THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Fish and Game

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December 20, 2017

Jennifer Murrell
Alaska Department of Natural Resources
State Pipeline Coordinator's Section
3651 Penland Parkway
Anchorage, Alaska 99508

Dear Ms. Murrell:

The Alaska Department of Natural Resources (ADNR) received applications from Harvest Alaska for two pipeline Right-of-Way (ROW) leases. The Tyonek W-10 Gas Pipeline (Tyonek Pipeline) application is for the construction of a new natural gas pipeline from the Tyonek platform to Ladd Landing. The Cook Inlet Gathering System-A Marine Pipeline (CIGGS-A Pipeline) application is for the conversion of the CIGGS-A Pipeline from gas to oil. In this document, both projects are collectively referred to as the Cross Inlet Pipeline Extension Project (Cross Inlet Project). ADNR requested input from the Alaska Department of Fish and Game (ADF&G) for these projects on the following topics:

1.) Description of the Fish, Wildlife, and Biotic resources in the area.
2.) Description of Sport Fishing in the vicinity.
3.) Description of the Commercial Fishery in the vicinity.
4.) Description of Subsistence Use in the vicinity.
5.) ADF&G proposed mitigation measures.

ADF&G has reviewed the ROW lease applications and would like to provide the attached comments and information on ADF&G-managed resources for these projects. ADNR's ROW lease authority for these projects is for areas below mean high tide. ADF&G comments, including recommended mitigation measures, are therefore focused on marine waters, anadromous fish, and intertidal areas, with a few exceptions, such as including information for species that primarily live above the high tide line but may go below it for periods of time (i.e., bald eagles to feed). Any questions about these comments can be directed to Habitat Biologist Jeanette Alas at 267-2805 or jeanette.alas@alaska.gov.

Sincerely,

Jeanette Alas
Habitat Biologist

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Enc: ADF&G comments – Cross Inlet Project
Timing Concerns
Tyonek Harvest Use Table
Beluga Harvest Use Table
Nikiski Harvest Use Table
References Cited

Ecc: R. Benkert, ADF&G, Hab
K. Harper, ADF&G, Hab
B. Blossom, ADF&G, Hab
J. Rumble, ADF&G, CF
B. Marston, ADF&G, SF
B. Davis, ADF&G, Sub
S. Goodglick, ADF&G, WC
M. Marie, ADF&G, Hab
A. Ott, ADF&G, Hab
P. Shields, ADF&G, CF
L. Olsen, ADF&G, Sub
A. Wiita, ADF&G, Sub
M. Petrula, ADF&G, WC

1.) Description of the Fish, Wildlife, and Biotic resources in the area.

Fish

Cook Inlet supports an extensive diversity of both marine and freshwater fish species. Freshwater species in the streams near the Cross Inlet Project include Dolly Varden, lamprey, stickleback, longnose sucker, and rainbow trout. Marine species found in Cook Inlet include several species of forage fish and groundfish. Five species of Pacific salmon (Chinook, pink, coho, chum, and sockeye salmon) are found in marine and freshwaters of Cook Inlet (ADF&G 2017b; 2017j; 2017k).

Salmon

Reasonably large concentrations of the five species of adult Pacific salmon migrate through Cook Inlet beginning in early May through the summer into fall. All five species transit through the proposed Cross Inlet Project ROW migrating from south to north as they migrate to freshwater spawning areas north of the project sites. Juvenile Pacific salmon feed on drifting insects and other invertebrates in upper Cook Inlet during summer (Moulton 1997).

Most salmon spawn in freshwater with some pink salmon spawning in intertidal areas. Salmon spawning takes place between June and October, depending on the species. Eggs are typically deposited in the gravel of rivers where the eggs overwinter and then hatch in the spring. Pink and chum salmon emigrate to sea as fry soon after emerging from the gravel. Chinook, coho, and sockeye juvenile salmon spend one to four years rearing in freshwater before emigrating to sea (ADF&G 2017b; Moulton 1997). Smolts spend varying amounts of time in estuaries depending on the species and population. Sockeye, pink, and chum salmon then typically move offshore in the fall and little is known about their winter distribution, whereas coho and Chinook salmon tend to remain in more coastal environments along the continental shelf (Quinn 2005). Pacific salmon spend differing amounts of time in marine waters, typically one to four years, before returning to their natal streams to spawn (ADF&G 2017b; Quinn 2005). All salmon bound for their home waters in rivers of upper Cook Inlet pass through the project area, and outmigrating or rearing smolts may be found in nearshore waters throughout the year.

Marine Forage Fish

Many species of forage fish can be found in upper Cook Inlet waters, including Pacific herring, capelin, eulachon (candlefish or hooligan), longfin smelt, pond smelt, and Pacific sand lance (ADF&G 2017b). Forage fish are important prey species for birds, marine mammals, and commercially important fish and shellfish (5 AAC 39.212).

Groundfish

The saltwater groundfish are species that live on, in, or near the floor of Cook Inlet. These species include walleye pollock, Pacific cod, lingcod, sablefish (black cod), rockfish, and Pacific halibut. Sablefish, walleye pollock, and Pacific cod are schooling fish, and pollock and cod are important prey species for a variety of marine mammals (ADNR 2009; J. Rumble, Fishery Biologist, ADF&G Commercial Fisheries, Homer, October 26, 2017, personal communication).

Shellfish

Cook Inlet has four species of crab: Dungeness, golden king, red king, and at the mouth of the inlet, Tanner crab. These crab populations are distributed all along the southern coast of Alaska and the Bering Sea with annual migratory patterns. The coast of the inlet supports a large population of razor clams along sand beaches and mudflats along with an abundance of Sitka periwinkle and other

marine snails. Littleneck clams live on small beaches and prefer coarse sand or fine gravel mixed with mud, stones, or shells. Weathervane scallops can be found on mud, sand, or gravel substrate in water depths of 120 to 390 feet. Baltic macoma clams are widespread in intertidal areas of upper Cook Inlet and are a primary food source for migratory birds (ADF&G 2017f).

Amphibians/Reptiles

Alaska observes the occasional migration of four species of turtles, but the leatherback sea turtle is the only species whose range may include Cook Inlet. Leatherback turtle sightings in Alaska are uncommon, only 19 have been reported between 1960 and 2007. The wood frog is the only amphibian known to occur in the uplands and wetlands of Cook Inlet (ADF&G 2017h).

