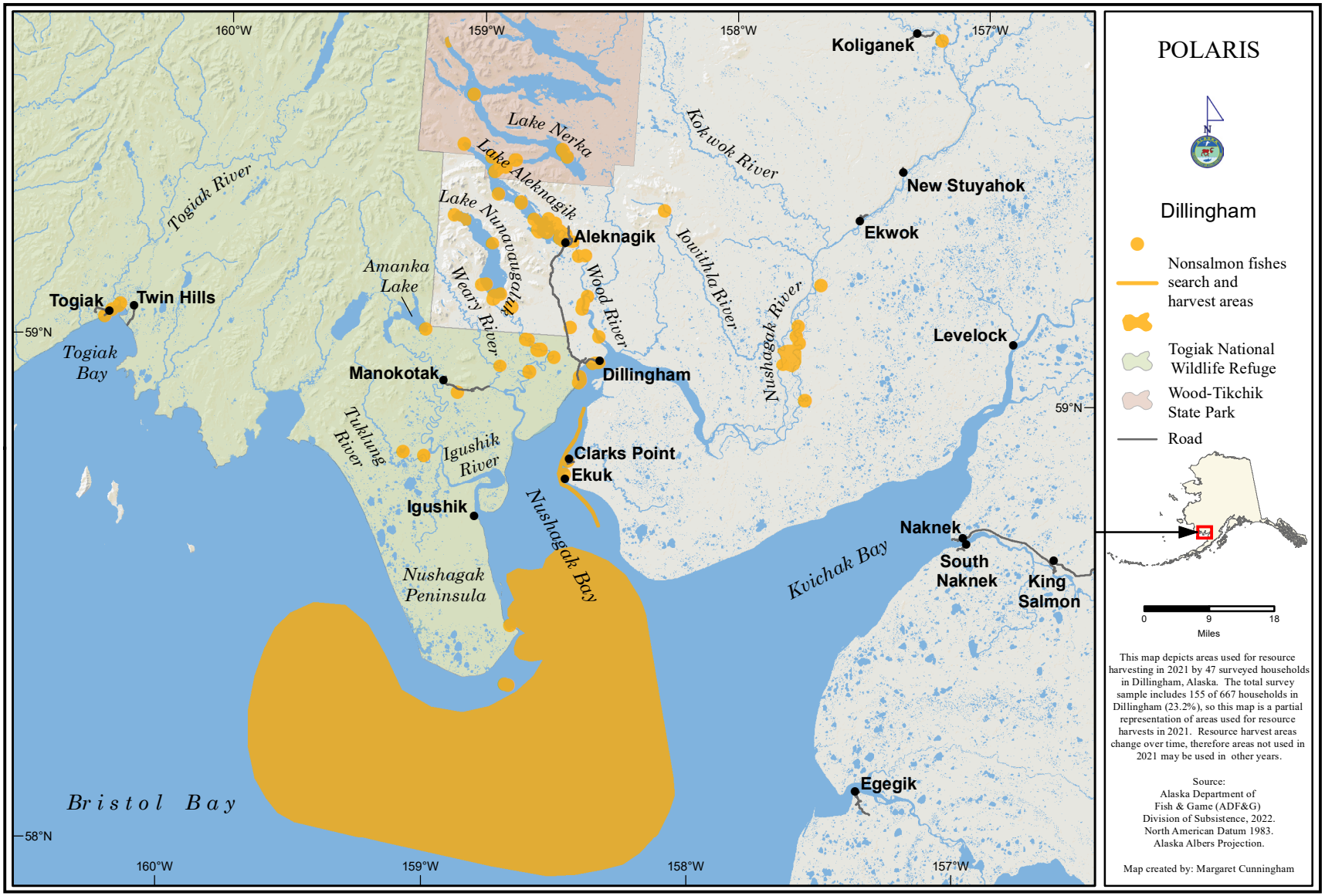


Figure 2-21.–Fishing and harvest locations of nonsalmon fish, Dillingham, 2021.

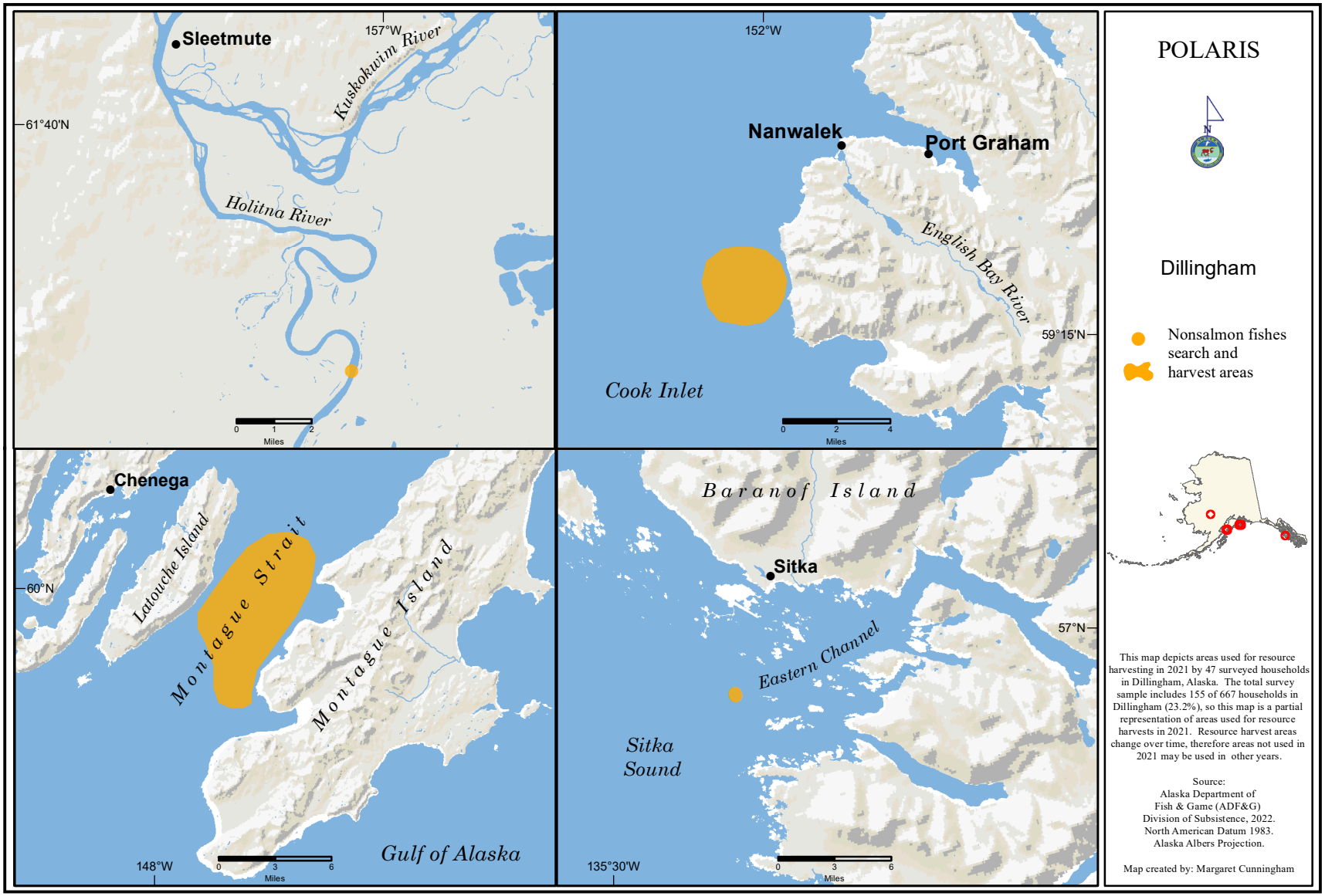
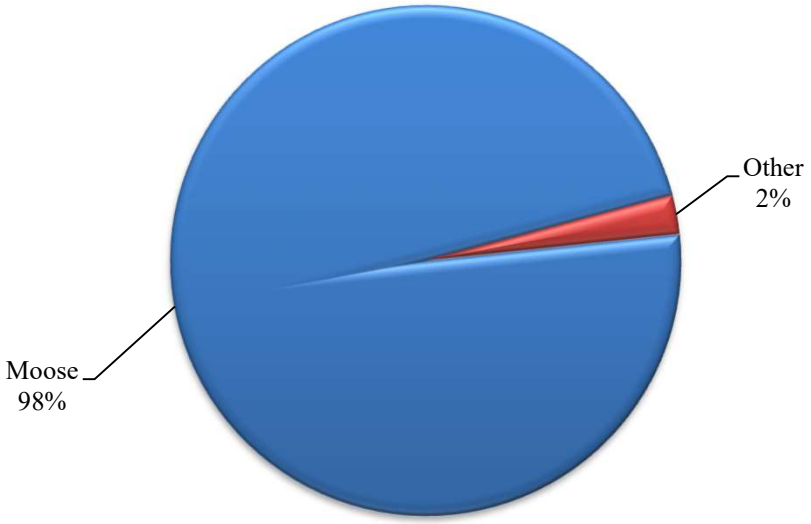


Figure 2-22.–Fishing and harvest locations of nonsalmon fish (statewide), Dillingham, 2021.



Note "Other" represents all species that each contributed less than 1.5% to the total category harvest weight.

Figure 2-23.–Composition of large land mammal harvest in pounds usable weight, Dillingham, 2021.

Large Land Mammals

Large land mammals accounted for approximately 21% of the total harvest by weight in Dillingham during 2021 (Figure 2-14). The majority (83%) of Dillingham households used at least one of the large land mammal species during the 2021 study year. The large land mammal harvest for consumption included four species: moose composed 98% of the large land mammal harvest weight, and deer, mountain goat, and bison made up the remaining 2% (Figure 2-23; Table 2-13). Brown bear was the only species harvested for non-consumptive purposes. As mentioned in Chapter 1, hunting for caribou locally in GMU 17 was closed by emergency order in the study year due to low abundance of the Mulchatna and Nushagak Peninsula caribou herds.

The total large land mammal harvest in 2021 was 81,162 lb, or 42 lb per capita (Table 2-13). The 2021 total moose harvest was 147 individuals, weighing 79,158 lb (41 lb per capita). Following use of sockeye salmon, the largest percentage (79%) of Dillingham households used moose during the study year (Table 2-14). Although widely used, moose were harvested by only 20% of households, though 45% of households attempted to harvest this resource (Table 2-13). Moose were given away by almost one-half (48%) of households and were received by 70% of households. These use metrics demonstrate the role of sharing moose in Dillingham residents' lives: moose are harvested by a relatively small percentage of the community and shared with other households who appear to reshare with even more, such that the majority of the community uses moose. All recorded moose harvests occurred during the regulatory hunting seasons, in August and September, and in the winter months of January, February, and December of the study year (Table 2-19). As described in Chapter 1, the registration hunt from August 20–September 15 provides an opportunity to harvest younger bulls and has an earlier season start date than the general hunt. This hunt is preferred by many local hunters who prioritize efficient harvest efforts and quality of meat above trophy attributes of bull moose. In total (general and registration hunt harvests combined), approximately 9 bull moose were harvested in January, and 4 in February, 43 were harvested in August, 82 in September, and 4 in December. For cow moose, approximately four were harvested in February.

Table 2-19.–Estimated large land mammal harvests by month and sex, Dillingham, 2021.

Resource	Estimated harvest by month													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All large land mammals	**8.6**	**8.6**	**1.0**	**0.0**	**0.0**	**0.0**	**0.0**	**56.2**	**99.0**	**0.0**	**12.9**	**4.3**	**0.0**	**190.6**
Bison	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**1.0**
Black bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Brown bear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	**4.3**
Caribou	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Caribou, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Deer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	0.0	0.0	12.9	0.0	0.0	**21.5**
Mountain goat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	12.9	0.0	0.0	0.0	0.0	**17.2**
Moose	8.6	8.6	0.0	0.0	0.0	0.0	0.0	43.3	81.8	0.0	0.0	4.3	0.0	**146.6**
Moose, male	8.6	4.3	0.0	0.0	0.0	0.0	0.0	43.3	81.8	0.0	0.0	4.3	0.0	**142.3**
Moose, female	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.3**
Moose, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2022.

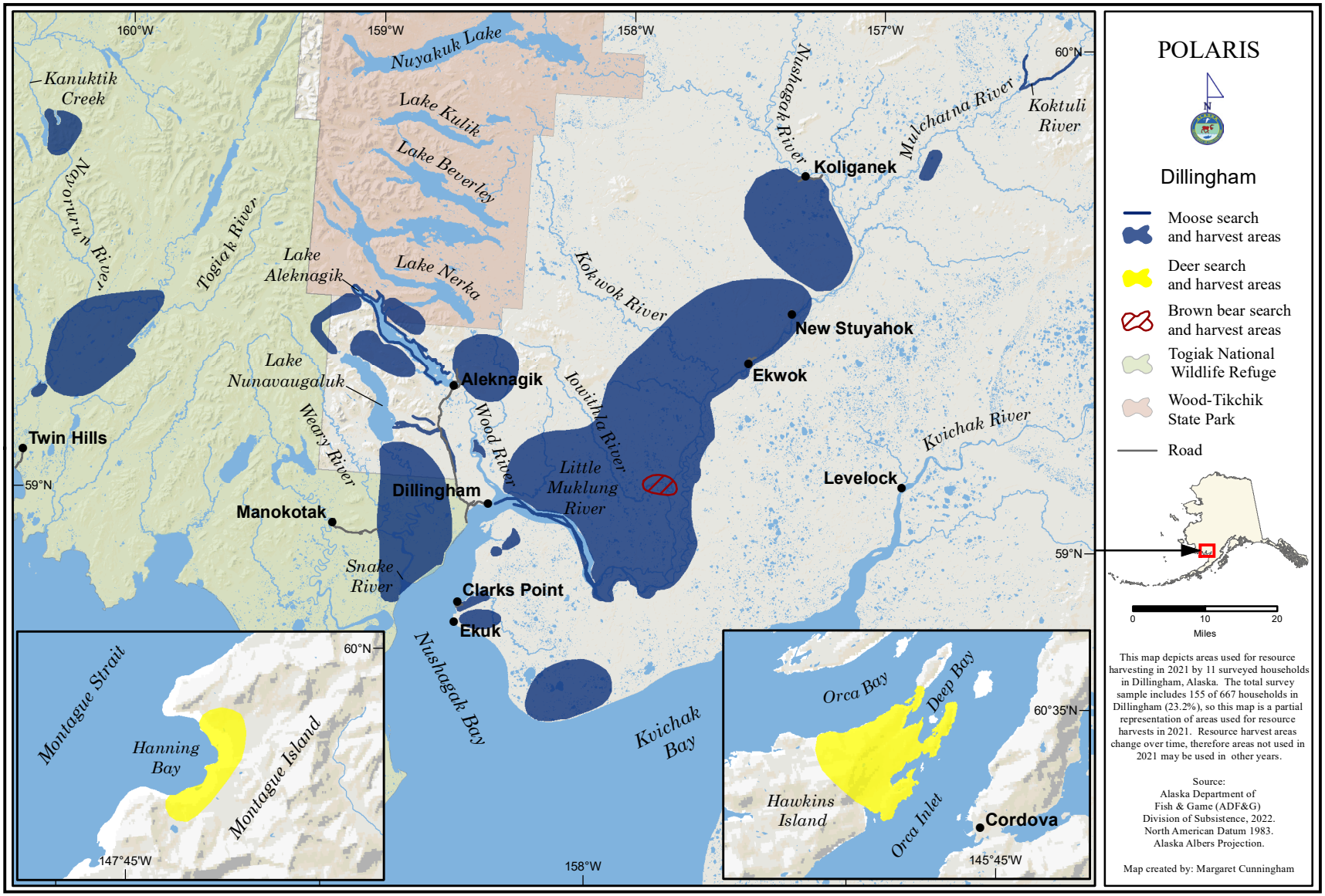


Figure 2-24.–Hunting locations of moose, deer, and brown bear, Dillingham, 2021.

Dillingham hunters described having to go farther or to new areas while moose hunting in recent years. In particular, people described hunting for moose in the Nushagak drainage as more challenging in the most recent five years compared to years before. When discussing moose hunting, the cost and amount of fuel needed to harvest a moose were frequently cited by survey respondents as challenging moose harvest efforts. For example, according to one survey respondent: "Moose upriver are low. [We wonder] why? Years ago, moose were plentiful. Not now. [It takes] 80 gallons of gas just to go moose hunting [now]." Many survey respondents expressed support for the registration winter moose hunt, explaining that this hunt was essential for many households to ensure that they have enough meat for the year.

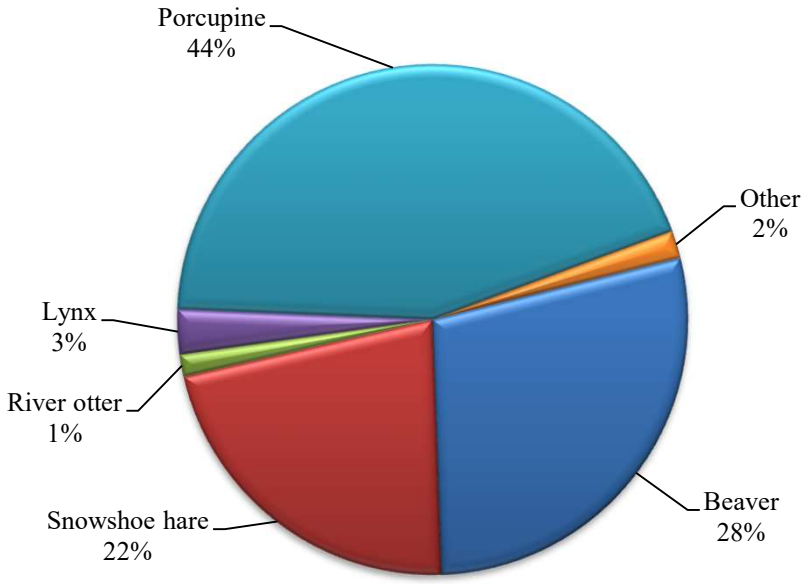
Deer, mountain goats, and bison are not locally available for harvest in the Bristol Bay region but were harvested. During the study year the total deer harvest weight was 930 lb, or 22 animals (Table 2-13). Deer were used by 5% of households; 3% of community households successfully harvested deer, which were given away by and received by 3% of households in 2021. The total mountain goat harvest weight was 624 lb, or 17 individuals. Mountain goats were used, harvested, and given away by 2% of Dillingham households during the study year. In 2021, the total bison harvest weight was 450 lb (one individual) and this resource was only used by 1% of households during the study year. During an internal review of data, the bison estimate seemed unusually high. As such, division staff consulted with ADF&G Department of Wildlife Conservation records and determined that all four bison permit holders were contacted during the survey effort. From this, analysts and researchers concluded an estimate was not warranted, and reported values were used for the community's estimated bison harvest. The per capita harvest was less than 1 lb each for deer, mountain goat, and bison. Additionally, a small percentage (less than 1%) of households harvested brown bear for fur only during the study year. Though no harvests occurred in 2021, two other species of large land mammals were used and shared by Dillingham households: caribou (12% of households used and received, 5% gave away) and black bear (1% of households used, received, and gave away).

As depicted in Figure 2-24, large land mammal search and harvest areas occurred throughout the Bristol Bay region and several areas outside of the Bristol Bay region. Moose search and harvest areas included lands close to the community of Dillingham, from the mouth of the Snake River to areas north of Dillingham near the community of Aleknagik. Moose hunting occurred between Nunavaugaluk and Aleknagik lakes, as well as along almost the entire shoreline of Lake Aleknagik and in an area north of the shore within the Wood–Tikchik State Park. To the west of Dillingham, areas within the Togiak National Wildlife Refuge along the Nayorurun River and the Togiak River were used as search and harvest areas for moose during the study year. East from Dillingham, moose were also hunted or harvested along the shores of the Wood River, along both sides of the Nushagak River—toward the communities of Ekwok, New Stuyahok, and Koliganek—as well as along the Mulchatna and Koktuli rivers. Finally, south of Dillingham moose were hunted in areas near the communities of Clarks Point and Ekuk. Brown bear search and harvest areas were to the east of Dillingham, near the Iowithla River. Deer are not available in the Bristol Bay region; all deer search and harvest areas were located in the Prince William Sound region of Alaska. Deer search and harvest areas included areas near Hanning Bay on Montague Island and on Hawkins Island between Orca Bay and Orca Inlet, near the community of Cordova.

Small Land Mammals/Furbearers

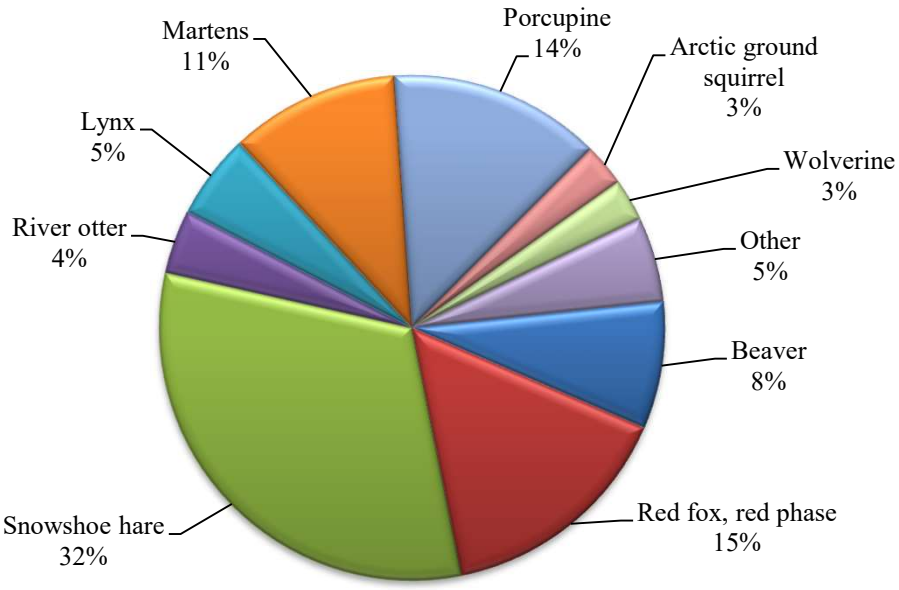
Small land mammals made up less than 1% of the total harvest by weight in Dillingham during the study year and the per capita harvest of each consumed resource was less than 1 lb (Figure 2-14; Table 2-13). Figure 2-25 illustrates the small land mammal harvest by usable weight for animals that were consumed (not harvested for fur only).[14] Dillingham residents harvested 129 porcupines (797 lb), which accounted for 44% of the total small land mammal harvest weight (Table 2-13; Figure 2-25). Beavers accounted for 28% of the harvest weight with a total of 78 individuals harvested (516 lb). Dillingham residents harvested a total of 301 snowshoe hares (400 lb), which accounted for 22% of the total harvest weight. Other small land

14. Note that, according to project co-lead Cody Larson from Bristol Bay Native Association, weasels and river otters are not typically eaten and harvested animals may not have been consumed. The estimates reflect responses collected during survey administration.



Note "Other" represents all species that each contributed less than 1.3% to the total category harvest weight.

Figure 2-25.–Composition of small land mammal/furbearer harvest in pounds usable weight, Dillingham, 2021.



Note "Other" represents all species that each contributed less than 1.5% to the total individual animal harvest amount.

Figure 2-26.–Composition of small land mammal/furbearer harvest by individual animals harvested, Dillingham, 2021.

mammals harvested in lower quantities included lynx (3% of total harvest by weight) and river otters (1%); the harvests each of the following resources were less than 1.3% of the harvest weight: unspecified hares, Arctic ground squirrels, Alaska hares, and weasels. Figure 2-26 illustrates the small land mammal and furbearer harvest by individual animals, which includes both small land mammals harvested for food and fur and animals harvested for fur only. Snowshoe hare was the most harvested small land mammal species by individual animals harvested, composing 32% of the harvest. This was followed by the harvests of red foxes (15%), porcupines (14%), martens (11%), beavers (8%), lynx (5%), river otters (4%), wolverines (3%), Arctic ground squirrels (3%), and several other species of small land mammals/furbearers—including coyote, muskrat, and gray wolf, among others—that composed the remaining 5% of the total small land mammal harvest by individual animals (Figure 2-26; Table 2-13).

Overall, 25% of Dillingham households used small land mammals in 2021 and 17% harvested small land mammals during the study year (Table 2-13**)**. Focusing only on the species that contributed significantly to the harvest weight: 16% of households used and 10% of households harvested porcupines; regarding beavers, 6% of Dillingham households used and 3% harvested animals; and snowshoe hares were used by 8% of households and harvested by 7%. Small land mammals were not widely shared, but porcupine, the most harvested eaten resource, was given away the most (by 7% of households).

Most small land mammals and furbearers were harvested in winter months (January–March, November, and December), although there were fall harvests in August and September of select resources; for example, muskrats and Arctic ground squirrels were only harvested in August (Table 2-20). Porcupines were harvested during more months of the study year—in all seasons except spring—compared to any other resource. Excepting an estimated 43 porcupines harvested in unspecified months, more porcupines were harvested in September (34) than any other month, followed by February and August when 13 porcupines were harvested during each of these months. For beaver harvest timing, February was the month with the greatest number of harvests (17). Most snowshoe hares were harvested in winter: January (43), February (95), March (43), and December (82); the rest were harvested in unknown months.

In 2021, small land mammal search and harvest locations took place within a 30-mile range of the community of Dillingham (Figure 2-27). Small land mammal search and harvest areas included areas close to the community: along the Weary River, located northwest of Dillingham; at select points along the Wood River; to the east of Lake Nunavaugaluk; and west of Dillingham along the Snake and Weary rivers and areas northeast of Manokotak. Additionally, some Dillingham households harvested small land mammals near the community of Clarks Point, and in several areas to the east of Dillingham along the Nushagak River. Several survey respondents explained that fewer Dillingham residents harvested small land mammals in recent years than in the past because snow conditions do not consistently allow for snowmachine travel during the winter season.

Table 2-20.–Estimated small land mammal/furbearer harvests by month, Dillingham, 2021.

Resource	Estimated harvest by month													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All small land mammals	**150.6**	**210.9**	**77.5**	**0.0**	**0.0**	**4.3**	**4.3**	**47.3**	**34.4**	**8.6**	**43.0**	**163.5**	**207.0**	**951.5**
Beaver	0.0	17.2	0.0	0.0	0.0	0.0	0.0	4.3	0.0	8.6	12.9	0.0	34.4	**77.5**
Coyote	0.0	4.3	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	**12.9**
Red fox, cross phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Red fox, red phase	43.0	21.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.2	43.0	21.5	**146.3**
Alaska hare	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	**4.3**
Snowshoe hare	43.0	94.7	43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81.8	38.7	**301.2**
Unspecified hares	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	**4.3**
River otter	8.6	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	8.6	0.0	**38.7**
Lynx	17.2	4.3	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0	**51.8**
Martens	30.1	30.1	17.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.8	**103.3**
Mink	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	0.0	**12.9**
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	**4.3**
Porcupine	4.3	12.9	8.6	0.0	0.0	4.3	4.3	12.9	34.4	0.0	0.0	4.3	43.3	**129.4**
Arctic ground squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.8	0.0	0.0	0.0	0.0	0.0	**25.8**
Red squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Weasels	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	**8.6**
Gray wolf	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.3**
Wolverine	0.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.2	**25.8**

Source ADF&G Division of Subsistence household surveys, 2022.

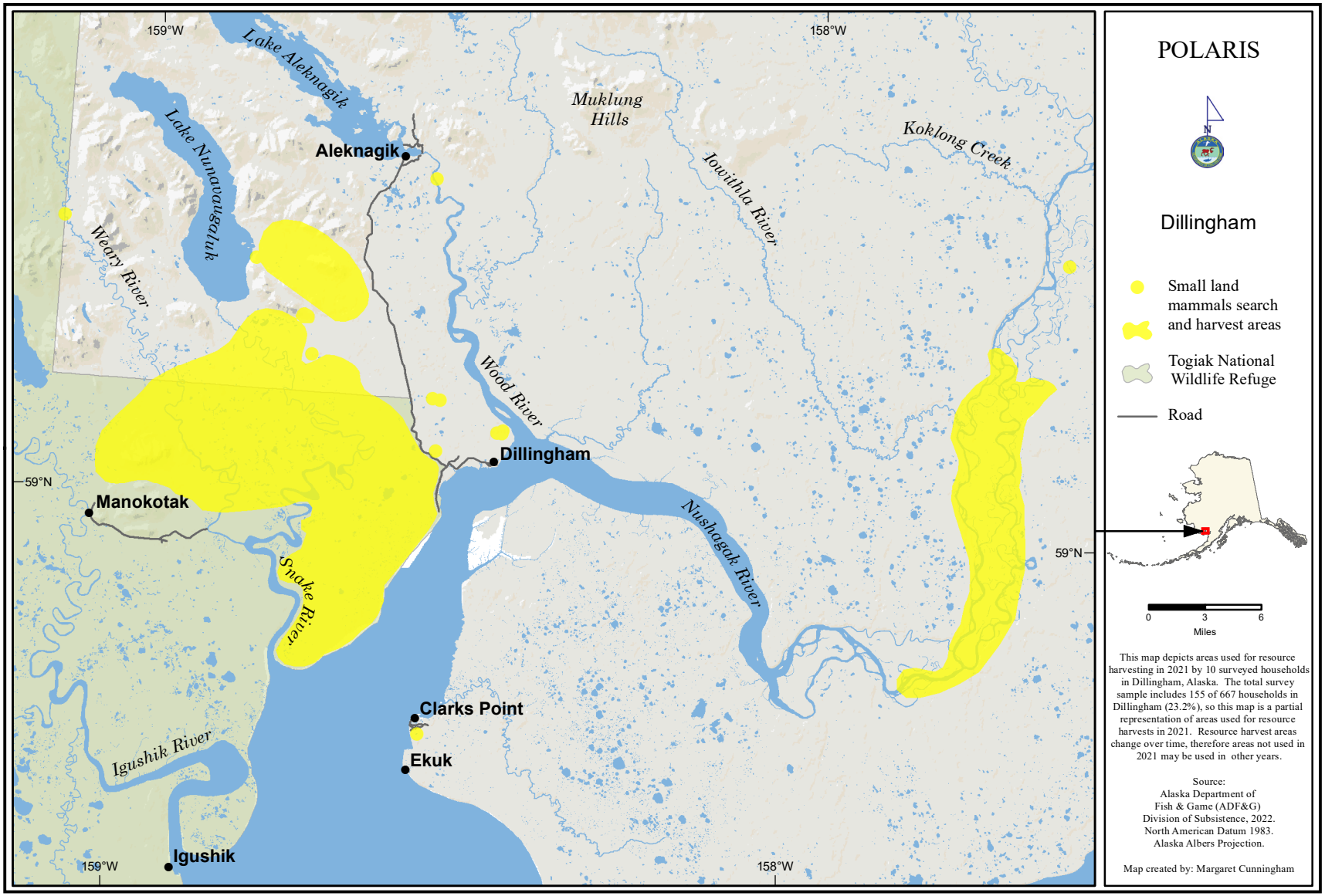


Figure 2-27.–Hunting and trapping locations of small land mammals, Dillingham, 2021.

