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# THE IMPORTANCE OF SALMON FISHING TO AREA M: REPORT TO THE ALEUTIANS EAST BOROUGH

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## INTRODUCTION AND PURPOSE

This socioeconomic report on the importance of salmon and salmon fisheries to Aleutians East Borough (AEB) communities, assessing effects of changes in salmon management, is a response to a request by the Aleutians East Borough Natural Resources Department in anticipation of the Alaska Board of Fisheries (BOF) Alaska Peninsula meeting in February 2019. Proposals submitted ahead of that meeting in April 2018 and an Agenda Change Request (ACR) submitted in October 2018 indicate that Chignik (Area L) fishermen are concerned about sockeye returns to Chignik and Black Lakes and are shifting their attention to neighboring salmon fishing areas to explain local declines. Following the sockeye salmon season of 2018, Alaska's Governor Walker issued a disaster declaration in the Chignik communities for which there were very weak returns of sockeye to the Chignik River and Black River. The five-year average commercial harvest from 2013-2017 for sockeye in the Chignik Area Fishing District was 1,373,913 fish. In 2018, only 128 total sockeye were commercially harvested. Alaska Peninsula/Aleutian Islands (Area M) fishermen also experienced a weak sockeye season in 2018, and were also restricted by the ADF&G Commissioner's Emergency Order in response to Chignik. They have weathered both the volatility of the salmon fishery but also the negative political attention directed at their fishery informally and formally through the Board of Fisheries process.

The purpose of this report is not to diminish the serious consequences of run failure to the five villages of the Chignik area, the processors, crew, or to support services. Those communities are struggling to get through this winter and next year. Sockeye run projections for 2019 are also poor and disaster relief may be needed for subsequent years. The "warm blob," or marine heat wave, recorded by the Alaska Fisheries Science Center in the Gulf of Alaska is expected to continue through the next year and there are changes ecosystem-wide affecting numerous species and coastal communities, including both Areas M and L. The goal of this report is to describe the historical and present engagements of fishermen in Sand Point, King Cove, and False Pass in salmon fishing; demonstrate their many millennia-long place in the region as indigenous fishermen and hunters; situate the local communities within the development of the commercial salmon fishing enterprise; describe the villages, fleets, processors and their interdependencies; characterize social and economic change over time; describe the relationship between commercial fishing and subsistence harvesting; discuss past engagements with the Board of Fisheries; and make a speculative forecast for how the Aleutians East Borough, Sand Point, King Cove, and False Pass would fare under drastic cuts to the Area M salmon management regime. Despite the volatility in the Gulf of Alaska, Borough fishermen contend that current management measures are working both for salmon conservation and for community sustainability.

This report draws on two decades of social research in the Alaska Peninsula and Aleutian communities by the author. This work has largely been ethnographic, combining participant observation, surveys, and interviews over the courses of multiple projects to characterize the histories and current engagements of these local salmon fishermen, the communities more broadly, and the processors in the Aleutians East Borough. This long-term research has focused on the sustainability of coastal communities and their important relationships to their natural resources that support that sustainability.

## METHODS AND DATA SOURCES

The author has conducted socioeconomic fieldwork in the Aleutians East Borough and Aleutian Islands communities since 1999 funded variously by the University of Cambridge, the National Science Foundation, the Office of Subsistence Management, the Bureau of Ocean Energy Management, and the Aleutians East Borough on a variety of projects involving subsistence and commercial fisheries, fisheries engagement, and sustainability of coastal communities. The most recent project upon which the present socioeconomic and subsistence and commercial fishing data were collected is an Office of Subsistence Management (OSM) Grant #14-452 “Western Gulf of Alaska Salmon and Other Harvests on Federal Lands and Waters” awarded 2016-2019. Interviews and household surveys were conducted in 2017 and 2018 in Sand Point and King Cove. Data from an Aleutians East Borough study of the Western Gulf of Alaska in 2014-2016 on community baselines and the potential effects of the rationalization of the Gulf of Alaska cod and pollock trawl fisheries are also used in the present report. Cumulative data since initial fieldwork in 1999 also contribute to this record (Reedy-Maschner 2009; Reedy-Maschner 2012; Reedy-Maschner and Maschner 2013; Reedy and Maschner 2014).

Data from a previous study on subsistence in advance of the North Aleutian Basin oil and gas offshore development in 2010 for the Bureau of Ocean Energy Management (BOEM) also contributes to this report. Comprehensive household surveys and interviews with residents of Nelson Lagoon, False Pass, and Akutan were a part of that project (Reedy-Maschner and Maschner 2012). Both the OSM project and the BOEM project collected the same data on household harvests of all wild foods, sharing of wild foods, household economics, expenses, harvest locations and other important sites, sharing networks of goods and services, and wildlife and environmental observations.

A study of the Alaska Board of Fisheries in the mid-2000s tracked the cultural resources used before the Board of Fish in the 1990s and 2000s from AYK, Bristol Bay, Chignik, and Area M fishermen to influence subsistence and commercial allocations and time and area restrictions (NSF/OPP #0454734). The study analyzed the roles and outcomes of stakeholder participation in the creation of fisheries policy in western Alaska by exploring narratives of salmon management, use, rights, and conservation surrounding the Area M salmon fishery. The project followed the ways in which various stakeholders promote environmental, political, social, and cultural narratives to their own gain, producing social and environmental knowledge and packaging these in testimony in ways that both are palatable to policymakers but have clear aims for maximizing their own roles in the fisheries (Reedy-Maschner 2001; Reedy-Maschner 2004). Relevant findings from that project appear in this report.

## ALEUTIAN PREHISTORY AND HISTORICAL BACKGROUND

Archaeological sources indicate this Eastern Aleutian region once supported the largest sedentary hunter gatherer villages on earth (Laughlin 1980b; Liapunova 1989; Liapunova 1996; Maschner and Hoffman 2003; Maschner 1999a; Maschner, et al. 1997; McCartney 1984). This was possible due to the abundant marine resources found in the area, with migratory birds and a few terrestrial mammals on the Alaska Peninsula and Unimak Island supplementing sea mammal hunting and fishing. The first inhabitants of the Alaska Peninsula and Aleutian Chain arrived about 9,000 years ago at the end of the

last ice age (Maschner 1999b; Maschner and Reedy-Maschner 2005). They established small villages in key harvesting locations and seemed to have maintained a sedentary hunter-gatherer lifestyle at a relatively low population scale for the next several thousand years. Over time, these villages grew in size and social complexity, with extended families living in larger semi-subterranean *barabaras* (houses) (Maschner and Hoffman 2003). Remains of sea mammals, hunting technology, zoomorphic figures, and masks were found in abundance in the archaeological record at this time. Salmon fishing was done with the use of bone hooks weighted with notched stones on woven kelp lines.

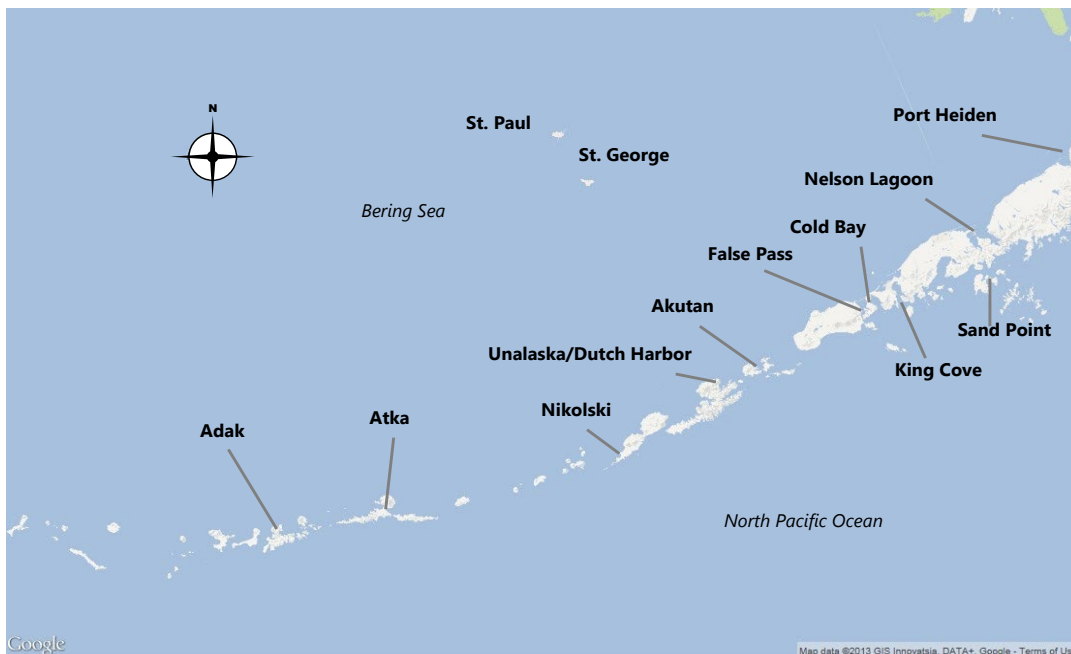
At about 1150 A.D., a major shift occurred in the archaeological record (Maschner and Hoffman 2003; Maschner 2000; Maschner and Reedy-Maschner 2005). House sizes tripled, estimated to hold 30-60 residents each. They began storing foods inside homes rather than outside storage pits. Evidence of warfare in armor, shields, and bows begin to appear (Maschner and Reedy-Maschner 1998). Villages were then relocated to higher defensible sites, island refuges, and nearer to salmon streams (Hoffman 1999). All of the major Aleut villages for the next several hundred years are located on or near major sockeye spawning streams and lakes. Sea mammals are still an important part of the diets, and for bone and hides, but the major emphasis shifted to salmon fishing and storage. Russian explorers and hunters arrived in the 1740s to find a politically and socially complex society in the Eastern Aleutians and Alaska Peninsula. They were engaged in warfare with other Aleut to the west and Alutiiq to the east, they had a nobility and ranked social classes, they had slaves from their raids, and they were harvesting millions of salmon (Maschner and Reedy-Maschner 2005).

Ethnographic sources from the Aleutian region reveal a rich heritage culturally, linguistically, economically, and politically (Bergsland 1959; Bergsland 1998; Berreman 1953; Black 1984; Black, et al. 1999; Hudson 1998; Jochelson 1933; Laughlin 1980a; Liapunova 1996; Reedy-Maschner 2010; Veniaminov 1984 [1840]). The Alaska Peninsula and Aleutian region (Figure 1) have a long history of engaging with foreign commercial enterprises: the Russians pursued sea otters and fur seals; Americans pursued fur seals, salmon, and crab; and Scandinavians chased cod, herring, and whales. Russian fur hunters and missionaries reorganized an indigenous population affected by conflict and disease (Black 2004). The Russian American Company imposed its own hierarchy over the indigenous system of chiefs such that these chiefs became company clerks (Lantis 1984). Aleut men were transported to new hunting territories, such as the Pribilof Islands and Southeast Alaska, and their traditional hunting methods were used by the Company to harvest sea otters for skins. In the Aleutians East region, hunters were moved to the Sanak Islands and then to Belkofski in the early 1800s (Black and Taksami 1999). Commercial whaling at Akutan began under Russian rule as well, and continued after the purchase of the Alaska Territory by the United States in 1867 (Black 1987; Black 2004; McGowan 1999). Sea otter hunting also continued and the Alaska Commercial Company took over trading posts (Hooper 1897). Multiple commercial industries in mining, cattle ranching, fox farming, among others had periods of success in the region and brought more Euro-American entrepreneurs to the area and the resident Aleut populations participated in these economies alongside codfish saltery and salmon cannery companies, and the current connection to commercial fisheries is an extension of historical processes (Black, et al. 1999; Reedy-Maschner 2010). The Eastern Aleutian villages escaped much of the major disruption of World War II that devastated so many communities in the Aleutian Chain and Pribilofs through forced

evacuation and village destruction (Kohlhoff 1995). Military camps were installed in or near their villages and Aleut fishermen from King Cove, Sand Point, and False Pass worked on military transport ships.

Commercial cod fishing was the first major export fishery to form under American control. In the 1870s, cod fisheries began in the Eastern Aleutian region. Schooners transporting dories and primarily Scandinavian fishermen from the West Coast of the United States arrived for the cod seasons (Shields 2001). Men fished from dories using hand lines, and dried and salted cod in barrels for shipping to market. Shore stations for the salted cod market were built beginning in the 1880s on Sanak Island and Unga, for example. These new fishermen began moving into the communities, marrying local Aleut women, and fishing cod for a living.

After 1915, codfish began to disappear from the region and by 1930, they were not sufficient in numbers to support the fishery. Shore stations began to close, but cod continued to be sporadically fished from offshore in the Bering Sea. The majority of active fishermen of False Pass, King Cove, Nelson Lagoon, and Sand Point are descendants of these cod fishermen and draw on their Scandinavian cod fishing ancestors and heritage when describing their life histories (Figure 2). Elders often describe how they missed eating cod and fishing for cod, since the cod were gone from most of this region for most of their youth and young adult life (Maschner, et al. 2008; Maschner, et al. 2013; Reedy and Maschner 2014). Their families eventually relocated from these cod stations to their current communities forming around salmon canneries. Cod fishing has gone through major cycles since this first boom, and since the 1970s has been fished by resident Aleutians East fishermen using pots, jigs, and longlines, with trawl gear added in the 1990s. Recent warming trends in the North Pacific combined with proposed management changes have made these cod and pollock fisheries less stable for Sand Point, King Cove, and False Pass fishermen (Himes-Cornell and Kasperski 2014; Reedy 2018; Reedy 2015).



**FIGURE 1 ALEUTIAN AND PRIBILOF ISLAND COMMUNITIES.**

Your report is required by Act of Congress. This Act also makes it unlawful for the Bureau to divulge any facts, including names or identity, from your census reports. Only sworn census employees will see your statements. Data collected will be used solely for preparing statistical information concerning the Nation's population, commerce, and business activities. Your Census Reports Cannot be Used for Purposes of Taxation, Regulation, or Investigation.

DEPARTMENT OF COMMERCE—BUREAU OF THE CENSUS  
SIXTEENTH CENSUS OF THE UNITED STATES: 1940  
**POPULATION—ALASKA**

Form No. A-100  
Judicial Division  
Recording District  
Name of Institution  
Name of Place  
Enumeration District No.  
Examined by me on  
Sheet No.

Unga, (Perranaska) No. 29  
King Cove Village  
460  
March 2, 1940  
Mark A. Ferguson, Examiner.

RESIDENCE Oct. 1, 1940	NAME	RELATION	HOME DATA		PERSONAL DESCRIPTION		PLACE OF BIRTH		EDUCATION		RESIDENCE Oct. 1, 1940		EMPLOYMENT STATUS OF PERSONS 10 YEARS OLD OR OVER										INCOME			
			Household number	Room number	Sex	Color	Age	Marital status	State	County	Grade completed	Years of school	State	County	Persons at work	Persons at home	Persons in military or naval service	Persons in civilian occupation	Persons in agriculture	Persons in industry or commerce	Persons in service	Persons in domestic service	Persons in other occupations	Wages or salaries	Income from other sources	
19	Mack, Fannie	Head	8	10	F	Wh	42	Alaska	XI	Yes	7	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1650
14	Brandt, George	Head	9	10	M	Wh	43	Alaska	XI	No	8	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1600
14	Brandt, George	Wife			F	Wh	36	Alaska	XI	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1600
	Seward	Son			M	Wh	1	Alaska	XI	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1600
	Laurie	Daughter			F	Wh	14	Alaska	XI	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1600
	Anderson, Andy	Son			M	Wh	17	Alaska	XI	No	8	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1600
	Arthur	Son			M	Wh	8	Alaska	XI	No	3	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1600
	Emma	Son			F	Wh	7	Alaska	XI	No	1	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1600
	Arthur	Son			F	Wh	5	Alaska	XI	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1600
15	Holt, John	Head	8	10	M	Wh	22	Alaska	XI	No	7	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1650
	Yena	Wife			F	Wh	40	Alaska	XI	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1650
	Leanne	Daughter			F	Wh	20	Alaska	XI	No	8	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1650
	Karl	Daughter			F	Wh	18	Alaska	XI	No	8	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1650
	Edna	Daughter			F	Wh	17	Alaska	XI	No	9	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1650
	Genia	Daughter			F	Wh	9	Alaska	XI	No	1	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1650
14	Jack, Karl	Head	5	10	M	Wh	21	Sweden	PA	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1800
17	Smith, John	Head	15	10	M	Wh	32	Alaska	XI	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1750
	John	Wife			F	Wh	14	Alaska	XI	No	8	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1750
	Harold	Daughter			F	Wh	5	Alaska	XI	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1750
18	Verakin, John	Head	8	10	M	Wh	34	Alaska	XI	No	7	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1800
	John	Wife			F	Wh	23	Alaska	XI	No	6	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1800
	Harry	Son			M	Wh	9	Alaska	XI	No	2	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1800
	Arthur	Son			M	Wh	3	Alaska	XI	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1800
	Stephen	Daughter			F	Wh	2	Alaska	XI	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1800
	Tom	Son			M	Wh	1	Alaska	XI	No	0	A	XI	No	No	No	No	No	No	No	No	No	No	No	0	1800