Wildlife

Terrestrial Mammals

Large terrestrial game mammals in the Cook Inlet area include moose, brown and black bear, caribou, wolf, mountain goat, and Dall sheep. Many small terrestrial mammals and furbearers are also found in the Cook Inlet area, including squirrels, voles, collared pika, snowshoe hare, shrews, little brown bats, hoary marmots, American mink, American marten, river otters, beavers, muskrats, porcupine, ermine, coyote, lynx, fox, and wolverine (ADF&G 1994; 2006; 2015; 2017d).

Marine Mammals

Beluga whales (*Delphinapterus leucas*) are managed by the National Marine Fisheries Service (NMFS). Cook Inlet beluga whales were listed as depleted under the Marine Mammal Protection Act of 1972 (MMPA) in 2000 (NOAA 2015a). NMFS issued a final determination to list the Distinct Population Segment (DPS) of beluga whales found in Cook Inlet as endangered under the Endangered Species Act (ESA), effective December 22, 2008 (NMFS 2008). In 2011, NMFS designated two areas in Cook Inlet as critical habitat for the ESA-listed population of Cook Inlet beluga whales, comprising 3,013 square miles of marine habitat (Figure 1). The offshore components of both proposed projects are within the boundary of Critical Habitat Area 2, which is used by belugas as dispersed fall and winter feeding and transit areas (NMFS 2011). The proposed new Tyonek Pipeline is also within the Susitna Delta Sensitive Area (Figure 2). This region is an area of high importance to Cook Inlet beluga whales, especially from mid-April to mid-October when large concentrations (sometimes >200 belugas) use this area for foraging, reproduction, and calving (CISCP 2017). Cook Inlet beluga whales are a high-priority Species of Greatest Conservation Concern for ADF&G (ADF&G 2015).

Cook Inlet beluga whales were an important part of subsistence diets for Alaska Natives, and unregulated hunts prior to 1999 likely contributed to the decline of this population. When hunting was regulated in 1999, NMFS expected the beluga population to increase.
While the rapid decline ceased, the population continued to decline. NMFS co-managed the subsistence use of Cook Inlet beluga whales with the Cook Inlet Marine Mammal Council for several years, but that council disbanded in 2012 and there are no current co-management agreements for this population (NMFS 2017a).

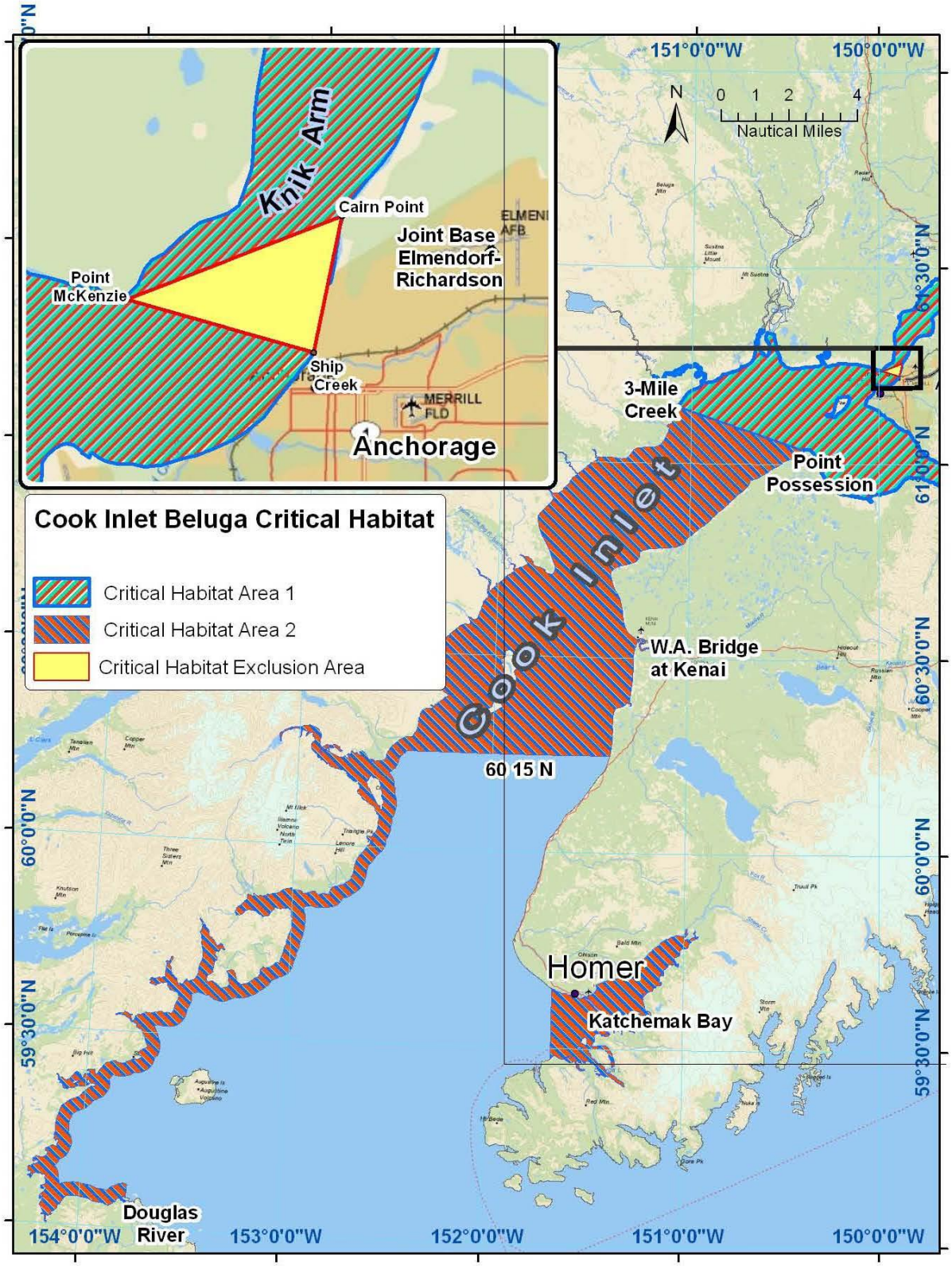


Figure 1. Designated Cook Inlet Beluga Whale Critical Habitat.