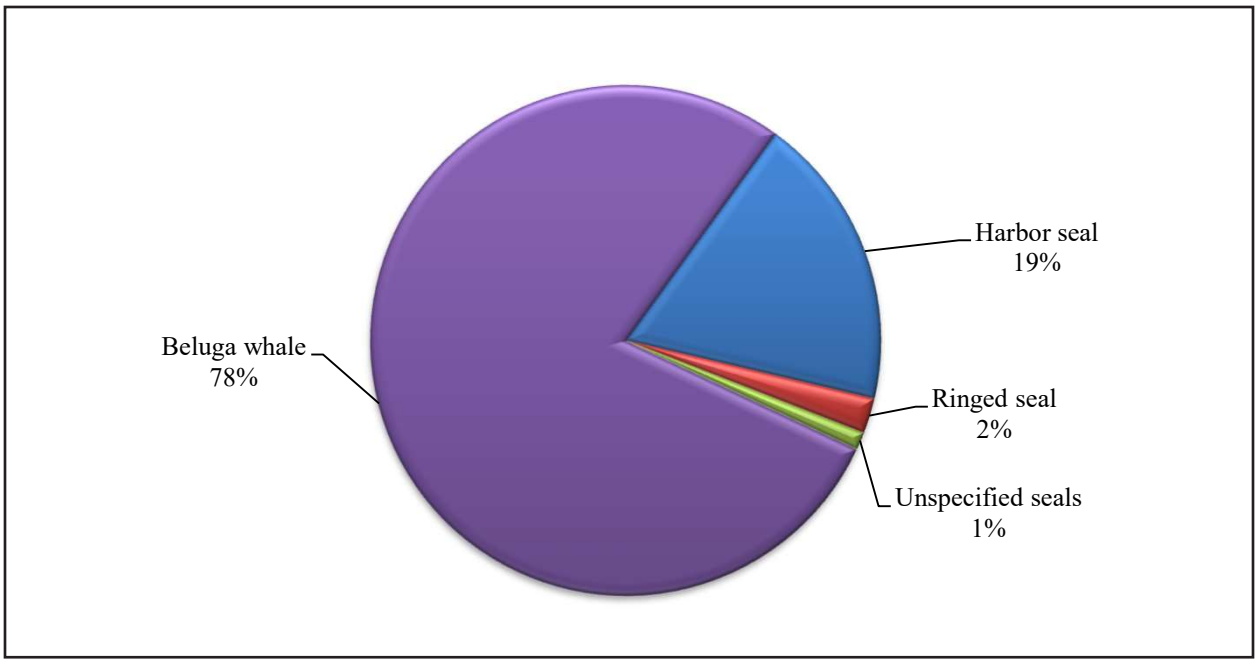


Figure 2-28.–Composition of marine mammal harvest in pounds usable weight, Dillingham, 2021.

Marine Mammals

As mentioned in Chapter 1, not all Dillingham households are eligible to hunt marine mammals, but all households can use marine mammal resources. Marine mammals accounted for approximately 6% of the total harvest weight in Dillingham during 2021 (Figure 2-14). Based on harvested weight, the majority (78%) of the marine mammal harvest was beluga whales (Figure 2-28). The remaining marine mammal harvest comprised harbor seals (19%), ringed seals (2%), and unspecified seals (1%).

In 2021, the species used by the largest proportion of Dillingham households was beluga whale with 18% of households using this resource; however, fewer households (3%) harvested beluga whale during the study year (Table 2-13). In 2021, Dillingham residents harvested 17,127 lb of beluga whale, or 9 lb per capita. Harbor seals were used by 16% of households and harvested by 5% of Dillingham households in 2021. The total harbor seal harvest in 2021 was 4,097 lb (2 lb per capita). Ringed seals were used by 2% of Dillingham households in 2021 and 1% of households attempted to harvest and also harvested this species. The total ringed seal harvest was 491 lb (less than 1 lb per capita). For every marine mammal resource harvested, more households received resources than gave away resources. There were two species not harvested that were received and used by approximately 1% of households: walrus and bowhead whale.

The harvests of beluga whale occurred in September, April, and May: in 2021 approximately 17 beluga whales were harvested (Table 2-21). The harvests of harbor seals occurred exclusively in the spring (April and May): approximately 52 harbor seals were harvested in April and 22 harbor seals were harvested in May. The total number of ringed seals harvested was approximately nine, and all harvests occurred in May for this species. During the study year, the majority of marine mammal search and harvest areas occurred within Nushagak Bay from Dillingham to the southern tip of the Nushagak Peninsula (Figure 2-29). Dillingham households also reported marine mammal search and harvest areas in the lower portion of the Wood River, near where it meets the Nushagak River.

Birds and Eggs

Birds and bird eggs accounted for approximately 4% of the total harvest in Dillingham during the study year and approximately two dozen types of resources from this category were harvested (Figure 2-14; Table 2-13). An estimated total of 13,429 lb of birds and eggs were harvested in Dillingham, equating to a per

Table 2-21.–Estimated marine mammal harvests by month and sex, Dillingham, 2021.

Resource	Estimated harvest by month													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unk	**Total**
All marine mammals	**0.0**	**0.0**	**0.0**	**55.9**	**34.4**	**0.0**	**0.0**	**0.0**	**4.3**	**0.0**	**0.0**	**0.0**	**8.6**	**103.3**
Bearded seal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Bearded seal, male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Bearded seal, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Bearded seal, unknown sex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Harbor seal	0.0	0.0	0.0	51.6	21.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**73.2**
Harbor seal, male	0.0	0.0	0.0	21.5	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**25.8**
Harbor seal, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Harbor seal, unknown sex	0.0	0.0	0.0	30.1	17.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**47.3**
Ringed seal	0.0	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**8.6**
Ringed seal, male	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.3**
Ringed seal, female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Ringed seal, unknown sex	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.3**
Unspecified seals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	**4.3**
Steller sea lion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Walrus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Beluga whale	0.0	0.0	0.0	4.3	4.3	0.0	0.0	0.0	4.3	0.0	0.0	0.0	4.3	**17.2**
Bowhead whale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**

Source ADF&G Division of Subsistence household surveys, 2022.

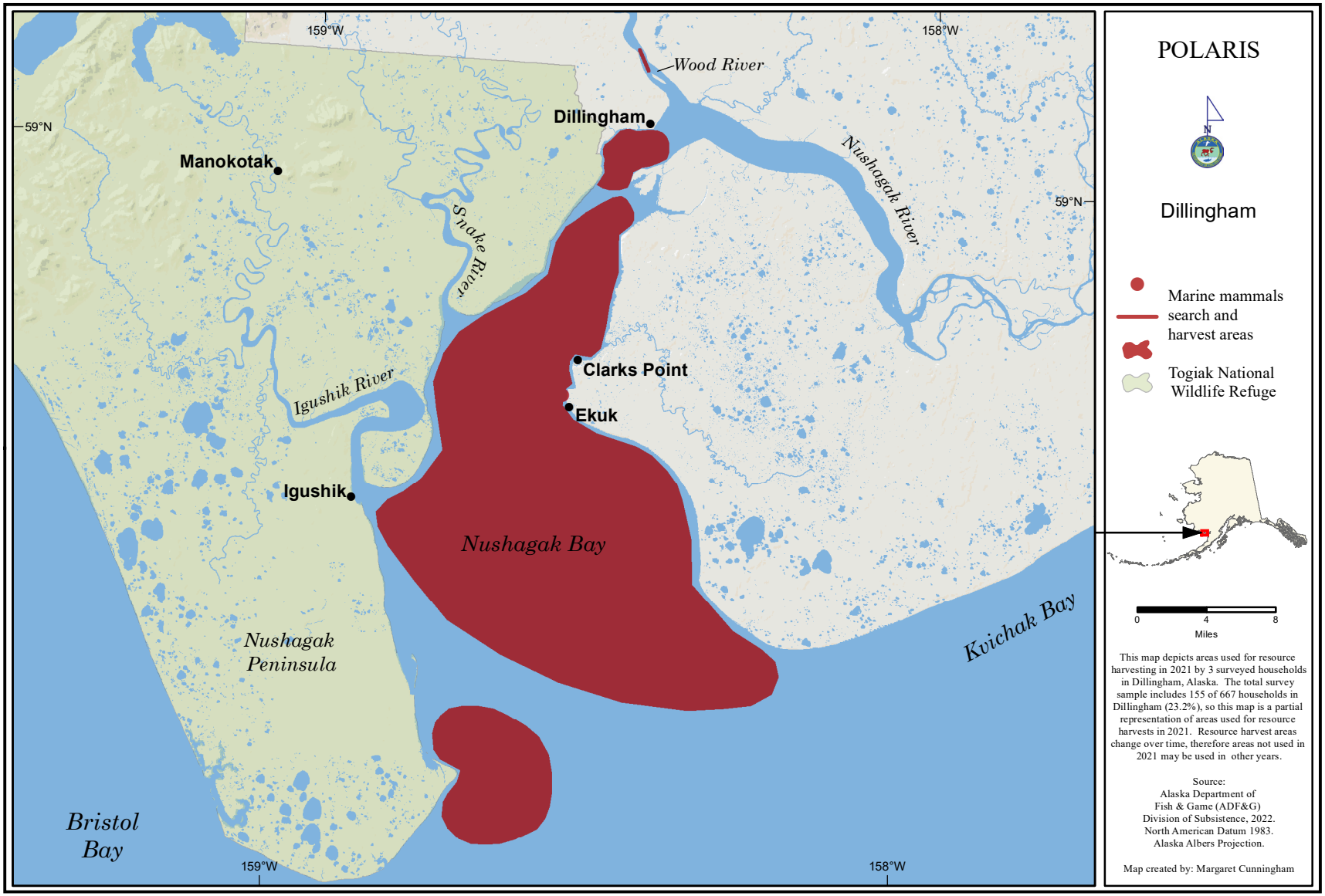
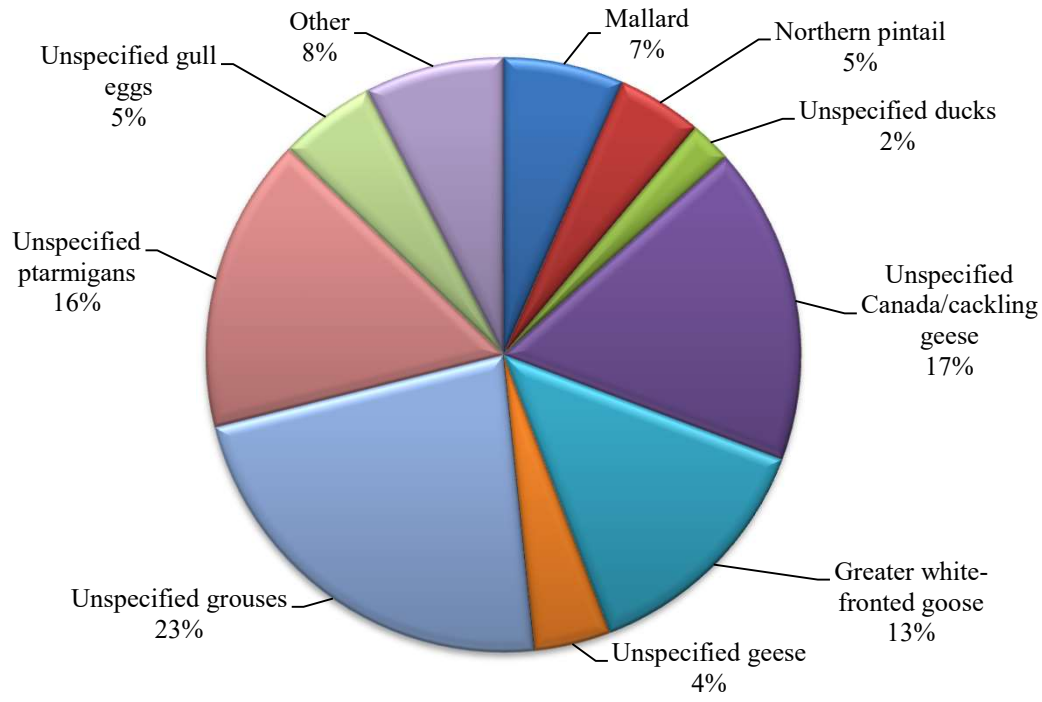


Figure 2-29.–Hunting locations of marine mammals, Dillingham, 2021.



Note "Other" represents all resources that each contributed less than 1.5% to the total category harvest weight.

Figure 2-30.–Composition of bird and bird egg harvest in pounds usable weight, Dillingham, 2021.

capita harvest of 7 lb (Table 2-13). Approximately 68% of Dillingham households used at least one kind of bird or egg resource during the 2021 study year. The composition of the birds and eggs harvest included a variety of resources, including: grouses (23% of total category harvest weight), Canada/cackling geese (17%), ptarmigans (16%), greater white-fronted geese (13%), mallards (7%), gull eggs (5%), northern pintails (5%), unspecified geese (4%), unspecified ducks (2%), and more than a dozen other species of birds and eggs made up the remaining 8% of the of total category harvest weight (Figure 2-30; Table 2-13).

The total grouses harvest in 2021 was 3,055 lb, or approximately 2 lb per capita (Table 2-13). This resource was harvested by 35% of Dillingham households and was used by 43% of households in 2021. The total Canada/cackling goose harvest in 2021 was 2,322 lb (1 lb per capita) and this resource was harvested by 10% of households and used by 14% of households. The third most harvested bird resource by weight was unspecified ptarmigans with a total harvest of 2,160 lb (1 lb per capita). During the study year, 25% of households harvested ptarmigans and 36% of households used this resource. These three top harvested category resources—grouses, Canada/cackling geese, and ptarmigans—were also the most frequently shared bird resources, with the exception of gull eggs (given away by 21% of households and received by 28%). No other bird resource was given away or received by more than 11% of households.

An estimated annual total of 9,671 individual birds were harvested by Dillingham residents during the study year (Table 2-22). Of this total, 2,586 birds were harvested in the spring. Large portions of the spring harvests included migrating species: Canada/cackling geese (491 individuals), greater white-fronted geese (478), northern pintails (379), and mallards (336). In the summer, fewer birds were harvested (155 individuals), and the harvest was dominated by grouses (142 birds). Dillingham hunters harvested the largest number of birds in the fall. Of the 3,490 birds harvested in the fall, approximately 75% (2,565 birds) were upland game birds (grouses and ptarmigans) and the remaining one-quarter (925 birds) were migratory species. The winter harvest nearly equaled that of the fall (3,034 birds), but the composition of the harvest was less varied. In the winter months, only two types of birds were harvested: ptarmigans were the most harvested (2,470 birds) followed by grouses (564 birds).

Table 2-22.–Estimated bird harvests by season, Dillingham, 2021.

Resource	Estimated harvest by season					
	Spring	Summer	Fall	Winter	Season unknown	**Total**
All birds	**2,586.2**	**154.9**	**3,489.9**	**3,033.8**	**405.9**	**9,670.7**
Bufflehead	0.0	0.0	0.0	0.0	0.0	**0.0**
King eider	51.6	0.0	0.0	0.0	0.0	**51.6**
Unspecified eiders	0.0	0.0	0.0	0.0	0.0	**0.0**
Unspecified goldeneyes	0.0	4.3	43.0	0.0	0.0	**47.3**
Harlequin duck	0.0	0.0	0.0	0.0	0.0	**0.0**
Mallard	335.7	0.0	206.6	0.0	4.3	**546.5**
Unspecified mergansers	0.0	8.6	0.0	0.0	4.3	**12.9**
Northern pintail	378.7	0.0	142.0	0.0	4.3	**525.0**
Unspecified scaups	0.0	0.0	0.0	0.0	0.0	**0.0**
Black scoter	0.0	0.0	0.0	0.0	0.0	**0.0**
Surf scoter	17.2	0.0	0.0	0.0	0.0	**17.2**
Northern shoveler	21.5	0.0	0.0	0.0	0.0	**21.5**
Green-winged teal	120.5	0.0	107.6	0.0	0.0	**228.1**
American wigeon	43.0	0.0	12.9	0.0	0.0	**55.9**
Unspecified ducks	236.7	0.0	68.9	0.0	86.1	**391.6**
Brant	0.0	0.0	0.0	0.0	0.0	**0.0**
Cackling goose	0.0	0.0	25.8	0.0	0.0	**25.8**
Unspecified Canada/cackling geese	490.6	0.0	159.2	0.0	43.3	**693.1**
Emperor goose	8.6	0.0	8.6	0.0	0.0	**17.2**
Snow goose	0.0	0.0	0.0	0.0	0.0	**0.0**
Greater white-fronted goose	477.7	0.0	68.9	0.0	21.5	**568.0**
Unspecified geese	120.5	0.0	77.5	0.0	34.4	**232.4**
Trumpeter swan	0.0	0.0	0.0	0.0	0.0	**0.0**
Tundra (whistling) swan	12.9	0.0	0.0	0.0	0.0	**12.9**
Sandhill crane	30.1	0.0	4.3	0.0	0.0	**34.4**
Unspecified shorebirds	25.8	0.0	0.0	0.0	0.0	**25.8**
Unspecified grouses	94.7	142.0	2,384.0	563.7	173.2	**3,357.6**
Unspecified ptarmigans	120.5	0.0	180.7	2,470.1	34.4	**2,805.7**

Source ADF&G Division of Subsistence household surveys, 2022.
Note Spring = April, May and June; Summer = July and August; Fall = September and October; Winter = January, February, March and also Novmber and December.

Resources from this category were harvested from many areas close to the community of Dillingham, as well as areas farther away from the community (Figure 2-31). Bird eggs were harvested within the city limits of Dillingham, as well as north of the community along the shores and on islands in Lake Nunavaugaluk, Lake Aleknagik, and Lake Nerka. Bird eggs were also harvested south of Dillingham near Clarks Point and Igushik. Migratory birds were harvested in Lake Nunavaugaluk, along the Wood River, along Snake River, along the Nushagak River, near Clarks Point and Ekuk, and along the entire coastline of the Nushagak Peninsula. Ptarmigan and grouse search and harvest areas were extensive during the study year. Ptarmigan and grouses were hunted within Dillingham, as well as near Lake Nunavaugaluk, and the Wood, Snake, and Igushik rivers. To the northeast and east of Dillingham, ptarmigan and grouse search and harvest areas included near the Muklung and Iowithla rivers and Koklong Creek, and near the communities of Ekwok and New Stuyahok. Ptarmigan and grouse search and harvest areas also included coastline south of Ekuk, and north of Dillingham near the Kogrukluk River**.**

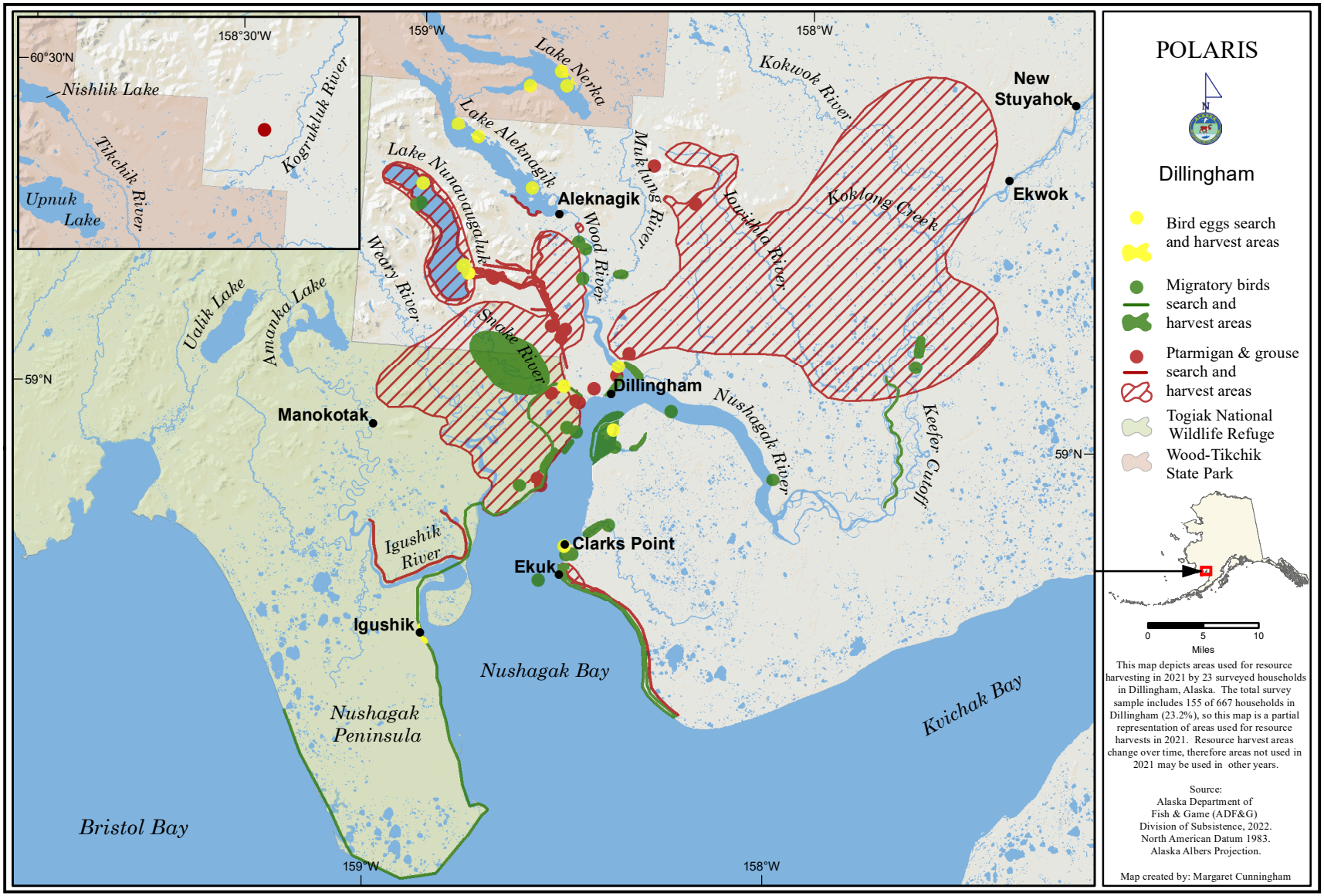


Figure 2-31.–Gathering, hunting, and harvest locations of bird eggs, migratory birds, and ptarmigan and grouse, Dillingham, 2021.

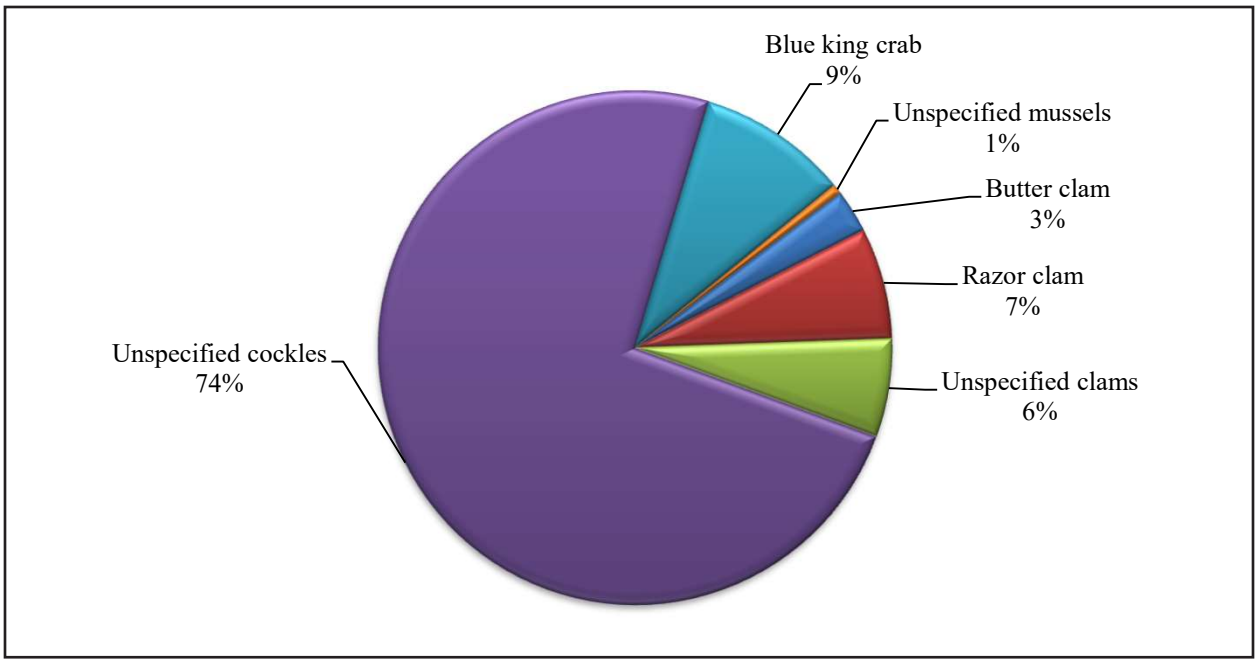


Figure 2-32.–Composition of marine invertebrate harvest in pounds usable weight, Dillingham, 2021.

Marine Invertebrates

Marine invertebrates contributed the least harvest weight of all the resource categories (less than 1%) (Figure 2-14). Marine invertebrates were used by 27% of Dillingham households in 2021 (Table 2-13). The total harvest of marine invertebrates was 1,046 lb, or less than 1 lb per capita. The composition of the marine invertebrates harvest included a variety of species: cockles (74% of harvest weight), blue king crab (9%), razor clams (7%), unspecified clams (6%), butter clams (3%), and mussels (1%) (Figure 2-32).

Cockles were used by 17% of Dillingham households (Table 2-13). Three percent of Dillingham households harvested a total of 775 lb of cockles. During the study year, 8% of households gave away some of this resource, and 15% of households received cockles. The total blue king crab harvest was 99 lb; however, this species was used and harvested by less than 1% of Dillingham households in 2021 and was not shared. The total razor clam harvest in 2021 was 73 lb, which was almost as much as the king crab harvest; however, razor clams were used by 6% of Dillingham households and 2% of households harvested this resource.

During the 2021 study year, Dillingham residents searched for and harvested marine invertebrates along the beaches close to the communities of Clarks Point and Ekuk, and close to the southern tip of the Nushagak Peninsula (Figure 2-33). Additionally, marine invertebrates were also harvested by Dillingham residents within Kulukak Bay, which is west of Dillingham.

According to survey respondents, marine invertebrate resources are not a significant component to the Dillingham community's wild resource use and harvest patterns since these resources are not available for harvest close to Dillingham. Most of the marine invertebrate harvest was associated with cockles from Kulukak Bay. Harvests typically occur in April and May but are dependent on the tide cycle and water or snow conditions. The round-trip expense of boating (200 miles) or snowmachining (120 miles) to the cockle beds is more economically efficient when harvesting for many households at once. As such, sharing through generalized distribution is an essential characteristic for this type of community harvest, as reflected in the sharing and likely re-sharing of cockles in 2021 (Table 2-13). Also, to further economize subsistence activities, marine invertebrate harvest efforts overlap with seabird egg gathering and also Pacific herring roe on kelp harvests in Togiak Bay.

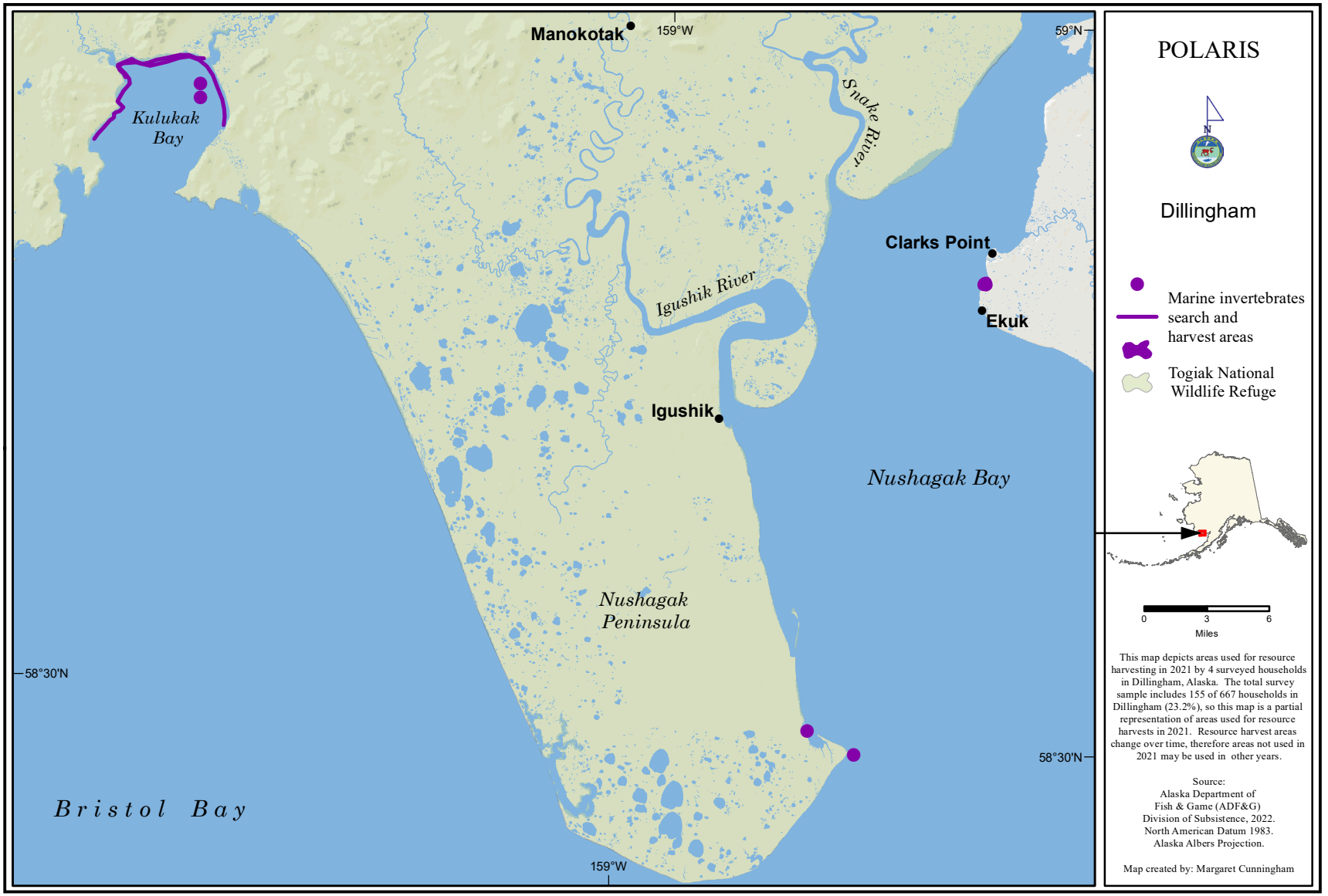
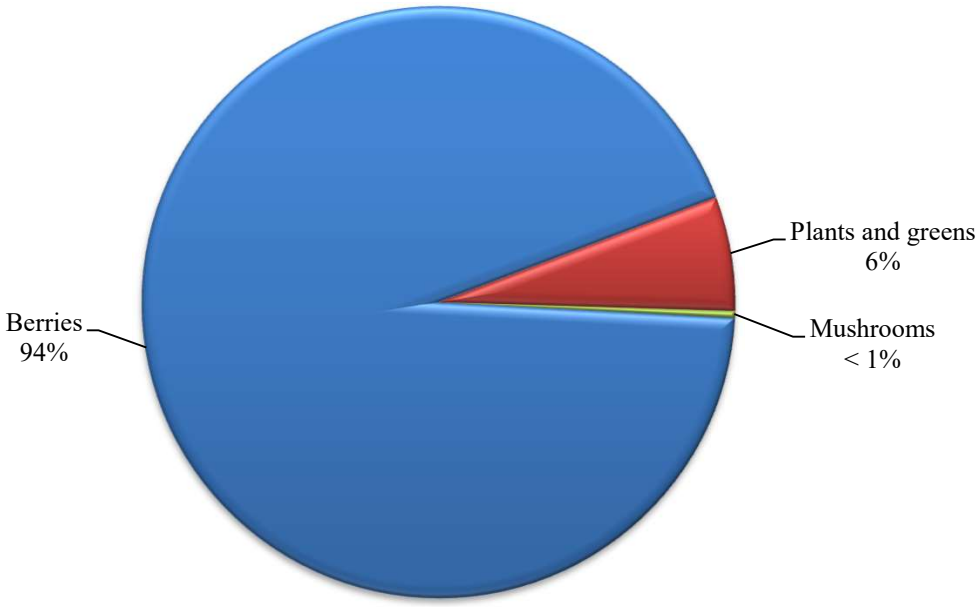


Figure 2-33.–Search and harvest locations of marine invertebrates, Dillingham, 2021.



Note Seaweed and kelp resources used for fertilizer and having no estimated harvest weight were removed from figure.

Figure 2-34.–Composition of vegetation harvest by type in pounds usable weight, Dillingham, 2021.

Table 2-23.–Use of firewood for home heating, Dillingham, 2021.

Percentage of home heating from wood	Households using firewood for home heating	
	Number	Percentage
0%	76	49.0%
1–25%	44	28.4%
26–50%	19	12.3%
51–75%	11	7.1%
76–99%	5	3.2%
100%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2022.

Vegetation

Vegetation (wild plants) is a resource category that was highly used in Dillingham during the 2021 study year. Approximately 85% of households used at least one type of vegetation (Table 2-13). Households in Dillingham used more than 30 different types of plants or other vegetation. Overall, vegetation made up 7% of the total community harvest weight by contributing 25,905 lb, averaging 14 lb per capita harvested (Figure 2-14; Table 2-13). Divided by specific vegetation category, berries made up 94% of the total vegetation harvest weight, followed by plants and greens (6%), and mushrooms (less than 1%) (Figure 2-34).