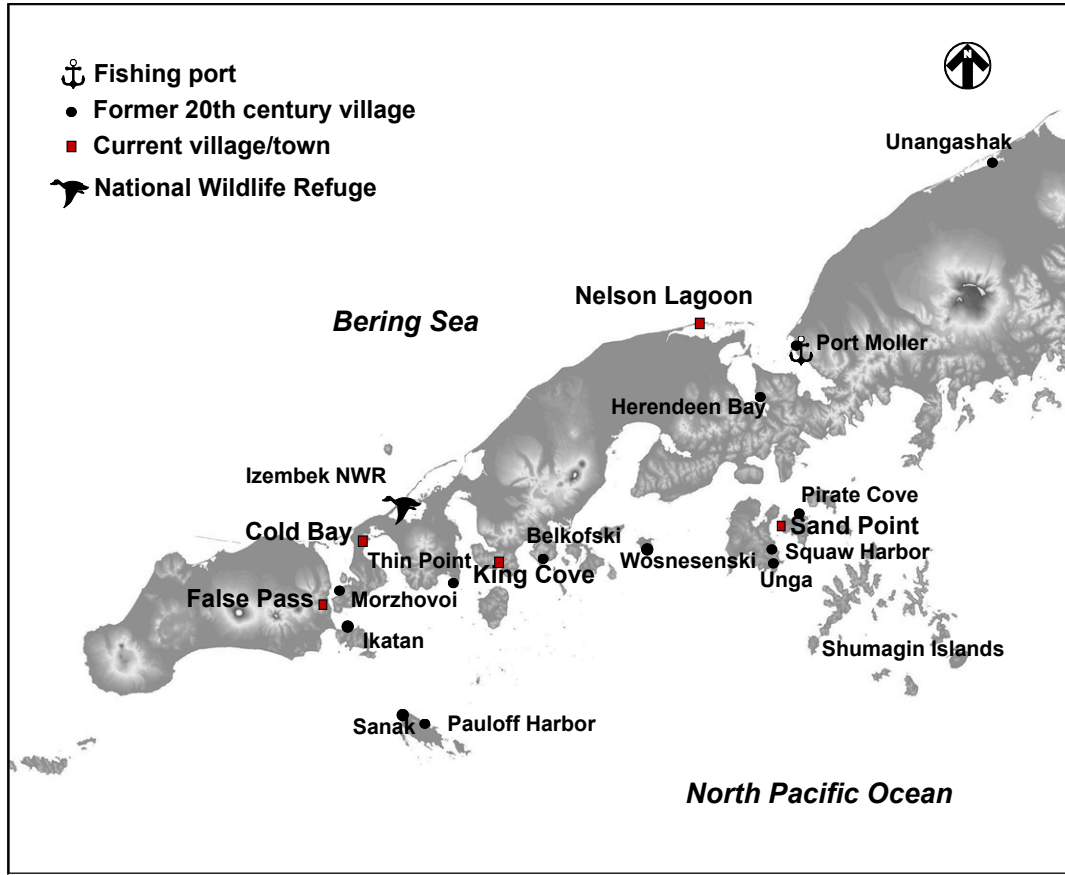
SYMBOLS TO BE USED IN COLUMNS INDICATED  
 Col. 6. HOME OWNED OR RENTED: Owned O, Rented R  
 Col. 9. SEX: Male M, Female F  
 Col. 10. COLOR OR RACE: White W, Amer. Al, Asian A, Indian I, Chinese C, Filipino F, Japanese J, Korean K, Negro N, Other races, spell out in full  
 Col. 11. LINGUISTIC STOCK: American Am, Eskimo Esk, Alutian Al, Eskimo Esk, Athabaskan Ath, English Eng, Finnish Fin, French Fr, German Ger, Italian It, Japanese Jp, Korean Kor, Russian Rus, Spanish Spa, U. S. stocks U, Canadian stocks Can, Other races, spell out in full  
 Col. 12. MARRIAGE STATUS: Single S, Married M, Divorced D, Widowed W, Naturalized Na, Having first papers Pa, Alien Al, American citizen born abroad A-C  
 Col. 13. HIGHEST GRADE COMPLETED: None N, Elementary school, first to eighth grade 1, 2, 3, to 8, High school, first to fourth year 9, 10, 11, 12, College, first year or more 13 to 16, College, fifth year or more 17  
 Col. 14. RESIDENCE, OCTOBER 1, 1940: State St, Foreign F, U. S. possession (abbreviated) Can, Dominion or territory (abbreviated) Dom, other foreign country (F)  
 Col. 15. CLASS OF WORKER: Wage or salary worker W, Employer E, Working on own account O, Unpaid family worker UF, Private employment P, Regular government (Federal, Territorial, local) Gov, Public emergency employment (WPA, RFA, CCC, etc.) P-E  
 Col. 16. SOURCE OF WAGES OR SALARY: None N, Working on own account O, Unpaid family worker UF, Private employment P, Regular government (Federal, Territorial, local) Gov, Public emergency employment (WPA, RFA, CCC, etc.) P-E

FIGURE 2 U.S. CENSUS SAMPLE SHEET FROM KING COVE, ALASKA, 1940.

The closing down of cod fishing also prompted commercial processing companies to shift focus to salmon in the late 1800s. This necessitated geographical shifts in processing to be closer to the salmon fishing grounds. Villages formed around these canneries by depopulating the former cod stations and other communities (Figure 3). Sand Point, for example, formed with residents from Pirate Cove, Squaw Harbor, Unga, Wosnesenski, and Sanak Island. King Cove grew with residents of Belkofski, Thin Point, and Sanak Island. False Pass formed from Ikatan and Morzhovoi residents.

Salmon canneries initially operated with company-owned salmon traps that needed little labor to operate them. Eventually, small fleets of fishermen were hired by the canneries, both newcomers to the area and Scandinavian and Aleut men, to fish areas without salmon traps. The canneries leased boats to these fishermen and paid them with company coins that were only good at their own store or paid them with a percentage of their catch. Later the canneries financed boat purchases and these extended systems of debt kept the fishermen under the control of the canneries. There were floating processors in the area paying more money for salmon deliveries but the canneries could require those in debt to deliver exclusively to their creditors (Jacka 1999).





**FIGURE 3 MAP OF CURRENT AND FORMER 19<sup>TH</sup> - 21<sup>ST</sup> CENTURY VILLAGES IN THE EASTERN ALEUTIAN REGION.**

Although the canneries fought hard against the ban, fish traps were outlawed in 1959 by the State of Alaska as a conservation measure and as a means to increase resident participation in commercial fisheries. The canneries began to rely on the local resident salmon fleets, which grew rapidly (Jacka 1999). A second conservation measure was enacted in 1973 with the Limited Entry Permit Plan (Langdon 1989). This act restricted the number of permits able to be fished by gear type in the salmon fisheries. Permits were issued based upon a qualifying points system of historical participation that included time, gear used, and harvest rates from a set of qualifying years. This resulted in residents receiving salmon permits, and some receiving up to the three if they fished all three gear types. This also resulted in the exclusion of many fishermen who may have not qualified for permits for a number of reasons, discussed in more detail below (Jacka 1999; Reedy-Maschner 2012; Reedy-Maschner 2010).

In the late 1930s, crab also began to be found in abundance. In the Aleutian region, a generation of elders described the crab as ‘weird bugs’ when they first saw them in the 1930s, having grown up without them. The commercial crab fisheries developed rapidly (Lowe and Knapp 2007). The Bering Sea crab fisheries intensified after World War II with processors and catcher-processor vessels developing canned and then frozen products. Canneries diversified into herring packing as well. These expansions changed the labor force. Local resident fishermen’s spouses were the primary cannery workers between the 1940s and 1970s, but were replaced by foreign workers over time, primarily from the Philippines,

China and Mexico. Cannery work became less attractive to fishermen's spouses as their husbands became more prosperous in salmon fishing and as the business of processing intensified (Aradanas and Sepez 2009).

## VILLAGE PROFILES AND BRIEF HISTORICAL RELATIONSHIPS TO THE SALMON FISHERIES

Each community in the Aleutians East Borough has a distinctive history and a unique modern profile. This section introduces the communities, their histories, and their long relationship to the salmon fisheries, focusing primarily on those North Pacific communities actively engaged in salmon fisheries. Cold Bay, a former military base turned regional travel hub, and Akutan, which focuses more on groundfish and crab fisheries, are briefly described as well. Over time, the local economy of fishermen in these communities has become weakened in the state fisheries and dominated in the federal fisheries by transient fishermen, and Aleut and coastal community resident involvement represents a shrinking portion of the industry. However, these coastal residents are dedicated to their home villages and these fisheries, and salmon fishing has become a cultural foundation.

Salmon fishermen in Sand Point, King Cove, and False Pass contend that they used to fish only in the summer to make a living but now must fish all year long, diversifying into groundfish and other fisheries. These communities live "entangled livelihoods" (Reedy-Maschner 2009) in that they perform commercial and subsistence lifestyles, cultures, and economies with 75 percent of economic activity directly and indirectly depending upon income from commercial fisheries.<sup>1</sup>

### SAND POINT

Sand Point is an incorporated city of 1,076 residents located on Popof Island in the Shumagin Islands (Figure 4). It is a commercial fishing community with Trident Seafoods as its main processor, a support facility owned by Peter Pan Seafoods, and a boat harbor. In addition to the City of Sand Point mayoral form of management, the community is governed by three Aleut tribal councils (Qagun Tayagungin Tribe, Pauloff Harbor Tribe, and Unga Tribe). The village was founded in 1898 as a cod fishing station and populated by people from nearby communities on Sanak Island, the Shumagins, and the Alaska Peninsula. It is now primarily supported by salmon fishing and groundfish fisheries, 97 salmon fishing permits are held by local residents across three gear types. Almost every household participates in subsistence hunting and fishing.

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<sup>1</sup> From an Alaska Fisheries Science Center survey, as reported in the community profiles. <http://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/communityprofiles>



**FIGURE 4 SALMON VESSELS IN DRY DOCK, SAND POINT, 2017. PHOTO BY KATE REEDY.**

#### KING COVE

King Cove is located on the Pacific side of the Alaska Peninsula between a lagoon and a bay. It was founded in 1911 around a Pacific American Fisheries salmon cannery and attracted Scandinavian and Aleut fishermen from villages around the region. It is an incorporated city with 1,014 residents. The village is dependent upon the commercial salmon and groundfish fisheries and has a processor and two boats harbors. 54 salmon permits across three gear types are held by local residents. Today, Peter Pan Seafoods processes salmon, cod, pollock, halibut, and crab primarily. The processor brings in hundreds of workers during peak fishing seasons. 36% of the villagers are “Asian or Pacific Islanders” which reflect the seafood processing workers who primarily live in group quarters that are largely separate from the village. King Cove is home to the Agdaagux Tribe and the Belkofski Tribe. The majority of residents are active subsistence hunters and fishermen.

#### FALSE PASS

False Pass is located on the eastern end of Unimak Island and was established around a P.E. Harris cannery in 1917 with people from Morzhovoi, Ikatan, and Sanak Island. The cannery was the focal point of False Pass, with fish traps near Ikatan and East Anchor. The P.E. Harris facility was sold to Pacific American Fisheries and later to Peter Pan Seafoods in the 1960s (Figure 5). It processed salmon, crab and other fish. Peter Pan Seafoods was closed between 1973 and 1976. The cannery burned in 1981, but the facility continued to be a supply base. Peter Pan’s shore buildings were saved from the fire and the docks repaired. A ghost town within the town site remains. In 2003, Peter Pan Seafoods announced closure of its facility altogether. Support facilities for fuel and other services operate out of the cannery site. In 2000, Bering Pacific Seafoods opened as a cannery as part of APICDA to process salmon, but it closed after two years. It reopened for the 2008 salmon season and every year until 2012. Peter Pan

Seafoods continued to send tenders to the area to collect fish from vessels. Trident Seafoods is now operating the plant in False Pass and Silver Bay will open a new plant there for the 2019 season.

Today, False Pass has a population of 40 with four commercial salmon fishing permits held. There is a relatively new harbor completed in July 2009 and new crab pot storage space created by the waste from the harbor dredge. Revenue from mooring fees, sales tax, bed taxes, and a raw fish tax fund the city. In 2005, the crab fisheries were restructured by the NPFMC to give quotas to both vessels and processors based upon historical participation, effectively reducing the crab fleet by approximately 75%. The affected both False Pass and King Cove who lost fuel sales, sales of bait to crab fishermen, and pot storage.

Commercial salmon fishing issues weigh heavily on False Pass as a community and as a fishery. In the late 1990s and early 2000s, the “False Pass” fishery became hotly contested by people of the Arctic-Yukon-Kuskokwim and Bristol Bay regions as intercepting salmon bound for those streams. “False Pass was a convenient target,” one local man said, and the controversy, and subsequent fluctuations in fishing regulations for the Area M fishery, added stress to an already fragile community.



**FIGURE 5 PETER PAN SEAFOODS SIGN IN FALSE PASS, 2010. PHOTO BY KATE REEDY.**

#### COLD BAY

Cold Bay is a small community located in the Izembek National Wildlife Refuge at the end of the Alaska Peninsula. Cold Bay was a strategic airbase during World War II and is now the headquarters of the U.S. Fish & Wildlife Service’s Izembek NWR and is the regional transportation hub. The 3<sup>rd</sup> longest runway in the state is located in Cold Bay and the airport is a primary economic driver for the small communities and villages it serves. There is no boat harbor, but there is a deepwater dock that receives barges and a state ferry. It incorporated as a city, and has approximately 125 residents, the majority of whom are White. It is not an Aleut village although several Aleut families live and work there (about 12%). The

community hosts numerous guided bird and game hunters, fishermen, wildlife observers, photographers, and hikers. These are estimated at about 1,000 people annually. Residents engage in subsistence hunting and fishing.

#### NELSON LAGOON

Nelson Lagoon is located between a lagoon and the Bering Sea on the north side of the Alaska Peninsula. In the lagoon itself, on Egg Island, a salmon saltery/cannery operated between 1906 and 1923. This facility was then moved to Port Moller as Peter Pan Seafoods, Inc. and residents and fishermen were scattered around the lagoon, coming together only during commercial fishing seasons. The modern town site grew up around a school beginning in 1960 with families from nearby Port Moller, Herendeen Bay, Bear River, and Ilnik regions moving there. In the 1950s four families lived in Herendeen Bay and operated two small fish canneries. At the end of the decade, they and others in the lagoon region began to coalesce around the modern town site of Nelson Lagoon. 52 people live in Nelson Lagoon. Commercial fishing is the primary occupation, and dozens of resident and transient boats operate between Nelson Lagoon and Port Heiden for the sockeye salmon fishery delivering to Peter Pan Seafoods in Port Moller. Nelson Lagoon has only drift gillnet and set gillnet permits (22 total) because of the environmental conditions of the fisheries. There are approximately 25 local boats and, with no harbor; they anchor in “the river” during the fishing season, a low tide channel that forms between sand bars in the lagoon. In the off season, the fishermen pull the nets and vessels out of the water and put them next to their houses outside or in garages, or store them in a boatyard or warehouse near the dock. Nelson Lagoon imports food and supplies by barge at Port Moller twice yearly. Food is also air freighted from King Cove or Cold Bay. All of these shipping options are very expensive. There is not much opportunity for employment outside of salmon fishing, tribal and corporation offices, or other local services.

The Port Moller North Peninsula fishery is fished by a group called Concerned Area M Fishermen (CAMF). A few locals from the region are part of CAMF, but it is largely a transient fleet, residing in other parts of Alaska and in Lower 48 states (primarily Washington). There is some contention between them and Nelson Lagoon. As one man said, “they can intercept our fishery in a great way.” Another woman stated that both Port Moller fleet harvests two million sockeye salmon, while the Nelson Lagoon harvest is 210,000 sockeye after escapement needs are met. If fishing is poor on the south side of the Peninsula, those fishermen from King Cove, Sand Point and False Pass will come up to Nelson Lagoon and Port Moller to fish.

#### AKUTAN

There are no commercial salmon permits held in Akutan but it is included here briefly as part of the Aleutians East Borough. Akutan is located on Akutan Island in the eastern Aleutians. It was founded in 1878 after it was chosen as the site for a trading post, a Russian Orthodox Church, and a school, attracting Aleuts from the region (Spaulding 1955). In 1878, the Western Fur and Trading Company opened a sea otter pelt trading facility there (McGowan 1999) and the company expanded into commercial cod fishing and processing. A Russian Orthodox Church was constructed at the site in the same year. The Alaska Commercial Company took over the trading facility in 1879 and was managed by

Hugh McGlashan, a Scotsman who is ancestor to many Akutan and Unalaska families today. In 1912, the Pacific Whaling Company built a whale processing station across the bay from Akutan, which operated until 1939. After the Japanese attacked Unalaska in June 1942, the U.S. government evacuated Akutan residents to Southeast Alaska. The village was re-established in 1944 with a smaller population. The City was incorporated in 1979, and Trident has managed a processing plant since the 1980s. Akutan is also a member of APICDA. The Census Bureau reported 1,037 residents in 2010, of which the vast majority is seasonal cannery employees. Only seven residents hold commercial fishing permits, none of which are in salmon fishing.

Trident Seafoods sits on an old homestead from a non-local resident and on former whaling station lands at the head of Akutan Bay (Figures 6 and 7). Trident Seafoods is a massive processing plant that employs up to 1000 people for year round processing. The majority of workers in the plant are migrant laborers from nations in North Africa, the Philippines, and Mexico, but they also recruit from the Lower 48. Local people tend not to work in the Trident plant in the actual processing sector, but may drive equipment or hold other jobs there. Other jobs include working at the post office, store, the Roadhouse bar, diving, halibut IFQ holders, cod/miscellaneous finfish permit holders, and boat piloting. The City of Akutan recently completed a harbor and other local capacities to increase their importance as a Bering Sea port.

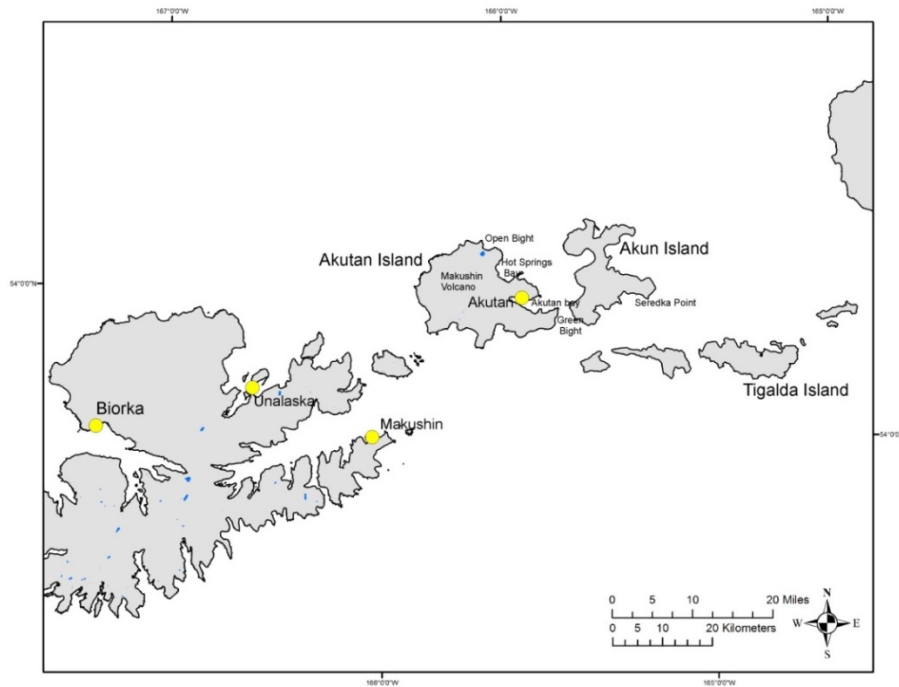


FIGURE 6 REGIONAL MAP OF AKUTAN VILLAGE. MAP DRAWN BY B. BENSON.