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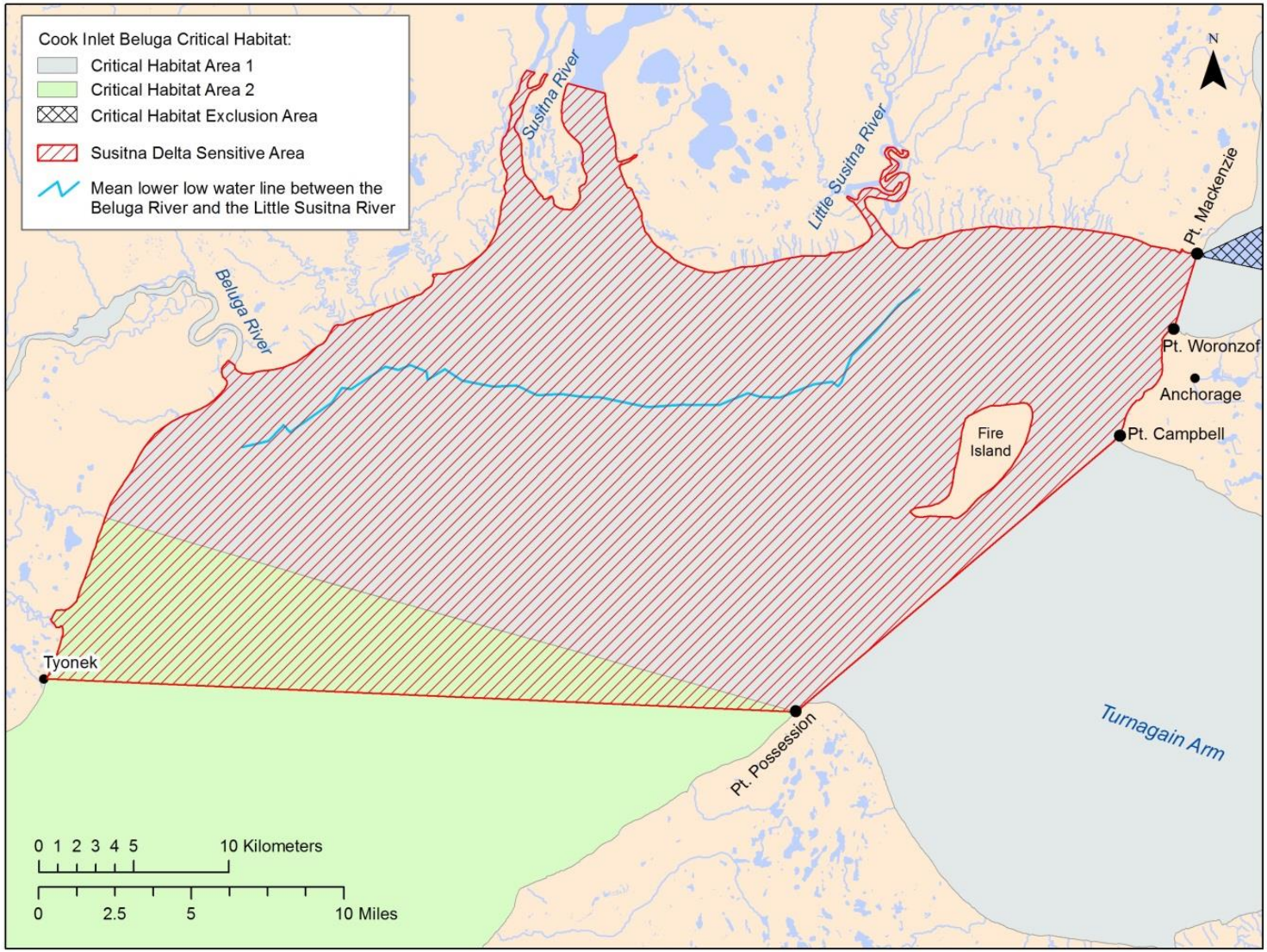


Figure 2. Map of Susitna Delta Sensitive Area for Cook Inlet beluga whales.

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Distribution of beluga whales varies by season and region, and is affected by a range of conditions such as temperature, ice cover, tides, prey availability, and human interactions (Muto et al. 2017); however they may be found throughout Cook Inlet at any time of the year (NMFS2016a). Cook Inlet belugas are often found in shallow, coastal waters, and river mouths in upper Cook Inlet, likely feeding on eulachon in the spring and Pacific salmon in the summer (NMFS 2016a; Shelden et al. 2017). Tagged whale studies confirm this population spends summer through late autumn in upper Cook Inlet waters north of East and West Foreland. In winter, belugas disperse into deeper waters in upper and mid Cook Inlet, but they do not leave Cook Inlet (Goetz et al. 2012; Hobbs et al. 2005; NMFS 2016a; Shelden et al. 2017).

Little is known about beluga mating behavior, but mating likely occurs in late winter or early spring. Shallow tidal flats with warmer water, such as the Susitna River Delta, may be used as calving grounds, and nursery areas are likely nearshore waters of upper Cook Inlet. Cook Inlet belugas have a slow reproductive cycle, usually giving birth to a single calf every two to three years (NMFS 2016a).

The 2016 biennial aerial survey for Cook Inlet beluga whale summer abundance showed 328 individuals. Population abundance estimates from 2006-2016 show a 10-year trend in rate of decline of -0.5% (Shelden et al. 2017). Aerial surveys since 1978 show a contraction in summer habitat range towards upper Cook Inlet (NMFS 2016a; Shelden et al. 2017).

Harbor seals (*Phoca vitulina*) are managed by NMFS and are protected by the MMPA. They are found in marine and estuarine waters throughout Cook Inlet (Figures 3 and 4), and occasionally seasonally in freshwater rivers and lakes (ADF&G 2017d; Muto et al. 2017). Beginning in 2010, harbor seals in Alaska were identified as 12 separate stocks. The Cook Inlet/Shelikof harbor seal stock was last surveyed in 2011 with an estimated abundance of 27,386 (Muto et al. 2017).

Harbor seals are generally non-migratory, but they make local movements related to tides, weather, season, food availability, and reproduction. Haul out areas include rocks, reefs, beaches, and drifting glacial ice (Muto et al. 2017). They use haul outs to rest, give birth, nurse their pups, and for thermal regulation, social interaction, and to avoid predators (ADF&G 2017d; NMFS 2017b). They have a strong tendency to return to the same haul out sites during the breeding season (Muto et al. 2017). Harbor seals become sexually mature between 3 to 7 years old, and their pups are born from May through mid-July. Common prey includes walleye pollock, Pacific cod, capelin, eulachon, Pacific herring, salmon, octopus, and squid (ADF&G 2017d).