In 2021, 10 specified species of berries, plus other wild berries, were used by Dillingham households (Table 2-13). Blueberry was the most frequently harvested and used type of vegetation: 69% of households used blueberries. During the study year, 61% of households attempted to harvest blueberries and all Dillingham

households attempting to harvest this resource were successful. Though it was the most used and harvested berry, the total blueberry harvest was the second highest harvest weight for berries (second to cloudberry) with a total harvest of 5,407 lb, or 3 lb per capita. During the study year, 38% of households gave away some blueberries, and 27% of households received blueberries.

Cloudberry (known locally as salmonberry) was the second most harvested and used type of vegetation: 62% of households used salmonberries. During the study year, 52% of households attempted to harvest salmonberries and most were successful (51% of Dillingham households harvested salmonberries). The total salmonberry harvest was 5,675 lb, or 3 lb per capita. During the study year, 35% of households gave away some salmonberries, and 29% of households received salmonberries. Following those harvests were the harvests of huckleberries (4,020 lb), lowbush cranberries (3,205 lb), crowberries (2,837 lb), raspberries (1,584 lb), highbush cranberries (1,266 lb), and several other berry resources.

Other plants were harvested, used, and shared less frequently than berries. Stinkweed (known locally as *caiggluk*) was the most harvested of the plants/greens vegetation during the study year. This plant is gathered in the summer and used in concentrated tea for medicinal purposes and commonly used in steam baths to splash water or during rinsing. It is harvested locally but some households prefer plants harvested from neighboring communities, particularly the coastal locations of Igushik and Ekuk, because the stinkweed from the area is perceived to have stronger medicinal properties. In 2021, the total harvest weight of stinkweed was 327 lb, or less than 1 lb per capita. Though the harvest weight for stinkweed was the highest in this vegetation category, only an estimated 19% of households used stinkweed. Sourdock was the second highest harvested plants/greens species in 2021. The young leaves of this plant are harvested near streams throughout the summer and eaten raw, cooked, or are frozen to be eaten later. A total of 280 lb of sourdock were harvested and 9% of Dillingham households used sourdock. The third highest harvested plant by weight was young fiddlehead ferns with a total harvest of 262 lb, and this species of plant was the most used (31% of households) plant species during the study year.

This study also collected information on the use of firewood, but not harvest amounts. Nearly one-half (49%) of Dillingham households did not use firewood during the study year to heat their homes (Table 2-23). Approximately 28% of households stated that between 1%–25% of their home's heating came from firewood; 12% stated between 26%–50% of their home's heating came from firewood; 7% of households stated between 51%–75% of their home's heating came from firewood; and 3% of households stated between 79%–99% of their home's heating came from firewood. Firewood is typically harvested from trees growing near the community and accessed from the road to Aleknagik. Many households responded that they only use firewood to heat steam bathhouses (*maqi*). Communal bathing is also a cultural and social activity where wild plants like stinkweed and spruce are used. Finally, no household's heating came completely from firewood.

Vegetation was harvested from much of the lands within and surrounding Dillingham (Figure 2-35). Many households harvested both plants and berries within the immediate community area—predominantly north and east of the community. Specifically, to the north, some vegetation was harvested north of Dillingham along roads, along the shores and on islands in Lake Nunavaugaluk, Lake Aleknagik, and Lake Nerka. To the east of Dillingham, vegetation was harvested along the Nushagak River; berries were harvested from the confluence of the Iowithla River and the Nushagak River to areas near the community of Ekwok, while more plants such as wild greens and mushrooms were harvested in the lower Nushagak River. During the study year, vegetation was also gathered to the south of Dillingham near the communities of Clarks Point and Ekuk. Firewood was harvested predominantly north and west of Dillingham (Figure 2-36). Specifically, firewood harvesting areas included near Aleknagik and along the Aleknagik Lake road, as well as near the Snake River.

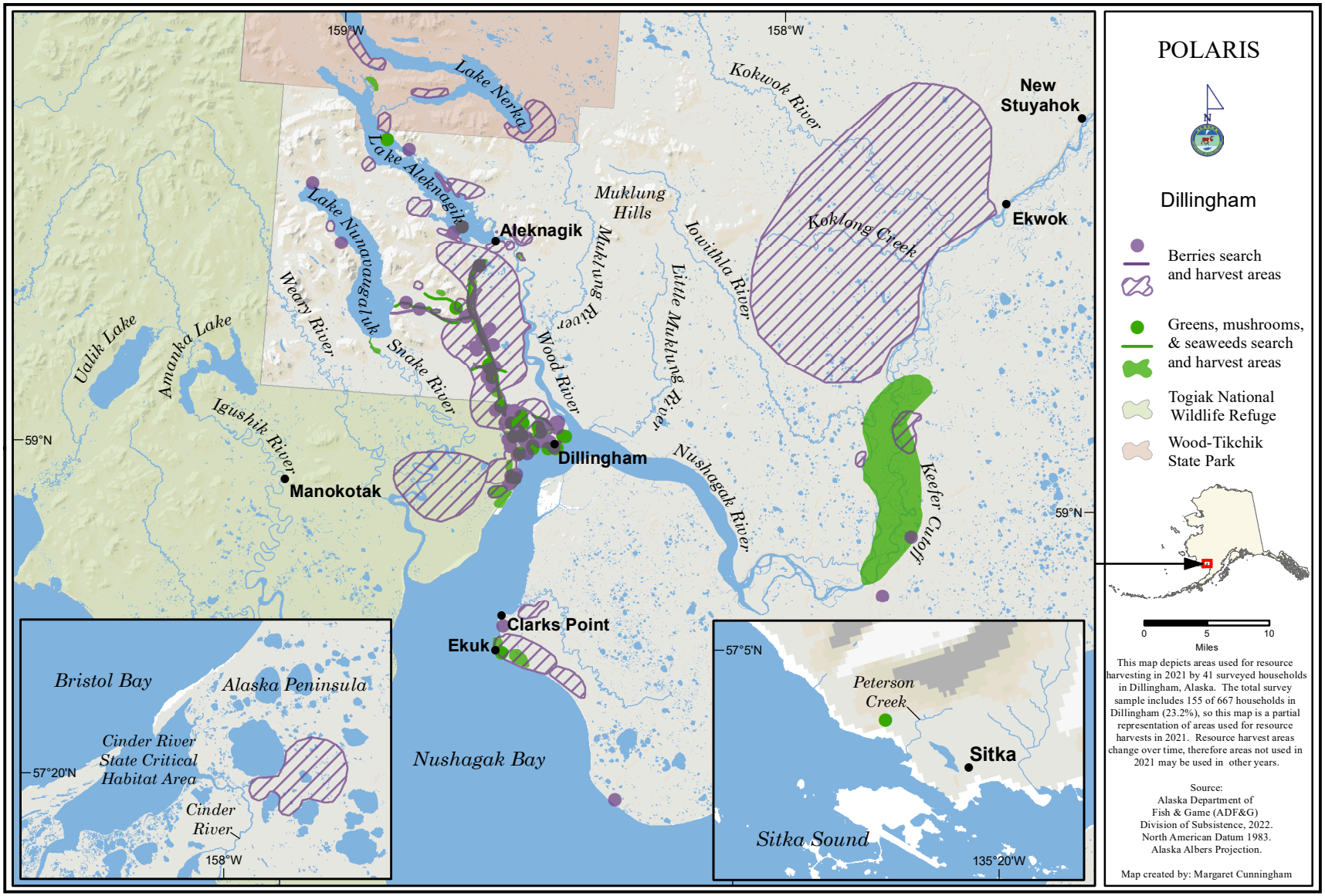


Figure 2-35.–Gathering and harvest locations of vegetation, Dillingham, 2021.

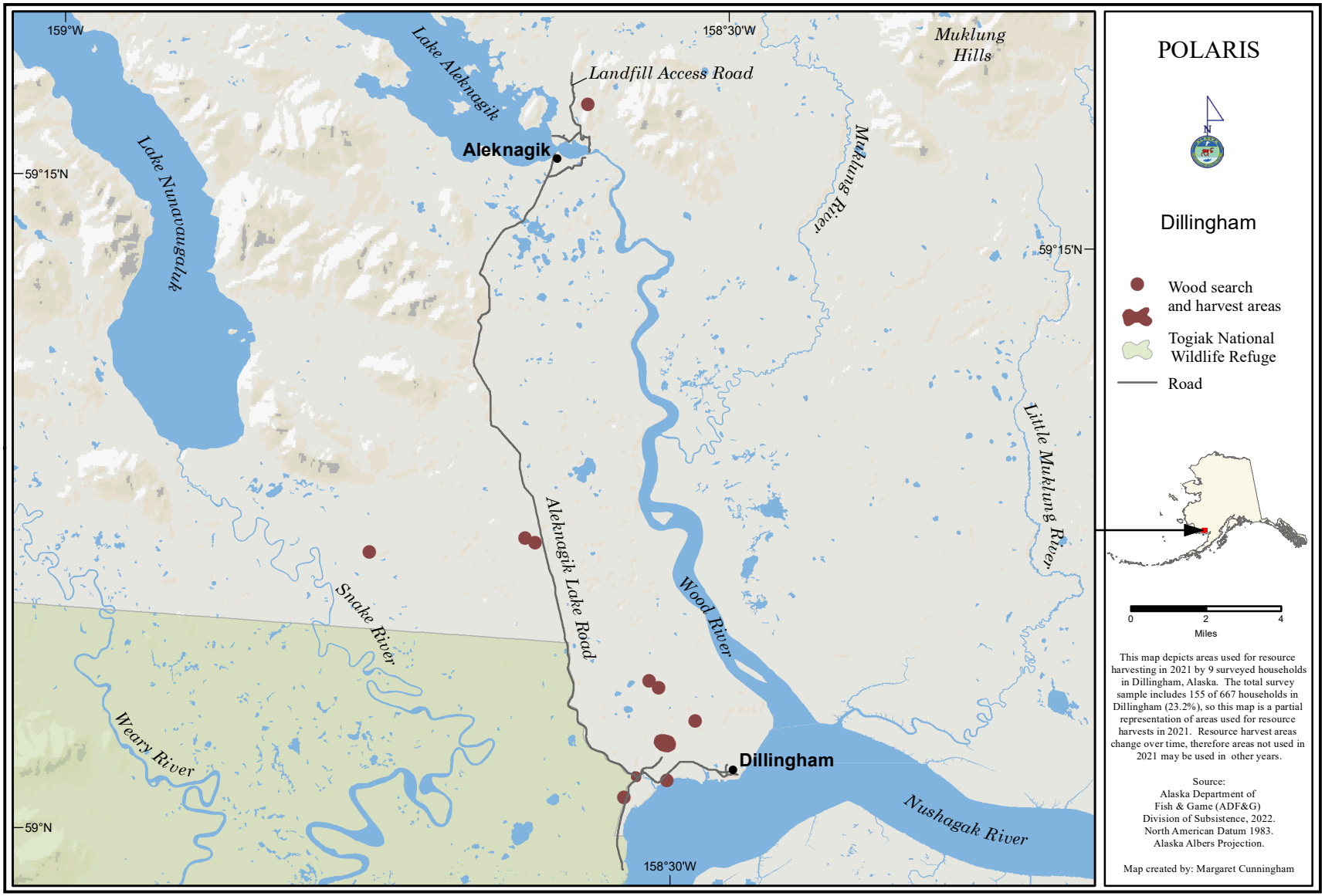


Figure 2-36.–Gathering and harvest locations of wood, Dillingham, 2021.

Harvest Assessments: Comparing Harvests and Uses in 2021 with Previous Years

In addition to responding to the series of food security statements on the survey, households considered having sufficient access to wild resources when researchers asked respondents to assess their own harvests in two ways: whether they used more, less, or about the same amount of eight resource categories in 2021 as in the past five years, and whether they got "enough" of each of the eight resource categories; the same questions were asked about wild resources overall. Households also were asked to provide reasons if their use was different or if they were unable to get enough of a resource. If they did not get enough of a resource, they were asked to evaluate the severity of the impact to their household as a result of not getting enough and to cite which wild resources the household needed in the study year. This section discusses responses to those questions.

Together, Table 2-24 and Figure 2-37 provide a broad overview of households' assessments of their use of harvested resources in 2021. Because not everyone uses all resource categories, some households did not respond to the assessment questions. Additionally, some households that do typically use a resource category simply did not answer questions.

Of all subsistence resource categories used by Dillingham households in 2021, salmon was the most harvested, by weight. During the study year, 43% of responding households used less salmon in 2021 as they did in previous years, 37% used the same amount of salmon, and 16% said they used more (Table 2-24; Figure 2-37). When asked why they used less, 36% of households that used less and provided at least one reason for why indicated that they did so because salmon were less available (Table 2-25). Through additional survey comments and key respondent interviews, researchers noted that respondents explained that, in most cases, "resources were less available" was referring to Chinook salmon specifically. Other stated reasons for using less salmon included: did not need (22%), working/no time (14%), less sharing (13%), family/personal reasons (9%), unsuccessful (6%), and lack of equipment (6%). For those households that used more salmon in the study year, approximately 22% of respondents who gave a reason reported that using more salmon was a result of needing more, 17% of respondents reported more use because of more success, 17% received more salmon in 2021, and 17% of respondents used more salmon because of store-bought expenses (Table 2-26). Although almost one-half of responding households said they used less salmon in 2021 than in recent years, the majority of households (76%) got enough (Figure 2-38). Comments offered during the surveys indicated that many households used less Chinook salmon during the study year as a result of low Chinook salmon abundance, but they were able to supplement their salmon harvest with more coho and sockeye salmon, thus acquiring enough salmon overall. When households that did not get enough salmon were asked to evaluate the impact of not getting enough, no households (0%) described it as not noticeable, 57% described the impact as minor, 24% explained that not getting enough salmon had a major effect on their household, and 14% stated that the impact was severe (Table 2-27).

In 2021, 43% of responding Dillingham households reported using the same amount of nonsalmon fish as they had in previous years, 27% reported using less, 11% reported using more nonsalmon fish, and approximately 18% reported not normally using nonsalmon fish (Table 2-24; Figure 2-37). Approximately 31% of respondents who used less nonsalmon fish in 2021 and cited a reason for why reported doing so because of less sharing. Other reasons included: lack of effort (23%), did not need (15%), lack of equipment (13%), family/personal reasons (13%), working/no time (10%), and COVID-related reasons (10%) (Table 2-25). Reasons cited for using more nonsalmon fish in 2021 were: received more (41%), increased effort (24%), family/personal (18%), and several other reasons each cited by 6% of households (Table 2-26). Of the households answering the question, 13% reported not getting enough nonsalmon fish. Of those households, 44% stated that not getting enough nonsalmon fish had a minor impact on their household, 19% reported a major impact, 13% reported that not getting enough nonsalmon fish had a severe impact to their household, and 13% reported the impact as not noticeable (Table 2-27).

Regarding large land mammals, 40% of responding Dillingham households explained that they used fewer large land mammals in 2021 as they did in previous years, 40% reported that they used the same

amount, and 11% said they used more (Table 2-24; Figure 2-37). About one-third (36%) of households that cited a reason explained that unsuccessful harvest was the primary reason for reduced use of large land mammals (Table 2-25). The second most cited reason for lower use was attributed to less sharing (31% of households). Other stated reasons for using less large land mammals included: did not need (14%), regulations (10%), resources less available (9%), family/personal reasons (5%), working/no time (5%), and COVID-related reasons (5%). For those households that used more large land mammals in the study year, almost one-half (47%) reported that using more large land mammals was a result of receiving more and 24% reported more use because of more success (Table 2-26). Other stated reasons for using more large land mammals in the study year included needed more and increased efforts (12% each). In Dillingham, 27% of sampled respondents stated that they did not get enough large land mammals (Figure 2-38). When responding households that did not get enough large land mammals were asked to evaluate the impact of not getting enough, 12% of households described it as not noticeable and 26% described the impact as minor (Table 2-27). Nearly one-half of the households said the lack of large land mammal resources in 2021 was a significant issue: 33% explained that not getting enough had a major effect on their household, and 14% stated that the impact was severe.

For the 2021 study year, more than one-half (69%) of responding Dillingham households reported that they do not usually use small land mammals (Figure 2-37). In Dillingham, 14% of responding households cited less use of small land mammals in 2021 than in previous years, 14% reported using the same amount, and 3% reported using more (Table 2-24). Those respondents who reported less use of small land mammals cited less effort (29%), working/no time (24%), less sharing (19%), and resources less available (14%) as the top reasons why their use was less (Table 2-25). The three reported reasons for using more small land mammals in 2021 than in recent years were: increased availability (60%), received more (40%), and increased effort (40%) (Table 2-26). Of the households answering the question, 13% (six households) reported not getting enough small land mammals, and 67% of these households said the impact to their household was minor, and 17% said the impact to their household was severe (Table 2-27). Based on these data, and according to survey respondents, fewer Dillingham community members participate in trapping small land mammals and these resources are not as significant to households today as in the past.

For the 2021 study year, 63% of responding Dillingham households reported that they do not use marine mammals generally (Figure 2-37). Of the households answering the question, 20% reported using the same amount of marine mammals in 2021 as in previous years, 12% cited less use, and 5% reported using more (Table 2-24). Of those respondents who reported less use of marine mammals and gave a reason why, 59% cited less sharing as a reason, 18% cited family/personal reasons, 12% cited lack of effort, and 6% cited each of the following reasons: unsuccessful harvest effort, COVID-related reasons, working/no time, and did not need (Table 2-25). Most households (63%) that used more marine mammals cited that they received more as the reason why (Table 2-26). Of the sampled households for the 2021 study, 10% stated that they did not get enough marine mammals (Figure 2-38). When households that did not get enough marine mammals were asked to evaluate the impact of not getting enough, 7% of those households described the impact as not noticeable, 40% described the impact as minor, 27% explained that not getting enough marine mammals had a major effect on their household, and no households stated that the impact was severe (Table 2-27).

During the study year, approximately 30% of responding Dillingham households reported not normally using birds or bird eggs (Figure 2-37). Of the households answering the question, 38% of households reported using the same amounts of birds and eggs in 2021 as compared to recent years, 21% reported using less, and 11% reported using more (Table 2-24). Of those households that reported using fewer bird resources in 2021 compared to recent years and provided a reason, slightly less than one-half (41%) attributed this to less sharing, 17% cited family/personal reasons, 14% stated resources were less available, and 14% stated this was a result of a lack of effort (Table 2-25). Those who reported using more birds provided these reasons: received more (38%), increased effort (38%), increased availability (19%), family/personal (6%), and more success (6%) (Table 2-26). During the study year, 14% of responding households reported not getting enough birds and eggs (Table 2-27). Of the 14 households that indicated not having enough birds or eggs, one household indicated that not having enough did not have a noticeable effect on

the household, the majority (eight households) indicated the impact was minor, one household indicated that not having enough birds and eggs had a major effect, and one household indicated that not having enough birds and eggs had a severe impact.

Approximately 66% of Dillingham households reported not normally using marine invertebrate resources, correlating with survey respondents indicating that marine invertebrates are not a significant component to household harvests, as discussed previously (Figure 2-37). However, 16% of households reported using the same amount of marine invertebrate resources in 2021 as they did in recent years, 13% of households reported using less, and 5% reported using more (Table 2-24). The most cited reasons for less use of marine invertebrates included less sharing (32% of responding households); working/no time (16%); did not need (16%); and 11% of responding households cited COVID-related reasons, the weather/environment, family/personal reasons, and another unspecified reason (Table 2-25). The sole reason cited for increased use of marine invertebrates was received more (100%) (Table 2-26). Out of the surveyed households, 7% (11 households) stated they did not get enough marine invertebrates during the study year (Figure 2-38; Table 2-27). Most households indicated that not having enough marine invertebrates was not a significant difficulty, but a small number of households (18%) stated that the impact was major (Table 2-27).

For 2021 in Dillingham, 48% of responding households reported using the same amount of vegetation as previous years, 35% reported using less, and 9% reported using more (Figure 2-37). Those households that reported using less vegetation in 2021 and provided a reason why cited the following reasons the most: family or personal reasons (26%), resources were less available (26%), working/no time (18%), lack of effort (12%), did not need (8%), and access restrictions (8%) (Table 2-25). The most cited reasons for more vegetation use included: needed more (33% of responding households), had more time (25%), favorable weather (25%), and increased effort (17%) (Table 2-26). Approximately 19% of sampled households reported not getting enough vegetation during the study year, while 72% of households reported they did get enough (Figure 2-38). Of the respondents who stated that they did not get enough vegetation resources, almost one-half (47%) thought that not getting enough had a minor impact on their household, and 17% reported that it had a severe impact, 13% reported the impact as not noticeable, and 10% reported the impact of not getting enough vegetation as major (Table 2-27).

Almost all households (98%) in Dillingham reported using at least one wild resource in 2021 (Table 2-24). When considering use of wild resources overall, approximately 47% of responding households reported using fewer resources in 2021 than they had in recent years, 40% reported using the same amount, and 12% reported using more. The most frequently reported reasons for decreased use of wild resources overall were family/personal circumstances (23%), less sharing (22%), and resources were less available (20%) (Table 2-25). Other reasons included did not need (15%), working/no time (14%), unsuccessful (9%), COVID-related reasons (8%), lack of effort (5%), and access restrictions (5%). The most frequently reported reason for using more resources overall in 2021 than in recent years was more success (35%) (Table 2-26). Other top reasons included: increased effort (24%), needed more (12%), received more (12%), family/personal reasons (12%), and increased availability (12%). Of the households answering the question, 25% reported not getting enough of all wild resources in general and of those respondents who did not get enough, almost one-half (46%) said the impact to their household was minor, while 30% reported the impact as major, 14% reported the impact as not noticeable, and 8% reported the impact as severe (Table 2-27). With regard to specific resources that households needed, moose (33% of sampled households), Chinook salmon (27%), and caribou (21%) were cited by households more frequently than any other specific resource or even any category of resources (all of which were cited by fewer than 10% of households) (Table 2-28). This finding underscores the responses discussed previously, which make evident that not all households in Dillingham had access to a sufficient amount of large land mammal resources. Listing Chinook salmon specifically as a needed resource reflects what was also noted previously—that researchers noted that "less resource availability" as a reason for less use of salmon overall was generally in reference to Chinook salmon.

Table 2-24.–Changes in household uses of resources compared to recent years, Dillingham, 2021.

Resource category	Sampled households	Valid responses[a]	Households reporting use: Total households Number	Total households Percentage	Less Number	Less Percentage	Same Number	Same Percentage	More Number	More Percentage	Households not using Number	Households not using Percentage
Any resource	155	155	152	98.1%	128	82.6%	134	86.5%	66	42.6%	141	91.0%
All resources	155	152	150	98.7%	72	47.4%	60	39.5%	18	11.8%	2	1.3%
Salmon	155	153	147	96.1%	66	43.1%	56	36.6%	25	16.3%	6	3.9%
Nonsalmon fish	155	152	124	81.6%	41	27.0%	66	43.4%	17	11.2%	28	18.4%
Large land mammals	155	153	139	90.8%	61	39.9%	61	39.9%	17	11.1%	14	9.2%
Small land mammals	155	153	47	30.7%	21	13.7%	21	13.7%	5	3.3%	106	69.3%
Marine mammals	155	153	56	36.6%	18	11.8%	30	19.6%	8	5.2%	97	63.4%
Birds and eggs	155	145	101	69.7%	30	20.7%	55	37.9%	16	11.0%	44	30.3%
Marine invertebrates	155	155	52	33.5%	20	12.9%	25	16.1%	7	4.5%	103	66.5%
Vegetation	155	151	139	92.1%	53	35.1%	72	47.7%	14	9.3%	12	7.9%

Source ADF&G Division of Subsistence household surveys, 2022.

a. Valid responses do not include households that did not provide any response.

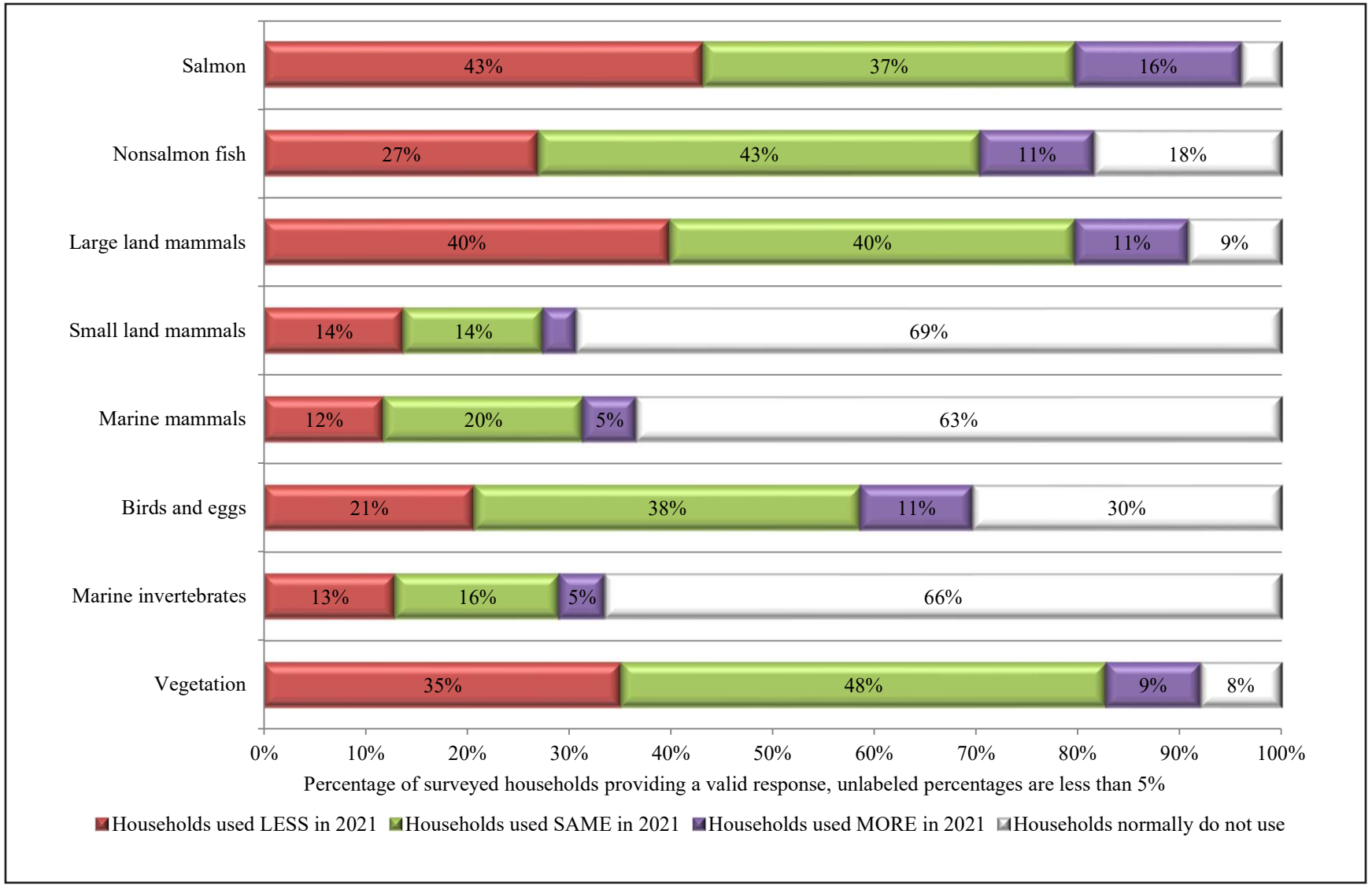


Figure 2-37.–Changes in household uses of resources compared to recent years, Dillingham, 2021.

Table 2-25.–Reasons for less household uses of resources compared to recent years, Dillingham, 2021.

Resource category	Valid responses[a]	Households reporting reasons for less use	Family/ personal		Resources less available		Too far to travel		Lack of equipment		Less sharing		Lack of effort		Unsuccessful		Weather/ environment		Covid-related	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	155	125	25	20.0%	46	36.8%	4	3.2%	10	8.0%	37	29.6%	27	21.6%	28	22.4%	11	8.8%	10	8.0%
All resources	152	65	15	23.1%	13	20.0%	0	0.0%	2	3.1%	14	21.5%	3	4.6%	6	9.2%	2	3.1%	5	7.7%
Salmon	153	64	6	9.4%	23	35.9%	0	0.0%	4	6.3%	8	12.5%	2	3.1%	4	6.3%	1	1.6%	2	3.1%
Nonsalmon fish	152	39	5	12.8%	0	0.0%	0	0.0%	5	12.8%	12	30.8%	9	23.1%	2	5.1%	2	5.1%	4	10.3%
Large land mammals	153	58	3	5.2%	5	8.6%	1	1.7%	2	3.4%	18	31.0%	1	1.7%	21	36.2%	0	0.0%	3	5.2%
Small land mammals	153	21	2	9.5%	3	14.3%	0	0.0%	0	0.0%	4	19.0%	6	28.6%	1	4.8%	1	4.8%	2	9.5%
Marine mammals	153	17	3	17.6%	0	0.0%	0	0.0%	0	0.0%	10	58.8%	2	11.8%	1	5.9%	0	0.0%	1	5.9%
Birds and eggs	145	29	5	17.2%	4	13.8%	1	3.4%	2	6.9%	12	41.4%	4	13.8%	2	6.9%	0	0.0%	1	3.4%
Marine invertebrates	155	19	2	10.5%	0	0.0%	1	5.3%	1	5.3%	6	31.6%	1	5.3%	0	0.0%	2	10.5%	2	10.5%
Vegetation	151	50	13	26.0%	13	26.0%	1	2.0%	1	2.0%	1	2.0%	6	12.0%	1	2.0%	3	6.0%	1	2.0%

-continued-

Table 2-25.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for less use	Other reasons		Working/ no time		Regulations		Small/ diseased animals		Did not need		Equipment/ fuel expense		Used other resources		Competition		Access restrictions	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	155	125	6	4.8%	30	24.0%	8	6.4%	2	1.6%	27	21.6%	1	0.8%	2	1.6%	2	1.6%	5	4.0%
All resources	152	65	2	3.1%	9	13.8%	1	1.5%	0	0.0%	10	15.4%	1	1.5%	0	0.0%	0	0.0%	3	4.6%
Salmon	153	64	2	3.1%	9	14.1%	0	0.0%	1	1.6%	14	21.9%	0	0.0%	1	1.6%	1	1.6%	0	0.0%
Nonsalmon fish	152	39	0	0.0%	4	10.3%	0	0.0%	0	0.0%	6	15.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	153	58	0	0.0%	3	5.2%	6	10.3%	0	0.0%	8	13.8%	0	0.0%	1	1.7%	0	0.0%	0	0.0%
Small land mammals	153	21	0	0.0%	5	23.8%	0	0.0%	0	0.0%	1	4.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	153	17	0	0.0%	1	5.9%	0	0.0%	0	0.0%	1	5.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	145	29	0	0.0%	3	10.3%	1	3.4%	0	0.0%	2	6.9%	0	0.0%	0	0.0%	1	3.4%	0	0.0%
Marine invertebrates	155	19	2	10.5%	3	15.8%	0	0.0%	0	0.0%	3	15.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	151	50	1	2.0%	9	18.0%	2	4.0%	1	2.0%	4	8.0%	0	0.0%	0	0.0%	0	0.0%	4	8.0%

Source ADF&G Division of Subsistence household surveys, 2022.

a. Valid responses do not include households that did not provide any response to the less, same, or more use assessment question.

Table 2-26.–Reasons for more household uses of resources compared to recent years, Dillingham, 2021.