**FIGURE 7 TRIDENT SEAFOODS AND AKUTAN VILLAGE, 2012. PHOTO BY KATE REEDY.**

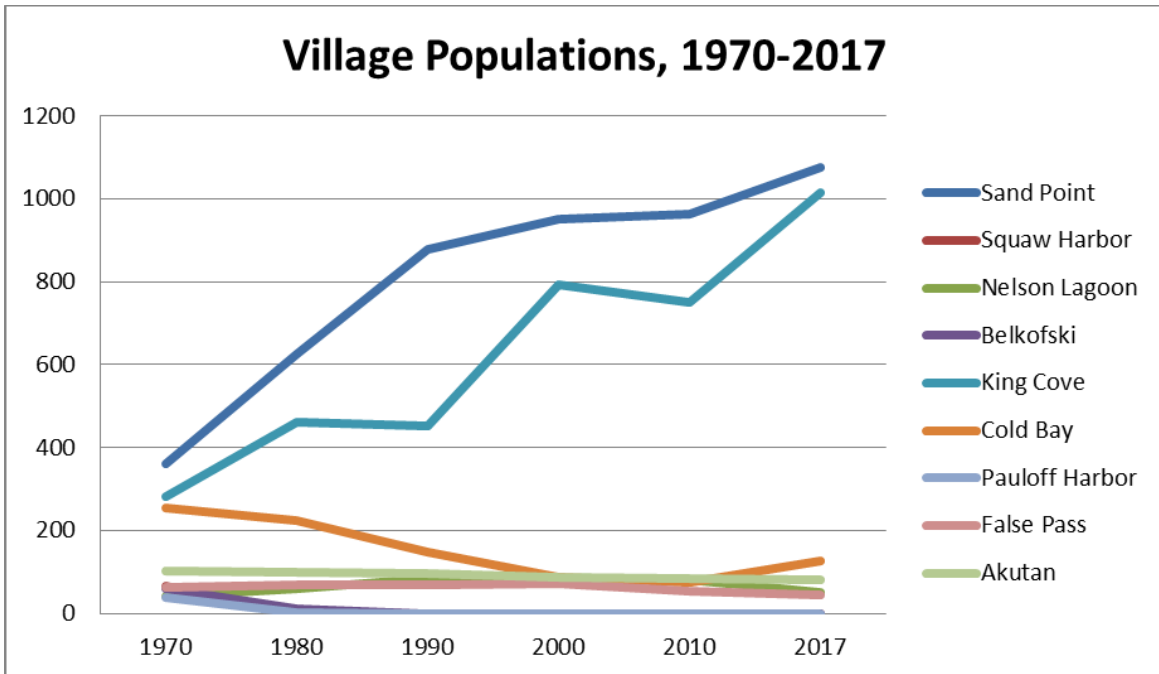
## INDICATORS OF COMMUNITY SUSTAINABILITY

Similar to measures of sustainability used by the NPFMC in the Ecosystem Stock Assessment and Fishery Evaluation (SAFE) reports, this report includes population and school enrollments in the local communities as indicators of community stability. Since the Aleutians East Borough communities are economically reliant upon fisheries, changes in fisheries access, crew employment, processing, and other factors often affect in- and out-migration patterns.

### POPULATION TRENDS

Figure 8 shows population trends in the AEB villages over the past five plus decades. The last family to leave Unga moved to Sand Point in 1969 so it does not appear on the chart even though many Sand Point residents grew up there and visit the site in the summers. Squaw Harbor, Belkofski, and Pauloff Harbor are also abandoned (and also visited by former residents when the opportunity presents itself). All Area M communities grew up around processing plants as other area communities dwindled in population. This trend continues but the forces at play today are more complex.

King Cove and Sand Point have seen steady growth, due in part to school closures, infrastructure losses, and rising costs of living in the smaller communities, such as Nelson Lagoon. Cold Bay has seen small trends of decline and growth but still ultimately could not retain families and keep a school open. False Pass's population has been low but stable over time; its permanent population has never been large. Community decline is not the same as decline of community. The people False Pass are loyal to place and to people who choose to live there.



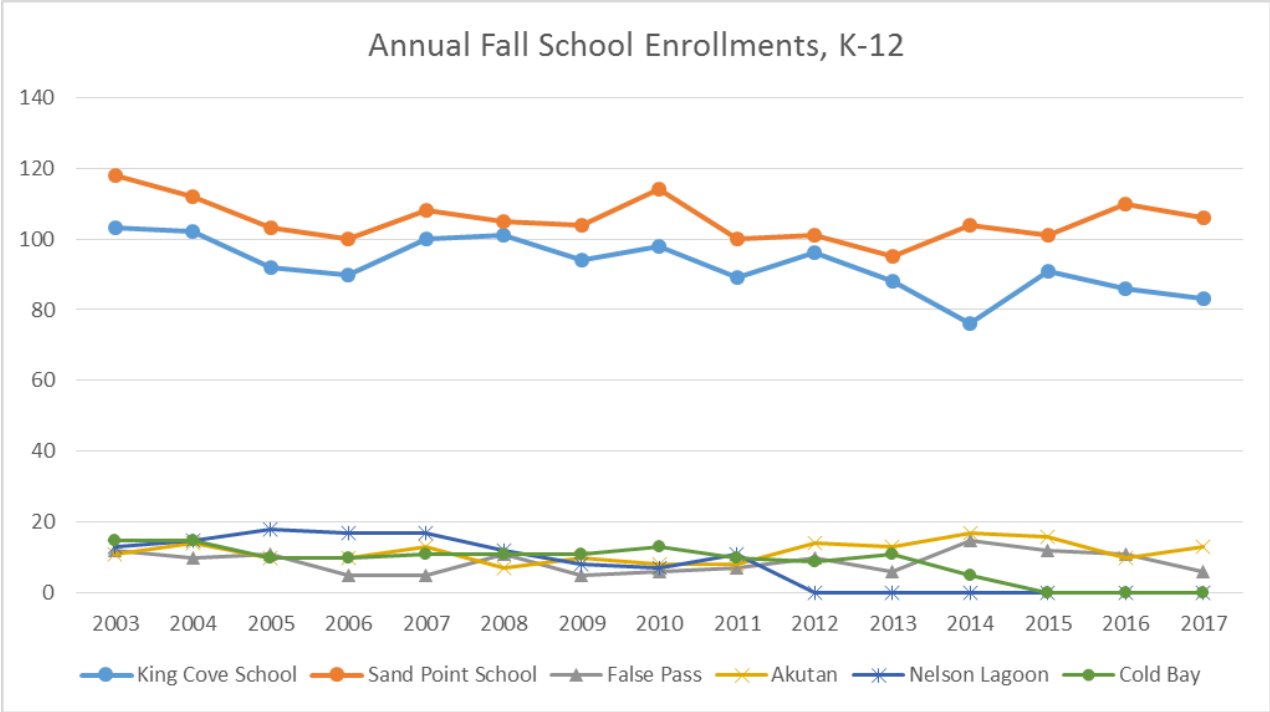
**FIGURE 8 OVER FOUR DECADES OF VILLAGE POPULATION TRENDS IN THE ALEUTIANS EAST BOROUGH (CENSUS.GOV). THOSE LIVING IN GROUP QUARTERS HAVE BEEN REMOVED FROM AKUTAN’S TOTAL RESIDENTS COUNTED IN THE CENSUS, SINCE THIS NUMBER REFERS TO MIGRANT LABOR AT TRIDENT SEAFOODS.**

#### SCHOOL ENROLLMENT TRENDS

School enrollments are a commonly used social indicator of community sustainability and vitality (Figure 9). They demonstrate the presence of young families, quantitatively measure well-being and change over time, and may foreshadow future trends. The Nelson Lagoon School closed in 2012 and the Cold Bay School closed in 2015. Some of those kids joined an online homeschooling network but most relocated to King Cove, Sand Point, or Anchorage. These smaller communities have experienced outmigration and families not wanting to have children with an uncertain economic future. It is unlikely that young families will move into Cold Bay or Nelson Lagoon without a school and so the trend will not be reversed.

The State of Alaska requires a minimum student count of 10 to keep a school open and staffed in rural Alaska. In 2015, the Legislature considered raising this minimum to 25, which would have closed schools in Akutan and False Pass. In under-enrolled years, the Aleutians East Borough will cover the budget gap. They are funded by fisheries and landing taxes, and so the fisheries are funding the schools these schools. Schools in these rural communities often double as cultural and community centers, places for recreation in the gyms, places for potlucks and community gatherings, among many functions.

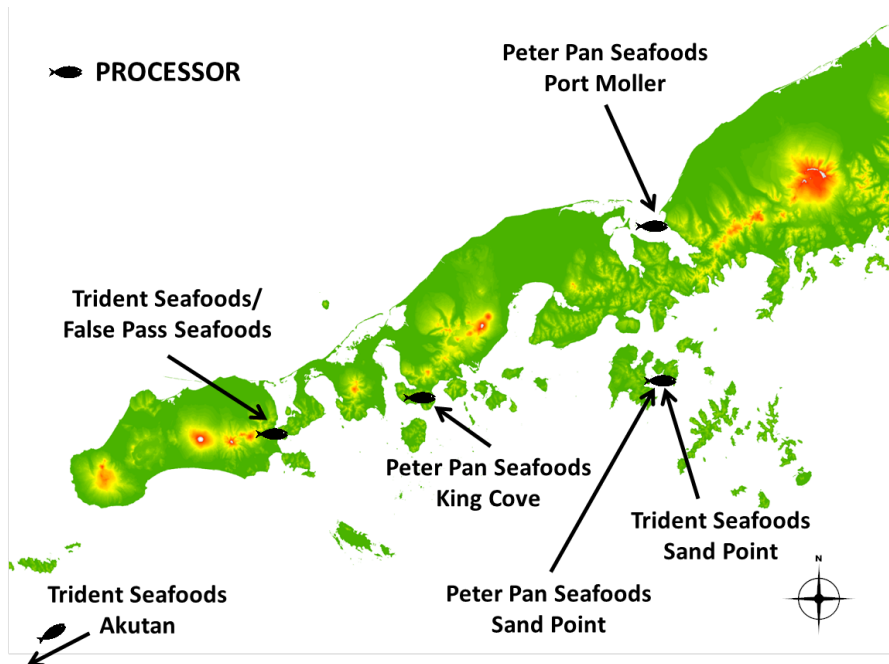




**FIGURE 9 ANNUAL FALL SCHOOL ENROLLMENTS, ALEUTIANS EAST, 2003-2017 (SOURCE: [HTTPS://EDUCATION.ALASKA.GOV](https://education.alaska.gov)).**

**PROCESSORS AND COMMUNITY RELIANCE**

As described above, the present day Aleut communities formed around canneries/processors over the past 130 years. Today two major corporations operate six facilities in the Aleutians East Borough (Figure 10). In Akutan and Sand Point, Trident Seafoods operates a processor in each community. In False Pass, Trident owns seventy-five percent of False Pass Seafoods and Fuel Services, with APICDA Joint Ventures retaining 25 percent from when they started the operation as Bering Pacific Seafoods. Silver Bay Seafoods is also scheduled to open a new processing facility in False Pass for the 2019 salmon season. Peter Pan Seafoods operates two processors in King Cove and Port Moller, and a smaller facility in Sand Point. Peter Pan Seafoods recently rebuilt the cannery in Port Moller after it burned in August 2017. They were unable to open in 2018 for the salmon season but Peter Pan kept support operations open and sent tenders to transport salmon to its King Cove plant. They anticipate opening for the 2019 season.



**FIGURE 10 FISHERIES PROCESSORS OPERATING IN THE AEB.**

Each of these processing plants represents a large investment in its community, and significant employment in Alaska (both local and migrant/transient). They rely on stable fisheries. Peter Pan Seafoods in King Cove is operating year round employing up to 500 annually. Peter Pan Seafoods in Port Moller typically has about 400 employees working three shifts during the salmon season. Trident Seafoods in False Pass employs 200 between May and August. Their Sand Point plant hires between 50 and 400 employees depending upon the harvest season and operates year round. Trident’s Akutan plant is the largest processing facility in North America and can house up to 1,400 employees in peak seasons. A significant local job is tendering for the processors.

The Aleutians East Borough and municipalities derive a significant tax base from processing. Salmon represent a significant proportion of the taxes generated in Sand Point, King Cove and False Pass (Table 1). Figures 11, 12, and 13 show the relative value of fish deliveries to all ports in the Aleutians East Borough over the past three years.

**TABLE 1 PERCENT CONTRIBUTION OF SALMON LANDINGS TO TAXES GENERATED IN EACH PORT.**

Community	% Contribution of Salmon Landings to Taxes Generated
Akutan	0.2
False Pass	53
King Cove	48
Port Moller	7
Sand Point	32

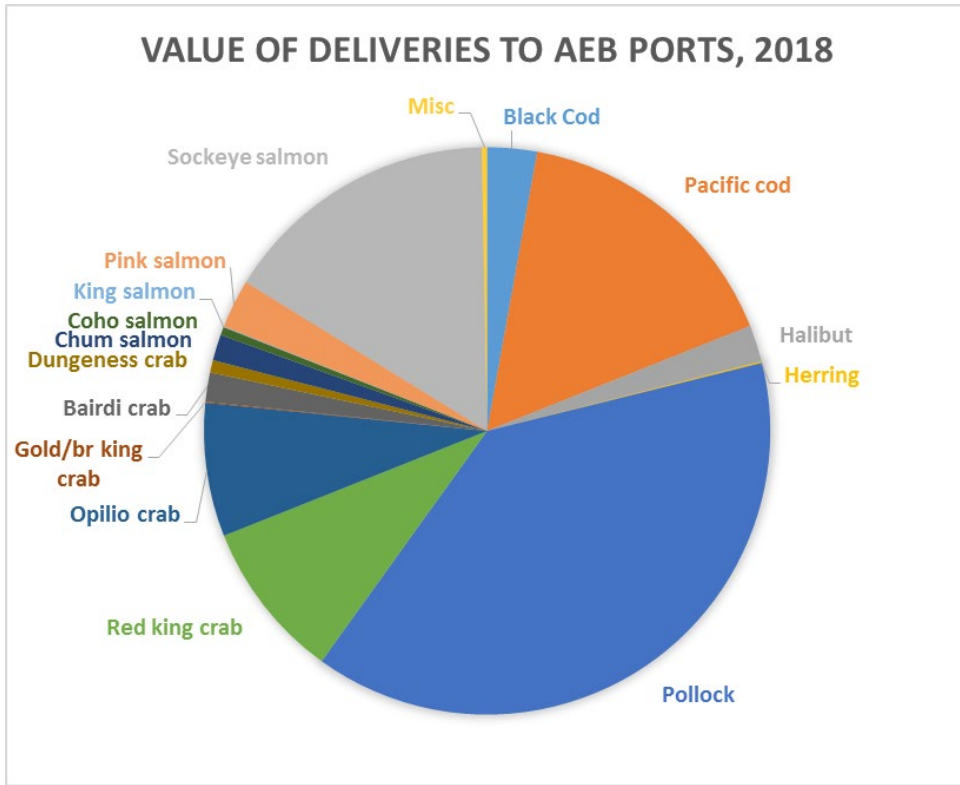


FIGURE 11 VALUE OF FISH DELIVERIES TO AEB PORTS, 2018.

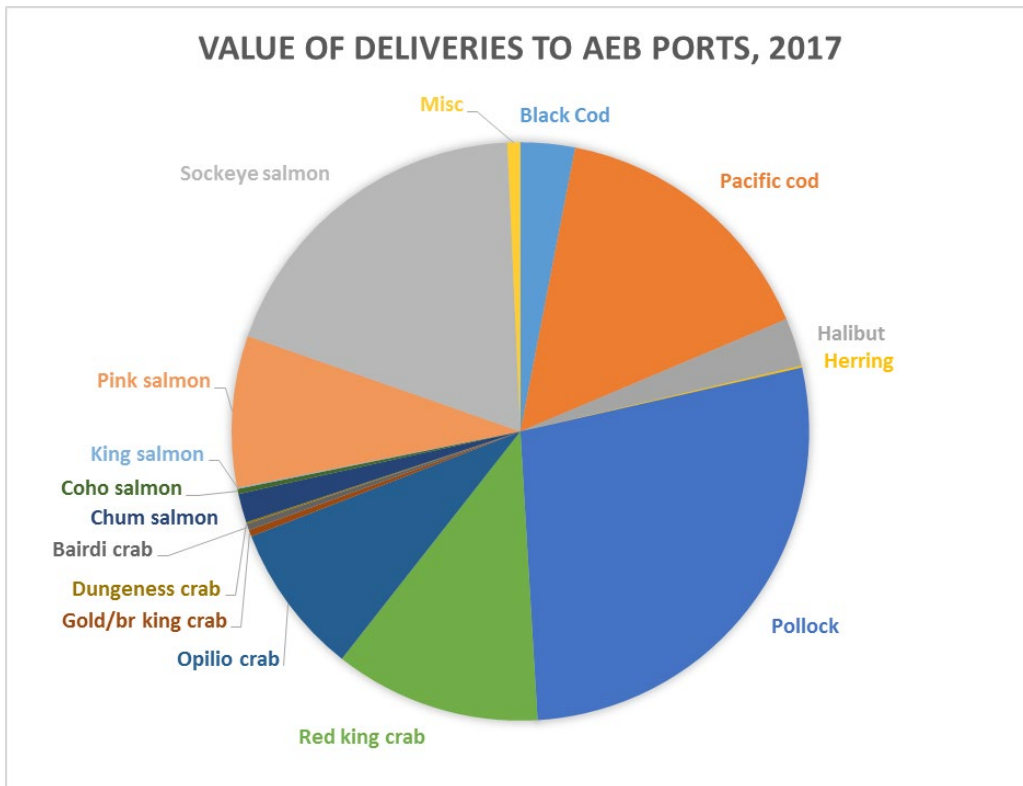


FIGURE 12 VALUE OF FISH DELIVERIES TO AEB PORTS, 2017

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## VALUE OF DELIVERIES TO AEB PORTS, 2016