Harbor seals occur regularly in the proposed project areas, both in the water and hauled-out on land (NOAA 2017b; Shelden et al. 2013). The choice of a haulout site is fundamental to survival and reproduction of harbor seals. The proposed Tyonek Pipeline is in NMFS survey unit IG19 and the western side of the CIGGS-A Pipeline is in survey unit IG20, both of which typically have an average of 1 to 9 seals hauled out (Figures 3 and 4). Survey units are defined as seals in an area that includes 10 to 15 km of coastline. See Figures 3 and 4 for harbor seal concentration location and abundance information. Counts were conducted by the National Marine Mammal Laboratory in August 1997-2011, noting that variability in numbers occurred throughout the year. Areas with high abundance indicate likely pupping and molting activities. Harbor seals are protected from disturbance under the MMPA. Harassment includes any act which disrupts

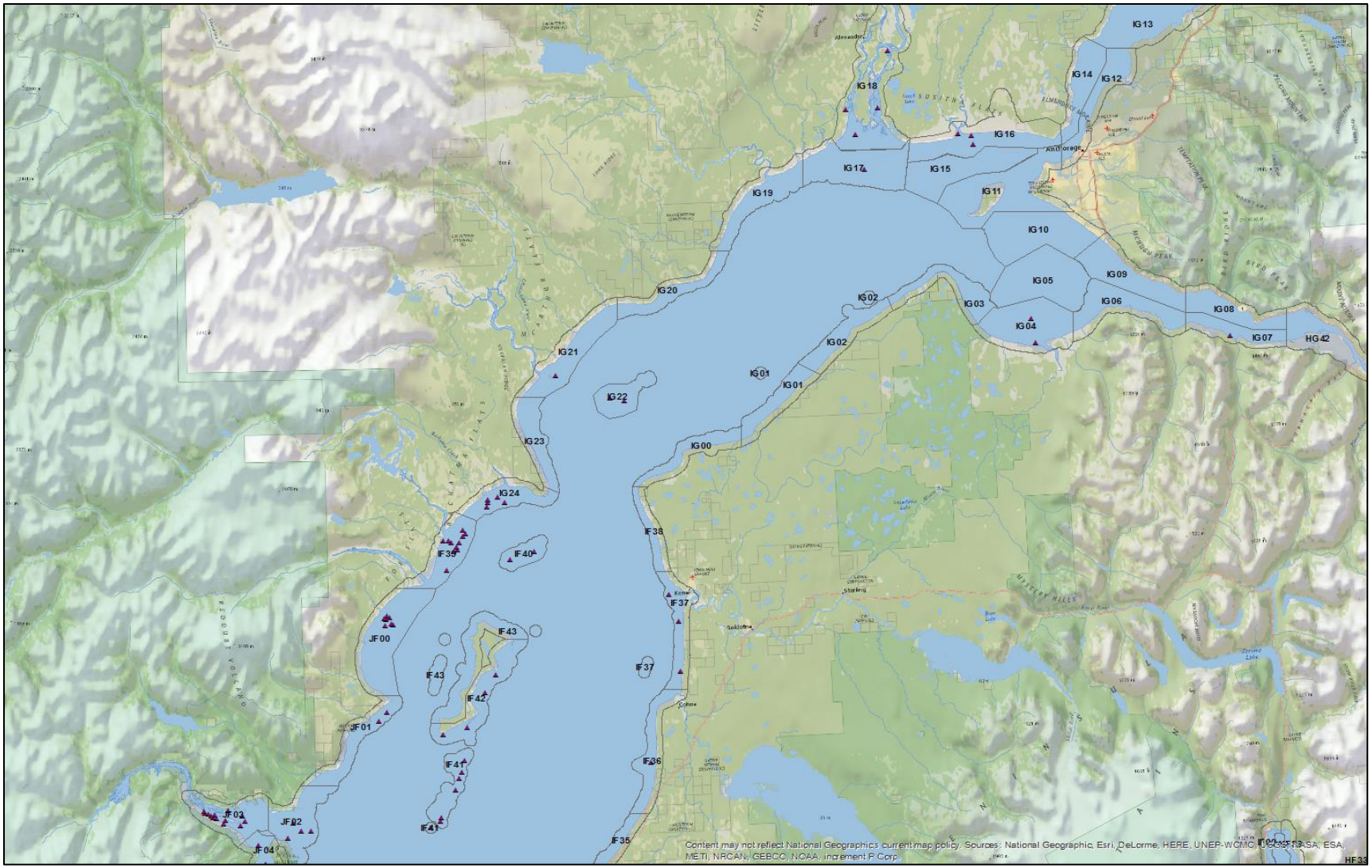


Figure 3. Harbor seal units in upper Cook Inlet. Survey units are defined as seals in an area that includes 10-15 km of coastline. Specific haulout locations within the survey units are indicated by triangles; specific locations can change during seasonal and annual shifts in location. Map provided by Erin Richmond, National Marine Mammal Laboratory, October 2017.