Resource category	Valid responses[a]	Households reporting reasons for more use	Family/personal		Increased availability		Used other resources		Favorable weather		Received more		Needed more		Increased effort		Regulations	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	155	66	5	7.6%	11	16.7%	1	1.5%	4	6.1%	30	45.5%	12	18.2%	19	28.8%	0	0.0%
All resources	152	17	2	11.8%	2	11.8%	0	0.0%	0	0.0%	2	11.8%	2	11.8%	4	23.5%	0	0.0%
Salmon	153	23	2	8.7%	3	13.0%	0	0.0%	0	0.0%	4	17.4%	5	21.7%	3	13.0%	0	0.0%
Nonsalmon fish	152	17	3	17.6%	1	5.9%	0	0.0%	1	5.9%	7	41.2%	1	5.9%	4	23.5%	0	0.0%
Large land mammals	153	17	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8	47.1%	2	11.8%	2	11.8%	0	0.0%
Small land mammals	153	5	0	0.0%	3	60.0%	0	0.0%	0	0.0%	2	40.0%	0	0.0%	2	40.0%	0	0.0%
Marine mammals	153	8	0	0.0%	0	0.0%	1	12.5%	0	0.0%	5	62.5%	3	37.5%	0	0.0%	0	0.0%
Birds and eggs	145	16	1	6.3%	3	18.8%	0	0.0%	0	0.0%	6	37.5%	0	0.0%	6	37.5%	0	0.0%
Marine invertebrates	155	7	0	0.0%	0	0.0%	0	0.0%	0	0.0%	7	100.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	151	12	1	8.3%	0	0.0%	0	0.0%	3	25.0%	0	0.0%	4	33.3%	2	16.7%	0	0.0%

-continued-

Table 2-26.–Continued.

Resource category	Valid responses[a]	Households reporting reasons for more use	Covid-related		More success		Had more time		Store-bought expense		Got/ fixed equipment		Substitute for unavailable resource(s)		Had more help		Other	
			Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Any resource	155	66	1	1.5%	12	18.2%	5	7.6%	4	6.1%	0	0.0%	2	3.0%	2	3.0%	1	1.5%
All resources	152	17	0	0.0%	6	35.3%	1	5.9%	1	5.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Salmon	153	23	1	4.3%	4	17.4%	1	4.3%	4	17.4%	0	0.0%	1	4.3%	2	8.7%	0	0.0%
Nonsalmon fish	152	17	0	0.0%	1	5.9%	1	5.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Large land mammals	153	17	0	0.0%	4	23.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	5.9%
Small land mammals	153	5	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine mammals	153	8	0	0.0%	1	12.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Birds and eggs	145	16	0	0.0%	1	6.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Marine invertebrates	155	7	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vegetation	151	12	0	0.0%	0	0.0%	3	25.0%	0	0.0%	0	0.0%	1	8.3%	0	0.0%	0	0.0%

Source ADF&G Division of Subsistence household surveys, 2022.

a. Valid responses do not include households that did not provide any response to the less, same, or more use assessment question.

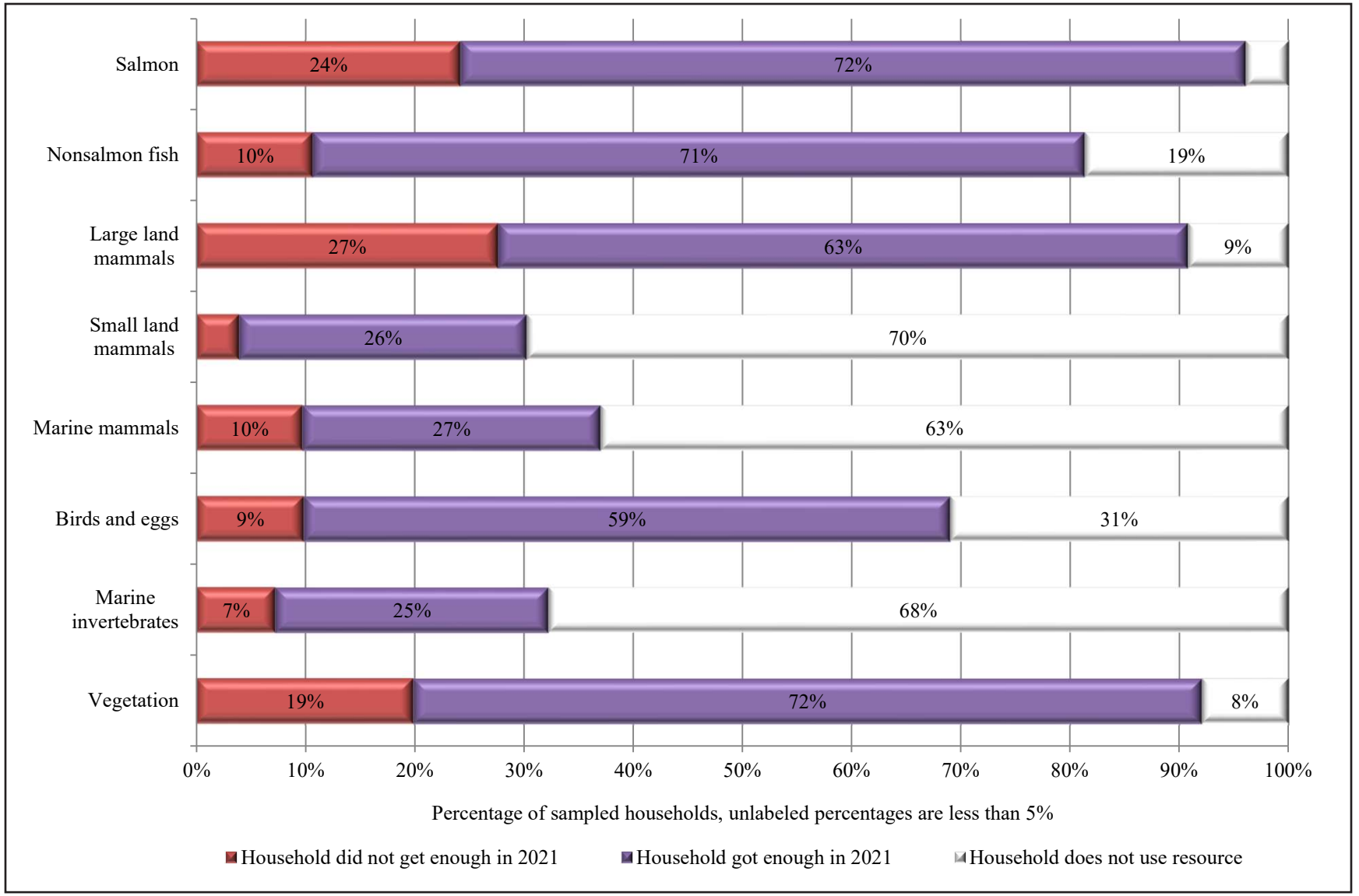


Figure 2-38.–Percentage of sampled households reporting whether they had enough resources, Dillingham, 2021.

Table 2-27.–Reported impact to households reporting that they did not get enough of a type of resource, Dillingham, 2021.

		Households not getting enough _____.				Impact to those not getting enough _____.									
	Sampled	Valid responses[a]		Did not get enough		No response		Not noticeable		Minor		Major		Severe	
Resource category	households	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
All resources	155	148	95.5%	37	25.0%	1	2.7%	5	13.5%	17	45.9%	11	29.7%	3	8.1%
Salmon	155	147	94.8%	37	25.2%	2	5.4%	0	0.0%	21	56.8%	9	24.3%	5	13.5%
Nonsalmon fish	155	122	78.7%	16	13.1%	2	12.5%	2	12.5%	7	43.8%	3	18.8%	2	12.5%
Large land mammals	155	138	89.0%	42	30.4%	6	14.3%	5	11.9%	11	26.2%	14	33.3%	6	14.3%
Small land mammals	155	46	29.7%	6	13.0%	1	16.7%	0	0.0%	4	66.7%	0	0.0%	1	16.7%
Marine mammals	155	57	36.8%	15	26.3%	4	26.7%	1	6.7%	6	40.0%	4	26.7%	0	0.0%
Birds and eggs	155	98	63.2%	14	14.3%	3	21.4%	1	7.1%	8	57.1%	1	7.1%	1	7.1%
Marine invertebrates	155	49	31.6%	11	22.4%	1	9.1%	1	9.1%	7	63.6%	2	18.2%	0	0.0%
Vegetation	155	139	89.7%	30	21.6%	4	13.3%	4	13.3%	14	46.7%	3	10.0%	5	16.7%

Source ADF&G Division of Subsistence household surveys, 2022.

a. Valid responses do not include households that did not provide any response and those households not using the resource category.

Table 2-28.–Resources that households reported needing, Dillingham, 2021.

Resource	Households needing	Percentage of households
Moose	51	32.9%
Chinook salmon	42	27.1%
Caribou	32	20.6%
Salmon	11	7.1%
Unspecified seal oil	9	5.8%
Sockeye salmon	8	5.2%
Smelts	8	5.2%
Northern pike	7	4.5%
Seals	7	4.5%
Pacific halibut	6	3.9%
Gull eggs	6	3.9%
Geese	5	3.2%
Ptarmigans	5	3.2%
Porcupine	4	2.6%
Coho salmon	3	1.9%
Beluga whale	3	1.9%
Spruce grouse	3	1.9%
All resources	2	1.3%
Fish	2	1.3%
Whitefishes	2	1.3%
Beaver	2	1.3%
Ducks	2	1.3%
Cranes	2	1.3%
Pacific herring roe	1	0.6%
Cods	1	0.6%
Burbot	1	0.6%
Arctic char	1	0.6%
Trouts	1	0.6%
Rainbow trout	1	0.6%
Large land mammals	1	0.6%
Deer	1	0.6%
Common muskox	1	0.6%
Snowshoe hare	1	0.6%
Lynx	1	0.6%
Marine mammals	1	0.6%
Harbor seal	1	0.6%
Unspecified seals	1	0.6%
Birds and eggs	1	0.6%
Mallard	1	0.6%
Brant	1	0.6%
Sandhill crane	1	0.6%
Grouses	1	0.6%

Source ADF&G Division of Subsistence household surveys, 2022.

Local Comments and Concerns

Following is a summary of local observations of wild resource populations and trends that were recorded during the surveys or key respondent interviews. Some households did not offer any additional information during the survey interviews, therefore not all households are represented in the summary. In addition, respondents expressed their concerns about wild resources during the community meeting to review preliminary data. These concerns have been included in the summary.

Salmon

Many residents of Dillingham expressed concerns about the overall run health and abundance of Chinook salmon. Specifically, respondents reported a decrease in the overall abundance of Chinook salmon in recent years. Survey respondents also expressed concern that the Chinook salmon that are returning are smaller in size than they historically have been. Some community members explained that as a result of decreasing Chinook salmon harvests, they have placed more effort on targeting other salmon species, such as coho salmon, in order to put away enough salmon for the year. Some Dillingham residents explained they had to change the way that they put up, or preserve, Chinook salmon; instead of harvesting the amount needed to last the year and put away the harvest quickly after one or two sets of a subsistence net, these residents had to fish many tides over a longer span and freeze the Chinook salmon until they got enough harvested to warrant drying and smoking the fish. Others explained that their household made do without Chinook salmon. There was an overwhelming consensus that the Chinook salmon returns have declined in recent years. Respondents provided an array of reasons they speculated for the decline in Chinook salmon, including: warming ocean temperature, bycatch in high seas trawler fisheries, river and stream erosion, and competition from hatchery salmon.

Large Land Mammals

Throughout this study, residents of Dillingham expressed concerns about the area caribou populations. Respondents spoke about the large abundance of caribou that used to exist and how the lowered population is concerning. Many respondents told research staff that they understood why presently caribou hunts are closed but expressed that the closure has resulted in the need to harvest more moose. Dillingham hunters described having to go farther or to new areas while moose hunting in recent years and how the cost of fuel and amounts needed to harvest a moose was challenging. Survey respondents expressed support for the winter moose hunt and described that this hunt was essential for many households to ensure they have enough meat for the year.

Vegetation

Throughout the survey effort, the topic of the closure of village corporation lands to nonshareholders from Aug. 1 to Dec. 31 during the 2021 study year was mentioned by several respondents regarding vegetation harvesting. These respondents explained that the inability to access those lands limited berry picking areas and ultimately led to less berry harvesting for their households during the study year. Multiple survey respondents expressed their appreciation for berries and greens, explaining that wild vegetation is a healthy and fresh source of food and that gathering these foods helps significantly supplement store-bought food, and that these resources are often better quality than store-bought berries and vegetables.

Store-Bought Food

Throughout the surveys, and especially during administration of the food security section, respondents commented on issues they experienced with grocery supply chain failures throughout the year. Many Dillingham residents explained that the local grocery stores ran out of many types of foods throughout the study year. One respondent discussing this issue stated: “This year it was hard to always get fresh fruit, veggies, and dairy products at local stores.” Another respondent explained, “Store foods were in short supply some months.” Community residents also commented on the high prices of groceries from the local stores. Some residents observed store food shortages during the spring and summer due to the stores waiting on the first barge to arrive, and demand placed by a population increase when commercial fishing workers arrived in late April and May. Many respondents mentioned subsistence foods were important as a

means of saving money by harvesting wild resources. For example, one survey respondent shared: “I like the opportunity for subsistence in Dillingham. It helps supplement your food bill. Dillingham is the land of plenty.”

Fuel Prices

The high cost of gasoline was a commonly cited concern by survey respondents. For example, one Dillingham resident stated: “The cost of fuel is prohibitive to subsistence activities. Dependence on gas and oil has changed the way we are able to subsist. Lower energy costs would increase subsistence activities.” High fuel prices were often referenced in relation to moose hunting—as area hunters have had to travel farther to find moose to harvest, the price of fuel has become an important factor for these hunters. Lower fall harvest success has made the cost-benefit assessment more critical than in past years.

3. DISCUSSION AND CONCLUSIONS

This chapter considers the 2021 harvest and use data through a comparison with the previous studies conducted in Dillingham by the Division of Subsistence, as well as a discussion of historical and contemporary harvest and use areas. Finally, this chapter concludes with a brief overview of main points about the importance of subsistence resources in Dillingham.

Harvest Data: Comparing Harvests and Uses in 2021 with Previous Years

Changes in the harvest of resources by Dillingham residents can be evaluated through comparisons with findings from earlier study years. In addition to the 2021 study, comprehensive subsistence harvest surveys were conducted in Dillingham for the study years 1984 (baseline) and 2010. In addition, surveys documenting the harvest and use of salmon were carried out for study years 2014 and 2016. Several other studies, including marine mammal surveys and large land mammal surveys, have been carried out in Dillingham, however the methods used in those studies rendered the results incomparable to the data collected in this study.

Examining the harvest composition for a particular community over time using longitudinal data can provide insights into changes, trends, and patterns in subsistence practices in order to gain a more holistic understanding of the subsistence economy. Changes in harvest composition over time were analyzed in two ways:

- By comparing the percentage each resource category composed of the total harvest between the 1984, 2010, and 2021 estimates, and
- By comparing the per capita harvest weight for each resource category and key resources such as salmon, moose, and caribou.

Comparing community harvest composition and per capita harvests can illustrate key subsistence harvest changes or consistencies through time. Per capita harvest estimates across the study years are a metric that allows for comparisons between the study years even if the overall human population has fluctuated over time. Looking at all wild resource harvests, the overall harvest weight decreased between each study year, with a total decline from 1984 to 2021 of 113,702 lb, or 43 lb per capita. In 1984, Dillingham households harvested 494,486 lb of wild resources, or 242 lb per capita, which was higher than the 2010 harvest of 486,532 lb usable weight, or 212 lb per capita, and higher than the 2021 harvest of 380,784 lb of wild resources, or 199 lb per capita (Table 3-1). Over this timeframe, some aspects of the composition of the resources harvested have also changed.

Figure 3-1 compares the estimated per capita harvests, by resource category, for the three comprehensive study years. The per capita harvests for salmon, large land mammals, small land mammals, and marine invertebrates decreased since the 1984 study, while the per capita harvests for vegetation, marine mammals, birds and eggs, and nonsalmon fish increased in 2021 compared to 1984.

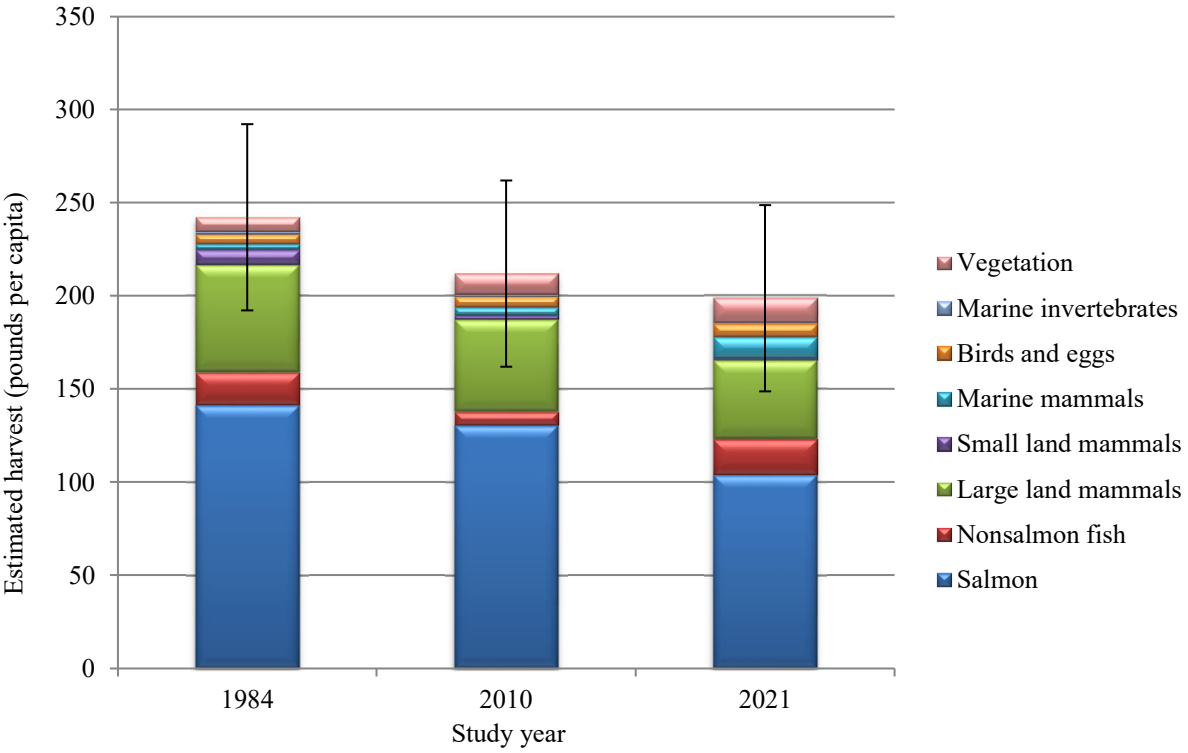
Both historically and contemporarily, salmon have made up the largest portion of the overall harvest based on household surveys: this resource category composed more than one-half of the overall resource harvest weight in all three comprehensive survey study years (1984, 2010, and 2021) (Table 3-1). However, the overall harvest weight of salmon decreased by 89,693 lb between 1984 and the current study year (2021). In 1984 the total salmon harvest weight was 288,651 lb, or 141 lb per capita (58% of total harvest), in 2010 the total salmon harvest weight was 299,567 lb, or 131 lb per capita (62% of total harvest), and in 2021 the salmon harvest weight was 198,958 lb, or 104 lb per capita (52% of total harvest).

For salmon specifically, changes in the harvests of each salmon species over time by the community of Dillingham can be discerned through comparisons with findings from other study years (1984, 2010, 2014, 2016) and also data for the Bristol Bay Area from the subsistence salmon permit database. Permit data collected by ADF&G are available from 1983 onward and there has been a high level of participation (Table 3-2).

Table 3-1.–Comparison of estimated total and per capita harvests, by resource category, Dillingham, 1984, 2010, and 2021.

	Estimated harvest in pounds usable weight											
	1984			95%	2010			95%	2021			95%
Resource	Total	Per capita	Percentage of harvest	confidence interval (±) harvest	Total	Per capita	Percentage of harvest	confidence interval (±) harvest	Total	Per capita	Percentage of harvest	confidence interval (±) harvest
All resources	**494,486.0**	**242.2**	**100.0%**	**20.0%**	**486,532.0**	**212.1**	**100.0%**	**12.0%**	**380,783.7**	**198.8**	**100.0%**	**20.4%**
Salmon	288,651.0	141.4	58.4%	24.0%	299,567.0	130.6	61.6%	16.3%	198,958.2	103.9	52.2%	22.5%
Nonsalmon fish	35,649.0	17.5	7.2%	30.0%	16,692.0	7.3	3.4%	23.2%	36,492.7	19.1	9.6%	52.0%
Large land mammals	117,878.0	57.7	23.8%	28.0%	113,241.0	49.4	23.3%	22.0%	81,161.6	42.4	21.3%	28.6%
Small land mammals	16,612.0	8.1	3.4%	67.0%	5,120.0	2.2	1.1%	34.1%	1,835.5	1.0	0.5%	75.4%
Marine mammals	6,067.0	3.0	1.2%	91.0%	10,108.0	4.4	2.1%	43.8%	21,955.1	11.5	5.8%	64.5%
Birds and eggs	10,807.0	5.3	2.2%	27.0%	13,052.0	5.7	2.7%	19.2%	13,429.3	7.0	3.5%	35.9%
Marine invertebrates	2,488.0	1.2	0.5%	53.0%	2,590.0	1.1	0.5%	61.8%	1,046.1	0.5	0.3%	71.1%
Vegetation	16,328.0	8.0	3.3%	43.0%	26,159.0	11.4	5.4%	16.3%	25,905.3	13.5	6.8%	19.0%

Sources For 2021, ADF&G Division of Subsistence household surveys, 2022; for previous study years, ADF&G Division of Subsistence Community Subsistence Information System (CSIS), accessed 2023.



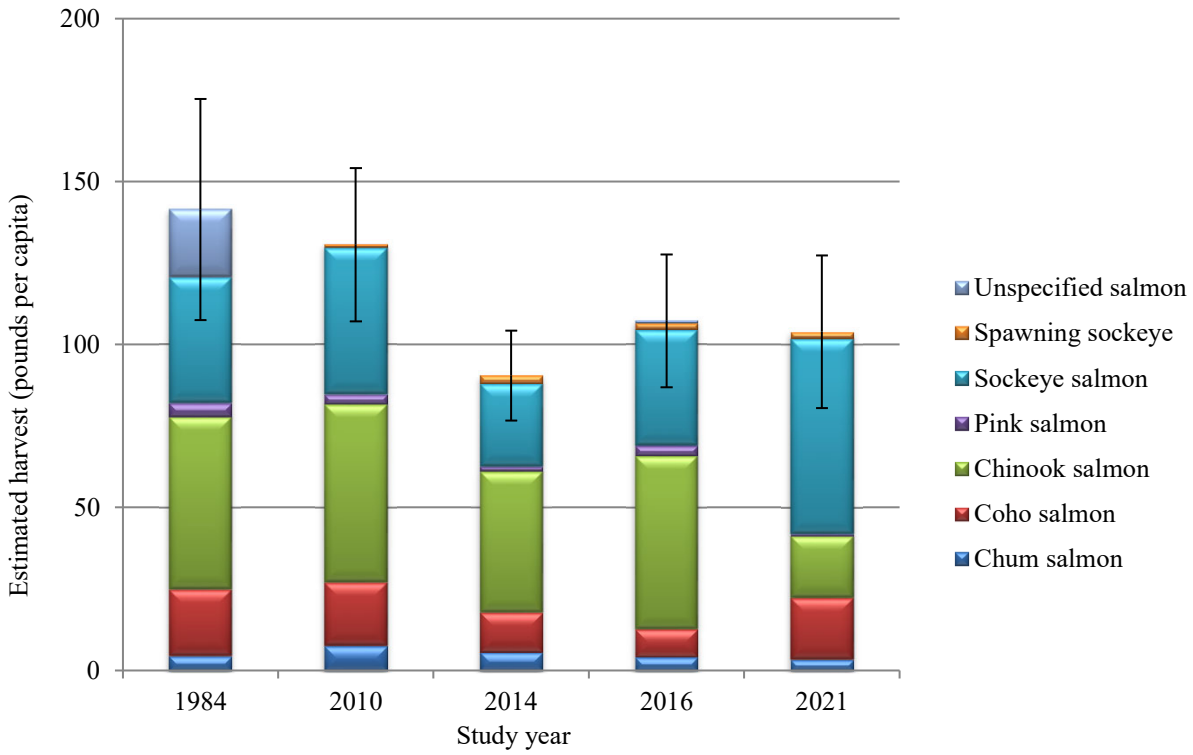
Note Error bars represent the upper and lower bounds of the 95% confidence interval for all resources combined.

Figure 3-1.–Composition of harvest weight, by resource category, Dillingham, 1984, 2010, and 2021.

Table 3-2.–Estimated historical subsistence salmon harvests, Bristol Bay Area, 1983–2021.

	Permits		Estimated salmon harvest					
Year	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	Total
1983	224	192	4,073	9,171	3,580	1,060	211	18,095
1984	266	230	3,882	11,782	4,717	1,590	3,368	25,339
1985	237	211	2,778	10,000	3,536	1,008	227	17,549
1986	242	208	5,651	10,852	5,775	2,024	1,294	25,596
1987	270	249	4,773	16,520	3,509	1,313	66	26,181
1988	290	266	4,312	12,180	3,402	2,398	4,793	27,085
1989	287	261	3,720	15,519	6,574	1,633	259	27,705
1990	303	271	4,585	14,280	4,550	1,971	2,340	27,726
1991	342	304	6,756	16,274	7,614	1,504	113	32,261
1992	301	263	7,549	14,430	4,565	2,178	2,189	30,911
1993	306	272	7,541	11,184	3,637	1,204	74	23,640
1994	335	291	8,038	14,142	3,999	1,911	1,698	29,788
1995	295	277	7,639	12,419	2,866	1,127	142	24,193
1996	303	270	8,439	10,948	2,869	2,626	870	25,752
1997	301	280	7,928	11,335	2,254	885	74	22,476
1998	339	326	5,341	12,154	3,840	1,209	760	23,305
1999	342	338	4,332	17,129	2,633	1,338	42	25,474
2000	341	299	4,898	15,718	4,326	1,326	1,414	27,683
2001	337	312	5,287	14,371	4,086	1,431	181	25,357
2002	331	299	5,595	12,070	3,588	2,072	1,051	24,376
2003	325	287	10,914	10,636	3,283	1,196	84	26,113
2004	307	271	8,185	8,911	2,276	1,668	1,268	22,308
2005	307	280	5,807	10,409	3,385	1,149	192	20,942
2006	283	248	4,649	11,614	2,071	1,733	1,329	21,397
2007	315	265	6,988	14,552	1,736	1,272	199	24,747
2008	325	293	6,626	13,201	3,165	1,640	1,275	25,908
2009	325	290	7,167	15,385	3,908	2,240	234	28,934
2010	319	296	4,878	12,284	1,979	1,467	1,125	21,732
2011	327	305	6,583	13,715	3,896	1,386	169	25,749
2012	328	277	5,055	12,921	1,420	1,331	651	21,378
2013	339	282	4,090	15,058	4,037	1,350	129	24,663
2014	340	301	6,714	13,193	3,487	2,637	1,546	27,577
2015	344	330	6,697	13,666	3,673	1,452	234	25,722
2016	379	339	9,732	16,313	3,034	3,147	3,701	35,927
2017	325	293	5,935	17,330	3,685	2,470	166	29,587
2018	323	265	6,385	13,603	2,726	2,049	524	25,287
2019	338	275	5,541	14,911	3,527	1,744	232	25,955
2020	313	238	3,713	20,888	2,842	1,147	401	28,991
2021	326	105	2,102	25,500	3,586	611	18	31,818
5-year average (2016–2020)	336	282	6,261	16,609	3,163	2,111	1,005	29,149
10-year average (2011–2020)	336	291	6,044	15,160	3,233	1,871	775	27,084
Historical average (1983–2020)	312	278	6,020	13,449	3,580	1,655	911	25,616

Source ADF&G Division of Subsistence, Alaska Subsistence Fisheries Database (ASFDB) 2021.



Note Error bars represent the upper and lower bounds of the 95% confidence interval for all resources combined.

Figure 3-2.–Composition of salmon harvest weight, by species, Dillingham, 1984, 2010, 2014, 2016, and 2021.

Figure 3-2 and Table 3-3 portray the estimated per capita harvests of salmon by species for each of the five years for which data were collected using household surveys. Historically (1984, 2010, 2014, 2016), Chinook salmon was the salmon species with the highest per capita harvest weight, around 50 lb, and composed 37%–49% of the salmon harvest. Sockeye salmon was the species with the second highest per capita harvest weight, ranging from 25 lb to 45 lb, and composed approximately one-third of the harvest. In 2021, the harvest changed and sockeye salmon was the species with the highest per capita weight (60 lb) and composed 58% of the salmon harvest and the Chinook salmon harvest was only 19 lb per capita (18% of the harvest).

Reasons for this shift in composition of the total salmon harvest weight may be explained by residents harvesting fewer Chinook salmon but may also be partially explained by the changing size of Chinook salmon. For example, based on the conversion factors used in the 1984 study, Chinook salmon had an average usable weight of 15.2 lb, whereas the 2021 survey-based harvest estimates were calculated on an average usable weight of 6.8 lb (Fall et al. 1986:166; see also Appendix C). Therefore, even if residents harvested the same number of Chinook salmon as in previous years, the total usable weight would be less, and Chinook salmon would account for a smaller proportion of harvest weight. The decreasing weight used for the conversion factors for Chinook salmon reflect what respondents echoed through the survey effort: Chinook salmon returning to Bristol Bay have decreased in size and more "jacks" (small Chinook salmon that mature after spending only one winter in the ocean and are typically male[1]) are being harvested than in the past.

1. Alaska Department of Fish and Game "Chinook Salmon" Last modified 2008, accessed January 2024. https://www.adfg.alaska.gov/static/education/wns/chinook_salmon.pdf

Table 3-3.–Comparison of estimated total and per capita harvests of salmon, by species, Dillingham, 1984, 2010, 2014, 2016, and 2021.

	Estimated harvest in pounds usable weight											
	1984			95%	2010			95%	2014			95%
Resource	Total	Per capita	Percentage of harvest	confidence interval (±) harvest	Total	Per capita	Percentage of harvest	confidence interval (±) harvest	Total	Per capita	Percentage of harvest	confidence interval (±) harvest
Salmon	**288,651.0**	**141.4**	**100.0%**	**24.0%**	**299,567.0**	**130.6**	**100.0%**	**18.0%**	**219,035.3**	**90.5**	**100.0%**	**15.3%**
Chum salmon	9,183.0	4.5	3.2%	66.0%	17,420.0	7.6	5.8%	26.0%	13,810.2	5.7	5.8%	23.4%
Coho salmon	41,750.0	20.5	14.5%	29.0%	44,681.0	19.5	14.9%	34.0%	29,323.7	12.1	14.9%	27.1%
Chinook salmon	107,844.0	52.8	37.4%	24.0%	125,124.0	54.5	41.8%	15.0%	104,558.7	43.2	41.8%	16.6%
Pink salmon	8,513.0	4.2	2.9%	42.0%	6,828.0	3.0	2.3%	88.0%	3,559.1	1.5	2.3%	48.3%
Sockeye salmon	78,587.0	38.5	27.2%	29.0%	103,075.0	44.9	34.4%	18.0%	61,195.6	25.3	34.4%	23.5%
Spawning sockeye			0.0%		2,339.0	1.0	0.8%	36.0%	6,588.0	2.7	0.8%	38.3%
Unspecified salmon	42,773.0	21.0	14.8%	73.0%	98.0	0.0	0.0%	180.0%	0.0	0.0	0.0%	

-continued-

Table 3-3.–Continued.

	Estimated harvest in pounds usable weight							
	2016			95%	2021			95%
Resource	Total	Per capita	Percentage of harvest	confidence interval (±) harvest	Total	Per capita	Percentage of harvest	confidence interval (±) harvest
Salmon	**245,962.4**	**107.3**	**100.0%**	**19.0%**	**198,958.2**	**103.9**	**100.0%**	**22.5%**
Chum salmon	9,528.8	4.2	3.9%	24.6%	6,602.3	3.4	3.3%	41.5%
Coho salmon	19,753.9	8.6	8.0%	32.7%	36,161.7	18.9	18.2%	30.1%
Chinook salmon	121,480.3	53.0	49.4%	23.7%	36,427.7	19.0	18.3%	27.2%
Pink salmon	7,350.4	3.2	3.0%	74.5%	1,130.1	0.6	0.6%	73.4%
Sockeye salmon	81,280.1	35.4	33.0%	25.6%	114,650.3	59.9	57.6%	26.2%
Spawning sockeye	4,531.2	2.0	1.8%	60.0%	3,986.1	2.1	2.0%	63.7%
Unspecified salmon	2,037.7	0.9	0.8%	177.1%	0.0	0.0	0.0%	0.0%

Sources For 2021, ADF&G Division of Subsistence household surveys, 2022; for previous study years, ADF&G Division of Subsistence Community Subsistence Information System (CSIS), accessed 2023.