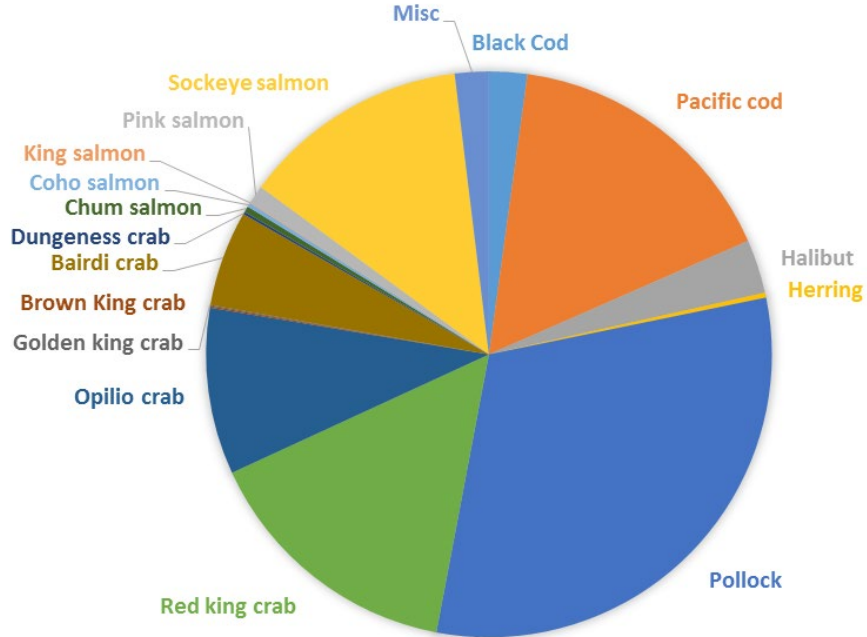


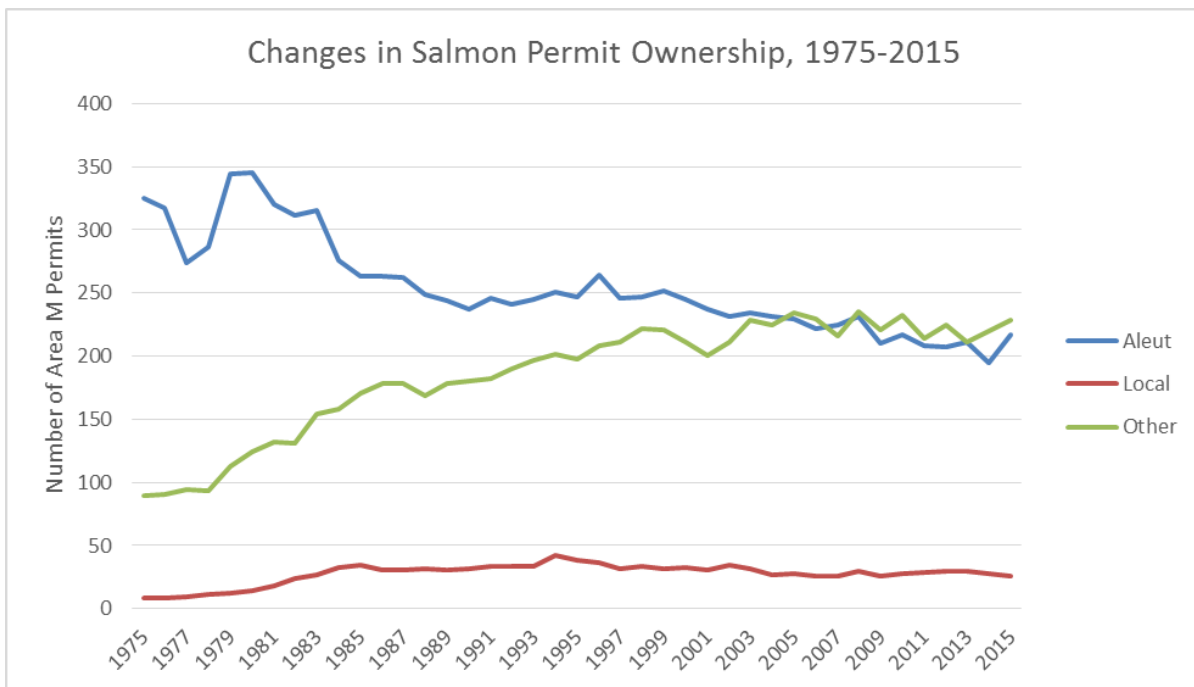
FIGURE 13 VALUE OF FISH DELIVERIES TO AEB PORTS, 2016.

### SALMON PERMIT AND VESSEL TRENDS

The Aleutians East Borough communities are part of a growing trend of declining fishing access by rural residents in the state and federal fisheries (Carothers and Chambers 2012; Carothers 2010; Langdon 2008; Langdon 1980b; Reedy 2018). Donkersloot and Carothers recently documented the financial and social barriers to acquire permits and quota in Alaska's fisheries, leading to an aging fleet and disproportionately impacting small rural villages (Donkersloot and Carothers 2016). As the only economy, the only economic opportunity, and the primary cultural and social foundation, declines in access to fishing affect individuals, families, community life, and sustainability. Limited Entry in Alaska's salmon fisheries, although designed to shift control of salmon fishing to Alaskans, has resulted in the opposite effect: a net transfer away from rural, resident hands. Fishing permits have been sold, cancelled, or transferred away through other processes. Through making salmon fishing rights a market-based commodity, the trends statewide have disfavored small-scale rural fishermen, young and new entrants to fishing, and indigenous coastal communities. Permit loan and other financing programs have been developed to support these demographics. Educational permits were also created to train young people in the fisheries. Still, retaining access is a major challenge.

Limited Entry was designed to prevent the flow of permits out of community-based hands but has resulted in the opposite situation (Langdon 1980a). The fluctuating value of permits, high costs of

operation, combined with the volatility of salmon abundance, has made it difficult for many to enter the fishery or take a financial risk even if they qualify for bank loans. Figure 14 presents ownership of Area M salmon permits over forty years by the categories of *Aleut*, *Local*, and *Other*. *Aleut* owners are the indigenous, resident permit owners who either received permits during Limited Entry or inherited or purchased permits since 1975. *Local* owners are those individuals who are not Aleut but live and work in the communities, have raised their children there, or are considered to be local by the majority community. *Other* refers to non-residents of the communities who often live outside the state and who initially received permits or have inherited or purchased them over time. These data tell a dramatic story of initial Aleut ownership of the lion’s share of salmon permits distributed in Area M. Those who are *Other* have acquired permits such that they are equal to or have surpassed Aleut ownership in the past decade. There is every indication that this trend of increasing outside ownership of salmon permits will continue. Rural, indigenous fishermen are more likely to have to sell permits or quota and are less likely to secure financing to purchase permits or quota (Carothers and Chambers 2012).



**FIGURE 14 CHANGES IN SALMON PERMIT OWNERSHIP IN AREA M, 1975-2015 (CFEC.STATE.AK.US).**

Privatization has changed the relationships between people and nature in these communities by first ascribing resource access to some and either revoking rights or locking up fishing opportunities away from others. The first experience with enclosure began with the Limited Entry Permit Plan of the early 1970s. Previous to that, the Aleut fishermen of these communities fished open access fisheries for cod, salmon, crab, halibut, and other species in small boats. Salmon fisheries for the entire state were deemed overcapitalized and overrun with non-Alaskans and a permit system was created to limit participation. The permits that were originally given to fishermen in these Alaska Peninsula communities were not without local controversy. Some received more than one for each gear type and some did not receive any because they could not prove their participation during the qualifying years. This also

produced controversy externally for having received a supposed windfall of multiple permits that they then spread around the communities and increased the fleet size and fishing effort. These fishermen were further deemed “interceptors” of salmon bound for the rivers and users of western Alaska, the potentially more authentic indigenous people. They were (and sometimes continue to be) treated as non-Native takers of fish destined for “real” indigenous Alaskans (discussed below). Their relative economic success during some years in the salmon fisheries compared to other regions of Alaska has also made them a target.

The salmon fishery has been the primary economic and social focus of Sand Point, King Cove, and False Pass. A few locals are engaged in Limited Entry herring fishing and halibut and sablefish IFQs have been owned and fished since the 1990s by some. Cod and pollock fishing represent a growing share of the year’s fishing emphasis relative to salmon volatility. Diversification has been the local strategy for generations. When asked, “What do you consider to be your primary fishery?” one vessel owner and skipper said, “All of them. I’m a fisherman.” Another said, “We are diversified fishermen here.” Diversifying their fisheries is less about profit-making and more about reducing risk and seeking opportunities in the environment and economy that they understand most and that supports their communities (Carothers 2010; Reedy 2018). As one Sand Point vessel owner said, “The [name of vessel] does herring. It does salmon. It does halibut. It does pollock. It does cod. A government charter. We do whatever we can. If you weren’t diversified in this town, you wouldn’t be able to make it on a boat that size [58’]. It is too costly.” They also stress that it is important to keep as many boats as possible actively fishing in the community.

Most salmon vessels are small set gillnetters, drift gillnetters, and 58’ seiners. Crew consist of many families fishing together, crew from around the village, and less frequently, crew recruited from outside the community. Within King Cove and Sand Point, vessels represent more than tools of the fishery. Each vessel in the fleet has its own history. Some pass through many families and some stay in the same family for generations. Salmon seine vessels have a State imposed limited of 58’ in length. Several fishermen have converted their vessels to a “wide body” style by sending them to boat yards in Washington and Oregon for work and sponsoring. The so-called Super 58s (also called Super 8s) started appearing in the Western Gulf following the addition of trawling. These vessels have had the hulls widened by four to five feet to become more robust trawlers and seiners (Figure 15). This expansion is not a unique situation; for example, the limited Bristol Bay 32’ drift vessel has a large range in height and width across the fleets (Knapp 2004).

The cost of permits and vessels has fluctuated significantly over time. In some cases, locals invested large sums of money in permits and vessels, requiring bank loans and consistent payments, which required steady incomes; these are difficult to achieve in the fishing business. Other studies in Bristol Bay and Kodiak (Carothers 2010; Koslow 1986; Langdon 1980a) have noted that outsiders have typically earned more working alongside rural residents in the same fisheries. These studies show that some rural people have sold their permits and vessels when they have short-term cash needs or because holding a permit disqualifies them from other types of aid, “providing perverse incentives for permit sales” (Carothers 2010). Following Limited Entry in the salmon fisheries, the people who owned boats and permits reached a point where they could pass on their operations or sell and retire. Many could not

afford to give their operations away or sell to local family members or other locals in the community because they would lose money or could not find a viable buyer. In Sand Point, one man said, “There’s been boats sold... I think one burned up, and they have never been replaced by someone in the community. The boats have left the community. Then permits go with them.” Young men have expressed their frustration in trying to buy into the salmon business. “You can’t,” said one. “Way to go backwards.”

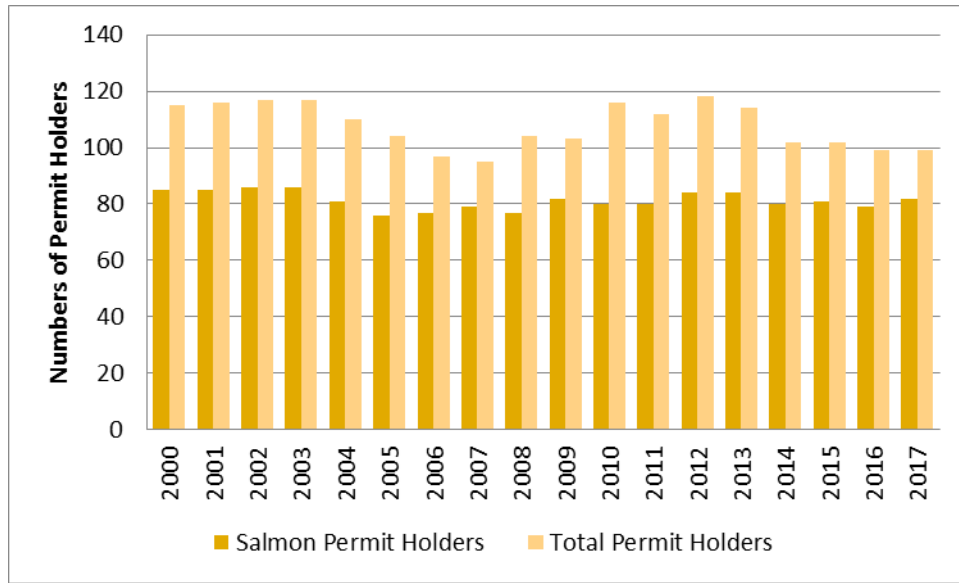


**FIGURE 15 TWO SAND POINT SALMON VESSELS OF DIFFERENT CAPACITIES AWAIT TO BE LAUNCHED FOR THE 2017 SALMON SEASON. PHOTO BY KATE REEDY.**

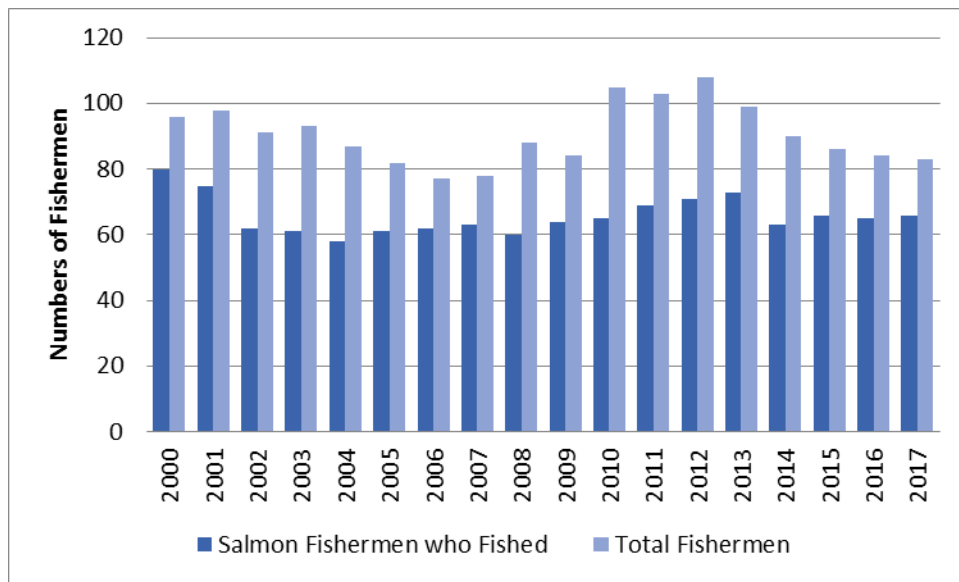
## SALMON FISHING ENGAGEMENT IN SAND POINT, KING COVE, AND THE AEB

The following data are from the “Permit and Fishing Activity by Year, State, Census Division, or Alaskan City” of the [www.cfec.state.ak.us](http://www.cfec.state.ak.us), January 2019. These data contrast the number of salmon permit holders, the number of persons fishing for salmon, the estimated pounds of salmon landed, and the estimated gross earnings from salmon fishing with the totals for Sand Point, King Cove, and the Aleutians East Borough overall from 2000-2017. 2017 is the most recent complete data available. In cases where there were few permits fished, pounds and revenue are either taken from fishery averages or the values are confidential. In the following figures, *permit holders* are the current holders at year end. Residency is based on the address claimed by the permit holder. The number of *fishermen who fished* refers to the permit holders who made at least one landing in the calendar year. *Pounds landed* are estimated pounds landed. *Estimated Gross Earnings* is the ex-vessel price per pound reported by the CFEC. Groundfish references do not include IFQ sablefish.

These data show that salmon permit holders are a substantial portion of the total number of permit holders in Sand Point (Figure 16). From 2000 to 2017 salmon permit holders were between 69% and 83% of the total permit holders in the community. For those same years, salmon fishermen were between 62% and 83% of the number of persons fishing in Sand Point (Figure 17). Salmon constituted between 13% (2010) and 57% (2017) of the estimated total pounds of fish landed in Sand Point. Earnings from salmon fishing are between 20% (2003) and 76% (2017) of the total earnings from fishing (Figure 18 and 19).

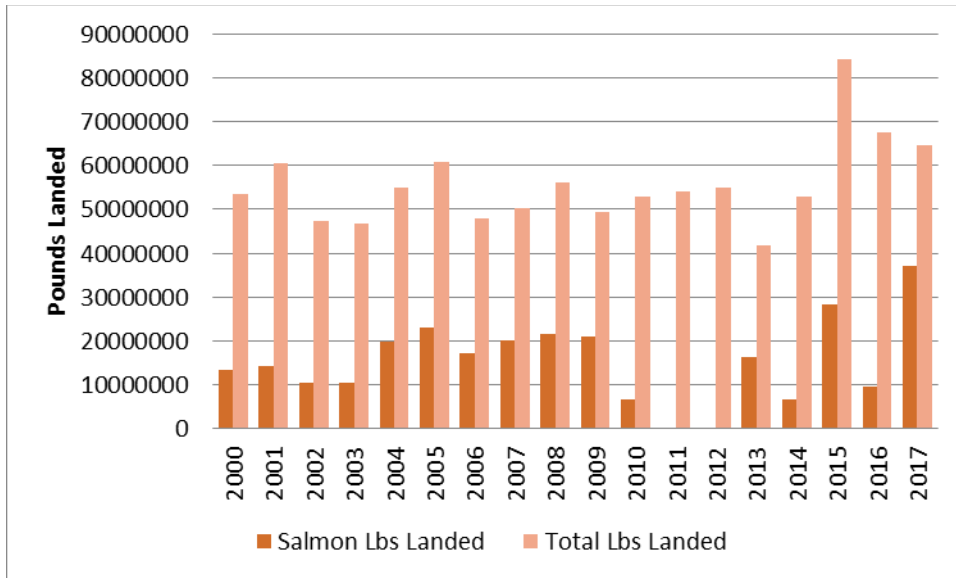


**FIGURE 16 NUMBER OF SALMON PERMIT HOLDERS IN SAND POINT VERSUS THE TOTAL FISHING PERMIT HOLDERS IN SALMON, CRAB AND GROUND FISH, 2000-2017.**



**FIGURE 17 NUMBER OF SAND POINT SALMON FISHERMEN WHO FISHED VERSUS THE TOTAL SAND POINT FISHERMEN ENGAGED IN SALMON, CRAB, AND GROUND FISH, 2000-2017.**



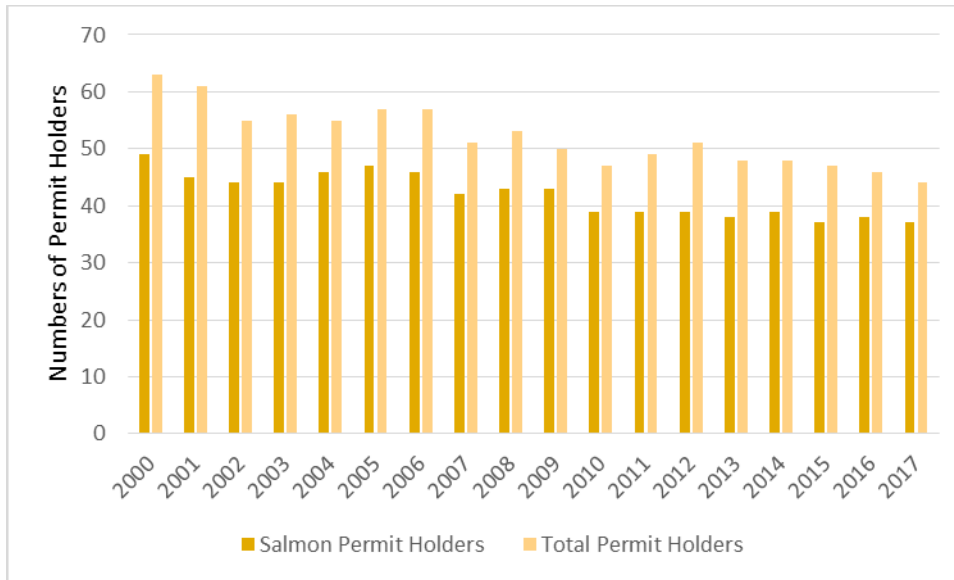


**FIGURE 18 ESTIMATED POUNDS OF SALMON LANDED IN SAND POINT VERSUS TOTAL POUNDS OF FISH LANDED, 2000-2017. SALMON DATA FOR 2011 AND 2012 ARE CONFIDENTIAL.**