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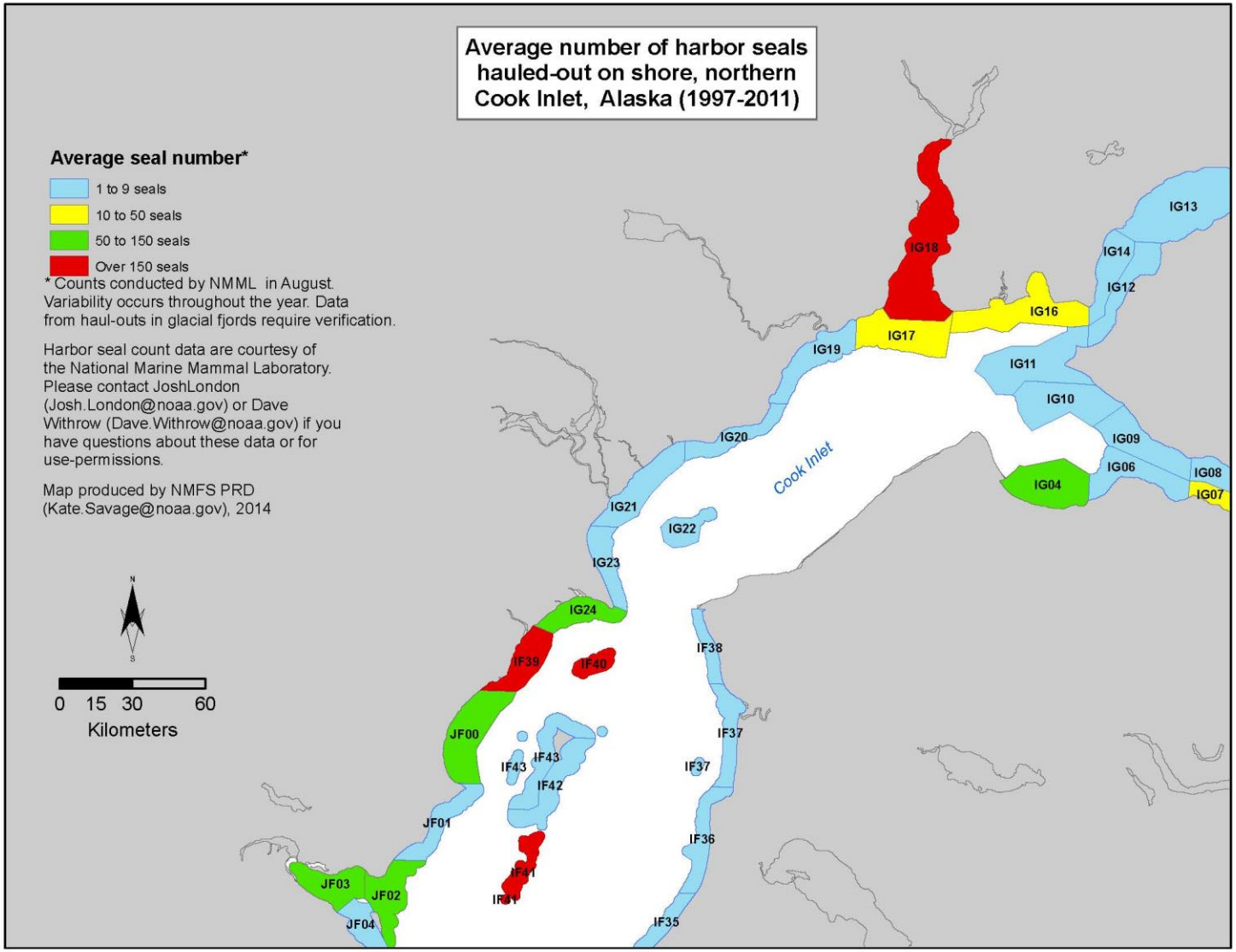


Figure 4. Average number of harbor seals hauled-out on shore, northern Cook Inlet, Alaska (1997-2011). Surveys conducted in August; variability occurs throughout the year. Survey units may include multiple haulouts. Map produced by NMFS PRD (Kate.Savage@noaa.gov), 2014.

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behavioral patterns, including but not limited to, migration, breathing, nursing, feeding, or sheltering (i.e., hauling out).

Steller sea lion *(Eumetopias jubatus)* populations that frequent the waters of Cook Inlet are part of both the western DPS, which is ESA-listed as endangered, and the eastern DPS, which was previously listed as threatened but has since recovered to the point that it has been delisted (NOAA 2017a). Steller sea lions are managed by NMFS and are protected under the MMPA. The western DPS is a high-priority Species of Greatest Conservation Concern for ADF&G (ADF&G 2015). Steller sea lions use rookeries and haulouts on land to rest and suckle their young. They do not migrate, but move their "central-place haulout," the center of their foraging activity, to track seasonal concentrations of their many types of prey. They breed on exposed, offshore rookeries during summer and generally move to more protected haulouts in winter, especially in southeastern Alaska (ADF&G 2017d). While sea lions will enter Cook Inlet waters to forage and for other purposes (often near river mouths during spring and summer periods to seek seasonal runs of eulachon and salmon), there are no recognized haulouts or rookeries near the proposed Cross Inlet Project, nor is it within designated critical habitat for this species.

Harbor porpoises *(Phocoena phocoena)* are managed by NMFS and receive protection under the MMPA. They are commonly found in bays, estuaries, large rivers, harbors, fjords less than 650 feet deep, and occasionally travel to deeper offshore waters in the winter (ADF&G 2017d). Females reach sexual maturity at 3 to 4 years and are able to give birth every year. Little is known of their reproductive biology although most mating occurs in summer with a gestation period of about 11 months; most births occur between May and July (NMFS 2017c). Harbor porpoises are wary and easily disturbed by boat traffic and are susceptible to fishery interactions and physical modifications of nearshore habitats resulting from urban and industrial development and other human activities (e.g., construction of docks and other over-water structures, filling of shallow areas, dredging, and noise) (Muto et al. 2017).

Harbor porpoise are found in upper and lower Cook Inlet (Dahlheim 2000) and have been observed in the areas of the Tyonek Pipeline (Shelden et al. 2014). Recent acoustic research in Cook Inlet by ADF&G indicates that harbor porpoises occur throughout Cook Inlet year-round. In the West Foreland area, reports by marine mammal observers during May – September 2012 recorded 137 sightings of 190 estimated individuals, similar to a spike of 129 between Granite Point and the Susitna River during 2006 and 2007 (NOAA 2015b). The increase of sightings in upper Cook Inlet may reflect more movement of harbor porpoise distribution than previously known (NMFS 2016b; Robert Small, Wildlife Biologist, ADF&G Wildlife Conservation, personal communication, December 2015). Harbor porpoise sightings in upper Cook Inlet appear to peak during April – May and September – October when smelt (eulachon) and longfin smelt are detected (Shelden et al. 2014).

Killer whales **(***Orcinus orca*) are managed by the NMFS and are protected by the MMPA**.** Seasonal and year-round occurrences of killer whales (orcas) have been observed throughout Alaska. Two different stocks of killer whales inhabit Cook Inlet: the Alaska Resident Stock and the Gulf of Alaska, Aleutian Islands, Bering Sea Transient Stock (also referred to as Bigg's killer whales). Genetically and behaviorally distinct, the resident stock feeds exclusively on fishes while the transient whales feed primarily on marine mammals.