Note Blank cells indicate no harvest of the resource reported for the study year.

A shift to an increasing reliance on sockeye salmon is also demonstrated in subsistence salmon permit data for the Bristol Bay region. Although permit data for the entire Bristol Bay Area might reflect harvests by more than just Dillingham households, the permit data offer extra perspective about changes to the salmon harvest composition. The historical average (1983–2020) demonstrates that sockeye salmon composed approximately one-half (53%) of the total average salmon harvest (in individual numbers of fish), followed by Chinook salmon (24%) (Table 3-2). The most recent 5-year average (2016–2020) demonstrates a similar harvest composition; however, the average harvest of sockeye salmon increased to a slightly higher proportion of the total average amount, and the average harvest of Chinook salmon decreased slightly: sockeye salmon composed 57% of the total 5-year average salmon harvest, followed by Chinook salmon (21%).

Large land mammal harvests were the second largest component of community harvests in all three study years: 24% of the total harvest in 1984, 23% in 2010, and 21% in 2021 (Table 3-1). Like the total wild resource harvest, both the per capita harvest weight and the overall harvest weight of large land mammals decreased over time. In 1984, the total large land mammal harvest weight was 117,878 lb (58 lb per capita), in 2010 the total large land mammal harvest weight was 113,241 lb (49 lb per capita), and in 2021 the large land mammal harvest weight was 81,162 lb (42 lb per capita).

In part, the decrease in total large land mammal harvest weight and the per capita harvest weight over time can likely be attributed to the declining caribou population in the area. For example, according to the estimates in the CSIS, in 1984, when caribou were abundant in the area, the moose and caribou harvests were similar: the total 1984 caribou harvest weight was 56,904 lb (28 lb per capita) and the total 1984 moose harvest weight was 60,974 lb (30 lb per capita). In 2010, area caribou populations were significantly lower than they had been in 1984, therefore community members shifted their hunting efforts toward moose, which is reflected in the harvest data: the total 2010 caribou harvest weight was 9,495 lb (4 lb per capita) and the total 2010 moose harvest weight was 102,547 lb (45 lb per capita). In 2021 caribou populations were lower than they had been in 2010, leading to regulatory hunting restrictions; no caribou harvests were reported during the 2021 survey, and the 2021 moose harvest (79,158 lb, or 41 lb per capita) was lower than it had been in 2010, but higher than in 1984 (Table 2-13).

Since the 1984 study, small land mammals have accounted for 3% or less of the total wild resource harvest in all of the study years: 3% in 1984, 1% in 2010, and less than 1% in 2021 (Table 3-1). Both the per capita harvest weight and the overall harvest weight of small land mammals decreased since 1984. In 1984 the total small land mammals harvest weight was 16,612 lb (8 lb per capita), in 2010 the total harvest weight was 5,120 lb (2 lb per capita), and in 2021 the small land mammals harvest weight was 1,836 lb (1 lb per capita). According to survey respondents, fewer community members trap small land mammals today than in the past. For marine invertebrates, the 1984 overall harvest weight was 2,488 lb (1 lb per capita), in 2010 the overall harvest weight increased to 2,590 lb (1 lb per capita), but in 2021 the overall harvest weight for marine invertebrates decreased to the lowest estimate of 1,046 lb (less than 1 lb per capita). Community members cited two reasons for harvesting fewer marine invertebrates in 2021: high fuel prices and fear of paralytic shellfish poison. Nonsalmon fish was the only resource category that had almost identical total and per capita harvest weight estimates in the 1984 and 2021 studies: 36,493 lb (19 lb per capita) in 2021 and 35,649 lb (18 lb per capita) in 1984; however the harvest in 2010, 16,692 lb (7 lb per capita), was lower than the other two study years.

In contrast to the resource categories that showed declines in overall harvest over time, three resource categories were harvested at higher levels in both 2010 and 2021 (in the overall harvest weight and the per capita harvest weight) compared to 1984: vegetation, birds and eggs, and marine mammals. The overall vegetation harvest weight in 1984 was 16,328 lb (8 lb per capita), in 2010 the overall harvest weight increased to 26,159 lb (11 lb per capita), and in 2021 the overall harvest weight for vegetation decreased to 25,905 lb but the per capita weight increased to 14 lb. Birds and eggs have made up a small portion of the overall harvest weight both historically and contemporarily: this resource category composed less than 4% of the overall resource harvest in 1984, 2010, and 2021. Though harvests were relatively small, bird and egg harvests did increase between the study years: the increase in the per capita harvest weight between 1984 and 2010 was less than 1 lb, and the increase in the per capita harvest weight between 1984 and 2021 was

1.7 lb. The overall bird and egg harvest weight in 1984 was 10,807 lb (5 lb per capita), and the 2010 and 2021 bird and egg overall harvest weights were higher than in 1984 but similar to each other at 13,052 lb (6 lb per capita) and 13,429 lb (7 lb per capita), respectively.

Finally, marine mammal harvests showed a marked increase: the overall marine mammal harvest weight in 1984 was 6,067 lb (3 lb per capita), in 2010 the overall harvest weight increased to 10,108 lb (4 lb per capita), and in 2021 the overall harvest weight for marine mammals further increased to 21,955 lb (12 lb per capita). It is more likely that these differences in harvest amounts reflect interannual variability in marine mammal harvests, rather than a trend of increasing harvests. While seal harvests composed a portion of the harvest in each study year, the overall change in marine mammal harvests was driven by an apparent increase in the beluga whale harvest: 0 animals in 1984, 9 animals in 2010, and 17 animals in 2021 (CSIS; Table 2-13). There is a long history of harvesting beluga whales in the Dillingham area (Chythook and Coiley 1994), and it is more likely that the lack of beluga in the 1984 harvest estimate reflects the survey sample missing the beluga harvesters, who are a small proportion of Dillingham residents. Little can be inferred about trends in the harvest or use of beluga whale in Dillingham based on only two data points occurring 11 years apart (2010 and 2011 study years). However, Frost and Suydam (2010) documented reported landings of beluga whales in Dillingham based on hunter surveys conducted by the Alaska Beluga Whale Committee from 1987 to 2006. During this timeframe, from one to eight belugas were harvested, with an average of four beluga harvested per year. While these data are not directly comparable to the division's household survey data, they do suggest that there was not a significant trend change in beluga harvests in Dillingham, either increasing or decreasing. Additional data on current beluga harvests are needed to better understand contemporary beluga harvesting.

Current and Historical Harvest Areas

As noted, mapping occurred for all wild resource harvest and use areas for the 2021 survey. The past study for 2010 similarly collected wild resource harvest and use area data for a comprehensive list of resources similar to those mapped during the 2021 survey (Evans et al. 2013:43–53, 116–131). The methods used to document the harvest and use maps published with the 1984 survey results differed from the mapping methods used later for 2010 and 2021. The maps published in Fall et al. (1986) are reflective of two decades (1963–1983) of harvest and use areas used by seven active subsistence users. A series of questions was included to provide information on intensity of use of trapping and hunting areas as well; for more information about the methods used to document search and harvest areas, see Fall et al. (1986:9, 56–67).

Comparing maps produced with each of the three studies, harvest and use areas have historically remained the same, concentrated around the Nushagak River drainage, the Wood River drainage, Nushagak Bay, Nushagak Peninsula, and Clarks Point (Figure 3-3). Maps presented in this section that compare spatial results from the three studies depict search and harvest areas from the local area only, where use was most concentrated. Resource categories for which the extent of harvest and use areas decreased from 2010 to 2021 include: nonsalmon fish, large land mammals, small land mammals, and vegetation. This study did not directly collect information regarding the reasons that harvest areas have changed over time, however information collected from the surveys provided context for some of the changes.

Salmon Harvest and Use Areas

Salmon harvest and use areas remain consistent when comparing the 2021 study with historical harvest and use areas published in reports for the 1984 and 2010 studies (Figure 3-4). In all three studies, salmon harvest and use areas were concentrated around the city of Dillingham on the beaches at the confluence of the Wood and Nushagak rivers, with harvest and use extending up the Wood River into Lake Aleknagik. Harvest and use of salmon in the 2010 and 2021 studies also include the majority of Nushagak Bay, extending up the Nushagak River until Ekwok, and near Ekuk and Clarks Point, but these harvest and use areas were not observed in the maps published in Fall et al. (1986:56–67) showing fishing areas during 1963–1983. However, in comparison to 2010 and 2021, salmon fishing in 1963–1983 extended north of Lake Aleknagik into other lakes in the Wood-Tikchik State Park that was established in 1978. Of note, in 2010, Chinook and coho salmon in particular were fished for throughout Nushagak Bay as far from Dillingham as Protection Point, while in 2021 use of Nushagak Bay was more limited and did not extend past Igushik and Ekuk.

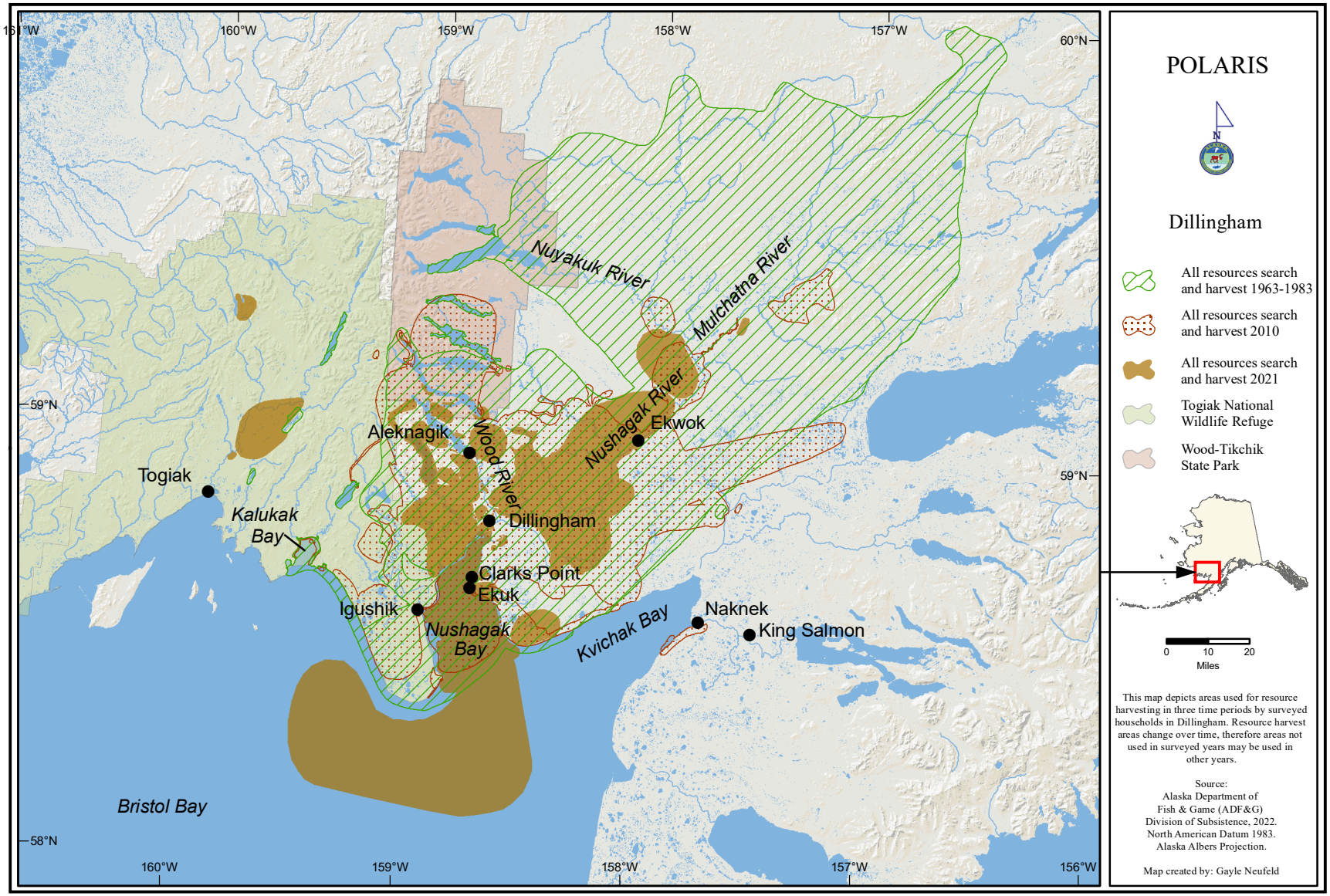


Figure 3-3.–Comparison of all resource harvest and use areas, Dillingham, 1963–1986, 2010, and 2021.

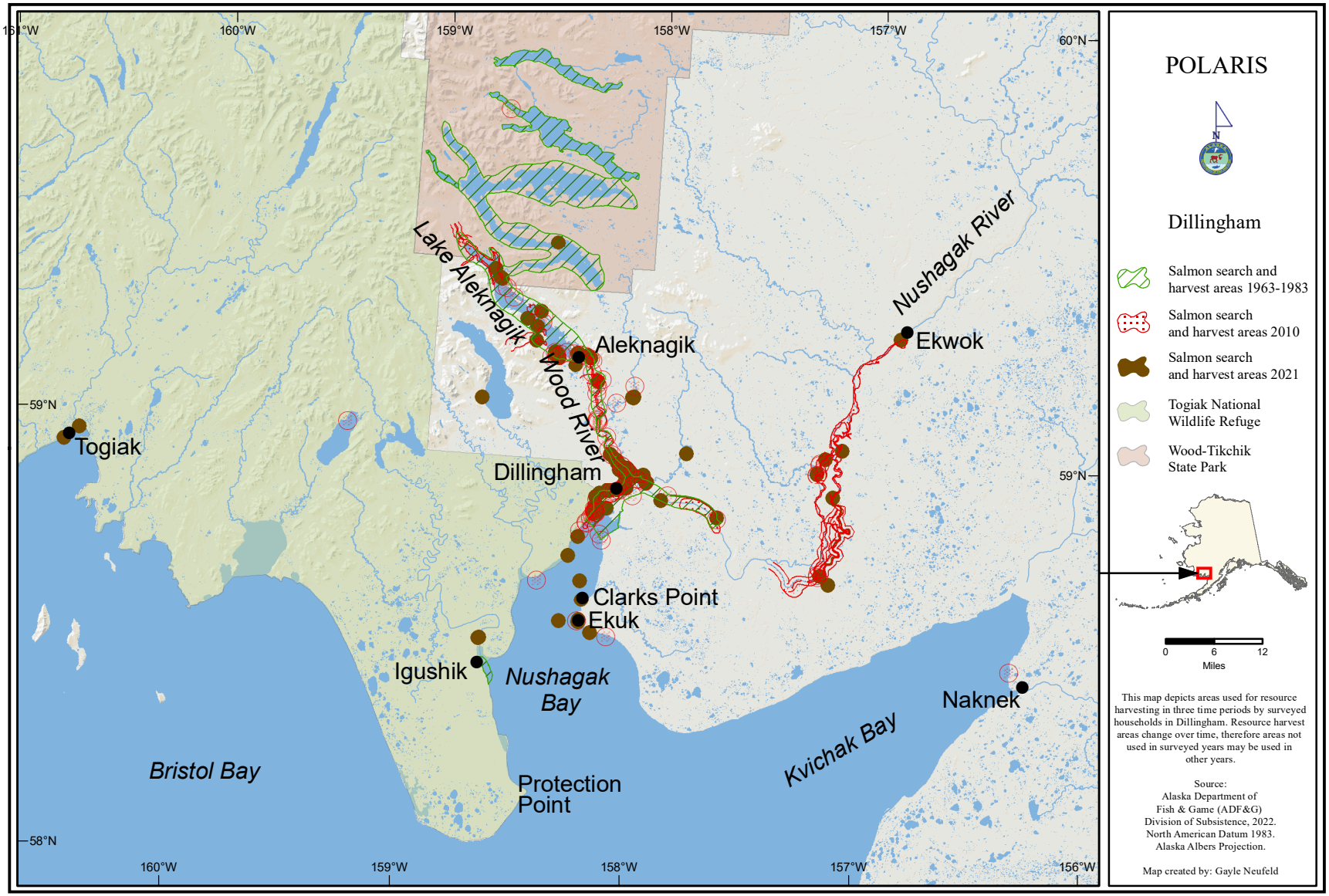


Figure 3-4.–Comparison of salmon harvest and use areas, Dillingham, 1963–1986, 2010, and 2021.

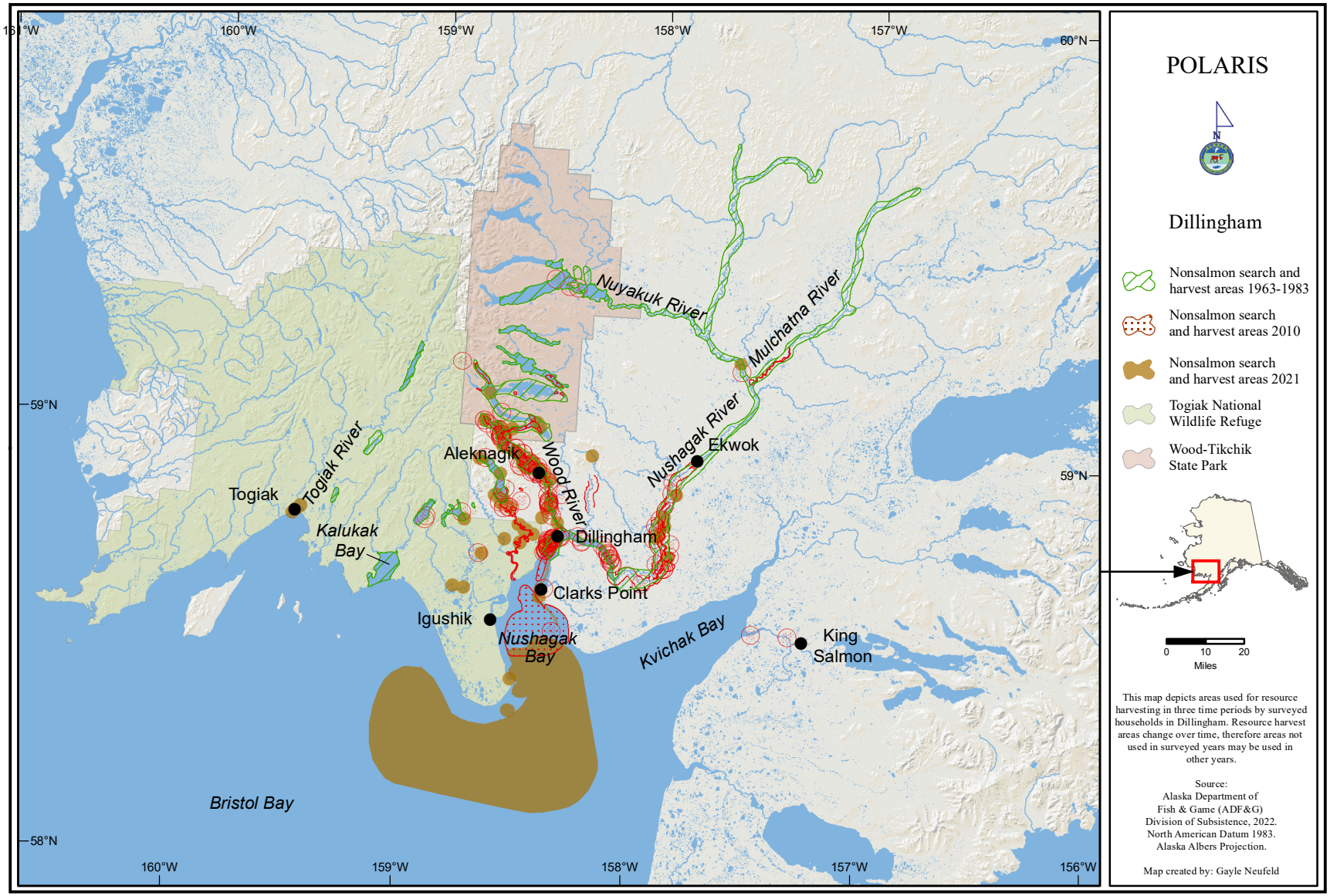


Figure 3-5.–Comparison of nonsalmon fish harvest and use areas, Dillingham, 1963–1986, 2010, and 2021.



Figure 3-6.–Comparison of caribou harvest and use areas, Dillingham, 1963–1986, 2010, and 2021.

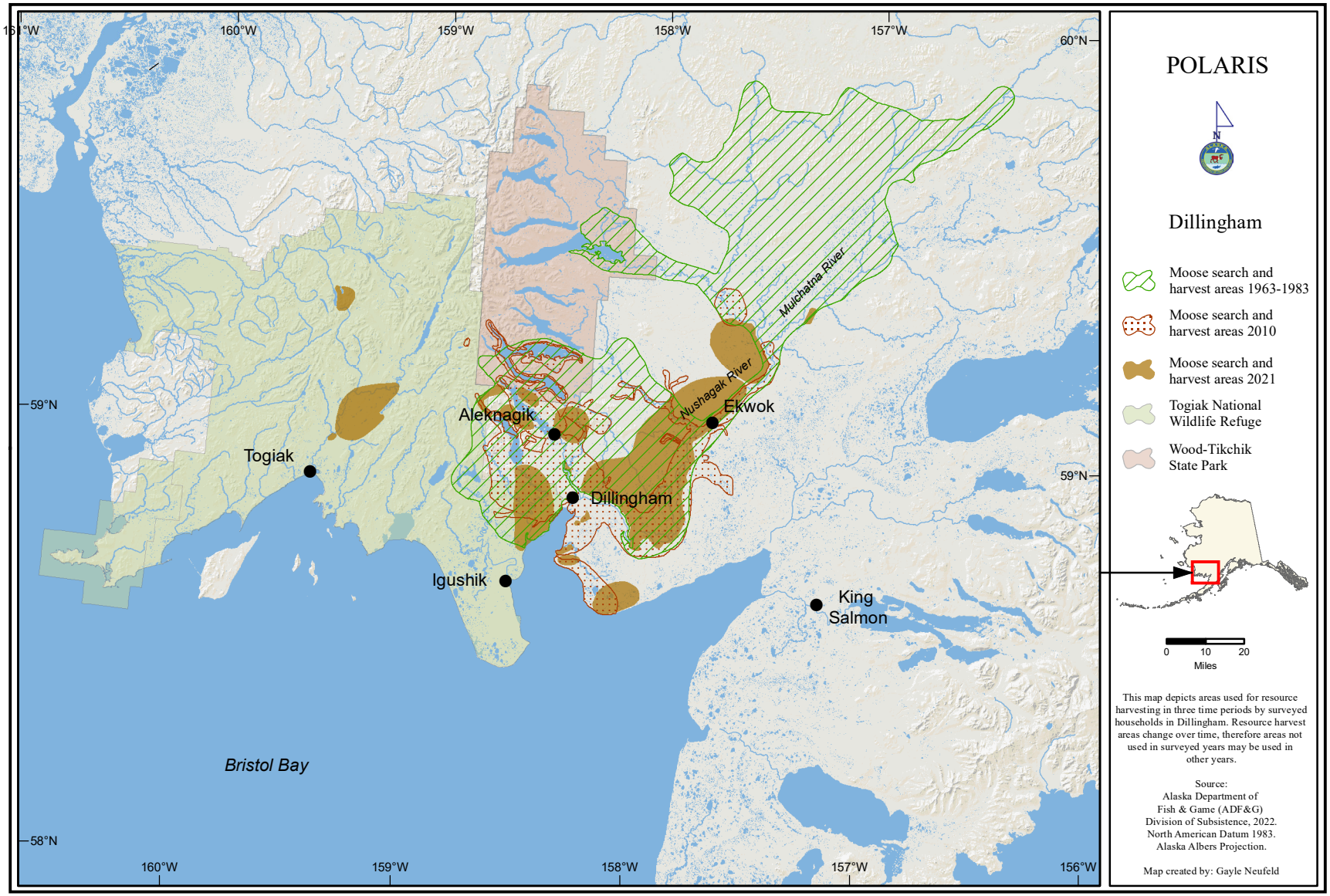


Figure 3-7.–Comparison of moose harvest and use areas, Dillingham, 1963–1986, 2010, and 2021.

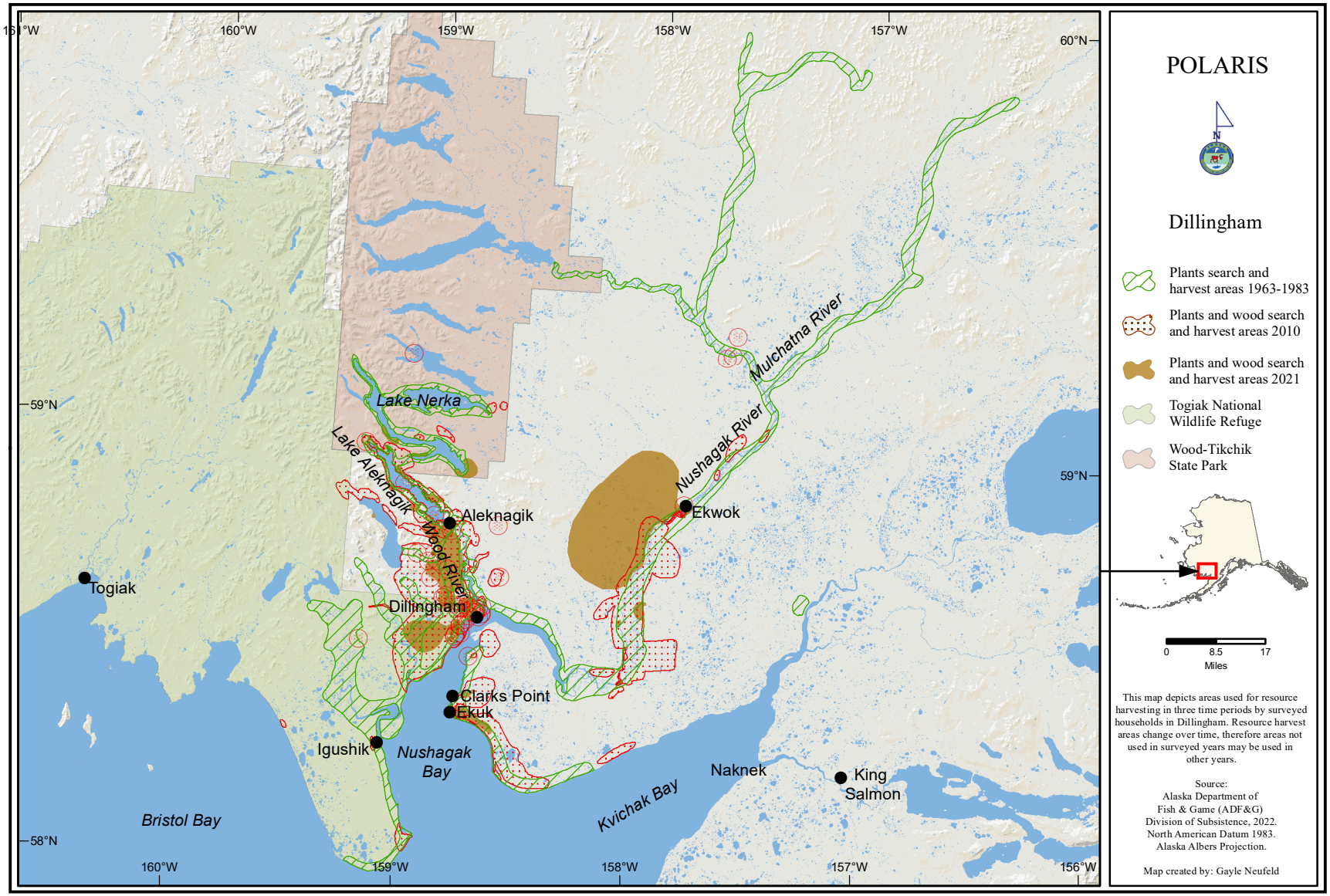


Figure 3-8.–Comparison of vegetation harvest and use areas, Dillingham, 1963–1986, 2010, and 2021.

Nonsalmon Fish Harvest and Use Areas

Historical harvest and use areas of freshwater nonsalmon fish documented for 1963–1983 extend from Nushagak Bay up the Nushagak, Nuyakuk, and Mulchatna rivers, as well as the Wood River and throughout the Wood River Lakes system (Figure 3-5). The earliest study also documented freshwater nonsalmon fish harvest and use within the Togiak River drainage, in areas that were not used during the 2010 and 2021 study years. The documented harvest and use areas are consistent for both the 2010 and 2021 studies; however, the two more recent studies documented less geographically extensive harvest and use areas within the Nuyakuk and Mulchatna rivers compared to the areas published in Fall et al. (1986:60). This decrease in the geographic extent may be a result of increasing fuel prices inhibiting travel to pursue nonsalmon fish.

Fishing in the marine environment in 1963–1983 appeared concentrated in Kulukak Bay, where Dillingham residents target Pacific herring spawn and Pacific herring (Fall et al. 1986:99). The 2021 study documented a Pacific halibut harvest and use area extending beyond the Nushagak Bay and further into Bristol Bay than occurred in previous years.

Marine Invertebrate Harvest and Use Areas

Harvest and use areas of marine invertebrates have remained consistent throughout all three studies (Evans et al. 2013:126; Fall et al. 1986:59; Figure 2-33). Kulukak Bay, Clarks Point and Ekuk, and along the Nushagak Peninsula in the vicinity of Protection Point are documented as harvest and use areas historically and during 2021. In the 2010 study, harvest and use of marine invertebrates were documented along Kvichak Bay south of South Naknek; this area was not documented in Fall et al. (1986:59) or during surveys for this study.

Marine Mammal Harvest and Use Areas

Harvest and use areas of marine mammals have consistently been concentrated in Nushagak Bay and the mouth of the Nushagak River in all three studies (Evans et al. 2013:53, 117; Fall et al. 1986:57; Figure 2-29). In 1963–1983, marine mammal harvest and use areas extended around the Nushagak Peninsula as far as Kulukak Bay, which was not documented in the 2010 and 2021 studies.

Large Land Mammal Harvest and Use Areas

Harvest and use areas of large land mammals have varied between the three studies (Evans et al. 2013:49–50, 119; Fall et al. 1986:57–58; Figure 2-24). Moose and caribou, but no bear, search and harvest areas were asked about for 1963–1983. The 2010 study documented bear harvests along the Snake, Nushagak, Iowithla, Nuyakuk, and Wood rivers, as well as the Wood River Lakes system (Evans et al. 2013:119). In comparison, in 2021, there was only one small harvest and use area of brown bear where the Iowithla River enters the Nushagak River (Figure 2-24).

Both the 1963–1983 and 2010 studies documented extensive caribou harvest and use areas throughout the Nushagak, Wood, and Kvichak drainages (Figure 3-6). As a result of the decline in the population of the Mulchatna caribou herd, in 2021, caribou hunting was closed in GMU 17 by regulation and no search and harvest areas were documented. See Van Lanen et al. (2018) for more information about changes to the Mulchatna caribou herd's distribution, movements, and habitat, as well as ecological shifts, such as increased deciduous shrubs, that have increased moose abundance in the region. Moose harvest and use areas remained consistent historically, concentrated around the Nushagak River drainage and the Wood River Lakes system (Figure 3-7). The 1963–1983 use area data document moose hunting further along the Mulchatna and Nuyakuk rivers than the other two studies. In 2021, moose harvest and use areas were documented north of the community of Togiak, within the Togiak River drainage, unique to this study.

Small Land Mammal Harvest and Use Areas

Harvest and use areas of small land mammals have become smaller and more concentrated around the city of Dillingham. The Fall et al. (1986:59) report presented a harvest and use area of furbearers that extended along the Nushagak River to the mouth of the Nuyakuk River, as well as throughout the Wood River Lakes system, the Snake River, and the Nushagak Peninsula. A smaller range of harvest and use of furbearers was

documented in 2010—with harvest and use along the Nushagak River extending only to Ekwok and with no harvest and use on the Nushagak Peninsula. Distinct from the other years, in 2010 porcupine were sought in the area of South Naknek (Evans et al. 2013:129). Finally, in 2021 harvest and use of small land mammals concentrated around the Snake River and along the Nushagak River between Portage Creek and the mouth of the Iowithla River (Figure 2-27). The more concentrated small land mammal harvest and use areas may be a result of decreased trapping activity by Dillingham residents in the area over time.