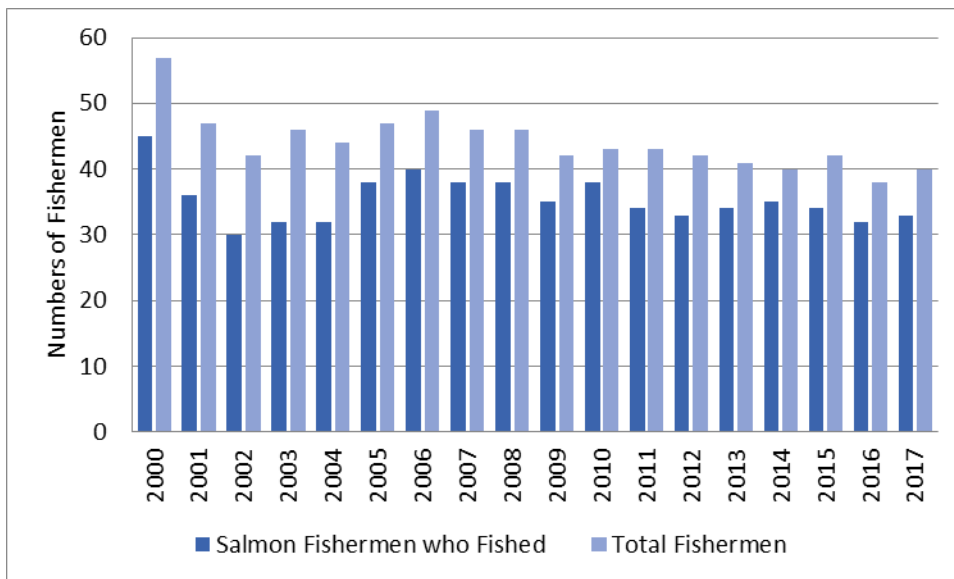


**FIGURE 19 ESTIMATED GROSS EARNINGS IN SAND POINT FROM SALMON FISHING COMPARED TO TOTAL GROSS FISHING EARNINGS, 2000-2017. SALMON DATA FOR 2011 AND 2012 ARE CONFIDENTIAL.**

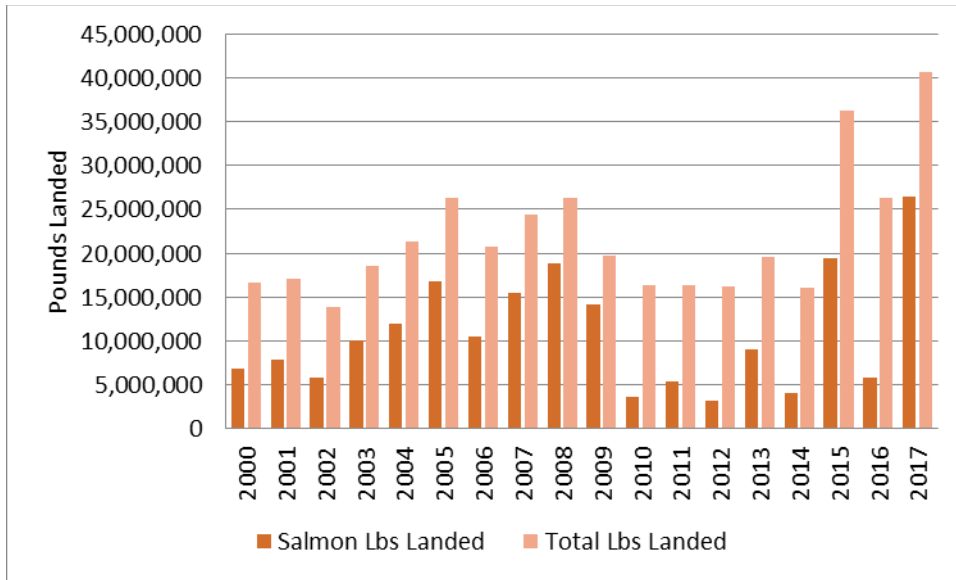
In King Cove, salmon fishing forms an even larger component of the overall fishing activity. Between 2000 and 2017, salmon permit holders constituted between 73% (2001) and 84% (2017) of the total permit holders in King Cove (Figure 20). Salmon fishermen are between 70% (2003) and 88% (2010) of the number of persons fishing in King Cove (Figure 21). Salmon are between 19% (2012) and 71% (2008 and 2009) of the estimated total pounds landed (Figure 22). Estimated earnings from salmon fishing are between 26% (2002) and 76% (2017) of the total earnings from fishing in King Cove (Figure 23).



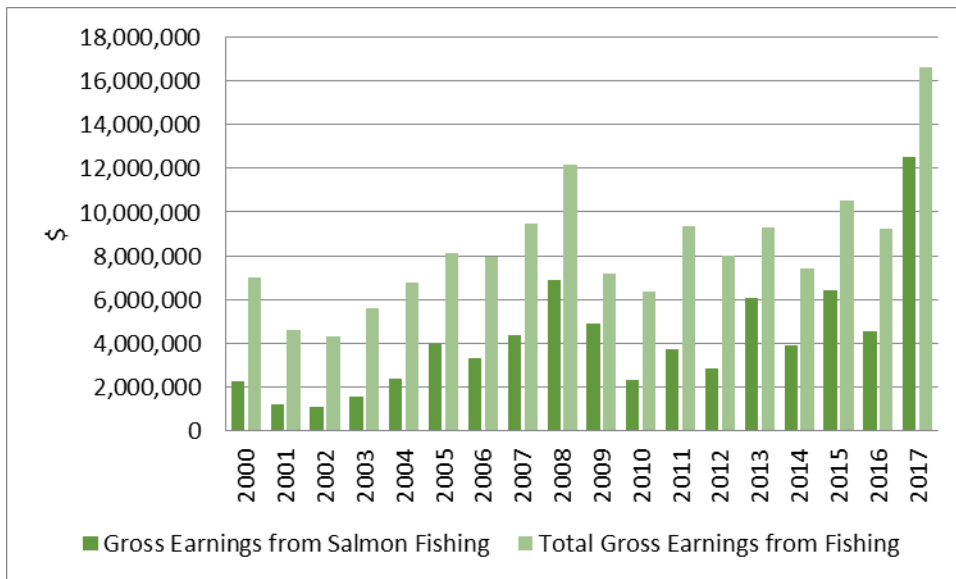
**FIGURE 20 NUMBER OF SALMON PERMIT HOLDER IN KING COVE VERSUS THE TOTAL FISHING PERMIT HOLDERS IN SALMON, CRAB, AND GROUND FISH, 2000-2017.**



**FIGURE 21 NUMBER OF KING COVE SALMON FISHERMEN WHO FISHED VERSUS THE TOTAL KING COVE FISHERMEN ENGAGED IN SALMON, CRAB, AND GROUND FISH, 2000-2017.**



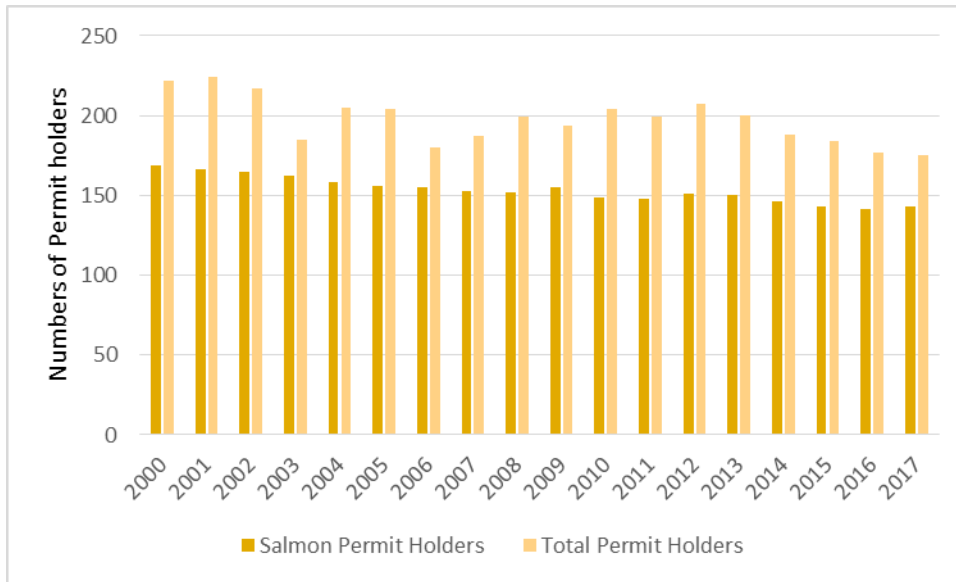
**FIGURE 22 ESTIMATED POUNDS OF SALMON LANDED IN KING COVE VERSUS TOTAL POUNDS OF FISH LANDED, 2000-2017.**



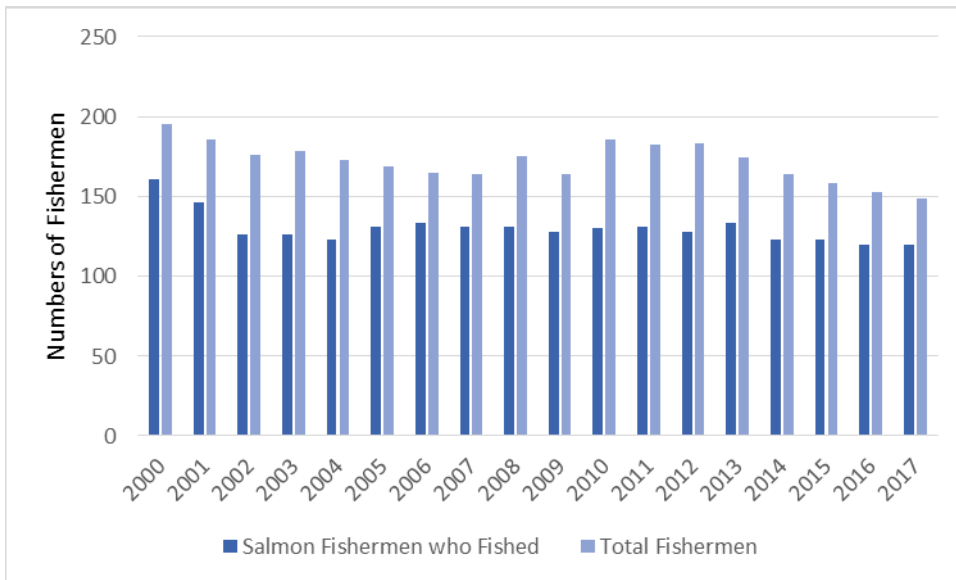
**FIGURE 23 ESTIMATED GROSS EARNINGS IN KING COVE FROM SALMON FISHING COMPARED TO TOTAL GROSS FISHING EARNINGS, 2000-2017.**

For the Aleutians East Borough, salmon fishing is a critical economic activity region-wide (Figure 24-27). Of the total permit holders in the Borough, salmon permit holders have been 78% of the total on average in the region since 2000. Salmon fishermen have constituted on average 76% of the number of persons fishing in the AEB. Salmon have been on average 36% of the estimated total pounds landed in the Borough since 2000. Estimated earnings from salmon fishing are 45% of the total earnings from fishing since 2000, and 58% in the past five years.

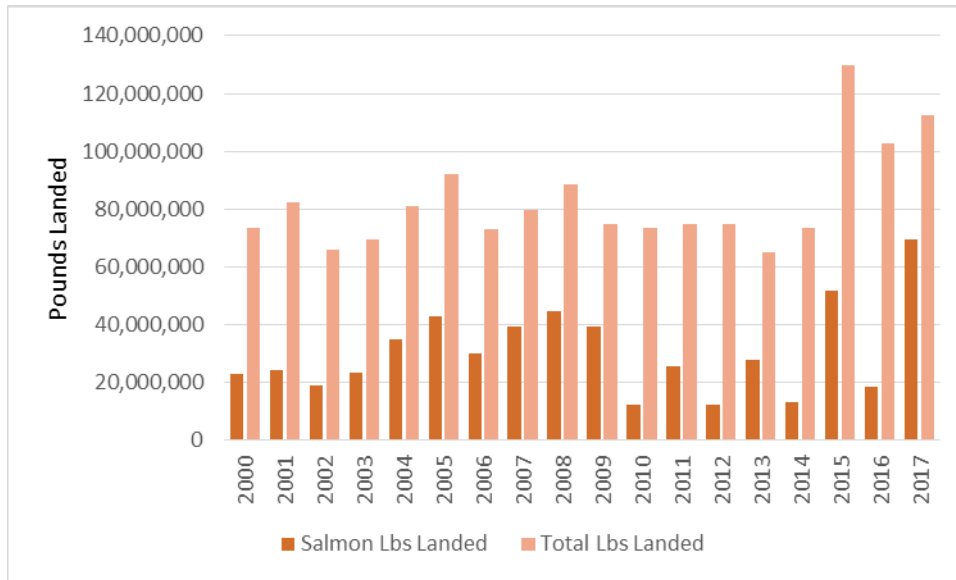
These graphs for Sand Point, King Cove, and the Aleutians East Borough show a fairly consistent but slightly declining level of participation by fishermen each year, but they also show the volatility of salmon fishery landings and earnings, some of which is dramatic between years. For example, 2010 and 2014 were low run and low earning years, whereas 2015 and 2017 were relatively high run and earning years.



**FIGURE 24 NUMBER OF SALMON PERMIT HOLDERS IN THE ALEUTIANS EAST BOROUGH VERSUS THE TOTAL FISHING PERMIT HOLDERS IN SALMON, CRAB AND GROUND FISH, 2000-2017.**



**FIGURE 25 NUMBER OF ALEUTIANS EAST BOROUGH SALMON FISHERMEN WHO FISHED VERSUS THE TOTAL ALEUTIANS EAST BOROUGH FISHERMEN ENGAGED IN SALMON, CRAB, AND GROUND FISH, 2000-2017.**



**FIGURE 26 ESTIMATED POUNDS OF SALMON LANDED IN THE ALEUTIANS EAST BOROUGH VERSUS TOTAL POUNDS OF FISH LANDED, 2000-2017.**



**FIGURE 27 ESTIMATED GROSS EARNINGS IN THE ALEUTIANS EAST BOROUGH FROM SALMON FISHING COMPARED TO TOTAL GROSS FISHING EARNINGS, 2000-2017.**

## SUBSISTENCE AND COMMERCIAL INTERDEPENDENCE

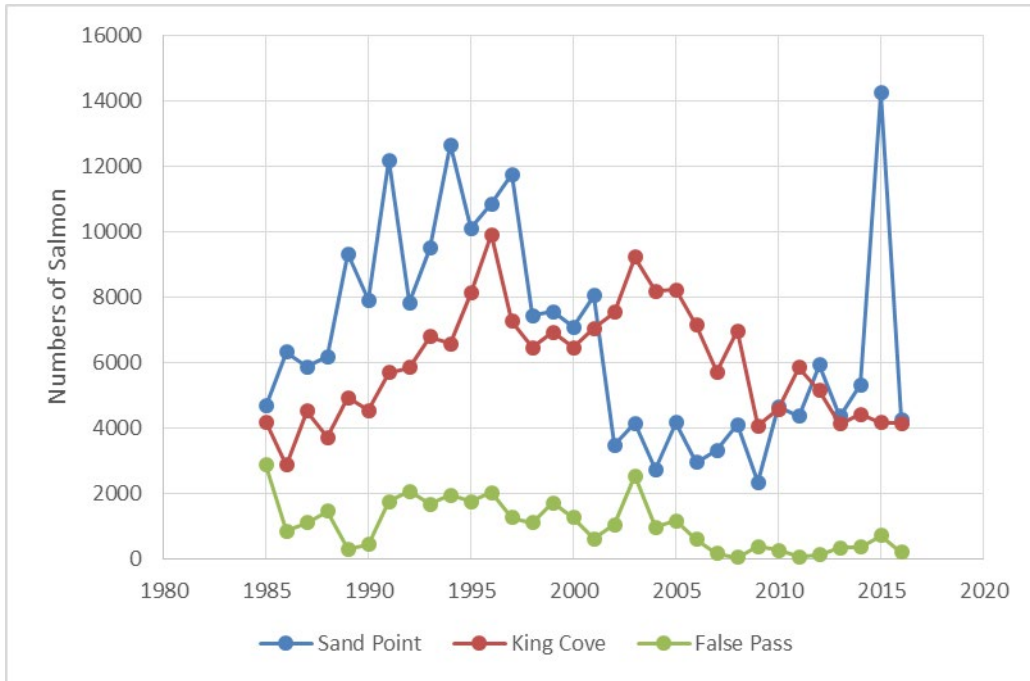
The fishermen and families of these Aleutians East communities have made commercial salmon fishing a large part of their cultural foundation. They have strong historical relationships to fishing commercially and combine commercial and subsistence harvesting practically and conceptually. These communities have struggled to demonstrate their legitimacy as indigenous commercial fishermen where, generally speaking, the state’s Board of Fisheries and the North Pacific Fishery Management Council tend to treat

these two worlds separately. Native Alaskans are often cast as *either* Native village-based subsistence harvesters *or* non-Native community resident and transient commercial harvesters. Sand Point, King Cove, and False Pass blend these practices such that a great of subsistence harvesting is primarily possible by using commercial gear.