Numbers of killer whales in Cook Inlet are small compared to the overall population and most are recorded in lower Cook Inlet. Killer whales are rare in upper Cook Inlet, where Bigg's killer whales feed on beluga whales and resident killer whales feed on anadromous fish (Lammers et al. 2013). The availability of these prey species largely determines the likeliest times for killer whales to be in the area. From 1982 through 2014, 29 killer whale sightings in upper Cook Inlet (north of East and West Foreland) were reported to NMFS. From 2011 through 2014, NMFS received no reports of killer whale sightings in upper Cook Inlet. Killer whales have no natural predators; however, sources of human-caused serious injury and mortality include ship strikes, fishery interactions, and gun-shot wounds (Muto et al. 2017).

Northern sea otters (*Enhydra lutris kenyoni*) are generally found in shallow coastal waters where they dive to prey on bottom dwelling invertebrates (ADF&G 2017d). The U.S. Fish and Wildlife Service (USFWS) is responsible for managing sea otters. The southwest Alaska DPS of Northern sea otters is ESA-listed as threatened by the USFWS. This population is found in southwest Cook Inlet (USFWS 2014) and the northern boundary of designated critical habitat in Cook Inlet is Redoubt Point (USFWS 2009), south of the Cross Inlet Project. All sea otters are protected under the MMPA which prohibits direct harvest of marine mammals with the exception of subsistence hunting (USFWS 2014) and federal take permits are required if disturbances to sea otters will occur. Sea otters (southcentral Alaska DPS) are common in Kachemak Bay, but their range does not include upper Cook Inlet (Muto et al. 2017). The known range of sea otters does not extend north of lower Cook Inlet and this species is not likely to be found in the proposed project area (USFWS 2014).

Humpback whales **(***Megaptera novaeangliae)* are managed by NMFS. In 2016, NMFS revised the listing status of humpback whales and divided the global population into 14 DPSs. Three DPSs of humpback whales occur in Alaska: the Western North Pacific DPS, ESA-listed as endangered, the Mexico DPS, ESA-listed as threatened, and the Hawaii DPS, which is not ESA-listed. The Western North Pacific DPS includes a portion that breeds near Okinawa and the Philippines and another portion whose breeding location is unknown. This population migrates to feeding grounds in the northern Pacific. The Mexico DPS of humpback whales breed along the Pacific coast of mainland Mexico and the Revillagigedos Islands. This population feeds in concentrations from California to the Aleutian Islands. The Hawaii DPS breeds in Hawaii, and migrates north to the Bering Sea, Gulf of Alaska, and northern British Columbia to feed. In Cook Inlet, the humpback whales most likely to be encountered are expected to be 89% Hawaii DPS, 10.5% Mexico DPS, and 0.5% Western North Pacific DPS (NOAA 2016a; 2016b). The DPSs are not distinguishable by sight. Humpback whales are also protected by the MMPA. Humpback whale sightings in Cook Inlet were rare historically but have increased in recent years. They occur in Cook Inlet in low numbers and in the offshore waters extending to the 200 nm EEZ in greater numbers (CISCP 2017). It is unlikely humpback whales will be in the project area.

Fin whales (*Balaenoptera physalus*) are ESA-listed as endangered and are protected under the MMPA. They are managed by NMFS. Fin whales can be found in the Gulf of Alaska during summer, and occasionally may enter Cook Inlet (CISCP 2017). Fin whales have also been observed in the Gulf of Alaska and around Kodiak during winter months, but it is still unknown if these individuals remain in the area year round or migrate (Mizroch et al. 2009). It is unlikely fin whales will be present in the project areas.

Birds

Five groups of migratory birds can be found in Cook Inlet in nearshore waters or adjacent uplands, including seabirds, waterfowl, shorebirds, diving birds, and raptors or birds of prey (RPI 1985; WPG 2012). Seabirds, such as puffins and murres, are typically only found on shore during nesting (ADF&G 1994). There are no known seabird colonies in the vicinity of the Cross Inlet Project ROW (USFWS 2011). Waterfowl, such as geese and ducks, use shorelines and bays. Shorebirds, such as sandpipers and turnstones, use tidal mudflats and rocks. Raptors, such as bald eagles, may prey on marine birds (WPG 2012). Common waterfowl in upper Cook Inlet include trumpeter swans, geese, dabbling ducks, and diving ducks (ADF&G 1994). Several bald eagle nests are located along the Chuit River about two miles south of the Tyonek Pipeline ROW at Ladd Landing. A bald eagle nest is located about three miles west of the CIGGS-A Pipeline western ROW (RPI 1985).

The western portion of the CIGGS-A Pipeline is less than two miles northeast of Audubon Alaska's Trading Bay Important Bird Area (IBA). This habitat includes intertidal mudflats and is an important migratory stop in the spring for shorebirds. The Tyonek Pipeline is about two miles south of the Susitna Flats IBA which includes vegetated and unvegetated tidal flats and supports large numbers of waterfowl during the spring migration, as well as a great diversity of shorebirds. Almost the entire population of the nominate race of the rock sandpiper (*Calidris ptilocnemis ptilocnemis*) overwinters in upper Cook Inlet feeding on clams in the intertidal mudflats from mid-October to mid-May, including Trading Bay and Susitna Flats (Audubon Alaska 2014; CISCP 2017). This population is a high-priority Species of Greatest Conservation Concern for ADF&G (ADF&G 2015).

Trading Bay State Game Refuge is located several miles southwest of the western portion of the CIGGS-A Pipeline, and is entirely encompassed within the Trading Bay IBA. ADF&G 2017l describes bird species in, and their use of, this habitat:

> Trading Bay wetlands provide critical spring feeding, summer nesting, and fall staging habitat for thousands of ducks, geese, swans, and cranes. The first habitat to be used in spring is a narrow band of ice-free coast where large concentrations of waterfowl rest and feed. Canada geese (including the lesser, cackling, and Taverner's sub-species), lesser snow geese, Pacific white-fronted geese, Tule white-fronted geese, and trumpeter and tundra swans use the area in large numbers. Small numbers of Pacific brant are also found. As spring break-up moves inland, waterfowl disperse throughout Trading Bay to nest. Particularly high concentrations of nesting trumpeter swans are found along the Kustatan River. Nesting ducks include mallard, pintail, green-winged teal, wigeon, shoveler, common eider, mergansers, scoters, scaup, and goldeneye. Loons, shorebirds, and bald eagles also nest on the refuge. Tule geese are known to nest in the McArthur River drainages and molt in the Middle River area. In the fall, waterfowl populations once again concentrate in flocks on the refuge in preparation for their southward migration.