Bird and Egg Harvest and Use Areas

Harvest and use areas of birds in 1963–1983 were documented for only waterfowl, which extended throughout the Nushgak Peninsula and Nushagak Bay, north to Kulukak Bay and extending east along the shore of Kvichak Bay, as well as within the mouths of the Wood, Nushagak, and Snake rivers (Fall et al. 1986:60). The 2010 study similarly observed harvest and use areas of waterfowl within the mouths of these rivers and extending upriver on the Nushagak to Ekwok (Evans et al. 2013:51). However, waterfowl harvest and use areas were more limited in 2021—the areas were concentrated to the coastline on both sides of the Nushagak Peninsula; the Nushagak Bay coastline, including on the west side; as well as areas of the Snake, Wood, and Nushagak rivers that are closer in proximity to the city of Dillingham than in previous studies (Figure 2-31).

Regarding the harvest and use areas of upland birds in 2010, the study documented a large area around the Wood River Lakes system, extending south to the mouths of the Igushik, Snake, and Wood rivers, across Nushagak Bay around Clarks Point, and up the Nushagak River until reaching Ekwok (Evans et al. 2013:52). In comparison, the 2021 study documented a smaller harvest and use area for upland birds. In 2021, search and harvest areas for upland birds encompassed more of the Nushagak River drainage than in 2010, a less extensive area west of Dillingham in the Snake River, and efforts were concentrated to the north at Lake Nunavaugaluk (Figure 2-31).

Egg search and harvest areas in 2010 occurred in the east side of Nushagak Bay south of Ekuk, areas directly surrounding the city of Dillingham, along the road to Lake Nunavaugaluk, and near Lake Nerka (Evans et al. 2013:122). The 2021 study observed similar egg harvest areas within Lake Nunavaugaluk and Lake Nerka, Clarks Point, and across the Nushagak River from the city of Dillingham, but also included Lake Aleknagik (Figure 2-31).

Vegetation Harvest and Use Areas

Harvest and use areas for vegetation from 1963–1983 were extensive (Fall et al. 1986:61). Vegetation was harvested from the southernmost tip of the Nushagak Peninsula to areas near Dillingham and Aleknagik, throughout the Wood-Tikchik State Park as far north as around Lake Nerka, and along much of the Nushagak and Mulchatna rivers (Figure 3-8). The 2010 and 2021 studies showed less extensive area use when compared to the 1963–1983 areas. The 2010 and 2021 study years documented similar vegetation harvest and use areas concentrated around the city of Dillingham, the road system, the Wood River Lakes system, in proximity to Clarks Point and Ekuk, and along the Nushagak River.

Wood harvest areas in 2010 were documented along the road system from Dillingham to the community of Aleknagik, southwest toward Kanakanak, as well as within Wood-Tikchik State Park, and a section of the Nushagak River north of Portage Creek (Evans et al. 2013:118). The 2021 study observed smaller harvest and use areas—in 2021 wood harvest and use areas were concentrated to areas along the Dillingham Road system (Figure 2-36). As mentioned in Chapter 2, during the 2021 study year, some survey residents explained they had to go to different areas to harvest plants and berries than typical due to the closure of village corporation lands to nonshareholders.

Conclusions

This report described the contemporary harvests and uses of wild resources by Dillingham residents in 2021. The information gathered through this study documented the continuing importance of subsistence hunting, fishing, and gathering for this community. Dillingham is a large hub community with a vibrant subsistence economy where almost all households use wild foods, and the majority of households harvest them. In 2021, most Dillingham households reported meeting their subsistence needs, and, overall, the community exhibited relatively high food security.

The composition of subsistence harvests by resource category in Dillingham are remarkably similar between this study (2021) and previous comprehensive surveys undertaken for the 2010 and 1984 study years. However, the findings demonstrate the total estimated harvest of wild foods and the per capita harvest have decreased over time. As data from this study and prior study years indicate, Dillingham is heavily reliant upon subsistence resources, in particular salmon and large land mammals. These two resource categories combined composed approximately 73% of the total estimated harvest during the 2021 study year, 85% in 2010, and 82% in 1984.

Throughout this study, community members expressed concerns about the overall health and abundance of Chinook salmon returning to the Nushagak River in recent years. Survey respondents commented that returning Chinook salmon were smaller than they used to be and run timing and run strength of Chinook salmon have been sporadic and unpredictable for the past five to 10 years. Due to lower returns of Chinook salmon and the smaller size of the fish, community members had to spend more time fishing to harvest the number of Chinook salmon necessary to meet their household's needs. Other residents discussed focusing their harvest efforts on catching more sockeye and coho salmon in order to obtain enough fish.

Historically, large land mammal harvests were primarily made up of both caribou and moose; however, because of caribou population declines, only moose were available to be harvested during this study. As discussed in Chapter 1, in GMU 17, under state regulations, there are multiple opportunities for residents to harvest moose: under either a registration permit or a general harvest ticket. A Dillingham resident explained that the fall registration hunts provide an opportunity for residents to harvest moose earlier, when the antlers are still soft, or in velvet. It also allows for younger bull moose to be harvested, which is preferred by some Dillingham residents because of the meat quality. Community members expressed concerns that moose populations may also be declining, with many stating that they had to go farther or to new locations to harvest moose during the study year.

Though salmon and large land mammals represent a significant portion of the harvest weight each year, the remainder of the harvest is widely diversified and composed of many species that are also important to the Dillingham community. The importance of access to a variety of wild resources was demonstrated by the number of resources harvested and used by Dillingham households as well as the high rate of individual participation in harvesting and processing wild resources during the study year.

One major theme echoed by survey participants was the overarching dietary and cultural importance of subsistence to the people of Dillingham, including participating in harvesting, processing, and sharing. As demonstrated by the study findings, such as the high levels of participation in harvesting resources and high levels of sharing within the community, subsistence uses of wild resources link people to each other and to the local environment. Obtaining wild food is vital to the present health of this community. As a survey respondent stated: "Subsistence is an extremely important part of our lifestyle. We only take what we need. Subsistence is what makes our lives out here. It's a really big part of our everyday life." Another community member stated: "Family, friends take care of each other—sharing is so important. [Our] son goes hunting for us. He provides for several families. … food stamps only goes so far, that [is] why the subsistence foods in our freezers is so important." Community members from Dillingham desire to continue harvesting and processing wild resources, not only for themselves, but also for their children and future generations. The intent of this report has been to provide updated information that will help Dillingham residents maintain their goal of sustaining their subsistence way of life.

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APPENDIX A: SURVEY FORM

COMPREHENSIVE WILD FOOD HARVEST SURVEY

DILLINGHAM, ALASKA

From January 1, 2021 to December 31, 2021

This survey is used to estimate wild food harvests and to describe rural community economies. We will publish a summary report, and send it to all households in your community. We share this information with the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service and the National Park Service. We work with the Federal Regional Advisory Councils and with local Fish and Game Advisory Committees to better manage wild food resources.

We will NOT identify your household. We will NOT use this information for enforcement. Participation in this survey is voluntary. Even if you agree to be surveyed, you may skip questions or stop at any time.

HOUSEHOLD ID:		
COMMUNITY ID:	Dillingham	113
INTERVIEWER 1:		
INTERVIEWER 2:		
INTERVIEW DATE:		
START TIME:		
STOP TIME:		
DATA CODED BY:		
DATA ENTERED BY:		
SUPERVISOR:		



COOPERATING ORGANZATIONS

ALASKA DEPARTMENT OF FISH AND GAME
1300 COLLEGE RD.
FAIRBANKS, AK 99701
907-328-6107

BRISTOL BAY NATIVE ASSOCIATION
PO BOX 310
DILLINGHAM, AK
907-842-5257

RECORD TYPE NAME: RECORD TYPE **DILLINGHAM: 113**

HOUSEHOLD MEMBERS

HOUSEHOLD ID HHID

First, I would like to ask about the people in your household, permanent members of your household who sleep at your house. This includes students who return home every summer. I am NOT interested in people who lived with you temporarily, even if they stayed several months.

Last year, that is, between January 1, 2021 and December 31, 2021 WHO were the head or heads of your household?

Is this person answering questions on this survey?		How is this person related to HEAD 1?	Is this person MALE or FEMALE?	Is this person an ALASKA NATIVE?	In what YEAR was this person born?	Where were parents living when this person was born?	Total years person lived in Dillingham?	Did this person live somewhere before Dillingham? Where?
ID #	*(circle)*	*(relation)*	*(circle)*	*(circle)*	*(year)*	*(AK city or state)*	*(year)*	*(AK city or state)*
HEAD 1	Y N		M F	Y N				
1								
NEXT enter spouse or partner. If a household has a SINGLE HEAD, leave HEAD 2 row BLANK and move to PERSON 3.								
HEAD 2	Y N		M F	Y N				
2								
BELOW, enter children (oldest to youngest), grandchildren, grandparents, or anyone else living full-time in this household.								
PERSON 03	Y N		M F	Y N				
3								
PERSON 04	Y N		M F	Y N				
4								
PERSON 05	Y N		M F	Y N				
5								
PERSON 06	Y N		M F	Y N				
6								
PERSON 07	Y N		M F	Y N				
7								
PERSON 08	Y N		M F	Y N				
8								
PERSON 09	Y N		M F	Y N				
9								
PERSON 10	Y N		M F	Y N				
10								
PERSON 11	Y N		M F	Y N				
11								
PERSON 12	Y N		M F	Y N				
12								
PERSON 13	Y N		M F	Y N				
13								
PERSON 14	Y N		M F	Y N				
14								
PERSON 15	Y N		M F	Y N				
15								

PERMANENT HH MEMBERS: 01 **DILLINGHAM: 113**

HOUSEHOLD PARTICIPATION

HOUSEHOLD ID HHID

To continue our questions about people in your household, I would like to ask a few questions about participation in harvesting wild foods…

Between January 1, 2021 and December 31, 2021 ...

Did this person….

PERSON ID FROM PAGE 2	FISH		MARINE INVERTEBRATES		LARGE LAND MAMMALS		SMALL LAND MAMMALS/ FURBEARERS		MARINE MAMMALS		BIRDS AND EGGS		PLANTS/ BERRIES/ WOOD	
	FISH FOR	PROCESS	GATHER	PROCESS	HUNT	PROCESS	HUNT / TRAP	PROCESS	HUNT	PROCESS	GATHER	PROCESS	GATHER	PROCESS
ID #	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*	*(circle)*
HEAD 1	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
1														
HEAD 2	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
2														
PERSON 03	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
3														
PERSON 04	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
4														
PERSON 05	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
5														
PERSON 06	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
6														
PERSON 07	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
7														
PERSON 08	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
8														
PERSON 09	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
9														
PERSON 10	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
10														
PERSON 11	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
11														
PERSON 12	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
12														
PERSON 13	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
13														
PERSON 14	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
14														
PERSON 15	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
15														

PERMANENT HH MEMBERS: 01 **DILLINGHAM: 113**

RETAINED COMMERCIAL HARVESTS

HOUSEHOLD ID HHID

1. Do you or members of your household USUALLY participate in any commercial fishery?..... Y N

2. During the last year (January 1, 2021 and December 31, 2021),
did you, or members of your houseohld PARTICIPATE in any commercial fishery?..... Y N

IF the answer to QUESTION 2 is NO, go to the *NEXT PAGE* .

IF the answer to QUESTION 2 is *YES*, continue on this page...

During the last year,[1]
did you or members of your household…

A … FISH commercially for _____?

B … KEEP any ____ from your commercial catch for your own use[2] or to share?

C Was the ____ that you kept INCIDENTAL[4] catch?

if keep is "yes"

Please estimate how many fish ALL MEMBERS OF YOUR HOUSEHOLD removed from commercial harvests for personal use during the last year.

Include COMMERCIALLY HARVESTED fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If helping others, report ONLY THIS HOUSEHOLD's share.

Read names below in blanks above	A COMM FISH?	B KEEP?	C INCI?	How many were removed for your OWN USE?[5] *number*	How many were removed for your CREW?[5] *number*	How many were removed for your OTHERS? *number*	Units[3] *specify*	*comments*
CHINOOK SALMON *TARYAQVAK*	Y N	Y N	Y N				IND.	
113000003								
CHUM SALMON *KANGITNEQ*	Y N	Y N	Y N				IND.	
111000001								
SOCKEYE SALMON *SAYAK*	Y N	Y N	Y N				IND.	
115000003								
PINK SALMON *AMAQAAYAK*	Y N	Y N	Y N				IND.	
114000003								
COHO SALMON *QAKIIYAQ*	Y N	Y N	Y N				IND.	
112000001								
UNKNOWN SALMON	Y N	Y N	Y N				IND.	
119000003								
HALIBUT *NATERNARPAK*	Y N	Y N	Y N				LB.	
121800001								
HERRING *IQALLUARPAK*	Y N	Y N	Y N				GAL.	
120200001								
SEA RUN DOLLIES *ANGYUK*	Y N	Y N	Y N				GAL.	
125006021								
PACIFIC "GRAY" COD *CETURRNAQ*	Y N	Y N	Y N				IND.	
121004001								
IRISH LORD	Y N	Y N	Y N				IND.	
123006001								

… Continue on next page

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*
4 *"INCIDENTAL CATCH" means the fish kept was not being commercially fished. For example, a king salmon kept from a chum commerical fishery.*
5 *Double counting (captains' removals for crew members and crew members' removal for own uses) is fixed in analysis. Collect both.*

RETAINED COMMERCIAL HARVESTS

HOUSEHOLD ID HHID

IF this household did not participate in any commercial fishery during the last year (January 1, 2021 and December 31, 2021) skip this page.

… Continued from previous page

During the last year,[1] **did you or members of your household…**

A … FISH commercially for _____?

B … KEEP any ____ from your commercial catch for your own use[2] or to share?

C Was the ____ that you kept INCIDENTAL[4] catch?

if keep is "yes"

Please estimate how many fish ALL MEMBERS OF YOUR HOUSEHOLD removed from commercial harvests for personal use during the last year.

Include COMMERCIALLY HARVESTED fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If helping others, report ONLY THIS HOUSEHOLD's share.

Read names below in blanks above	A COMM FISH?	B KEEP?	C INCI?	How many were removed for your OWN USE?[5] *number*	How many were removed for your CREW?[5] *number*	How many were removed for your OTHERS? *number*	Units[3] *specify*	*comments*
STARRY FLOUNDER *NATERNAQ*	Y N	Y N	Y N				IND.	
121406001								
YELLOWFIN SOLE *SAGIK*	Y N	Y N	Y N				IND.	
123606001								
	Y N	Y N	Y N					
	Y N	Y N	Y N					
	Y N	Y N	Y N					
	Y N	Y N	Y N					
	Y N	Y N	Y N					
	Y N	Y N	Y N					
	Y N	Y N	Y N					
	Y N	Y N	Y N					
	Y N	Y N	Y N					
	Y N	Y N	Y N					
	Y N	Y N	Y N					

During the last year, did your household retain any other kind of commercialy retained fish or marine invertebrate?..... Y N

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

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*

3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

4 *"INCIDENTAL CATCH" means the fish kept was not being commercially fished. For example, a king salmon kept from a chum commerical fishery.*

5 *Double counting (captains' removals for crew members and crew members' removal for own uses) is fixed in analysis. Collect both.*

HARVESTS: SALMON

HOUSEHOLD ID HHID

1. Do you or members of your household USUALLY fish for salmon for subsistence, personal use, or sport?..... Y N

2. During the last year (January 1, 2021 and December 31, 2021),
did you, or members of your household USE or TRY TO HARVEST salmon ?..... Y N

IF the answer to QUESTION 2 is NO, go to the *NEXT PAGE* .

IF the answer to QUESTION 2 is *YES*, continue on this page...

During the last year,[1]
did you or members of your household…

A … use[2] _____?
B … receive _____ from another HH or community?
C … give ____ to another HH or community?
D …try[2] to harvest _____?
E … actually harvest any _____?

if harvest is "yes"

Please estimate how many salmon ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested with ….

INCLUDE salmon that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest. DO NOT INCLUDE catch and release fish or retained commercial harvests.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	SET GILL NET	DRIFT GILL NET	SEINE	DIP NET	ROD & REEL[3]	OTHER GEAR (specify type)	Units[4]	# of those used just for dog food?
						(number harvested by each gear type)					*amount / type*	*unit*	*amount*
CHINOOK (KING) SALMON *TARYAQVAK*	Y N	Y N	Y N	Y N	Y N						/	IND.	
113000000													
SOCKEYE (RED) SALMON *SAYAK*	Y N	Y N	Y N	Y N	Y N						/	IND.	
115000000													
CHUM (DOG) SALMON *KANGITNEQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
111000000													
PINK SALMON *AMAQAAYAK*	Y N	Y N	Y N	Y N	Y N						/	IND.	
114000000													
COHO (SILVER) SALMON *QAKIIYAQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
112000000													
SPAWNING REDS *SAYALLEQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
117050000													
UNKNOWN SALMON	Y N	Y N	Y N	Y N	Y N						/	IND.	
119000000													
	Y N	Y N	Y N	Y N	Y N						/		
	Y N	Y N	Y N	Y N	Y N						/		
	Y N	Y N	Y N	Y N	Y N						/		
	Y N	Y N	Y N	Y N	Y N						/		

During the last year, did your household use any other kind of salmon?..... Y N

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

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *"ROD AND REEL" includes fish caught in open water with a hook and a line attached to a rod or a pole.*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVEST SUMMARY: SALMON

HOUSEHOLD ID HHID

If this household DID NOT USE or HARVEST salmon last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping, and assessment sections…

MAPPING *Refer to data collection maps and mapping instructions to map salmon…*

ASSESSMENTS: SALMON 110000000

To conclude our salmon section, I am going to ask a few general questions about salmon.

During the last year,[1]

...Did your household use LESS, SAME, or MORE salmon than in recent years?..... X L S M

X = do not use

IF LESS or MORE …

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

… did your household GET ENOUGH salmon?..... Y N

IF NO…

What KIND of salmon did you need? _____

How would you describe the impact to your household of not getting enough last year?

not noticable?	*minor?*	*major?*	*severe?*
(0)	(1)	(2)	(3)

What kinds of foods did you use instead of salmon? *(list the most important)*

Wild foods?.....	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME
Store-bought foods?.....	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

ASSESSMENTS OF SALMON: 66 **DILLINGHAM: 113**

HARVESTS: OTHER FISH

HOUSEHOLD ID HHID

1. Do you or members of your household USUALLY fish for other fish for subsistence, personal use, or sport?..... Y N

2. During the last year (January 1, 2021 and December 31, 2021),
did you, or members of your household USE or TRY TO HARVEST other fish ?..... Y N

IF the answer to QUESTION 2 is NO, go to the *NEXT PAGE*.

IF the answer to QUESTION 2 is *YES*, continue on this page...

During the last year,[1]
did you or members of your household…

A … use[2] _____?
B … receive _____ from another HH or community?
C … give ____ to another HH or community?
D …try[2] to harvest _____?
E … actually harvest any _____?

if harvest is "yes"

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested with ….

INCLUDE other fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest. DO NOT INCLUDE catch and release fish or retained commercial harvests.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	OPEN WATER SET GILL NET	OPEN WATER DRIFT GILL NET	UNDER ICE SET GILL NET	OPEN WATER JIGGING or ROD & REEL[3]	UNDER ICE JIGGING or ROD & REEL[3]	OTHER GEAR (specify type)	Units[4]	# of those used just for dog food?
						(number harvested by each gear type)					*amount / type*	*unit*	*amount*
SMELT *IQALLUAQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
120400000													
PIKE *CUUKVAK*	Y N	Y N	Y N	Y N	Y N						/	IND.	
125400000													
BURBOT "LING COD" *ATGIAQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
124800000													
ARCTIC CHAR	Y N	Y N	Y N	Y N	Y N						/	IND.	
125002000													
DOLLY VARDEN *YUGYAQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
125006010													
SEA RUN DOLLIES *ANGYUK*	Y N	Y N	Y N	Y N	Y N						/	IND.	
125006020													
TOGIAK TROUT *ANERRLUAQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
125006030													
LAKE TROUT *CIKIGNAQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
125010000													
RAINBOW TROUT *TALAARIQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
126204000													
TROUT - UNKNOWN	Y N	Y N	Y N	Y N	Y N						/	IND.	
126299000													
GRAYLING *NAKRULLUGPAK*	Y N	Y N	Y N	Y N	Y N						/	IND.	
125200000													

… Continue on next page

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *"ROD AND REEL" includes fish caught in open water with a hook and a line attached to a rod or a pole.*
4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVESTS: OTHER FISH

HOUSEHOLD ID HHID

IF this household did not USE or TRY TO HARVEST other fish during the last year (January 1, 2021 and December 31, 2021) skip this page.

…continued from previous page

During the last year,[1] **did you or members of your household…**

- **A** … use[2] _____?
- **B** … receive _____ from another HH or community?
- **C** … give ____ to another HH or community?
- **D** …try[2] to harvest _____?
- **E** … actually harvest any _____?

if harvest is "yes"

Please estimate how many other fish ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested with ….

INCLUDE other fish that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If fishing with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest. DO NOT INCLUDE catch and release fish or retained commercial harvests.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	OPEN WATER SET GILL NET	OPEN WATER DRIFT GILL NET	UNDER ICE SET GILL NET	OPEN WATER JIGGING or ROD & REEL[3]	UNDER ICE JIGGING or ROD & REEL[3]	OTHER GEAR (specify type)	Units[4]	# of those used just for dog food?
						(number harvested by each gear type)					*amount / type*	*unit*	*amount*
ROUND WHITEFISH "CANDLEFISH" *CINGIKEGGLIQ*	Y N	Y N	Y N	Y N	Y N						/	IND	
126412000													
HUMPBACK WHITEFISH *URARUQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
126408000													
OTHER WHITEFISH *(specify)*	Y N	Y N	Y N	Y N	Y N						/	IND.	
126499000													
BLACKFISH *CANGIIQ*	Y N	Y N	Y N	Y N	Y N						/	GAL.	
124600000													
SUCKER	Y N	Y N	Y N	Y N	Y N						/	IND.	
126000000													
HERRING *IQALLUARPAK*	Y N	Y N	Y N	Y N	Y N						/	GAL.	
120200000													
HERRING SPAWN-ON-KELP *MELUCUAQ*	Y N	Y N	Y N	Y N	Y N						/	GAL.	
120306000													
HALIBUT *NATERNARPAK*	Y N	Y N	Y N	Y N	Y N						/	LB.	
121800000													
PACIFIC "GRAY" COD *CETURRNAQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
121004000													
STARRY FLOUNDER *NATERNAQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
121406000													
YELLOWFIN SOLE *SAGIQ*	Y N	Y N	Y N	Y N	Y N						/	IND.	
123606000													
	Y N	Y N	Y N	Y N	Y N						/		

During the last year, did your household use any other kind of other fish?..... Y N

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

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*

3 *"ROD AND REEL" includes fish caught in open water with a hook and a line attached to a rod or a pole.*

4 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVEST SUMMARY: OTHER FISH

HOUSEHOLD ID HHID

If this household DID NOT USE or HARVEST other fish last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping, and assessment sections…

MAPPING *Refer to data collection maps and mapping instructions to map other fish…*

ASSESSMENTS: OTHER FISH 120000000

To conclude our other fish section, I am going to ask a few general questions about other fish.

During the last year,[1]

...Did your household use LESS, SAME, or MORE other fish than in recent years?..... X L S M

X = do not use

IF LESS or MORE …

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

… did your household GET ENOUGH other fish?..... Y N

IF NO…

What KIND of other fish did you need? _____

How would you describe the impact to your household of not getting enough last year?

not noticable?	*minor?*	*major?*	*severe?*
(0)	(1)	(2)	(3)

What kinds of foods did you use instead of other fish? *(list the most important)*

Wild foods?.....	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME
Store-bought foods?.....	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

HARVESTS: MARINE INVERTEBRATES

HOUSEHOLD ID HHID

1. Do you or members of your household USUALLY harvest marine invertebrates?..... Y N

2. During the last year (January 1, 2021 and December 31, 2021),
did you, or members of your household USE or TRY TO HARVEST marine invertebrates ?..... Y N

IF the answer to QUESTION 2 is NO, go to the NEXT PAGE.

IF the answer to QUESTION 2 is *YES*, continue on this page...

During the last year,[1]
did you or members of your household…

A … use[2] _____?
B … receive _____ from another HH or community?
C … give ____ to another HH or community?
D …try[2] to harvest _____?
E … actually harvest any _____?

if harvest is "yes"

Please estimate how many marine invertebrates ALL MEMBERS OF YOUR HOUSEHOLD got during the last year. How many were harvested?

INCLUDE marine invertebrates that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If harvesting with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest. DO NOT INCLUDE retained commercial harvests.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	Amount *(amount)*	Units[3] *unit*	Comments
COCKLES (UNKNOWN)	Y N	Y N	Y N	Y N	Y N		GAL.	
500899000								
RAZOR CLAMS *ALIRUAQ*	Y N	Y N	Y N	Y N	Y N		GAL.	
500612000								
OTHER CLAMS *(specify)*	Y N	Y N	Y N	Y N	Y N		GAL.	
500699000								
SHRIMP *CUNGARALUKVAK*	Y N	Y N	Y N	Y N	Y N		LB.	
503400000								
RED KING CRAB *PUPSULEGPAK*	Y N	Y N	Y N	Y N	Y N		IND.	
501008080								
OTHER CRAB *(specify)*	Y N	Y N	Y N	Y N	Y N		IND.	
501099000								
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			

During the last year, did your household use any other kind of marine invertebrates?..... Y N

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

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVEST SUMMARY: MARINE INVERTEBRATES

HOUSEHOLD ID HHID

If this household DID NOT USE or HARVEST marine invertebrates last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping, and assessment sections…

MAPPING *Refer to data collection maps and mapping instructions to map marine invertebrates…*

ASSESSMENTS: MARINE INVERTEBRATES 500000000

To conclude our marine invertebrates section, I am going to ask a few general questions about marine invertebrates.

During the last year,[1]

...Did your household use LESS, SAME, or MORE marine invertebrates than in recent years?..... X L S M

X = do not use

IF LESS or MORE …

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

… did your household GET ENOUGH marine invertebrates?..... Y N

IF NO…

What KIND of marine invertebrates did you need? _____

How would you describe the impact to your household of not getting enough last year?

not noticable?	*minor?*	*major?*	*severe?*
(0)	(1)	(2)	(3)

What kinds of foods did you use instead of marine invertebrates? *(list the most important)*

Wild foods?.....	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME
Store-bought foods?.....	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

ASSESSMENTS OF MARINE INVERTEBRATES: 66 **DILLINGHAM: 113**

HARVESTS: LARGE LAND MAMMALS

HOUSEHOLD ID HHID

1. Do you or members of your household USUALLY hunt for large land mammals?..... Y N

2. During the last year (January 1, 2021 and December 31, 2021),
did you, or members of your household USE or TRY TO HARVEST large land mammals ?..... Y N

IF the answer to QUESTION 2 is NO, go to the NEXT PAGE.

IF the answer to QUESTION 2 is *YES*, continue on this page...

During the last year,[1]
did you or members of your household…

A … use[2] _____?
B … receive _____ from another HH or community?
C … give ____ to another HH or community?
D …try[2] to harvest _____?
E … actually harvest any _____?

if harvest is "yes"

Please estimate how many large land mammals ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE large land mammals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	SEX M/F	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units[3]	# used for food or food & fur? (num)
MOOSE *TUNTUVAK*	Y N	Y N	Y N	Y N	Y N	M														IND.	
						F														IND.	
211800000						UNK														IND.	
211800001						1															
211800002						2															
211800009						-9															
CARIBOU *TUNTUQ*	Y N	Y N	Y N	Y N	Y N	M														IND.	
						F														IND.	
211000000						UNK														IND.	
211000001						1															
211000002						2															
211000009						-9															
BLACK BEAR *TAN'GERLIQ*	Y N	Y N	Y N	Y N	Y N															IND.	
210600000																					
BROWN BEAR *TAQUKAQ*	Y N	Y N	Y N	Y N	Y N															IND.	
210800000																					
	Y N	Y N	Y N	Y N	Y N																
	Y N	Y N	Y N	Y N	Y N																
	Y N	Y N	Y N	Y N	Y N																
	Y N	Y N	Y N	Y N	Y N																
	Y N	Y N	Y N	Y N	Y N																

During the last year, did your household use any other kind of large land mammals?..... Y N

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

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

LARGE LAND MAMMALS: 10 **DILLINGHAM: 113**

HARVEST SUMMARY: LARGE LAND MAMMALS

HOUSEHOLD ID HHID

If this household DID NOT USE or HARVEST large land mammals last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping, and assessment sections…

MAPPING *Refer to data collection maps and mapping instructions to map large land mammals…*

ASSESSMENTS: LARGE LAND MAMMALS 210000000

To conclude our large land mammals section, I am going to ask a few general questions about large land mammals.

During the last year,[1]

...Did your household use LESS, SAME, or MORE large land mammals than in recent years?..... X L S M

X = do not use

IF LESS or MORE …

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

… did your household GET ENOUGH large land mammals?..... Y N

IF NO…

What KIND of large land mammals did you need? _____

How would you describe the impact to your household of not getting enough last year?

not noticable?	*minor?*	*major?*	*severe?*
(0)	(1)	(2)	(3)

What kinds of foods did you use instead of large land mammals? *(list the most important)*

Wild foods?.....	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME
Store-bought foods?.....	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

ASSESSMENTS OF LARGE LAND MAMMALS: 66 **DILLINGHAM: 113**

HARVESTS: SMALL LAND MAMMALS OR FURBEARERS

HOUSEHOLD ID HHID

1. Do you or members of your household USUALLY hunt or trap for small land mammals or furbearers ?..... Y N

2. During the last year (January 1, 2021 and December 31, 2021),
did you, or members of your household USE or TRY TO HARVEST small land mammals or furbearers ?..... Y N

IF the answer to QUESTION 2 is NO, go to the NEXT PAGE.

IF the answer to QUESTION 2 is *YES*, continue on this page...

During the last year,[1]
did you or members of your household…

A … use[2] _____?
B … receive _____ from another HH or community?
C … give ____ to another HH or community?
D …try[2] to harvest _____?
E … actually harvest any _____?

if harvest is "yes"

Please estimate how many small land mammals or furbearers ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE small land mammals or furbearers that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting or trapping with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	# used for food or food & fur? (num)	Units[3]
						(specify amount harvested per month)														
SNOWSHOE HARE	Y N	Y N	Y N	Y N	Y N															IND.
221004000																				
ALASKA HARE (JACKRABBIT) *QAYUQUEGGLIQ*	Y N	Y N	Y N	Y N	Y N															IND.
221006000																				
UNKNOWN HARE	Y N	Y N	Y N	Y N	Y N															IND.
221099000																				
BEAVER *PALUQTAQ*	Y N	Y N	Y N	Y N	Y N															IND.
220200000																				
PORCUPINE *ISSALUQ*	Y N	Y N	Y N	Y N	Y N															IND.
222600000																				
RED FOX *KAVIAQ*	Y N	Y N	Y N	Y N	Y N															IND.
220804040																				
CROSS FOX *TUNGULIAYAAQ*	Y N	Y N	Y N	Y N	Y N															IND.
220804020																				
LAND OTTER *CUIGNILNGUQ*	Y N	Y N	Y N	Y N	Y N															IND.
221200000																				
MARTEN *QAVCICUAR*	Y N	Y N	Y N	Y N	Y N															IND.
222000000																				
WEASEL/ERMINE *NARULLGIQ*	Y N	Y N	Y N	Y N	Y N															IND.
223000000																				
WOLF *KEGLUNEQ*	Y N	Y N	Y N	Y N	Y N															IND.
223200000																				

… continue on next page

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

SMALL LAND MAMMALS OR FURBEARERS: 14 **DILLINGHAM: 113**

HARVESTS: SMALL LAND MAMMALS OR FURBEARERS

HOUSEHOLD ID HHID

IF this household did not USE or TRY TO HARVEST small land mammals or furbearers during the last year (January 1, 2021 and December 31, 2021) skip this page.