The ADF&G Subsistence Division has conducted several subsistence surveys in these villages over the years, only a few of which are comprehensive (Fall, et al. 1993a; Fall, et al. 1997; Fall and Shanks 2000; Fall, et al. 1993b; Fall, et al. 1993c; Wolfe and Bosworth 1994; Wolfe, et al. 1984; Wolfe and Walker 1987). Annual management reports contain subsistence information as well (Fox, et al. 2018; Hartill and Keyse 2010). These sources provide harvester characteristics, numbers, methods and locations for salmon, halibut, sea mammals and other species in each village, but lack a comprehensive appreciation of individual, local and regional dynamics. This is an under-documented region relative to other areas of Alaska both ethnographically and profiling subsistence use. Travel challenges due to weather and costs have been impediments to systematic research by the state but the author has been research active in these communities for two decades, and has demonstrated that commercial and subsistence fisheries are critical parts of the structure and function of the communities. These studies also demonstrate frequent and vast sharing networks, indicating that they are a valuable tool in understanding the vulnerability and resilience of these communities and of the region as a whole.

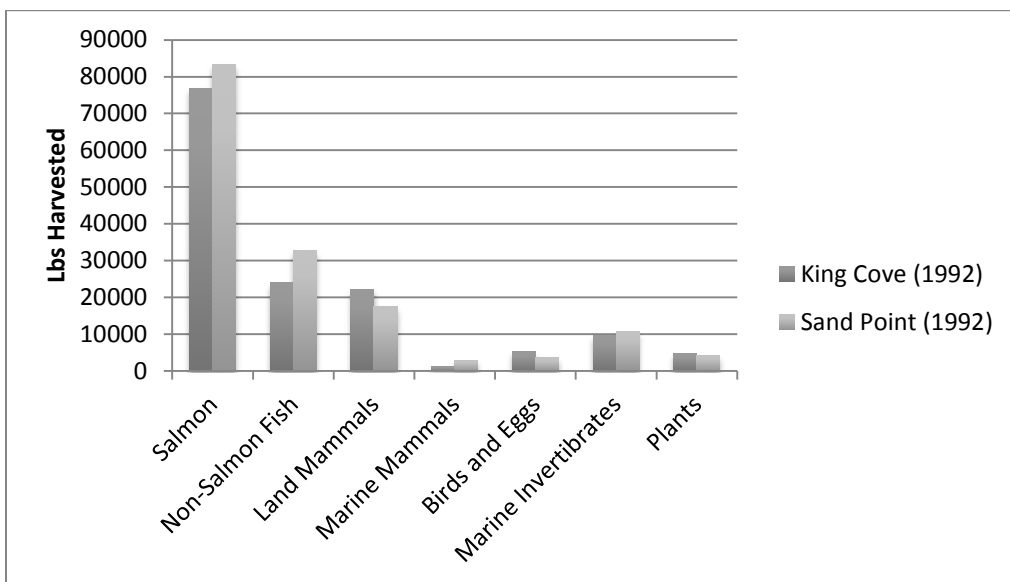
The majority of subsistence harvests in these communities occur in the context of commercial fishing (Reedy-Maschner 2010). Subsistence is vital to these communities and they have their own local and regional traditions that are based on family history, local knowledge, cooperative activities, and supported through wage earning and commercial fishing. Salmon are both removed from commercial catches for home use and harvested directly using a variety of methods such as rod-and-reel and beach seine. A great deal of other harvesting occurs while crews are in between fishing openers. Ethnographic summaries indicate occasional year round sea mammal hunting; summer fishing for salmon and other fish; spring/fall bird and egg harvesting; caribou hunting when legal; and a wide variety of marine invertebrates and plants in use. Restricting commercial fishing has negative effects on the ability to harvest subsistence foods.

Data from the Alaska Department of Fish & Game provide periodic subsistence harvest numbers for all five species of salmon for each community (Figure 28). These are underestimates because not every household requests or returns completed permits. Salmon are a major subsistence resource for all communities and are harvested from June to September. The contrasting abundances of harvest between villages are a function of community size and reporting.



**FIGURE 28 SALMON SUBSISTENCE HARVEST DATA (# OF FISH) BY COMMUNITY, 1985-2016 (FOX, ET AL. 2018).**

Figure 29 shows relative harvest abundance data in pounds by species category for King Cove and Sand Point from 1992. These are the most current data available from the Alaska Department of Fish & Game. In both communities, salmon are the dominant subsistence species in pounds harvested. A restriction in commercial fishing time and area translates into a restriction on subsistence harvesting of salmon and all other species except berries and plants.



**FIGURE 29 AVERAGE SUBSISTENCE LBS. HARVESTED BY SPECIES CATEGORY AND COMMUNITY FROM THE MOST RECENT TIME COMPREHENSIVE SURVEYS WERE CONDUCTED, 1992 (SOURCE: ADF&G CSIS).**



**FIGURE 30 KING COVE VESSEL DRYING SALMON WHILE COMMERCIAL FISHING. PHOTO BY KATE REEDY.**

#### PRELIMINARY RESULTS OF THE OSM STUDY

The study in progress for the Office of Subsistence Management on “*Western Gulf of Alaska Salmon and Other Harvests on Federal Lands and Waters*” documents and analyzes subsistence harvests in two Aleut/Unangan communities, Sand Point and King Cove, and one mixed community, Cold Bay. The study is collecting and analyzing detailed harvesting and sharing information, addressing the relationship between communities and subsistence resources and the effects of potential disturbances to access (Table 2). This project uses social network analysis to understand sharing, redistribution, and vulnerabilities. Household economic data, other income, assets, kinship, harvest locations, and reporting to management are also included in the survey. Compilations of existing qualitative and quantitative data are being made on the known history and modern role of food harvesting and distribution. This includes an understanding of current management systems and preliminary identification of some of the data shortcomings needed to assist in the management of subsistence harvesting. The project also addresses resource access concerns on federal lands and waters, and the local relationship with the national wildlife refuges.

**TABLE 2 HOUSEHOLDS SURVEYED FOR THE OSM STUDY.**

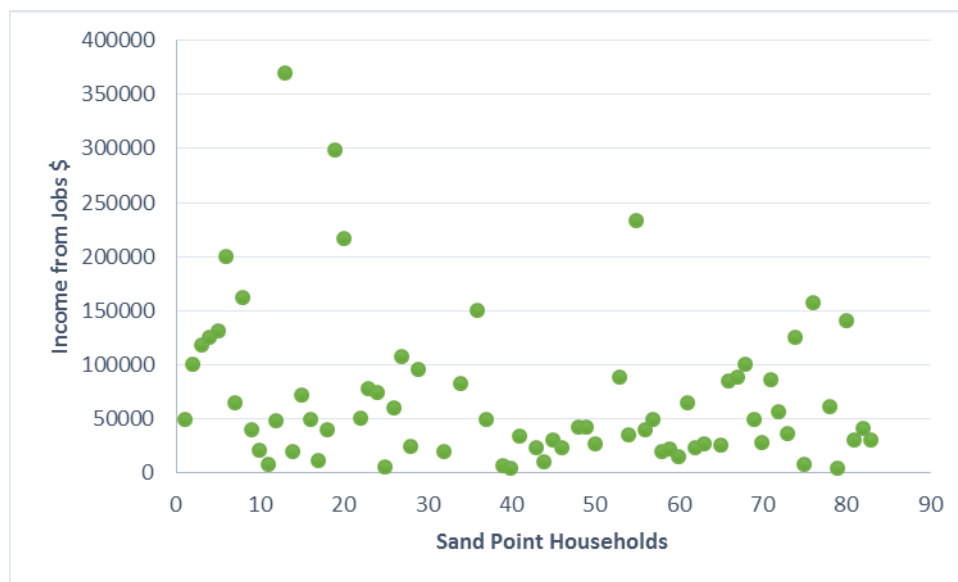
Community	Total Households	Surveyed Households
<b>Sand Point</b>	248	101
<b>King Cove</b>	180	44



## INCOME VERSUS EXPENSES

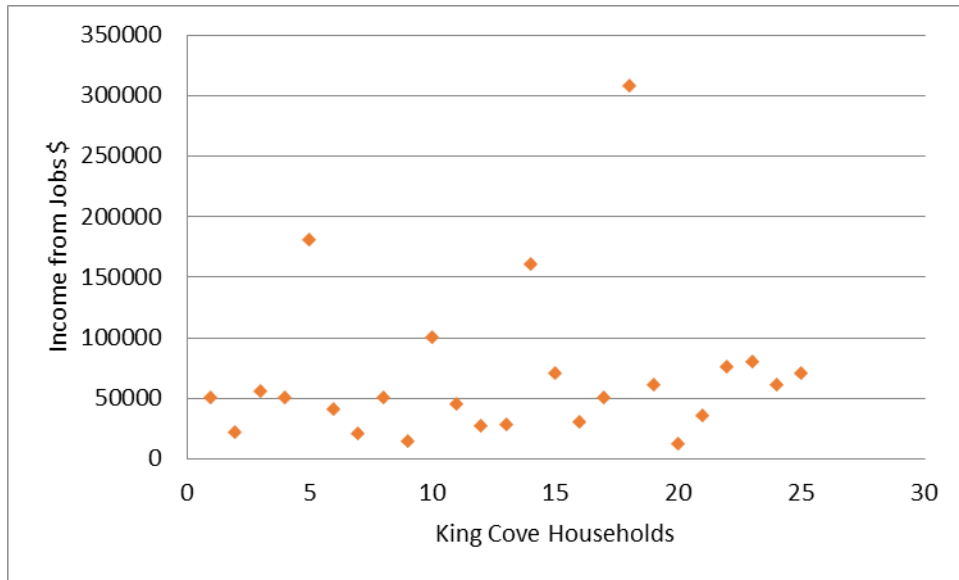
The project tracked income and expenses in a year to consider household needs and sustainability. Food security is a serious issue for some households. One resident stated, “It’s so expensive at the grocery store, you are paying \$100 every time you go there, you have to do subsistence.” Another said, “The price of food at store is going up,” indicating the hardship that will bring. Still another resident said, “I don’t ever want to get to the point where I need to rely on store-bought food,” signaling that the role of subsistence is significant. Fish and berries are their favorite wild food resources. Berries are harvested by everyone because they are in the villages and attainable by all. Several households reported that they spend “way too much” on groceries because they cannot go harvest. Several were concerned that store prices keep rising.

Of the 101 households surveyed in Sand Point, 71 reported their annual income from employment. Average household wages earned for this sample in 2017 is \$70,000. Income disparities are significant with the highest salary at \$370,000 and the lowest at \$5,500 (Figure 31). Income and financial support from other sources was also collected, such as Native corporation dividends, food stamps, social security, child support, and energy assistance. These supplements added an average of \$7,500 to household accounts.



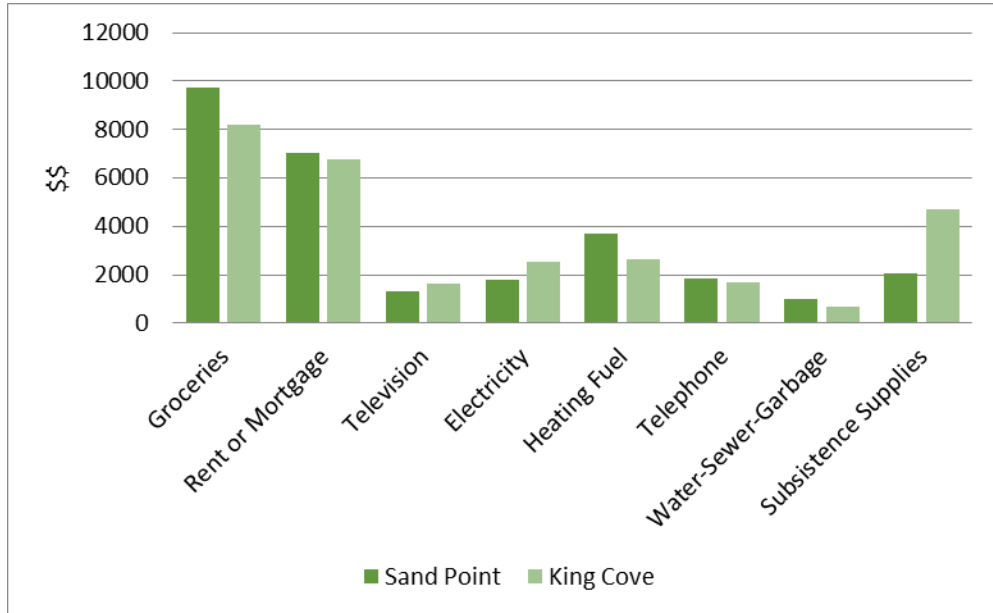
**FIGURE 31 REPORTED HOUSEHOLD INCOMES FROM EMPLOYMENT IN SAND POINT, 2017.**

Of the 44 households surveyed in King Cove, 25 shared their income information. Average household wages earned from this sample in 2018 was \$67,500, again with significant income disparities between \$300,000 and \$12,000 (Figure 32). Supplement sources such as Native corporation dividends, social security, and child support contributed on average \$6,300 per household.



**FIGURE 32 REPORTED HOUSEHOLD INCOMES FROM JOBS IN KING COVE, 2018.**

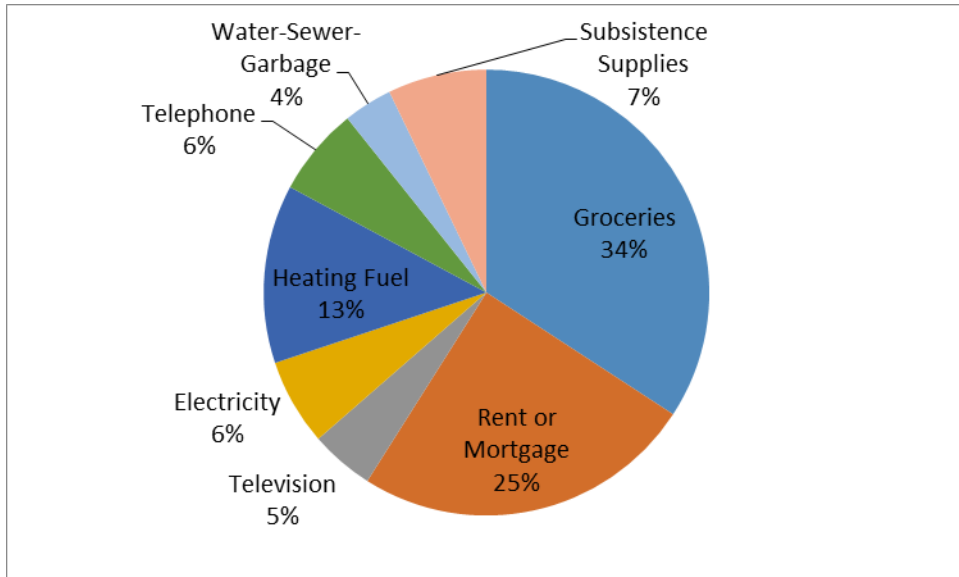
Only ten of the 101 households surveyed in Sand Point reported that they were enrolled in the food stamp program. Only five of the 44 households surveyed in King Cove reported they were enrolled in food stamps. This can signal a stigma of the program, a lack of understanding eligibility criteria, a lack of understanding the program altogether, or some other factors.



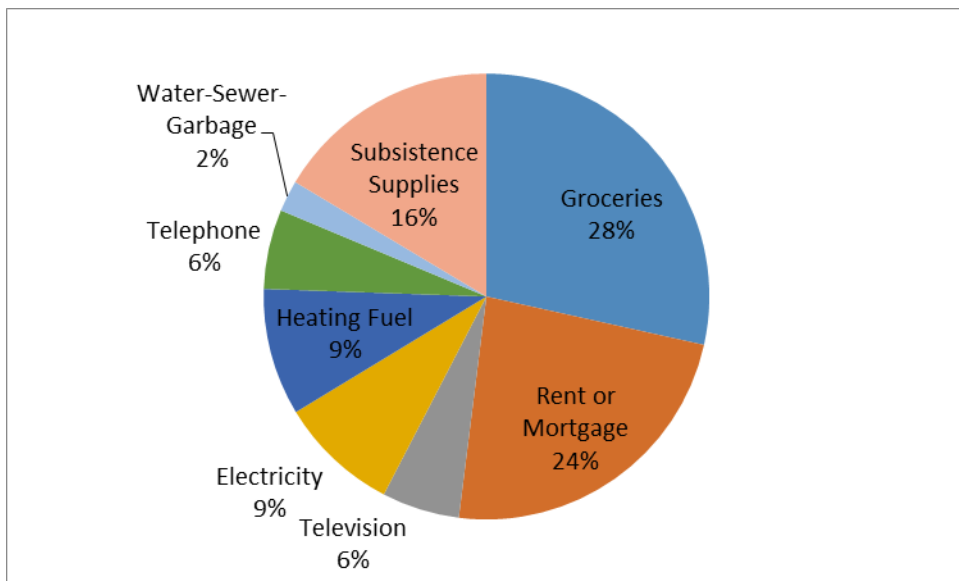
**FIGURE 33 HOUSEHOLD EXPENSES IN SAND POINT AND KING COVE, 2017 AND 2018.**

These are expensive communities in which to live and work. Groceries constituted the largest percentages of household expenses in Sand Point and King Cove (Figures 33, 34 and 35). Rent or

Mortgage represents the second largest percentage of expense. These two expense categories alone are more than half the total household expenses for each community.



**FIGURE 34 RELATIVE PERCENTAGES OF HOUSEHOLD EXPENSES, SAND POINT 2017.**



**FIGURE 35 RELATIVE PERCENTAGES OF HOUSEHOLD EXPENSES, KING COVE 2018.**

SALMON SUBSISTENCE HARVESTS, LOCATIONS, AND SHARING

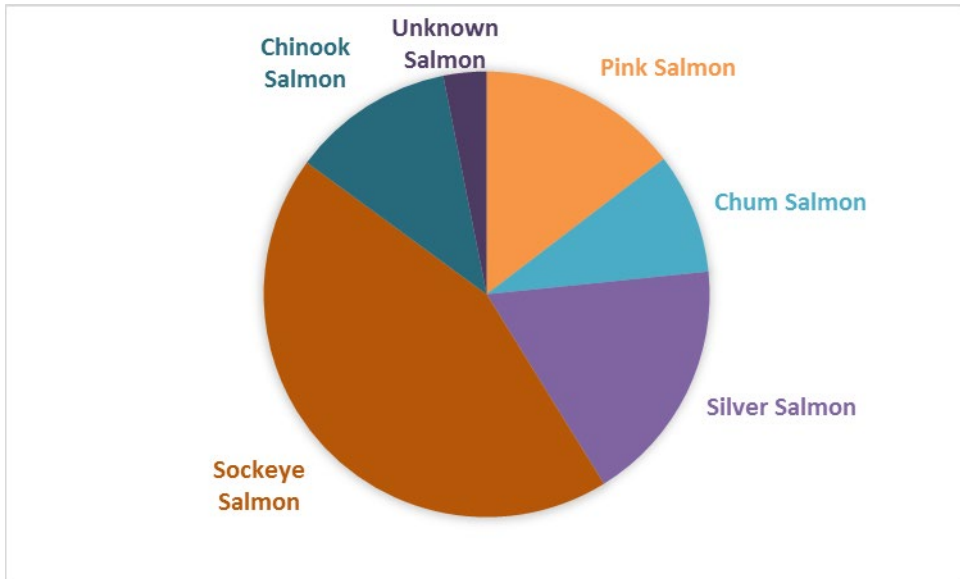


FIGURE 36 RELATIVE SALMON SUBSISTENCE HARVESTS, SAND POINT, 2017.