The west side of the CIGGS-A Pipeline ROW is located in Beshta Bay, which is known to support waterfowl in the fall (RPI 1985, ADF&G 2000) (see Figure 5).

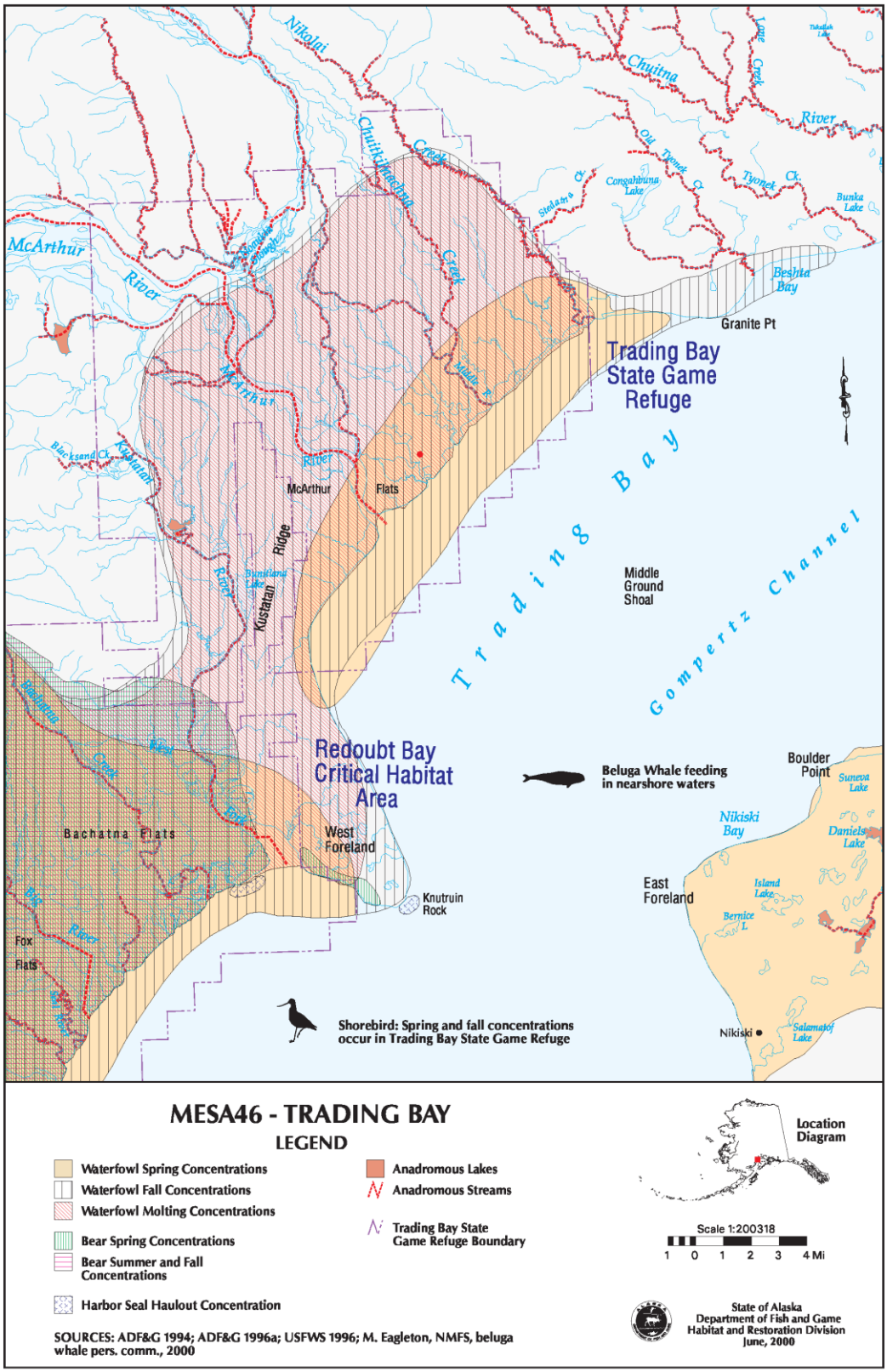


Figure 5. Wildlife concentrations in Trading Bay. Note fall waterfowl concentrations in Beshta Bay. *Source*: ADF&G 2000.

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Susitna Flats State Game Refuge is located several miles northeast of the Tyonek Pipeline, and is entirely encompassed within the Susitna Flats IBA. ADF&G 2017m describes bird species in, and their use of, this habitat:

> Perhaps the most spectacular feature of the Susitna Flats State Game Refuge - and certainly the prime reason for its refuge status - is the spring and fall concentration of migrating waterfowl and shorebirds. Usually by mid-April, mallards, pintails, and Canada geese are present in large numbers. Peak densities are reached in early May when as many as 100,000 waterfowl are using the refuge to feed, rest, and conduct their final courtship prior to nesting. The refuge also hosts several thousand lesser sandhill cranes and upwards of 8,000 swans. Northern phalaropes, dowitchers, godwits, whimbrels, snipe, yellowlegs, sandpipers, plovers, and dunlin are among the most abundant of shorebirds. Most of the ducks, geese, and shorebirds move north or west to nest in other areas of the state. About 10,000 ducks - mostly mallards, pintails, and green-winged teal, remain to nest in the coastal fringe of marsh ponds and sedge meadows found in the refuge. Recently, Tule geese, a subspecies of the greater white-fronted goose, have been discovered to nest and stage on Susitna Flats. In the fall, migrant waterfowl and shorebirds once again arrive in growing numbers to rest and feed on sedge meadows, marshes, and intertidal mud flats.

Although waterfowl and shorebirds will largely be concentrated in the nearby tidal flats and coastal wetlands of the IBAs and State Game Refuges, they, as well as seabirds, are likely to be present in nearshore waters of western Cook Inlet and the Cross Inlet Project.

Nikishka Bay, located less than two miles northeast of the eastern portion of the CIGGS-A Pipeline, and the uplands adjacent to the CIGGS-A Pipeline and Nikishka Bay are known to support nesting and staging waterfowl from April through August. Waterfowl, seabirds, and shorebirds are likely to be present in nearshore waters of the project area (RPI 1985).