… continued from previous page

During the last year,[1] **did you or members of your household…**

- **A** … use[2] _____?
- **B** … receive _____ from another HH or community?
- **C** … give ____ to another HH or community?
- **D** …try[2] to harvest _____?
- **E** … actually harvest any _____?

if harvest is "yes"

Please estimate how many small land mammals or furbearers ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE small land mammals or furbearers that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting or trapping with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	# used for food or food & fur? (num)	Units[3]
						(specify amount harvested per month)														
WOLVERINE *TERIKAANIAQ*	Y N	Y N	Y N	Y N	Y N															IND.
223400000																				
COYOTE *KAYU*	Y N	Y N	Y N	Y N	Y N															IND.
220400000																				
LYNX *TERTULI*	Y N	Y N	Y N	Y N	Y N															IND.
221600000																				
PARKA SQUIRREL (GROUND) *QANGANAQ*	Y N	Y N	Y N	Y N	Y N															IND.
222802000																				
TREE SQUIRREL (RED) *QIGUIQ*	Y N	Y N	Y N	Y N	Y N															
222804000																				
	Y N	Y N	Y N	Y N	Y N															
	Y N	Y N	Y N	Y N	Y N															
	Y N	Y N	Y N	Y N	Y N															
	Y N	Y N	Y N	Y N	Y N															
	Y N	Y N	Y N	Y N	Y N															
	Y N	Y N	Y N	Y N	Y N															
	Y N	Y N	Y N	Y N	Y N															

During the last year, did your household use any other kind of small land mammals or furbearers?..... Y N

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

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*

3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

SMALL LAND MAMMALS OR FURBEARERS: 14 **DILLINGHAM: 113**

HARVEST SUMMARY: SMALL LAND MAMMALS/FURBEARERS

HOUSEHOLD ID HHID

If this household DID NOT USE or HARVEST small land mammals/furbearers last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping, and assessment sections…

MAPPING *Refer to data collection maps and mapping instructions to map small land mammals/furbearers…*

ASSESSMENTS: SMALL LAND MAMMALS/FURBEARERS #N/A

To conclude our small land mammals/furbearers section, I am going to ask a few general questions about small land mammals/furbearers.

During the last year,[1]

...Did your household use LESS, SAME, or MORE small land mammals/furbearers than in recent years?..... X L S M

X = do not use

IF LESS or MORE …

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

… did your household GET ENOUGH small land mammals/furbearers?..... Y N

IF NO…

What KIND of small land mammals/furbearers did you need? _____

How would you describe the impact to your household of not getting enough last year?

not noticable?	*minor?*	*major?*	*severe?*
(0)	(1)	(2)	(3)

What kinds of foods did you use instead of small land mammals/furbearers? *(list the most important)*

Wild foods?.....	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME
Store-bought foods?.....	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

ASSESSMENTS OF SMALL LAND MAMMALS/FURBEARERS: 66 **DILLINGHAM: 113**

HARVESTS: MARINE MAMMALS

HOUSEHOLD ID HHID

1. Do you or members of your household USUALLY hunt for marine mammals?..... Y N

2. During the last year (January 1, 2021 and December 31, 2021),
did you, or members of your household USE or TRY TO HARVEST marine mammals ?..... Y N

IF the answer to QUESTION 2 is NO, go to the NEXT PAGE.

IF the answer to QUESTION 2 is *YES*, continue on this page...

During the last year,[1]
did you or members of your household…

A … use[2] _____?
B … receive _____ from another HH or community?
C … give ____ to another HH or community?
D …try[2] to harvest _____?
E … actually harvest any _____?

if harvest is "yes"

Please estimate how many marine mammals ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE marine mammals that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	SEX M/F	January	February	March	April	May	June	July	August	September	October	November	December	Unknown	Units[3] (specify)
							(specify amount harvested per month)													
HARBOR (SPOTTED) SEAL *ISSURIQ*	Y N	Y N	Y N	Y N	Y N	M														IND.
						F														IND.
300806000						UNK														IND.
300806001						1														
300806002						2														
300806009						-9														
RINGED SEAL *NAYIQ*	Y N	Y N	Y N	Y N	Y N	M														IND.
						F														IND.
300810000						UNK														IND.
300810001						1														
300810002						2														
300810009						-9														
BEARDED SEAL *MAKLAK*	Y N	Y N	Y N	Y N	Y N	M														IND.
						F														IND.
300802000						UNK														IND.
300802001						1														
300802002						2														
300802009						-9														
UNKNOWN SEAL *(OR SEAL OIL)*	Y N	Y N	Y N	Y N	Y N															IND.
300899000																				
SEA LION *UGINAQ*	Y N	Y N	Y N	Y N	Y N															IND.
301200000																				
WALRUS *ASVEQ*	Y N	Y N	Y N	Y N	Y N															IND.
301400000																				
BELUGA *CETAQ*	Y N	Y N	Y N	Y N	Y N															IND.
301602000																				
	Y N	Y N	Y N	Y N	Y N															

During the last year, did your household use any other kind of marine mammals?..... Y N

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

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVEST SUMMARY: MARINE MAMMALS

HOUSEHOLD ID HHID

If this household DID NOT USE or HARVEST marine mammals last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping, and assessment sections…

MAPPING *Refer to data collection maps and mapping instructions to map marine mammals…*

ASSESSMENTS: MARINE MAMMALS 300000000

To conclude our marine mammals section, I am going to ask a few general questions about marine mammals.

During the last year,[1]

...Did your household use LESS, SAME, or MORE marine mammals than in recent years?..... X L S M

X = do not use

IF LESS or MORE …

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

… did your household GET ENOUGH marine mammals?..... Y N

IF NO…

What KIND of marine mammals did you need? _____

How would you describe the impact to your household of not getting enough last year?

not noticable?	*minor?*	*major?*	*severe?*
(0)	(1)	(2)	(3)

What kinds of foods did you use instead of marine mammals? *(list the most important)*

Wild foods?.....	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME
Store-bought foods?.....	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

ASSESSMENTS OF MARINE MAMMALS: 66 **DILLINGHAM: 113**

HARVESTS: BIRDS

HOUSEHOLD ID HHID

1. Do you or members of your household USUALLY hunt for birds ?..... Y N

2. During the last year (January 1, 2021 and December 31, 2021),
did you, or members of your household USE or TRY TO HARVEST birds ?..... Y N

IF the answer to QUESTION 2 is NO, go to the NEXT PAGE.

IF the answer to QUESTION 2 is *YES*, continue on this page...

During the last year,[1]
did you or members of your household…

A … use[2] _____?
B … receive _____ from another HH or community?
C … give ____ to another HH or community?
D …try[2] to harvest _____?
E … actually harvest any _____?

if harvest is "yes"

Please estimate how many birds ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE birds that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	November - March WINTER	April - June SPRING	July - August SUMMER	September - October FALL	Season of harvest unknown	Units[3]
						(specify amount harvested per season)				*(number)*	*(specify)*
NORTHERN PINTAIL *UQULKATAQ*	Y N	Y N	Y N	Y N	Y N						IND.
410220000											
GREEN WINGED TEAL *TENGESQAAR*	Y N	Y N	Y N	Y N	Y N						IND.
410232060											
MALLARD *UQULKATAKGPAK*	Y N	Y N	Y N	Y N	Y N						IND.
410214000											
GOLDENEYE *ANARNISSAKAQ*	Y N	Y N	Y N	Y N	Y N						IND.
410210000											
BLACK SCOTER (BLACK DUCK) *KUKUMYAR*	Y N	Y N	Y N	Y N	Y N						IND.
410228020											
WIGEON *QATKEGALIQ*	Y N	Y N	Y N	Y N	Y N						IND.
410236000											
MERGANSER *PAYIQ*	Y N	Y N	Y N	Y N	Y N						IND.
410216000											
NORTHERN SHOVELER *SUGG'ERPAK*	Y N	Y N	Y N	Y N	Y N						IND.
410230000											
BUFFLEHEAD	Y N	Y N	Y N	Y N	Y N						IND.
410202000											
HARLEQUIN	Y N	Y N	Y N	Y N	Y N						IND.
410212000											
KING EIDER *QENALLEK*	Y N	Y N	Y N	Y N	Y N						IND.
410206040											

… continue on next page

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

BIRDS: 15 **DILLINGHAM: 113**

HARVESTS: BIRDS

HOUSEHOLD ID HHID

IF this household did not USE or TRY TO HARVEST birds during the last year (January 1, 2021 and December 31, 2021) skip this page.

… continued from previous page

During the last year,[1]
did you or members of your household…

A … use[2] _____?
B … receive _____ from another HH or community?
C … give ____ to another HH or community?
D …try[2] to harvest _____?
E … actually harvest any _____?

if harvest is "yes"

Please estimate how many birds ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE birds that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	November - March WINTER	April - June SPRING	July - August SUMMER	September - October FALL	Season of harvest unknown	Units[3]
						(specify amount harvested per season)				*(number)*	*(specify)*
UNKNOWN EIDER	Y N	Y N	Y N	Y N	Y N						IND.
410206990											
UNKNOWN DUCKS	Y N	Y N	Y N	Y N	Y N						IND.
410299000											
SHOREBIRDS	Y N	Y N	Y N	Y N	Y N						IND.
411000000											
GROUSE (SPRUCE HEN) *EGTUK*	Y N	Y N	Y N	Y N	Y N						IND.
421802000											
PTARMIGAN *QANGIIG*	Y N	Y N	Y N	Y N	Y N						IND.
421804000											
CANADA GEESE	Y N	Y N	Y N	Y N	Y N						IND.
410404000											
WHITE-FRONTED GEESE "SPECKLEBELLY" *NEQLEQ*	Y N	Y N	Y N	Y N	Y N						IND.
410410000											
BRANT "SEA GEESE" *NEQLERNAQ*	Y N	Y N	Y N	Y N	Y N						IND.
410402000											
EMPEROR GEESE *NACAULLEK*	Y N	Y N	Y N	Y N	Y N						IND.
410406000											
SNOW GEESE *KANGUQ*	Y N	Y N	Y N	Y N	Y N						IND.
410408000											
UNKNOWN GEESE	Y N	Y N	Y N	Y N	Y N						IND.
410499000											
TUNDRA SWAN (WHISTLING) *QUGYUK*	Y N	Y N	Y N	Y N	Y N						IND.
410604000											

… continue on next page

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

BIRDS: 15 **DILLINGHAM: 113**

HARVESTS: BIRDS

HOUSEHOLD ID HHID

IF this household did not USE or TRY TO HARVEST birds during the last year (January 1, 2021 and December 31, 2021) skip this page.

… continued from previous page

During the last year,[1] **did you or members of your household…**

- **A** … use[2] _____?
- **B** … receive _____ from another HH or community?
- **C** … give ____ to another HH or community?
- **D** …try[2] to harvest _____?
- **E** … actually harvest any _____?

if harvest is "yes"

Please estimate how many birds ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE birds that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If hunting with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	November - March WINTER	April - June SPRING	July - August SUMMER	September - October FALL	Season of harvest unknown	Units[3]
						(specify amount harvested per season)				*(number)*	*(specify)*
TRUMPETER SWAN	Y N	Y N	Y N	Y N	Y N						IND.
410602000											
SANDHILL CRANE *QUCILLGAQ*	Y N	Y N	Y N	Y N	Y N						IND.
410802000											
SCAUP *KIP'ALEK*	Y N	Y N	Y N	Y N	Y N						IND.
410226000											
	Y N	Y N	Y N	Y N	Y N						
	Y N	Y N	Y N	Y N	Y N						
	Y N	Y N	Y N	Y N	Y N						
	Y N	Y N	Y N	Y N	Y N						
	Y N	Y N	Y N	Y N	Y N						
	Y N	Y N	Y N	Y N	Y N						
	Y N	Y N	Y N	Y N	Y N						
	Y N	Y N	Y N	Y N	Y N						
	Y N	Y N	Y N	Y N	Y N						

During the last year, did your household use any other kind of birds?..... Y N

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

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*

3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

BIRDS: 15 **DILLINGHAM: 113**

HARVESTS: BIRD EGGS

HOUSEHOLD ID HHID

1. Do you or members of your household USUALLY gather bird eggs ?..... Y N

2. During the last year (January 1, 2021 and December 31, 2021),
did you, or members of your household USE or TRY TO HARVEST bird eggs ?..... Y N

IF the answer to QUESTION 2 is NO, go to the NEXT PAGE.

IF the answer to QUESTION 2 is *YES*, continue on this page...

During the last year,[1]
did you or members of your household…

A … use[2] _____?
B … receive _____ from another HH or community?
C … give ____ to another HH or community?
D …try[2] to harvest _____?
E … actually harvest any _____?

if harvest is "yes"

Please estimate how many bird eggs ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE bird eggs that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If gathering with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	AMOUNT	Units[3] (specify)	COMMENTS
GULL EGGS *NARU'YAQ*	Y N	Y N	Y N	Y N	Y N		IND.	
431212000								
MURRE EGGS *ALPAK*	Y N	Y N	Y N	Y N	Y N		IND.	
431218000								
TERN EGGS *TEKIYAAR*	Y N	Y N	Y N	Y N	Y N		IND.	
431226000								
GEESE EGGS *NEQLEQ*	Y N	Y N	Y N	Y N	Y N		IND.	
430400000								
DUCK EGGS *YAQULEK*	Y N	Y N	Y N	Y N	Y N		IND.	
430200000								
SWAN EGGS *QUGYUK*	Y N	Y N	Y N	Y N	Y N		IND.	
430600000								
SHOREBIRD EGGS	Y N	Y N	Y N	Y N	Y N		IND.	
431000000								
PTARMIGAN EGGS	Y N	Y N	Y N	Y N	Y N		IND.	
431804000								
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			

During the last year, did your household use any other kind of bird eggs?..... Y N

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

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVEST SUMMARY: BIRDS AND EGGS

HOUSEHOLD ID HHID

If this household DID NOT USE or HARVEST birds and eggs last year, go to the ASSESSMENT section below.

Otherwise, continue with mapping, and assessment sections…

MAPPING *Refer to data collection maps and mapping instructions to map birds and eggs…*

ASSESSMENTS: BIRDS AND EGGS 400000000

To conclude our birds and eggs section, I am going to ask a few general questions about birds and eggs.

During the last year,[1]

...Did your household use LESS, SAME, or MORE birds and eggs than in recent years? ..... X L S M

X = do not use

IF LESS or MORE …

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

… did your household GET ENOUGH birds and eggs? ..... Y N

IF NO…

What KIND of birds and eggs did you need? _____

How would you describe the impact to your household of not getting enough last year?

not noticable?	*minor?*	*major?*	*severe?*
(0)	(1)	(2)	(3)

What kinds of foods did you use instead of birds and eggs? *(list the most important)*

Wild foods?	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME
Store-bought foods?	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

ASSESSMENTS OF BIRDS AND EGGS: 66 **DILLINGHAM: 113**

HARVESTS: PLANTS AND BERRIES (INCLUDING WOOD)

HOUSEHOLD ID HHID

1. Do you or members of your household USUALLY gather plants and berries (including wood) ?..... Y N

2. During the last year (January 1, 2021 and December 31, 2021),
did you, or members of your household USE or TRY TO HARVEST plants and berries (including wood) ?..... Y N

IF the answer to QUESTION 2 is NO, go to the NEXT PAGE.

IF the answer to QUESTION 2 is *YES*, continue on this page...

During the last year,[1]
did you or members of your household…

A … use[2] _____?
B … receive _____ from another HH or community?
C … give ____ to another HH or community?
D …try[2] to harvest _____?
E … actually harvest any _____?

if harvest is "yes"

Please estimate how many plants and berries (including wood) ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE plants and berries (including wood) that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If gathering with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	AMOUNT	Units[3] (specify)	COMMENTS
BLUEBERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601002000								
RASPBERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601020000								
LOW BUSH CRANBERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601004000								
HIGH BUSH CRANBERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601006000								
CROWBERRY *(BLACKBERRY)*	Y N	Y N	Y N	Y N	Y N		GAL.	
601007000								
SALMONBERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601022000								
WATERMELLON BERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601032000								
HUCKLEBERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601014000								
OTHER WILD BERRY	Y N	Y N	Y N	Y N	Y N		GAL.	
601099000								
WILD RHUBARB	Y N	Y N	Y N	Y N	Y N		GAL.	
602006000								
STINKWEED *CAIGGLUK*	Y N	Y N	Y N	Y N	Y N		GAL.	
602044000								
LABRADOR TEA *AYUQ*	Y N	Y N	Y N	Y N	Y N		GAL.	

… continue on next page

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*
2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*
3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

VEGETATION: 17 **DILLINGHAM: 113**

HARVESTS: PLANTS AND BERRIES (INCLUDING WOOD)

HOUSEHOLD ID HHID

IF this household did not USE or TRY TO HARVEST plants and berries (including wood) during the last year (January 1, 2021 and December 31, 2021) skip this page.

… continued from previous page

During the last year,[1] **did you or members of your household…**

- **A** … use[2] _____?
- **B** … receive _____ from another HH or community?
- **C** … give ____ to another HH or community?
- **D** …try[2] to harvest _____?
- **E** … actually harvest any _____?

if harvest is "yes"

Please estimate how many plants and berries (including wood) ALL MEMBERS OF YOUR HOUSEHOLD got during the last year.

INCLUDE plants and berries (including wood) that members of this household gave away, ate fresh, fed to dogs, lost to spoilage, or got by helping others. If gathering with or helping others, report ONLY THIS HOUSEHOLD'S share of the harvest.

Read names below in blanks above	A USE	B REC	C GIVE	D TRY	E HAR	AMOUNT	Units[3] (specify)	COMMENTS
BEACH GREENS	Y N	Y N	Y N	Y N	Y N		GAL.	
602051000								
WILD CELERY (PUSHKI) *IKIITUK*	Y N	Y N	Y N	Y N	Y N		GAL.	
602032000								
FIDDLEHEAD FERNS	Y N	Y N	Y N	Y N	Y N		GAL.	
602014000								
FIREWEED	Y N	Y N	Y N	Y N	Y N		GAL.	
602042000								
SOURDOCK *QUAGCIK*	Y N	Y N	Y N	Y N	Y N		GAL.	
602028000								
OTHER WILD GREENS	Y N	Y N	Y N	Y N	Y N		GAL.	
602038000								
SEAWEED/KELP (FOR FOOD)	Y N	Y N	Y N	Y N	Y N		GAL.	
603099000								
SEAWEED/KELP (FOR FERTELIZER)	Y N	Y N	Y N	Y N	Y N		GAL.	
603090000								
UNKNOWN MUSHROOMS	Y N	Y N	Y N	Y N	Y N		GAL.	
602040000								
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			
	Y N	Y N	Y N	Y N	Y N			

During the last year, did your household use any other kind of plants and berries (including wood)?..... Y N

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

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

2 *"USE" includes eating, feeding to dogs, sharing or trading with others, etc.*

3 *UNITS will differ by species and situation. Units may be pounds (lbs), individuals (ind), portions of individuals (1/4), buckets, sacks, tubs, etc.*

HARVESTS: PLANTS AND BERRIES (INCLUDING WOOD)

HOUSEHOLD ID HHID

If this household DID NOT USE or HARVEST plants and berries (including wood) last year, go to the ASSESSMENT section below.

Otherwise, continue with firewood, mapping, and assessment sections…

FIREWOOD

	USE?	TRY TO HARVEST?	HARVEST?	RECEIVE?	GIVE AWAY?
FIREWOOD	Y N	Y N	Y N	Y N	Y N
604000000					

Please estimate the percentage of your household's heating needs in 2021 that came from firewood.

0%	1% - 25%	26% - 50%	51%-75%	76%-99%	100%
(0)	(1)	(2)	(3)	(4)	(5)

(circle one)

MAPPING *Refer to data collection maps and mapping instructions to map plants and berries (including wood)…*

ASSESSMENTS: PLANTS AND BERRIES (INCLUDING WOOD) 600000000

To conclude our plants and berries (including wood) section, I am going to ask a few general questions about plants and berries (including wood).

During the last year,[1]

...Did your household use LESS, SAME, or MORE plants and berries (including wood) than in recent years?..... X L S M

X = do not use

IF LESS or MORE …

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

… did your household GET ENOUGH plants and berries (including wood)?..... Y N

IF NO…

What KIND of plants and berries (including wood) did you ne _____

How would you describe the impact to your household of not getting enough last year?

not noticable?	*minor?*	*major?*	*severe?*
(0)	(1)	(2)	(3)

What kinds of foods did you use instead of plants and berries (including wood)? *(list the most important)*

Wild foods?.....	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME	WILD FOOD NAME
Store-bought foods?.....	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME	STORE BOUGHT FOOD NAME

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

ASSESSMENTS OF PLANTS AND BERRIES (INCLUDING WOOD): 66 **DILLINGHAM: 113**

HARVEST SUMMARY: ALL RESOURCES

HOUSEHOLD ID HHID

ASSESSMENTS: ALL RESOURCES 0

To conclude our harvests section, I am going to ask a few general questions about wild resources

During the last year,[1]

...Did your household use LESS, SAME, or MORE all resources than in recent years?..... X L S M

X = do not use

IF LESS or MORE …

WHY was your use different? _____ 1

_____ 2

During the last year,[1]

… did your household GET ENOUGH all resources?..... Y N

IF NO…

What KIND of all resources did you need? _____

How would you describe the impact to your household of not getting enough last year?

not noticable?	*minor?*	*major?*	*severe?*
(0)	(1)	(2)	(3)

HOUSEHOLD SHARING

During the last year,[1]

…did your household RECEIVE any kind of food or other supplies from URBAN places[2]?..... Y N

If YES, where did the people you RECEIVED from live?

FROM CITY	FROM CITY	FROM CITY	FROM CITY	FROM CITY
FROM CITY	FROM CITY	FROM CITY	FROM CITY	FROM CITY

…did your household GIVE wild resources to people in URBAN places[2]? Y N

if YES, where did the people you GAVE wild foods to live?

TO CITY	TO CITY	TO CITY	TO CITY	TO CITY
TO CITY	TO CITY	TO CITY	TO CITY	TO CITY

OTHER SOURCES OF FOOD

When you travel to URBAN places, do you bring food back with you?..... Y N

if YES, how much? DESCRIBE How many coolers/totes do you think that would fill? AMOUNT

(and)

What kinds of food?

- ☐ Canned or bulk food?
- ☐ Fresh foods?
- ☐ Something else? DESCRIBE

Do you have a garden or a greenhouse?..... Y N

If YES, how many YEARS have you been gardening?..... YEARS

(or)

If NO, have you thought about planting a garden?..... Y N

If YES, Why?..... _____

_____

1 *"LAST YEAR" means between January 1, 2021 and December 31, 2021.*

2 *'URBAN places' means large population centers such as: Anchorage, Fairbanks, Juneau, Kenai, Palmer and Wasilla…*

ASSESSMENTS OF ALL RESOURCES: 66 **DILLINGHAM: 113**

HARVEST SUMMARY: ALL RESOURCES

HOUSEHOLD ID HHID

MIGRATION

Besides the harvest and use of wild foods we are trying to understand how people move between communities, to rural hubs, and to cities. This all impacts how families support one another and their community.

Do you have a close family member or members who left Dillingham…..... Y N

(respond yes, even if they left and returned)

If YES, who?

Relationship?	Where did they move?	What year did they move?	Have they returned?	Why did they leave?

Thinking of people who have moved to Dillingham from elsewhere, what type of people are they and where did they come from?

Thinking of people you know who have moved out of Dillingham and returned, what type of people have come back and why?

Have you considered leaving Dillingham?..... Y N

If YES, Why might you consider leaving?..... *(list resons, most important first)*

1. _____
2. _____
3. _____

Have changes in harvests and availability of subsistence foods made you or anyone in your household consider moving to or from this community? …..... Y N

If YES, who moved and why?..... _____

(or)

If NO, why did you stay?..... _____

Do you have relatives living outside of Dillingham visit in order to participate in subsistence activities?..... Y N

What are the reasons you continue to live in Dillingham? *(list resons, most important first)*

1. _____
2. _____
3. _____

INSTRUCTION: (SEE PAGE 1) If this household does not have children, please skip the rest of this page and continue on the next.

We understand that in rural comunities, children benefit from having several family members who participate in caring for them.

Besides the other head of household, do you have other family members who assist you with childcare? …..... Y N

If YES, how many other households take care of your children?..... _____

ASSESSMENTS OF ALL RESOURCES: 66 **DILLINGHAM: 113**

FOOD SECURITY

HOUSEHOLD ID HHID

The questions on this page have been asked all over the United States to find out if Americans have enough to eat. We would like to know if people in your community have enough to eat. I'd like you to think about all your household's food, both and store-bought...

Which of these three statements best describes the food eaten in your household in the last 12 months…

(circle one)

HH1

❶ **STATEMENT 1**. We had enough of the kinds of WILD and STORE BOUGHT food we wanted to eat…
❷ **STATEMENT 2**. We had enough food, but not always the KIND of food we wanted to eat……..... 1 2 3
❸ **STATEMENT 3**. Sometimes, or often, we did **NOT HAVE ENOUGH** food to eat…….....

If *STATEMENT 2* or *STATEMENT 3* was *TRUE*, continue with food security questions on this page. Otherwise, go to next section…

Now I am going to read you several statements about different food situations.
Please tell me whether EACH statement was true for your household (HH) in the last 12 months.

❹ **STATEMENT 4. We WORRIED that our household would run out of food before we could get more.** HH4

In the last 12 months, was this ever true for your household?..... N Y ?
If YES…
…in which months did this happen? J F M A M J J A S O N D

…did this happen because your household couldn't get WILD FOOD,
your HH couldn't get STORE-BOUGHT food, or your HH couldn't get BOTH KINDS of food?..... WILD STOR BOTH

❺ **STATEMENT 5. We could not get the kinds of foods we wanted to eat because of a LACK OF RESOURCES.** HH5

In the last 12 months, was this ever true for your household?..... N Y ?
If YES…
…in which months did this happen? J F M A M J J A S O N D

…did this happen because your household couldn't get WILD FOOD,
your HH couldn't get STORE-BOUGHT food, or your HH couldn't get BOTH KINDS of food?..... WILD STOR BOTH

❻ **STATEMENT 6. The food we had JUST DID NOT LAST, and we could not get more.** HH6

In the last 12 months, was this ever true for your household?..... N Y ?
If YES…
…in which months did this happen? J F M A M J J A S O N D

Now, think just about your household's WILD FOOD…

❼ **STATEMENT 7. The WILD food we had JUST DID NOT LAST, and we could not get more.** HH7

In the last 12 months, was this ever true for your household?..... N Y ?
If YES…
…in which months did this happen? J F M A M J J A S O N D

Now, think just about your household's STORE-BOUGHT food…

❽ **STATEMENT 8. The STORE-BOUGHT food we had JUST DID NOT LAST, and we could not get more.** HH8

In the last 12 months, was this ever true for your household?..... N Y ?
If YES…
…in which months did this happen? J F M A M J J A S O N D

If any ONE of the STATEMENTS 4, 5, OR 6 was "YES," continue with food security questions on next page. Otherwise, go to next section…

FOOD SECURITY

HOUSEHOLD ID HHID

If any ONE of the STATEMENTS 4, 5, or 6 on previous page was "YES," continue with food security questions below. Otherwise, go to next section…

In the past 12 months, did you or other adults in your household ever CUT THE SIZE OF YOUR MEALS OR SKIP MEALS because the HH could not get the food that was needed? …… AD1
N Y ?

If YES…
…in which months did this happen?
J F M A M J J A S O N D

In the last 12 months, did you or other adults in your household ever EAT LESS THAN YOU FELT YOU SHOULD because the HH could not get the food that was needed?..... AD2
N Y ?

In the last 12 months, were adults in the HH ever HUNGRY BUT DID NOT EAT because there was not enough food?..... AD3
N Y ?

In the last 12 months, did adults in the HH LOSE WEIGHT because there was not enough food?..... AD4
N Y ?

In the last 12 months, did adults in the HH ever NOT EAT FOR A WHOLE DAY because there was not enough food?..... AD4
N Y ?

If YES…
…in which months did this happen?
J F M A M J J A S O N D

EMPLOYMENT

HOUSEHOLD ID HHID

The next few pages ask about jobs and income. We ask about these things because we are trying to understand all parts of the community economy. Many people use wages from jobs to support hunting, fishing, and gathering activities.

Between January 1, 2021 and December 31, 2021 ...

…Did any members of your household earn money from a JOB or from SELF EMPLOYMENT?.. Y N

… Was your income MORE, LESS, or ABOUT THE SAME compared to recent years?.. X L S M

X = Not in workforce

Between January 1, 2021 and December 31, 2021 ...

For each member of this household born before 2006, list EACH JOB held last year. For household members who did not have a job, write: RETIRED, UNEMPLOYED, STUDENT, HOMEMAKER, DISABLED, etc..

INCLUDE EACH PERSON 16 YEARS AND OLDER EVEN IF THEY DID NOT HAVE A JOB

	Person code from page 2 *(ID #)*	What kind of work did he or she do in this job? *(job title [1])*	For whom did he or she work in this job? *(employer)*	In the past year, what months did he or she work in this job? *(circle each month worked)*	WORK SCHEDULE[2]: FULL TIME / PART TIME / SHIFT - FULL TIME / ON CALL, VARIES / SHIFT PART-TIME *(circle one)*	In the past year how much did he or she earn in this job? *(gross income [3])*
1ST JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
1 6 910100000		SOC:	SIC:		schedule:	
2ND JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
2 6 910100000		SOC:	SIC:		schedule:	
3RD JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
3 6 910100000		SOC:	SIC:		schedule:	
4TH JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
4 6 910100000		SOC:	SIC:		schedule:	
5TH JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
5 6 910100000		SOC:	SIC:		schedule:	
6TH JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
6 6 910100000		SOC:	SIC:		schedule:	
7TH JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
7 6 910100000		SOC:	SIC:		schedule:	
8TH JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
8 6 910100000		SOC:	SIC:		schedule:	
9TH JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
9 6 910100000		SOC:	SIC:		schedule:	
10TH JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
10 6 910100000		SOC:	SIC:		schedule:	
11TH JOB				J F M A M J J A S O N D	FT PT SF OC SP	$ /YR
11 6 910100000		SOC:	SIC:		schedule:	

If a person FISHES COMMERCIALLY or is otherwise SELF-EMPLOYED, list that as a separate job. For job title, enter COMMERCIAL FISHER, CARVER, SEWER, BAKER, etc. Work schedule usually will be ON CALL. For gross income from self-employment, enter revenue MINUS expenses.

If a person does not earn money from any kind of work, enter RETIRED, UNEMPLOYED, DISABLED, STUDENT, or HOMEMAKER or other appropriate description as the job title.

Leave employer, months worked, schedule, and gross income blank.

WORK SCHEDULE
FT *- Fulltime (35+ hr/wk)*
PT *- Parttime (<35 hr/wk)*
SF *- Shift (2wks on/2wks off, etc.)*
SP *- Shift - part time*
OC *- Irregular, on call*
-- -Unemployed

GROSS INCOME is the same as TAXABLE INCOME on a W-2 form. Self-employment, enter revenue - expense

OTHER INCOME

HOUSEHOLD ID HHID

Between January 1, 2021 and December 31, 2021 ...

…Did any members of your household receive a dividend from the Permanent Fund or a native corporation?..... Y N

IF NO, go to the next section on this page

IF YES, continue below…

		Did anyone in your household receive income from _____ in 2021 (circle one)		TOTAL amount all members of your household received from _____ in 2021 (dollars)	
DIVIDENDS	ALASKA PERMANENT FUND DIVIDEND	Y	N	$	/YR
	32				
	NATIVE CORPORATION DIVIDENDS	Y	N	$	/YR
	13				

Alaska PFD IN 2021
1 PFD = $1,114
2 PFD = $2,228
3 PFD = $3,342
4 PFD = $4,456
5 PFD = $5,570
6 PFD = $6,684
7 PFD = $7,798
8 PFD = $8,912
9 PFD = $10,026
10 PFD = $11,140
11 PFD = $12,254
12 PFD = $13,368

Regional corporations	***Dividend***
Village corporations	***Dividend***

Between January 1, 2021 and December 31, 2021 ...