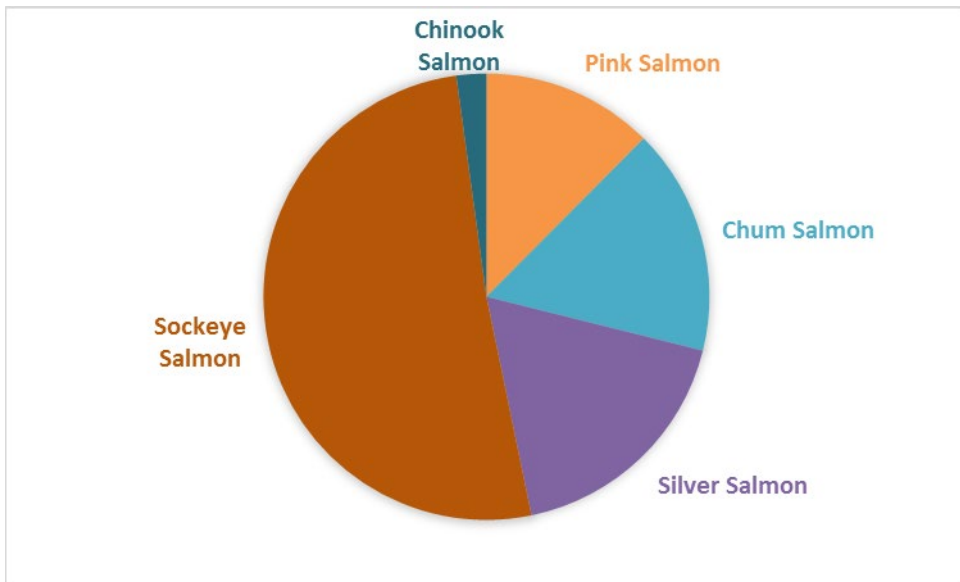


FIGURE 37 RELATIVE SALMON SUBSISTENCE HARVESTS, KING COVE, 2018.

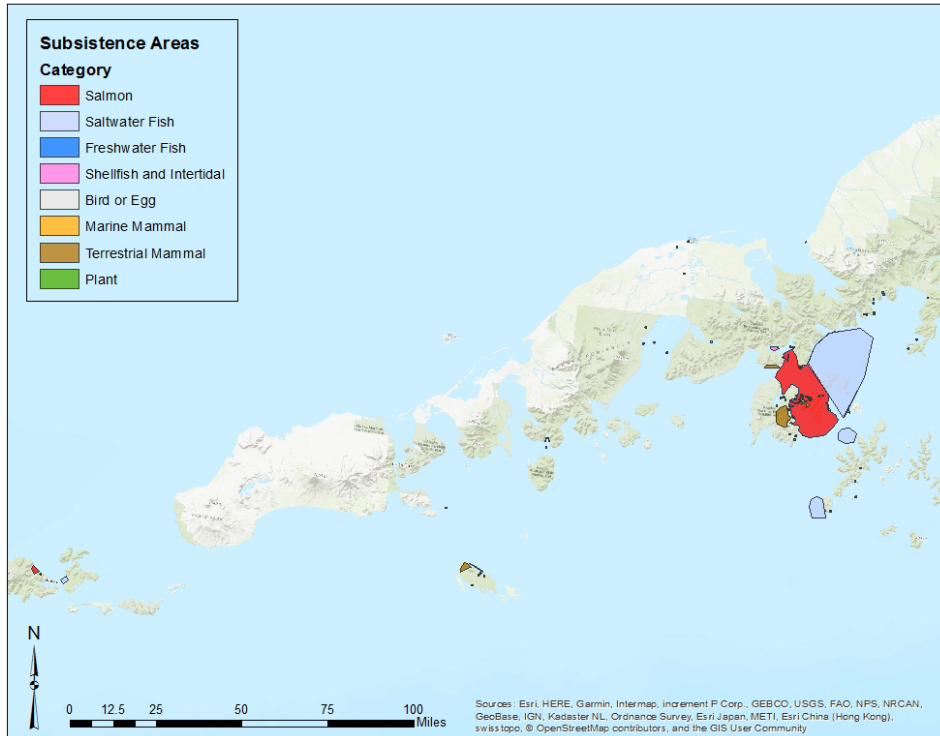


FIGURE 38 SAND POINT SUBSISTENCE HARVEST AREAS FROM HOUSEHOLD SURVEYS, 2017.

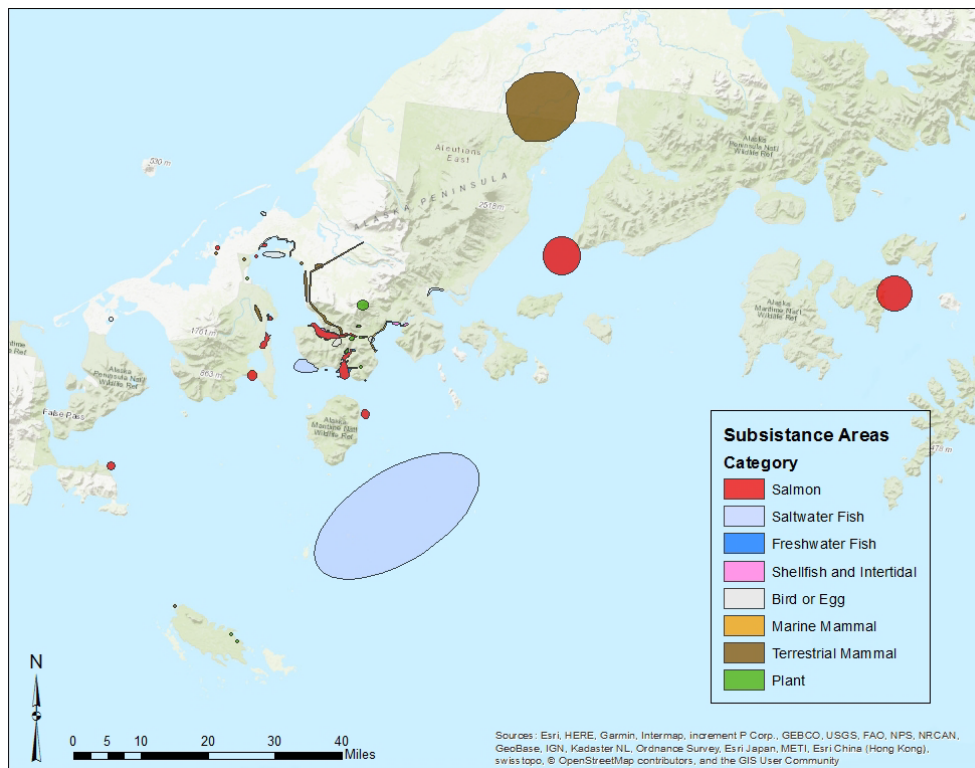
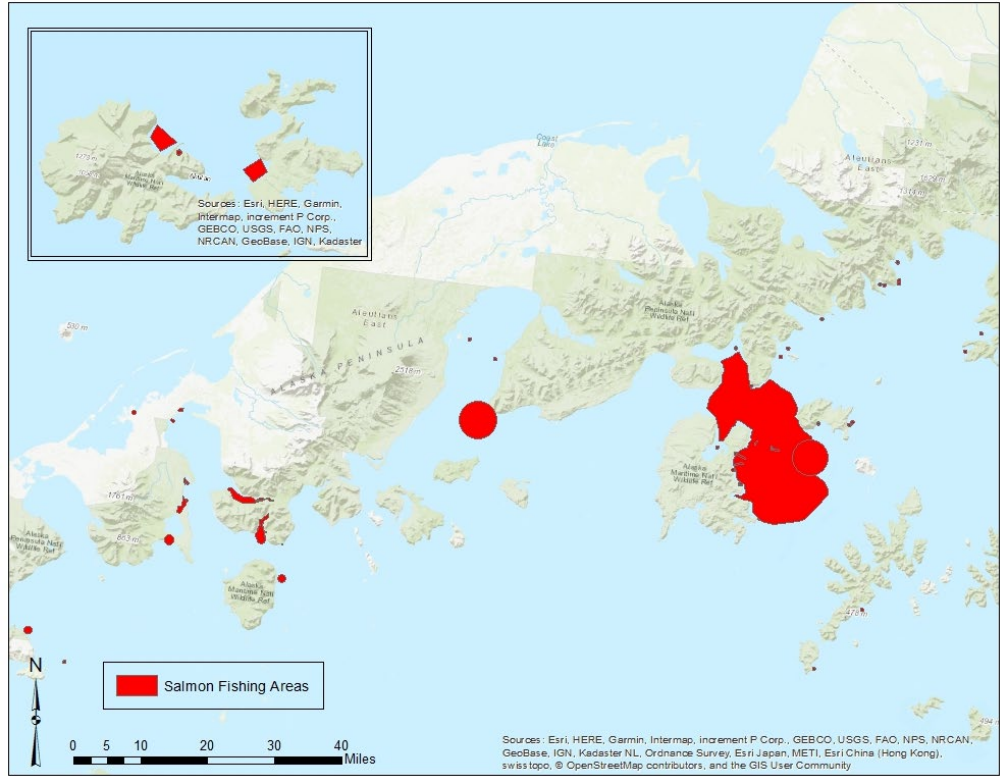


FIGURE 39 KING COVE SUBSISTENCE HARVEST AREAS FROM HOUSEHOLD SURVEYS, 2018.



**FIGURE 40 SALMON SUBSISTENCE HARVEST LOCATIONS FROM HOUSEHOLD SURVEYS IN SAND POINT (2017) AND KING COVE (2018).**

Preliminary data from the OSM project indicate vast sharing networks of wild foods and salmon in particular. Generally, the data show that there are a smaller number of key harvesters, typically vessel owners and crewmen, who have better access to variety and quantity of different wild foods. Although from a previous project a decade and a half ago, the diagram below is an example of a social network from the community of King Cove, Alaska, in 2004 (Figure 41). The chart is organized around five sisters ( $S_{A-E}$ ), with  $S_A$  as the primary matriarch.  $Br^{1-4}$  indicates four of their brothers,  $S$  indicates “Son of,” and  $D$  indicates “Daughter of”. Vessel symbols within a circle indicate that the person has a commercial salmon permit and boat. Fish indicate in whose hands the bulk of salmon first land when brought to shore. Arrows indicate movement of fish, with the thickness indicating relative quantity. Shaded circles indicate where the fish stops, meaning these are children, elders or others who through life’s circumstances do not contribute back into the network with fish products procured on their own. This chart shows that sharing networks are large multi-household, multi-vessel systems in which fish flow in every direction. Disruptions in one section through, for example, a death in the family, loss of permit, loss of boat, illness, or other cause, can often be compensated for by others in the network. This is an example of the kinds of data the current OSM project will produce showing relationship strengths, interaction, kinship, and assets in Sand Point and King Cove. The project is examining, modelling, and quantifying social networks surrounding subsistence related resources via production, processing, distribution, and consumption. This will allow for modelling changes following potential threats to the network, such as loss of time and area in salmon fisheries, consolidation of the fleet, fewer crew jobs, and other impacts.

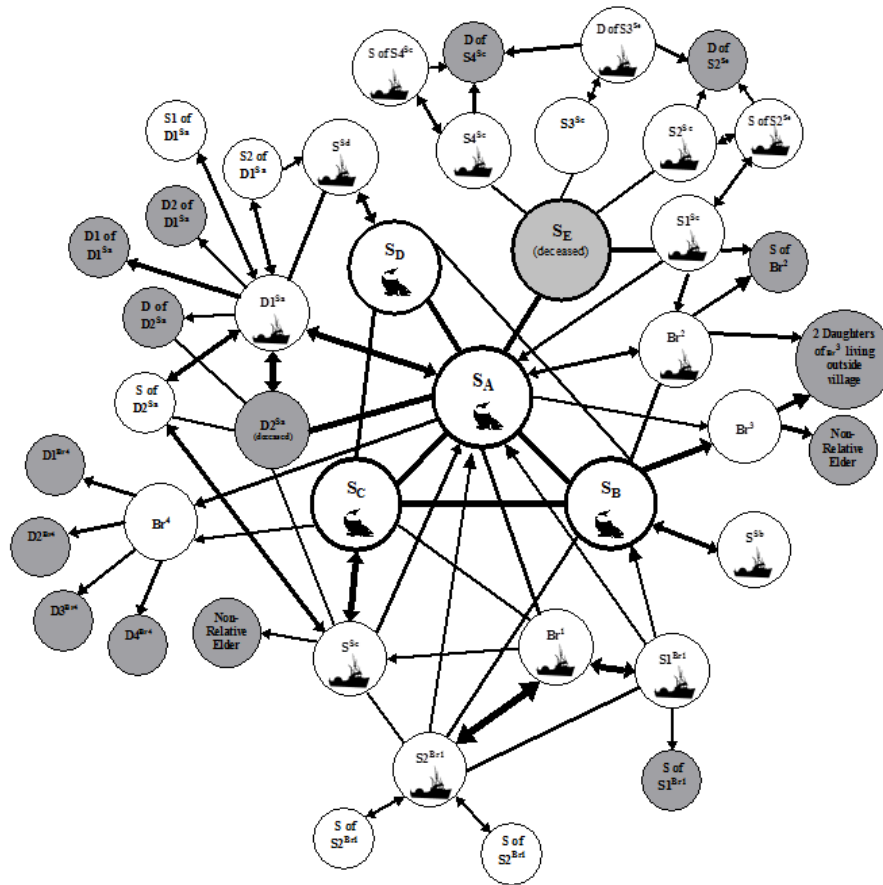


FIGURE 41 EXAMPLE OF A PORTION OF A SALMON SHARING NETWORK FROM KING COVE, 2004.

#### SALMON INTERVIEWS

Several recurring themes emerged from the household surveys and interviews relative to the salmon fisheries. The first is the love of salmon as an important food. Salmon is listed as the top, or one of the top, wild foods by every household interviewed. Sockeye are most often eaten fresh and kippered or smoked and jarred. Coho are frequently eaten fresh and salted. Salmon eggs are turned into *chisu*, a mixture of eggs, onion, salt and pepper. Some salmon are pickled. One household noted there are, “never enough sockeye.” The relationship between commercial and subsistence fishing is clear in these interviews. For example, pinks and chums are dried on the boat and taken home to share. One man said, “It [the chinook] came back to port, but went back to the boat as fish pie.” The importance of sharing was a large part of the subsistence discussions within the community, between communities, and “outside”. Salmon strips are favorite gifts. Jarred salmon are a high value barter item. However, when households are stressed financially, they are less likely to be able to share. One fishermen said, “Subsistence is a year round thing if you want to stay alive.”

The second theme is the love of salmon as a commercial fishery. “You’ve got to pay me to kill fish,” joked one crewman. They love the competition between fishermen, the excitement and challenges of the work, working alongside friends and family members, and carrying on their cultural traditions.

The third is a profound concern for future generations of fishing. If salmon fishing is lost, they can expect high rates of outmigration just for survival. But that comes with another set of challenges. One mother and grandmother said, “Most will do salmon. A few will go into other fisheries. Few kids are interested in college. Money is good fishing. They’re here; they’re comfortable. It’s scary out there.” Others mention the high costs of entry level in salmon fishing. Young men and women must inherit permits and vessels if they hope to have their own operations since buying in extremely costly.

A fourth major theme is a concern for not getting as much salmon as they need, and always “wanting more reds” were frequently mentioned. Once household head in Sand Point said, ““The wild food we had just did not last and we could not get more [during the months December – May, and they noted Salmon specifically].” Because so much salmon harvesting for homepack is dependent upon commercial fishing, some simply do not have the resources to be able to fish. Some elders in King Cove were not harvesting salmon because you have to travel out. They mentioned needing to take the ferry from King Cove to Cold Bay to do subsistence sockeye harvests. Otherwise, need a boat. As one elder said, “You have to get down to the dock at the right time, and by the time we get to the dock it’s gone. .... We didn’t ask [for fish] but friends were kind. You have to go to the harbor and beg for it.” A few people in King Cove noted that having to hold an 8-5 job can making salmon fishing difficult. “There’s not enough time to harvest.” Some in Sand Point and King Cove were buying their salmon from Trident and Peter Pan! Several interviewees would like to see the subsistence “bag limit” of 250 reds increased.



**FIGURE 42 TENDER DELIVERY OF SALMON, FALSE PASS, ALASKA, 2012. PHOTO BY KATE REEDY.**



## FORECASTING THE EFFECTS OF SALMON FISHING LOSS: TEMPERING THE BURDEN OF CONSERVATION

If no changes are made to the current management plans, the Area M fishermen can expect to continue to withstand the volatility of salmon returns, costs, market changes, climatic effects, and unknown factors that make each year of salmon fishing a gamble. Residents of Sand Point, King Cove, and False Pass are deeply entrenched in their communities and have weathered a great deal of change in the fishing business, and salmon fishing in particular. In the past few decades, the Alaskan salmon fishing industry has experienced major shifts in participation, effort, marketing, value, aquaculture, and consumption (e.g. <http://fishermen.alaska.edu/turning-the-tide>) (Donkersloot and Carothers 2016). These fishermen draw on their heritage as indigenous peoples and as descendants of pioneering cod fishermen. As coastal fishing communities, there are no lucrative economic alternatives to possibly engage in.

In projecting the effects on the communities of Sand Point, King Cove, fishermen and families, and AEB of restrictions, the section considers salmon dependencies of the *past five years*. If the salmon fisheries were to be closed down, although an extreme scenario, captains and crew would *lose 55% of their fishing income in Sand Point and 61% would be lost in King Cove*. The Aleutians East Borough would *lose between 14% and 29% of their tax revenue* that supports governance and social services in the region. Sand Point and King Cove would lose the vast majority of their fishing fleets. Fish taxes from commercial salmon fishing in King Cove and Sand Point are *92% of the total salmon landing taxes* accrued by those communities to the Aleutians East Borough since 2014 and *18% of the total taxes from all fishing* in the Borough since 2014. Adding in False Pass, and salmon landing taxes are *99% of the total salmon taxes in the Borough and 19% of the total taxes* from all fishing since 2014 in the Borough. These funds also keep schools open in under-enrolled communities, ultimately keeping young families in their home villages and maintaining strong traditions.

*Every fishery is critical to these communities for their survival.* Because of the volatility of salmon, one mother in Sand Point said in 2017, “These communities live and survive off groundfish now. Everything does. PenAir, the stores, schools. We have a hell of a time keeping kids in schools. We get X amount of dollars from the state. False Pass and Cold Bay are teetering. Everybody is moving out. This all trickles down to all other thing if there is no [salmon] fishing. If we don’t get fish, your wife doesn’t work at the store; your daughter doesn’t work at PenAir.”

In the event of a major decline in access to the salmon fisheries, we can expect Sand Point and King Cove to experience massive outmigration and be reduced to only a few families. We can expect a break in cultural and historical traditions, and connections to the land and sea, which would constitute a major loss to the Aleut people. Smaller communities such as False Pass would simply close down and people would be forced to relocate to the other villages or to Anchorage. Negative population trends and school enrollments in the Aleutians East Borough would accelerate. This outmigration would shift a burden on social services to Anchorage. The processing workforces would be cut dramatically and the plants likely would not be able to operate year round as they currently do in Sand Point and King Cove.

Vessels would be sold or left to rust. Families in Anchorage and elsewhere who depend upon villagers to supply them with subsistence foods would be disconnected from the foods of home.

Most of the men in these communities grew up on the boats and learned the skills of fishing. They are hard workers, but not formally trained in other skills, very few have college degrees, and they would have to start completely over somewhere else. Although not every Aleutians East child wants to grow up to be a fisherman, every child has a profound understanding of the business of fishing and what it means to the future of their villages. These children and the older generations would lose that foundation and encounter a way of life they do not want to engage in, and in places they do not want to live. Fear and uncertainty is already a constant condition in the salmon fishing business. It is the hope of these communities that the Board of Fisheries makes decisions that support their culture, lifestyle, community health, emotional health, and financial well-being. It is further the hope of these communities that the Board of Fisheries takes a long-view of the management plans, sees their success overall, and does not bend to reallocating fish to other areas because of short-term changes in the ecosystem.

The marine ecosystem has provided for the livelihood of Aleut/Unangan people for thousands of years and today the marine ecology of the North Pacific is considered among the world's richest marine environments. It is nevertheless subject to short-term climatic effects and unique events that cause concern for fishermen and communities.

In a 2018 interview with Sam Cotten by *Pacific Fishing*<sup>2</sup>, the Commissioner described an "uneven" sockeye season and the Chignik sockeye crisis. Cotten described the season with 114 million salmon harvested with about 50 million that were sockeye. Bristol Bay had its best season ever with both the largest run on record and the highest ex-vessel value ever. Sockeye was excellent statewide whereas pink harvests were very poor. There are indications from around the state that the "norms" are changing with delayed runs in several prime fishing sites. The "warm blob" in the Pacific Ocean has been recorded since 2013, and the salmon smolt entering the ocean could be a reason for the disparity between salmon productivity in Bristol Bay and on the south side of the Peninsula.

In regards to Chignik, the Commissioner stated,

"Sockeye salmon returned to the Chignik River in very low numbers in 2018, and early-run escapement objectives were not met. In response to the poor 2018 Chignik river sockeye salmon early run, the department took an unprecedented management action by restricting the Area M June South Unimak and Shumagin Islands fishery. The department took additional action in the post-June fishery (mid-July) by leaving a portion of the Dolgoi Island area closed during scheduled fishing periods.

Additionally, in early July, Chignik Area fishermen petitioned the Alaska Board of Fisheries to take emergency action in portions of Area M to protect the remainder of the 2018 Chignik River sockeye salmon run. The board determined the unexpectedly poor 2018 Chignik River sockeye

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<sup>2</sup> [http://www.pacificfishing.com/featured\\_stories/1118\\_story2.html](http://www.pacificfishing.com/featured_stories/1118_story2.html)

salmon fishery represented an emergency. Board members adopted emergency regulations extending the department's existing closures in Area M through early August unless late-run interim escapement objectives were being met.

In addition to these restrictions, Kodiak Area fisheries where relatively high proportions of Chignik-bound sockeye salmon are known to be present (Cape Igvak) were not opened, according to the management plan. Fortunately, the Chignik River late-run escapement goal and in-river run goal, meant to provide in-river subsistence fishing opportunity, were both met.

Salmon of diverse origins migrate through waters of the Kodiak, Chignik, and Alaska Peninsula management areas each summer. Concern for biological and allocative impacts of mixed stock salmon fisheries generates ongoing debate among the Board of Fisheries, members of the public, and the department. The challenge is to ensure escapement needs are met, while providing reasonable and fair fishing opportunity, without overly restricting traditional fisheries. ***While the 2018 Chignik sockeye salmon return clearly created an economic disaster, we don't believe the situation was significantly worsened by fishing in adjacent areas.*** [emphasis added]

Another short-term ecological and economic disaster was used to reallocate fish away from Area M in 2001. Area M was targeted over poor chum and king salmon returns in the Arctic-Yukon-Kuskokwim (AYK) as an "intercept fishery," that is, they harvest a mixed stock of salmon in the ocean returning to rivers in Area M but also other areas of Alaska. At that time, the Board of Fisheries had moved the start date of the June fishery further into the month to avoid the bycatch of chums presumed to be traveling to Western Alaska. Fishing openers were shortened and the returns of fish were uncertain. The effects on the local communities were profound. King Cove and Sand Point permit holders typically hire local family and community members and some outsiders to crew on their vessels, but crew jobs are not always desirable in poor fishing year. Many men were struggling to find work that could support their families. Young people were questioning whether they could take over the family fishing operations. Some men left the communities for work, leaving their families behind. In several cases, entire families had to relocate to Anchorage. Some of these relocations were temporary, but several families did not return. The restrictions were lessened three years later. Since that time, the Area M management plan has not experienced that level of restriction and western Alaska chum salmon runs are currently performing well. This might indicate that short-term ecological changes or single events are best managed with Emergency Order authority of Fish & Game, not used to impose unnecessary harm on a neighboring fishery when a re-allocation of fishing opportunity is unlikely to result in conservation benefits to areas that are struggling.

## AUTHOR

Dr. Katherine Reedy is a Professor of Anthropology at Idaho State University. She earned a Ph.D. in Social Anthropology from the University of Cambridge and has worked in Aleut and Alutiiq communities for 20 years on fisheries-related issues. She has served on the Scientific and Statistical Committee of the NPFMC since 2011. She is the author of *Aleut Identities: Tradition and Modernity in an Indigenous Fishery* (2010) McGill-Queen's University Press.

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## REFERENCES CITED

Aradanas, Clarito, and Jennifer Sepez

2009 Accommodating Cultural Diversity in the Alaska Seafood Processing Industry: the Transformation to a More "Welcoming Workplace". *In* Quarterly Report. Pp. 5-8. Seattle: Alaska Fisheries Science Center.

Bergsland, Knut

1959 Aleut Dialects of Atka and Attu. *Transactions of the American Philosophical Society* 49(3):1-128.

1998 Ancient Aleut Personal Names, Kadaangim Asangin/Asangis: Materials from the Billings Expedition 1790-1792: Alaska Native Language Center.

Berreman, Gerald D.

1953 A contemporary study of Nikolski: an Aleutian village, University of Oregon.

Black, L.

1984 Atka: An Ethnohistory of the Western Aleutian Islands. Kingston, Ontario: The Limestone Press.

1987 Whaling in the Aleutians [French summary]. *Etudes Inuit Studies* 11:7-50.

Black, Lydia

2004 Russians in Alaska, 1732-1867. Fairbanks: University of Alaska Press.

Black, Lydia, et al.

1999 The History and Ethnohistory of the Aleutians East Borough. Fairbanks: University of Alaska Press.

Black, Lydia, and Natalia Taksami

- 1999 Belkofski. *In* The History and Ethnohistory of the Aleutians East Borough. B.e. al, ed. Fairbanks: University of Alaska Press.
- Carothers, C., and C. Chambers
- 2012 Fisheries privatization and the remaking of fishery systems. *Environment and Society: Advances in Research* 3:39-59.
- Carothers, Courtney
- 2010 Tragedy of Commodification: Displacements in Alutiig Fishing Communities in the Gulf of Alaska. *MAST* 9(2):95-120.
- Donkersloot, Rachel, and C. Carothers
- 2016 The graying of the Alaskan fishing fleet. *Environment: Science and Policy for Sustainable Development* 58(3):30-42.
- Fall, J.A., et al.
- 1993a Noncommercial Harvests and Uses of Wild Resources in King Cove, Alaska, 1992: Division of Subsistence, Alaska Department of Fish and Game.
- Fall, J.A., et al.
- 1997 Subsistence harvests and uses of birds and eggs in four communities of the Aleutian Islands area: Akutan, False Pass, Nelson Lagoon, and Nikolski. ADF&G Division of Subsistence, Technical Paper No. 243.
- Fall, J.A., and R. Shanks
- 2000 Statewide Subsistence Fisheries Harvest Monitoring Strategy. S.n.F.-. Report to the Office of Subsistence Management, ed.
- Fall, James A., et al.
- 1993b Noncommercial harvest and uses of wild resources in Sand Point, Alaska, 1992: ADF&G Division of Subsistence.
- Fall, James A., et al.
- 1993c Noncommercial harvest and uses of wild resources in King Cove, Alaska, 1992: ADF&G Division of Subsistence.
- Fox, Elizabeth, Colton Lipka, and Lucas Stumpf
- 2018 South Alaska Peninsula Salmon Annual Management Report, 2017 and the 2016 Subsistence Fisheries in teh Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands Management Areas. Juneau: Alaska Department of Fish and Game, Division of Commerical Fisheries.
- Hartill, Trent, and Matthew Keyse
- 2010 Annual summary of the commercial, subsistence, and personal use salmon fisheries and salmon escapements in the Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands Management Areas, 2009. Alaska Department of Fish and Game, Fishery Management Report No. 10-21, Anchorage.
- Himes-Cornell, A., and S. Kasperski
- 2014 GOA Groundfish Trawl Bycatch Management: Voluntary Social Survey draft report.
- Hoffman, Brian

- 1999 Agayadan Village: Household Archaeology on Unimak Island, Alaska. *Journal of Field Archaeology* 26:147-162.  
Hooper, C.L.
- 1897 Report on the Sea-Otter Banks of Alaska. T.D.D. 1977, ed. Washington, D.C.: Government Printing Office.  
Hudson, Ray
- 1998 Moments Rightly Placed: An Aleutian Memoir. Fairbanks: Epicenter Press.  
Jacka, Jerry
- 1999 Fishing. *In* The History and Ethnohistory of the Aleutians East Borough. L. Black, S. McGowan, J. Jacka, N. Taksami, and M. Wright, eds. Pp. 213-242. Fairbanks: University of Alaska Press.  
Jochelson, Waldemar
- 1933 History, Ethnology, and Anthropology of the Aleut. Volume 432. Oosterhour, The Netherlands: Carnegie Institute of Washington.  
Knapp, Gunnar
- 2004 Innovation in Alaska Fisheries Management (and Why Innovation Isn't Always Popular).  
Kohlhoff, Dean
- 1995 When the Wind was a River: Aleut Evacuation in World War II. Seattle: University of Washington Press.  
Koslow, A.
- 1986 Limited Entry Policy and Impacts on Bristol Bay Fishermen. *In* Contemporary Alaskan Native Economies. S. Langdon, ed. Pp. 47-62. Langham, MD: University Press of America.  
Langdon, Stephen
- 1980a Transfer Patters in Alaskan Limited Entry Fisheries: Final Report for the Limited Entry Study Group. Juneau: Alaska State Legislature.
- 2008 The Community Quota Program in the Gulf of Alaska: A Vehicle for Alaska Native Village Sustainability? *In* Enclosing the Fisheries: People, Places, and Power. C. Carothers and M.E. Lowe, eds. Pp. 155-194: American Fisheries Society.  
Langdon, Stephen J.
- 1980b Transfer Patterns in Alaskan Limited Entry Fisheries. Final Report for the Limited Entry Study Group of the Alaska State Legislature.
- 1989 From communal property to common property to limited entry: historical ironies in the management of Southeast Alaska salmon. *In* A Sea of Small Boats. J. Cordell, ed. Cambridge, MA: Cultural Survival, Inc.  
Lantis, Margaret
- 1984 Aleut. *In* Handbook of North American Indians. D. Damas, ed. Pp. 161-184, Vol. 5. Washington, DC: Smithsonian Institution Press.  
Laughlin, W.S.
- 1980a Aleuts: Survivors of the Bering Land Bridge. New York: Rinehart and Winston.  
Laughlin, William

- 1980b Aleuts: Survivors of the Bering Land Bridge. New York: Holt, Rinehart and Winston.  
Liapunova, R.G.
- 1989 The Aleuts and their Ecosystem. *European Review of Native American Studies* 28:7-11.  
Liapunova, Rosa
- 1996 Essays on the Ethnography of the Aleuts at the End of the Eighteenth and First Half of the Nineteenth Century. Fairbanks: University of Alaska Press.  
Lowe, Marie E., and Gunnar Knapp
- 2007 Social and Economic Impacts of Crab Rationalization on Aleutian East Borough Communities: Report prepared for the Aleutians East Borough. Anchorage: Institute of Social and Economic Research.  
Maschner, H., et al.
- 2008 A 4,500 year time series of Pacific cod (*Gadus macrocephalus*): Archaeology, regime shifts, and sustainable fisheries. *Fishery Bulletin* 106(4):386-394.  
Maschner, H., et al.
- 2013 The Decline of Steller Sea Lions (*Eumetopias jubatus*) in the North Pacific: Insights from Indigenous People, Ethnohistoric Records, and Archaeological Data. *Fish and Fisheries*.  
Maschner, H.D.G., and B. Hoffman
- 2003 The Development of Large Corporate Households along the North Pacific Rim. *Alaska Journal of Anthropology*.  
Maschner, Herbert
- 1999a Prologue to the Prehistory of the Lower Alaska Peninsula. *Arctic Anthropology* 36(1-2):84-102.
- 1999b Sedentism, Settlement and Village Organization on the Lower Alaska Peninsula: A Preliminary Assessment. *In Settlement Pattern Studies in the Americas: Fifty Years since Viru*. B. Billman and G. Feinman, eds. Pp. 56-76. Washington, DC: Smithsonian Institution Press.
- 2000 Catastrophic Change and Regional Interaction: The Southern Bering Sea in a Dynamic World System. *In Identities and Cultural Contacts in the Arctic (Proceedings from a Conference at the Danish National Museum, Copenhagen, November 30-December 2, 1999)*. M. Appelt, J. Berglund, and H.C. Gulløv, eds. Pp. 252-265. Copenhagen, Denmark: Danish National Museum and Danish Polar Center.  
Maschner, Herbert, et al.
- 1997 The Archaeology of the Lower Alaska Peninsula: University of Wisconsin, Madison.  
Maschner, Herbert, and Katherine Reedy-Maschner
- 1998 Raid, Retreat, Defend (Repeat): The Archaeology and Ethnohistory of Warfare on the North Pacific Rim. *Journal of Anthropological Archaeology* 17:19-51.
- 2005 Letter from Alaska: Aleuts and the Sea. *In Archaeology*. Pp. 63-70, Vol. 58. US: Archaeological Institute of America.  
McCartney, Allen
- 1984 Prehistory of the Aleutian region. *In Handbook of North American Indians, volume 5, Arctic*. D. Damas, ed. Pp. 119-135. Washington: Smithsonian Institution Press.  
McGowan, Sarah

- 1999 Commercial Whaling at Akutan. *In* The History and Ethnohistory of the Aleutians East Borough. L. Black, ed. Pp. 265-278. Kingston, Ontario: The Limestone Press.  
Reedy-Maschner, K.
- 2009 Entangled Livelihoods: Economic Integration and Diversity in the Western Arctic. *Alaska Journal of Anthropology* 7(2):135-146.
- 2012 Deprivations amid Abundance: The Role of Salmon and "Other Natural Resources" in Sustaining Aleut Villages. *In* Keystone Nations: Indigenous Peoples and Salmon across the Northern Pacific. J. Brooks and B. Colombi, eds: School of Advanced Research.  
Reedy-Maschner, K. L., and H. D. G. Maschner
- 2013 Sustaining Sanak Island, Alaska: A Cultural Land Trust. *SUSTAINABILITY* 5(10):4406-4427.  
Reedy-Maschner, K., and H. Maschner
- 2012 Subsistence Study for the North Aleutian Basin, Final Report and Technical Summary. Pp. 428: U.S. Department of Interior, Bureau of Ocean Energy Management.  
Reedy-Maschner, Katherine
- 2001 Aleut Identity and Indigenous Commercial Economies: Local Responses Under Global Pressures in the Eastern Aleutians. *Alaska Journal of Anthropology* 1(1):62-82.
- 2004 Aleut Identity and Indigenous Commercial Fisheries, University of Cambridge, UK.  
Reedy-Maschner, Katherine L.
- 2010 Aleut identities : tradition and modernity in an indigenous fishery: Montréal : McGill-Queen's University Press, 2010.  
Reedy, K.
- 2018 The Last Cowboys: Keeping open access in the Aleut groundfish fisheries of the Gulf of Alaska. *Maritime Studies*.  
Reedy, K., and H. Maschner
- 2014 Traditional foods, corporate controls: networks of household access to key marine species in southern Bering Sea villages. *POLAR RECORD* 50(4):364-378.  
Reedy, Katherine
- 2015 Social Impact Assessment of the Western Gulf of Alaska Trawl Bycatch Management Plan. Pp. 105. Pocatello, Idaho: Aleutians East Borough.  
Shields, Captain Ed
- 2001 Salt of the Sea: The Pacific Coast Cod Fishery and the Last Days of Sail. Lopez Island, WA: Pacific Heritage Press.  
Spaulding, Philip
- 1955 An Ethnohistorical Study of Akutan: An Aleut Community, University of Oregon.  
Veniaminov, Ivan
- 1984 [1840] Notes on the Islands of the Unalashka District. L.B.a.R.H. Geoghegan, transl. Kingston, Ontario: Limestone Press.  
Wolfe, R.J., and R.G. Bosworth



- 1994 Subsistence in Alaska: 1994 update: Alaska Department of Fish and Game, Division of Subsistence.  
Wolfe, R.J., et al.
- 1984 Subsistence-Based Economies in Coastal Communities of Southwest Alaska: Division of Subsistence, Alaska Department of Fish and Game.  
Wolfe, Robert J., and Robert J. Walker
- 1987 Subsistence economies in Alaska: productivity, geography, and development impacts. *Arctic Anthropology* 24:56-81.