…Did any members of your household receive OTHER income such as SENIOR BENEFITS or UNEMPLOYMENT?..... Y N

IF NO, go to the next section on this page

IF YES, continue below…

		Received? (circle one)		Total amount? (dollars)	
EMPLOYMENT RELATED	UNEMPLOYMENT	Y	N	$	/YR
	12				
	WORKERS' COMP	Y	N	$	/YR
	8				
	SOCIAL SECURITY	Y	N	$	/YR
	7				
	PENSION & RETIREMENT	Y	N	$	/YR
	5				
	DISABILITY	Y	N	$	/YR
	31				
	VETERANS ASSISTANCE	Y	N	$	/YR
	35				
ENTITLEMENTS	FOOD STAMPS (SNAP/QUEST CARDS)	Y	N	$	/YR
	11				
	ADULT PUBLIC ASSISTANCE	Y	N	$	/YR
	3				
	SUPPLIMENTAL SECURITY INCOME (SSI)	Y	N	$	/YR
STATE BENEFITS	10				
	ENERGY ASSISTANCE	Y	N	$	/YR
	9				
	ALASKA SENIOR BENEFITS (LONGEVITY)	Y	N	$	/YR
	6				

Senior Benefits of $125 per month for 12 months = $1,500 per elder

Senior Benefits of $175 per month for 12 months = $2,100 per elder

Senior Benefits of $250 per month for 12 months = $3,000 per elder

		Received? (circle one)		Total amount? (dollars)	
FAMILY & CHILD	TANF (say "tanif", used to be ADFC)	Y	N	$	/YR
	2				
	CHILD SUPPORT	Y	N	$	/YR
	15				
	FOSTER CARE	Y	N	$	/YR
	41				
OTHER	FUEL VOUCHERS	Y	N	$	/YR
	49				
	MEETING HONORARIA *(not per diem*)*	Y	N	$	/YR
	50				
	STIMULUS CHECK *(economic impact payment)*	Y	N	$	/YR
	51				
	OTHER (describe)	Y	N	$	/YR
	OTHER (describe)	Y	N	$	/YR

* per diem covers travel expenses, and is not counted as income.

Scratch paper for calculations

for _____ weeks =
for _____ weeks =

for _____ weeks =
for _____ weeks =

for _____ weeks =
for _____ weeks =

COMMENTS

HOUSEHOLD ID HHID

DO YOU HAVE ANY QUESTIONS, COMMENTS OR CONCERNS?

INTERVIEW SUMMARY:

DON'T FORGET TO FILL IN THE STOP TIME _____

COMMENTS: 300 **DILLINGHAM: 113**

APPENDIX B: PROJECT SUPPORT LETTERS

December 7, 2021

City of Dillingham
P.O. Box 889
141 Main St
Dillingham, AK 99576

Division of Subsistence
Alaska Department of Fish and Game
333 Raspberry Road
Anchorage, AK 99518

To the Division of Subsistence, Alaska Department of Fish and Game:

The City of Dillingham would like to acknowledge support for and our participation in the planned comprehensive subsistence harvest surveys scheduled to occur in Dillingham in March and April 2022 to be conducted by staff from the Division of Subsistence, Alaska Department of Fish and Game and staff from the Department of Natural Resources, Bristol Bay Native Association. We acknowledge that funding for this project was provided By the National Science Foundation through the Pursuing Opportunities for Long-Term Arctic Resilience for Infrastructure and Society (POLARIS) project.

We have been informed that the subsistence data collected for study year 2021 will address our subsistence way of life in all its complexity including the harvest, use, and sharing of wild resources, food security, economics, and health impact assessment questions. Researchers have conveyed to us the anonymous nature of the data collection and reporting, and that participation in the survey by any member is completely voluntary.

We have planned for Dillingham residents to participate in the survey. We will be assisting the project staff with identifying residences inhabited year-round, to capture an accurate assessment of subsistence activities, migration trends, and food security in our community.

Finally, we are aware project staff will present the findings of the study for community feedback and to verify the inclusion of any community concerns for the final report. The Division of Subsistence will send a complete final report for our records and short summary reports for all community households involved in the study at the end of the project.

Sincerely,



Mark Lynch
Interim City Manager
Dillingham, Alaska

CURYUNG TRIBAL COUNCIL

P.O. Box 216 – 715 Seward Street
Dillingham, AK 99576
Phone: (907)842-2384
Fax: (907)842-4510

December 21, 2021

Division of Subsistence
Alaska Department of Fish and Game
333 Raspberry Road
Anchorage, AK 99518

To the Division of Subsistence, Alaska Department of Fish and Game:

The Curyung Tribal Council would like to acknowledge support for and our participation in the planned comprehensive subsistence harvest surveys scheduled to occur in Dillingham in March and April 2022 to be conducted by staff from the Division of Subsistence, Alaska Department of Fish and Game and staff from the Department of Natural Resources, Bristol Bay Native Association. We acknowledge that funding for this project was provided By the National Science Foundation through the Pursuing Opportunities for Long-Term Arctic Resilience for Infrastructure and Society (POLARIS) project.

We have been informed that the subsistence data collected for study year 2021 will address our subsistence way of life in all its complexity including the harvest, use, and sharing of wild resources, food security, economics, and health impact assessment questions. Researchers have conveyed to us the anonymous nature of the data collection and reporting and that participation in the survey by any member is completely voluntary.

We have planned for Dillingham to participate in the survey. We will be assisting the project staff with recommendations about community members who may want to assist in collecting survey data as contract workers (Local Research Assistants). We have also indicated that we will provide a space at the Tribal office for the project staff and Local Research Assistants to conduct interviews.

Finally, we are aware project staff will present the findings of the study for community feedback and to verify the inclusion of any community concerns for the final report. The Division of Subsistence will send a complete final report for our records and short summary reports for all community households involved in the study at the end of the project.

Sincerely,

Courtenay Carty
Tribal Administrator

APPENDIX C: CONVERSION FACTORS

The following table presents the conversion factors used in determining how many pounds were harvested of each resource surveyed. For instance, if respondents reported harvesting 3 gal of Pacific herring, the quantity would be multiplied by the appropriate conversion factor (in this case 6.0) to show a harvest of 18 lb of Pacific herring.

Resource name	Reported units	Conversion factor
Chum salmon	Individual	3.9432
Chum salmon [CF retention]	Individual	3.9432
Coho salmon	Individual	4.6662
Coho salmon [CF retention]	Individual	4.6662
Chinook salmon	Individual	6.7724
Chinook salmon [CF retention]	Individual	6.7724
Chinook salmon [CF retention]	Pounds	1.0000
Pink salmon	Individual	2.4093
Pink salmon [CF retention]	Individual	2.4093
Sockeye salmon	Individual	3.5491
Sockeye salmon [CF retention]	Individual	3.5491
Spawning sockeye salmon	Individual	3.5491
Unspecified salmon	Individual	4.2680
Unspecified salmon [CF retention]	Individual	4.2680
Pacific herring	Gallons	6.0000
Pacific herring [CF retention]	Gallons	1.5000
Pacific herring spawn on kelp	Gallons	6.0000
Pacific herring roe on hemlock branches	Gallons	6.0000
Rainbow smelt	Individual	0.1800
Rainbow smelt	Gallons	6.0000
Pacific (gray) cod	Individual	3.2000
Pacific (gray) cod [CF retention]	Individual	3.2000
Pacific (gray) cod [CF retention]	Pounds	1.0000
Starry flounder	Individual	3.0000
Starry flounder [CF retention]	Individual	3.0000
Lingcod	Individual	4.0000
Pacific halibut	Individual	29.6400
Pacific halibut	Pounds	1.0000
Pacific halibut [CF retention]	Pounds	1.0000
Unspecified rockfishes	Individual	2.0000
Sablefish (black cod)	Individual	3.1000
Unspecified Irish lords [CF retention]	Individual	0.5000
Unspecified Irish lords	Individual	0.5000
Yellowfin sole	Individual	1.0000
Yellowfin sole [CF retention]	Individual	1.0000
Alaska blackfish	Gallons	6.0000
Burbot	Individual	1.0000
Arctic char	Individual	1.4000
Dolly Varden, freshwater	Individual	1.4000
Dolly Varden, saltwater	Individual	1.4000
Dolly Varden, saltwater [CF retention]	Individual	1.4000
Dolly Varden, Togiak trout	Individual	1.4000
Lake trout	Individual	2.7000

-continued-

Resource name	Reported units	Conversion factor
Arctic grayling	Individual	0.7000
Northern pike	Individual	2.8000
Sheefish	Individual	5.5000
Longnose sucker	Individual	1.5000
Rainbow trout	Individual	0.7000
Unspecified trouts	Individual	0.7000
Humpback whitefish	Individual	1.7500
Round whitefish	Individual	1.0000
Unspecified whitefishes	Individual	1.3800
Bison	Individual	450.0000
Black bear	Individual	58.0000
Brown bear	Individual	141.0000
Caribou	Individual	150.0000
Deer	Individual	43.2000
Mountain goat	Individual	72.5000
Moose	Individual	540.0000
Beaver	Individual	20.0000
Coyote	Individual	0.0000
Red fox, cross phase	Individual	0.0000
Red fox, red phase	Individual	0.0000
Alaska hare	Individual	1.5000
Snowshoe hare	Individual	1.5000
Unspecified hares	Individual	2.6720
River otter	Individual	3.0000
Lynx	Individual	4.0000
Martens	Individual	0.0000
Mink	Individual	2.5000
Muskrat	Individual	0.7500
Porcupine	Individual	8.0000
Arctic ground squirrel	Individual	0.5000
Red squirrel	Individual	0.5000
Weasels	Individual	0.5000
Gray wolf	Individual	0.0000
Wolverine	Individual	0.0000
Bearded seal	Individual	286.0000
Harbor seal	Individual	56.0000
Ringed seal	Individual	57.0000
Unspecified seals	Individual	56.0000
Steller sea lion	Individual	200.0000
Walrus	Individual	770.0000
Beluga whale	Individual	995.0000
Bowhead whale	Individual	0.0000
Bufflehead	Individual	0.5700
King eider	Individual	2.2500
Unspecified eiders	Individual	1.6000
Unspecified goldeneyes	Individual	1.2700
Harlequin duck	Individual	0.8500
Mallard	Individual	1.6100
Unspecified mergansers	Individual	1.7400

-continued-

Resource name	Reported units	Conversion factor
Northern pintail	Individual	1.1800
Unspecified scaups	Individual	1.3500
Black scoter	Individual	1.5100
Surf scoter	Individual	1.4600
Northern shoveler	Individual	0.8600
Green-winged teal	Individual	0.4700
American wigeon	Individual	1.0500
Unspecified ducks	Individual	0.7800
Brant	Individual	1.8900
Cackling goose	Individual	3.3500
Unspecified Canada/cackling geese	Individual	3.3500
Emperor goose	Individual	3.0800
Snow goose	Individual	2.8000
Greater white-fronted goose	Individual	3.1800
Unspecified geese	Individual	2.4000
Trumpeter swan	Individual	15.3300
Tundra (whistling) swan	Individual	10.3300
Sandhill crane	Individual	5.4000
Unspecified shorebirds	Individual	0.0500
Unspecified grouses	Individual	0.9100
Unspecified ptarmigans	Individual	0.7700
Unspecified duck eggs	Individual	0.1500
Unspecified duck eggs	Gallons	5.1300
Unspecified goose eggs	Individual	0.3000
Unspecified swan eggs	Individual	0.6330
Unspecified shorebird eggs	Individual	0.0180
Unspecified gull eggs	Individual	0.2140
Unspecified gull eggs	Gallons	3.5500
Unspecified murre eggs	Individual	0.2310
Unspecified tern eggs	Individual	0.0420
Unspecified ptarmigan eggs	Individual	0.0490
Butter clam	Individual	0.1200
Butter clam	Gallons	3.0000
Razor clam	Individual	0.2500
Razor clam	Gallons	3.0000
Unspecified clams	Gallons	3.0000
Unspecified cockles	Gallons	3.0000
Dungeness crab	Individual	0.7000
Blue king crab [CF retention]	Individual	2.3000
Red king crab	Individual	2.3000
Unspecified crabs	Individual	2.3000
Unspecified crabs	Pounds	1.0000
Unspecified mussels	Individual	0.2600
Unspecified mussels	Gallons	1.5000
Octopus	Individual	4.0000
Shrimps	Pounds	1.0000
Blueberry	Gallons	4.0000

-continued-

Resource name	Reported units	Conversion factor
Blueberry	Quarts	1.0000
Blueberry	Cup	0.2500
Lowbush cranberry	Gallons	4.0000
Lowbush cranberry	Quarts	1.0000
Lowbush cranberry	Cup	0.2500
Highbush cranberry	Gallons	4.0000
Highbush cranberry	Quarts	1.0000
Highbush cranberry	Cup	0.2500
Crowberry	Gallons	4.0000
Crowberry	Quarts	1.0000
Crowberry	Cup	0.2500
Currants	Gallons	4.0000
Huckleberry	Gallons	4.0000
Huckleberry	Quarts	1.0000
Huckleberry	Cup	0.2500
Raspberry	Gallons	4.0000
Raspberry	Quarts	1.0000
Cloudberry	Gallons	4.0000
Cloudberry	Quarts	1.0000
Cloudberry	Cup	0.2500
Strawberry	Gallons	4.0000
Twisted stalk berry (watermelon berry)	Gallons	4.0000
Twisted stalk berry (watermelon berry)	Quarts	1.0000
Other wild berries	Gallons	4.0000
Other wild berries	Quarts	1.0000
Other wild berries	Pints	0.5000
Wild rhubarb	Pounds	1.0000
Wild rhubarb	Gallons	1.0000
Wild potato	Gallons	4.0000
Wild potato	Quarts	1.0000
Fiddlehead ferns	Gallons	1.0000
Fiddlehead ferns	Quarts	0.2500
Fiddlehead ferns	Plastic bag (shopping bag)	1.0000
Hudson's Bay (Labrador) tea	Gallons	1.0000
Hudson's Bay (Labrador) tea	Quarts	0.2500
Hudson's Bay (Labrador) tea	Cup	0.6000
Lambsquarter	Gallons	1.0000
Dandelion greens	Gallons	1.0000
Sourdock	Gallons	1.0000
Spruce tips	Pounds	1.0000
Spruce tips	Gallons	1.0000
Wild celery	Gallons	1.0000
Wild celery	Quarts	0.2500
Valerians	Gallons	1.0000
Valerians	Quarts	0.2500
Wild rose hips	Gallons	4.0000
Wild rose hips	Quarts	1.0000
Yarrows	Gallons	1.0000

-continued-

Resource name	Reported units	Conversion factor
Yarrows	Quarts	0.2500
Other wild greens	Gallons	1.0000
Other wild greens	Quarts	0.2500
Other wild greens	Pints	0.1300
Unspecified mushrooms	Gallons	1.0000
Unspecified mushrooms	Quarts	0.2500
Fireweed	Gallons	1.0000
Fireweed	Quarts	0.2500
Stinkweed	Gallons	1.0000
Stinkweed	Quarts	0.2500
Puffballs	Gallons	1.0000
Puffballs	Pints	0.1300
Chaga	Gallons	1.0000
Unspecified fungus	Gallons	1.0000
Unspecified greens from land	Gallons	1.0000
Unspecified greens from land	Quarts	0.2500
Sea lovage	Gallons	1.0000
Beach greens	Gallons	1.0000
Beach greens	Quarts	0.2500
Wild chive	Gallons	1.0000
Mousefoods	Gallons	1.0000
Mousefoods	Quarts	0.2500
Seaweeds/kelps used for fertilizer	Gallons	0.0000
Unspecified seaweeds	Gallons	1.0000
Wood	Cords (wood 4'4'8' stack)	0.0000
Birches	Cords (wood 4'4'8' stack)	0.0000
Birch sap	Gallons	0.0000

Source ADF&G Division of Subsistence household surveys, 2022.

APPENDIX D: PROJECT SUMMARY



COMMUNITY SUMMARY - Technical Paper No. 499

Dillingham

Jones B., C. Larson, and R. Tomlin. 2024. *The Harvest and Use of Wild Resources in Dillingham, Alaska, 2021*. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 499, Anchorage.

Photos by Bronwyn Jones, ADF&G

Study Overview

Research staff at of the Alaska Department of Fish and Game (ADF&G) Division of Subsistence and the Bristol Bay Native Association (BBNA) Department of Natural Resources collaborated to document the continuing importance of subsistence hunting, fishing, and gathering in Dillingham, Alaska. Dillingham is a large hub community in Southwest Alaska with a vibrant subsistence economy. Researchers documented this information by administering a household survey that was designed to collect data about the full range of household harvests and uses of wild resources in study year 2021.

A major theme echoed by survey participants was the overarching dietary and cultural importance of subsistence to the people of Dillingham, including participating in harvesting, processing, and sharing wild resources. As demonstrated by the study findings, such as the high levels of participation in harvesting resources and sharing among households, subsistence resources link people to each other and to the local environment. Obtaining wild food is vital to the overall health of this community. This project was a component of a large interdisciplinary project entitled *Pursuing Opportunities for Long-Term Arctic Resilience for Infrastructure and Society* (POLARIS) funded by the National Science Foundation (NSF).

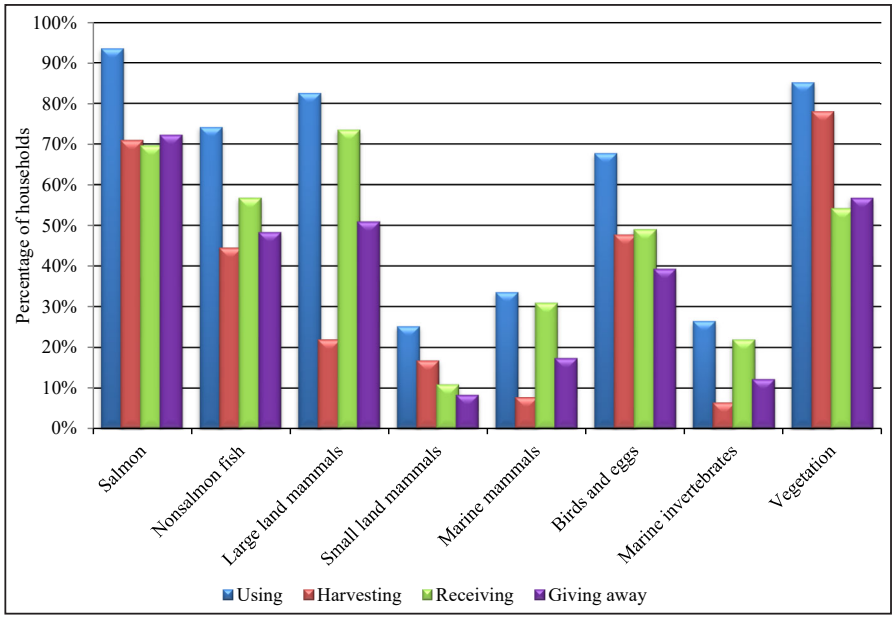
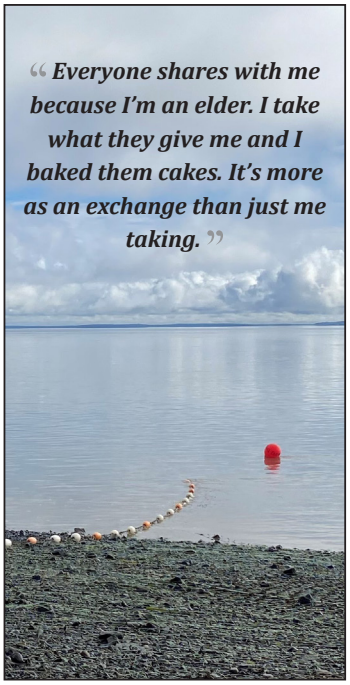


Figure 1.–Percentages of households using, harvesting, receiving, and giving away wild resources, by resource category, Dillingham, 2021.



Highlights of Harvest Survey Findings

During the study year an estimated 97% of households used at least one type of wild resource during the study year and approximately 87% of households harvested at least one type of wild resource. In addition to harvesting wild resources, most households shared what they harvested with others: 84% of households gave away at least one type of wild resource and 91% received wild resources from other households. Five resource categories—salmon, vegetation, large land mammals, nonsalmon fish, and birds and eggs—were used by the majority of households in Dillingham in 2021 (Figure 1). Sockeye salmon, moose, and Chinook salmon were the most used and given away resources.

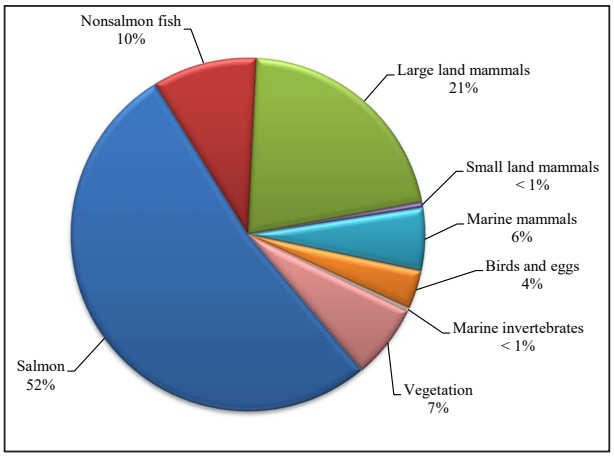


Figure 2.–Composition of harvest in pounds usable weight, by resource category, Dillingham, 2021.

Overall, 380,784 lb, or 199 lb per person, of wild resources were harvested during the study year. Salmon and large land mammals composed the largest portions of the overall wild resource harvest: salmon accounted for approximately one-half (52%) of the total wild resource harvest weight (198,958 lb, or 104 lb per person) and large land mammals composed 21% of the total wild resource harvest weight (81,162 lb, or 42 lb per person) (Figure 2). The third highest harvested resource category was nonsalmon fish (36,493 lb total; 19 lb per person), followed by vegetation (25,905 lb total; 14 lb per person), marine mammals (21,955 lb total; 12 lb per person), birds and eggs (13,429 lb total; 7 lb per person), small land mammals (1,836 lb total; 1 lb per person), and marine invertebrates (1,046 lb total; less than 1 lb per person). Resource search and harvest areas totaling 4,015 square miles were documented for 2021. The majority of locations where Dillingham residents harvested wild foods were relatively close to the community, but did spread across the Bristol Bay region and also included nonlocal areas spanning from Southeast Alaska to within the Kuskokwim River drainage.

Where to find the data?

The Community Subsistence Information System (CSIS) is an online database that hosts Alaska community harvest information gathered by the ADF&G Division of Subsistence. The results of the 2021 household surveys, as well as data from previous surveys, are available online:
www.adfg.alaska.gov/sb/CSIS



Food Security

In 2021, the community of Dillingham exhibited relatively high food security: 95% of Dillingham households fell in the high or marginal food secure subcategories (see Figure 3). According to study results, 63% of households had enough of the kinds of food desired; 35% had enough food, but not the desired kinds; and 1% sometimes, or often, did not have enough food. Researchers noted that respondents made comments about the local grocery store not being consistently fully stocked with groceries during the study year. Respondents expressed that subsistence foods are important for supplementing food when there are store shortages and for saving money.

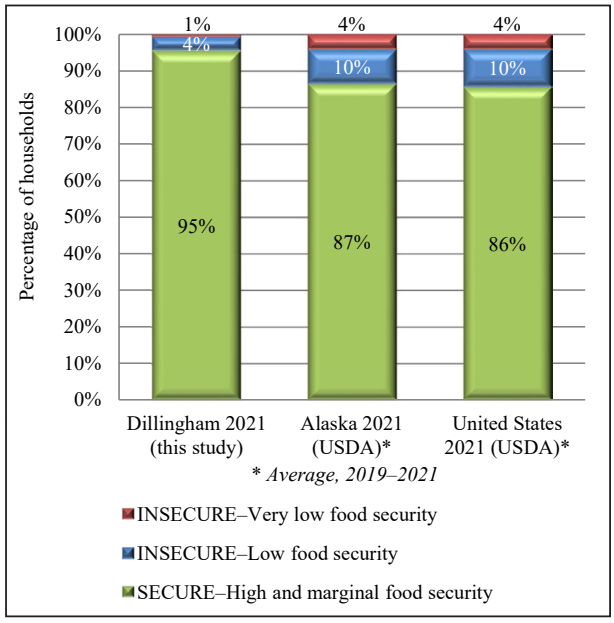


Figure 3.–Comparison of food security categories, Dillingham, Alaska, and United States, 2021.

Highlights of Household Assessments

Most Dillingham households reported meeting their subsistence needs: only one-quarter (24%) of sampled households indicated not having enough of all resources in general in 2021 (Figure 4). Large land mammals and salmon were the two categories for which the highest proportion of households (27% and 24%, respectively) did not have enough resources. For the salmon category, researchers noted that households identified Chinook salmon specifically as being used less due to low resource availability. Moose, Chinook salmon, and caribou were cited as resources that households needed in 2021 more so than any other specific resources.

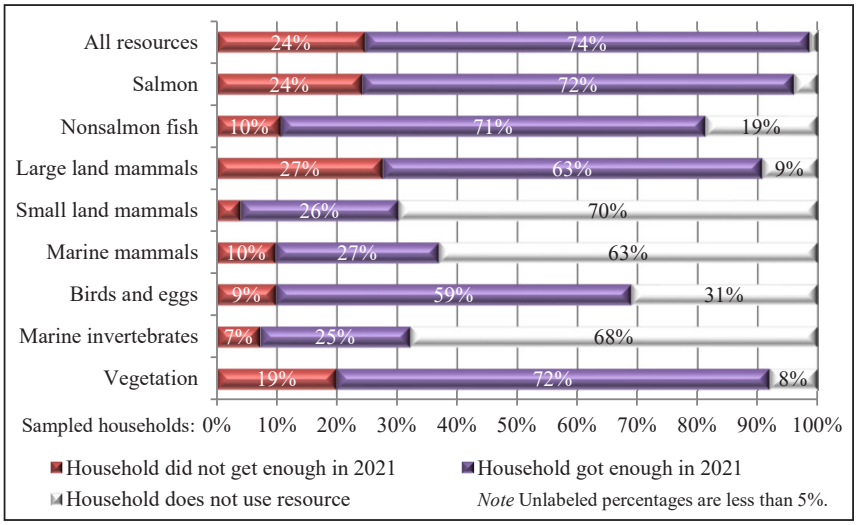


Figure 4.–Percentage of sampled households reporting whether they had enough resources, Dillingham, 2021.

Harvests: 2021 Compared to Previous Years

The composition of subsistence harvests by resource category in Dillingham are remarkably similar between this study (2021) and previous comprehensive surveys undertaken for the 2010 and 1984 study years (Figure 5). As data from this study and prior study years indicate, Dillingham is heavily reliant upon subsistence resources, particularly salmon and large land mammals. Regarding salmon, the total and per capita harvest weights have decreased over time and the composition of the salmon harvest by species has shifted as well: Chinook salmon harvests by weight have decreased while sockeye salmon harvests have increased. Throughout this study, community members expressed concerns about the overall health and abundance of Chinook salmon returning to the Nushagak River in recent years. Survey respondents commented that returning Chinook salmon were

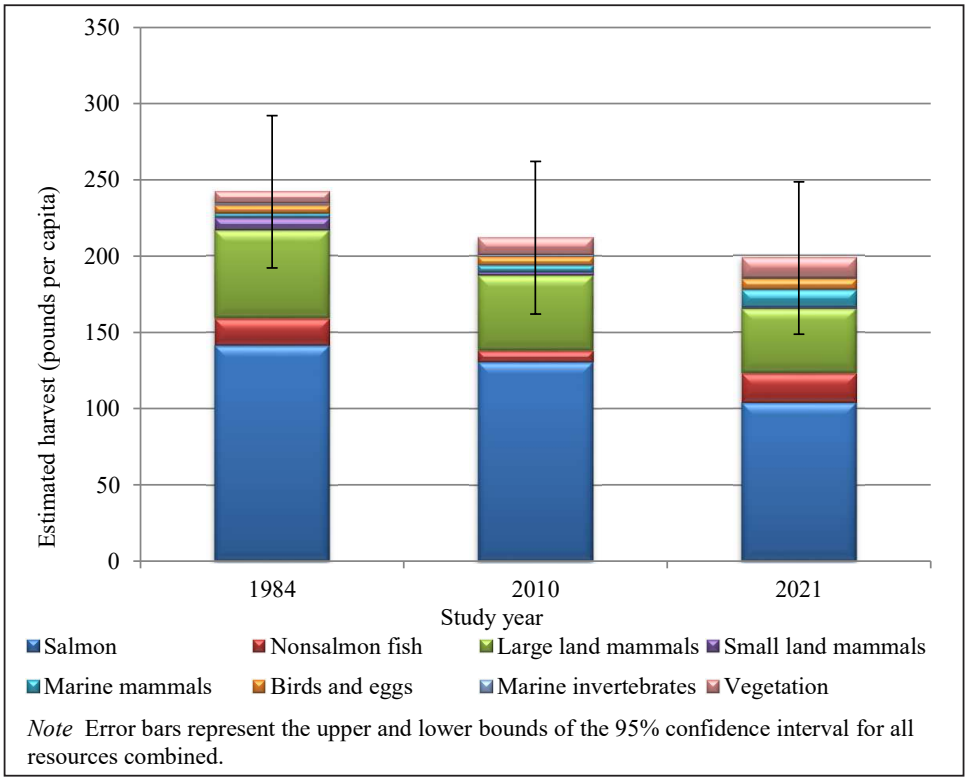
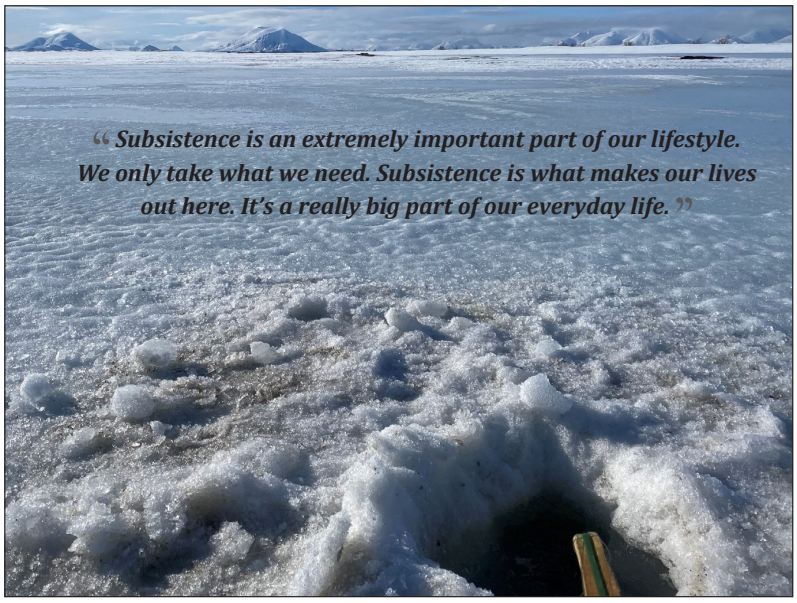


Figure 5.–Composition of per capita harvest weight, by resource category, Dillingham, 2021.

> ***"Back in the day all the berries used to get ripe all at once. Now it varies. King salmon have been on the decline. … Seasons, temps, have also been variable in recent years. It's unpredictable. This affects when salmon come."***



smaller than they used to be and run timing and run strength of Chinook salmon have been sporadic and unpredictable for the past five to 10 years. Aligning with local observations about smaller fish, the conversion factor for individual Chinook salmon harvested in pounds usable weight was lower in 2021 (6.8 lb) compared to 1984 (15.2 lb). As with salmon, the total and per capita large land mammal harvest weights have decreased since the 1984 study; in part, the decrease can likely be attributed to the declining Mulchatna caribou population in the area.

A comparison of maps that depict search and harvest areas for each of the three studies showed harvest and use areas have historically remained similar, with harvest efforts concentrated around the Nushagak River drainage, the Wood River drainage, Nushagak Bay, Nushagak Peninsula, and Clarks Point.

How Can Data Be Used?

Reports and data included in reports can be used to support a community’s proposals to develop or change subsistence fishing rules and regulations, including gear types, seasons, and limits, to ensure that fish populations are managed sustainably and the priority for subsistence uses is recognized in law. Information on the board processes, how to develop proposals, and board and advisory committee schedules are on the ADF&G website under “Regulations.”

Where to find the report?

The full report is available online:
www.adfg.alaska.gov/techpap/TP499.pdf

Paper copies available at
Bristol Bay Native Association
and Curyung Tribal Council

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DIVISION OF SUBSISTENCE

Bronwyn Jones
ADF&G Div. of Subsistence
1333 Raspberry Rd.
Anchorage, AK 99518
907-267-2178
bronwyn.jones@alaska.gov

Cody Larson
Bristol Bay Native Assoc.
PO Box 310
Dillingham, AK 99576
907-842-5257
clarson@bbna.com

Reve Tomlin
ADF&G Div. of Subsistence
1333 Raspberry Rd.
Anchorage, AK 99518
907-267-2357
reve.tomlin@alaska.gov



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