More detailed descriptions of the birds, bird species, and distribution can be found in the Cook Inlet Areawide Oil and Gas Lease Sale, Final Finding, January 20, 2009, Chapter 4 - Habitat, Fish and Wildlife, pages 4-21 to 4-32; the Knik Arm Crossing Draft Environmental Impact Statement 2006; the Trading Bay State Game Refuge and Redoubt Bay Critical Habitat Area Management Plan, July 1994; and the Susitna Flats State Game Refuge Management Plan, March 1988. These documents are incorporated herein by reference.

2.) Description of Sport Fishing and Hunting in the vicinity.

Sport Fishing

The Cross Inlet Project is within the Southcentral Alaska Upper Cook Inlet Salt Waters regulatory boundary for sport fishing. On the west side of Cook Inlet, both proposed pipeline projects are within the West Cook Inlet Management Unit of the Northern Cook Inlet sport fish management area. Between 1977 and 2014, this unit accounted for 7% of the average harvest from the Northern Cook Inlet management area, with the majority being coho and sockeye salmon (Oslund et al. 2017). On the east side of Cook Inlet, the CIGGS-A Pipeline is in the Northern Kenai Peninsula Management Area (Begich et al. 2017). Recreational fishing within the ROW for the Cross Inlet Project is expected to be limited during summer from boats targeting Pacific halibut (B. Marston, Fishery Biologist, ADF&G Sport Fish, Soldotna, personal communication, October 24, 2017). Major sport fisheries occur in many freshwater streams, such

as the Chuit, Theodore, Lewis, and Beluga rivers in west Cook Inlet and the Kenai, Kasilof, and Swanson rivers in east Cook Inlet (Begich et al. 2017; Oslund et al. 2017). These streams are located near the project sites but are outside of the ROW.

Personal Use

There are four locations in upper Cook Inlet with personal use fisheries for salmon: with set gillnets and dip nets at the mouth of the Kasilof River, with dip nets at the mouth of the Kenai River, with dip nets in the Beluga River, and with dip nets in Fish Creek (5 AAC 77.540). None of these personal use salmon fisheries would likely be impacted by the Cross Inlet Project.

There is a personal use smelt (5 AAC 77.527) and personal use herring (5 AAC 77.531) fishery that occurs in the marine waters of Cook Inlet. Both fisheries are open in salt water from April 1 through May 31. Eulachon, or hooligan, personal use fisheries are also open in fresh waters of Cook Inlet from April 1 through June 15 (ADF&G 2017c). Most harvest from the smelt personal use fishery in UCI typically occurs in the Twentymile River area and Kenai River, with additional harvest coming from the Susitna River, Little Susitna River, Deshka River, Placer River, Yentna River, the Turnagain Arm area, and north of the Ninilchik River (Shields 2005).

There is a popular personal use fishery for razor clams in lower Cook Inlet south of East Foreland that has been closed since 2015 due to low abundance (ADF&G 2017g). This fishery is outside the CIGGS-A ROW and is not likely to be impacted by the Cross Inlet Project.

Educational Fisheries

Educational Fishery Permits are issued by the ADF&G Division of Sport Fish on an annual basis. Several permits were issued in 2017 for educational fisheries in upper Cook Inlet, but none were located within the Cross Inlet Project ROW. For several years the Native Village of Tyonek was issued an Educational Fishery Permit for waters of Cook Inlet between North Foreland and the Beluga airstrip, but this permit has not been issued since 2010.

Sport Hunting

ADF&G maintains harvest records for game species based on geographic units. All of the proposed Tyonek Pipeline and the western portion of the CIGGS-A Pipeline is within Game Management Unit (GMU) subunit16B. The eastern portion of the CIGGS-A Pipeline falls within GMU subunit 15A.

The brown bear population in GMU 16B is estimated to be between 625 and 1,250 individuals. Between regulatory year (RY) (begins July 1 and ends June 30) 2004 and 2014, annual brown bear harvest in GMU 16B has ranged from a low of 66 to a high of 146 (Peltier 2015). The black bear population in GMU 16B is estimated to be between 3,200 and 3,800 individuals. Between RY 2008 and 2012, annual black bear harvest in GMU 16B ranged from a low of 200 to a high of 551. On average, 114 black bears have also been harvested annually from legal bait stations during this time (Peltier and Rinaldi 2014a). The moose population in GMU 16B (excluding Kalgin Island) is estimated at 6,782 ± 1,562 individuals. Between RY 2003 and 2012, annual moose harvest in GMU 16B ranged from a low of 128 to a high of 232 (Peltier and Rinaldi 2014b).

The brown bear population on Kenai Peninsula (GMUs 7 and 15) is 582 individuals, based on USFWS mark-recapture data extrapolated to all brown bear habitat on the peninsula. Between RY 2009 and 2013, brown bear harvest in GMUs 7 and 15 ranged from a low of 5 to a high of 96 (Selinger 2015). The black bear population on Kenai Peninsula (GMUs 7 and 15) is estimated to be greater than 4,000 individuals. Between RY 2008 and 2012, black bear harvest in GMU 15A ranged from a low of 41 to a high of 89. Additional black bear harvest from bait stations during 2009 to 2013 includes an average of 28 individuals annually (Herreman 2014a). The moose population in GMU 15A is estimated at 1,569 individuals. Between RY 2008 and 2012, annual moose harvest in GMU 15A ranged from a low of 4 to a high of 119 (Herreman 2014b).

Large game species may travel within the Cross Inlet Project ROW (e.g., bears will dig for clams in mudflats). There is a chance bears could be harvested opportunistically below mean high tide.

ADF&G and the USFWS cooperatively manage migratory bird hunting through the Pacific Flyway Council (ADF&G 2017e; PFC 2017). Recommendations for subsistence spring/summer migratory bird harvests are developed through the Alaska Migratory Bird Co-Management Council, which includes the USFWS, ADF&G, and representatives of the Alaska Native population (AMBCC 2017). Migratory birds may travel within the Cross Inlet Project ROW and could be harvested below mean high tide.

3.) Description of the Commercial Fisheries in the vicinity.

The commercial fishery for Cook Inlet is large and divided into two management areas by the ADF&G, the UCI and LCI. The Cross Inlet Project is within the UCI management area, which is divided into the Central and Northern districts. Currently, there are commercial fisheries in UCI for all five species of Pacific salmon, Pacific herring, smelt, and razor clams (Shields and Dupuis 2017). Pacific salmon and smelt are the only species commercially fished in the vicinity of the Cross Inlet Project.

The Tyonek Pipeline and the western CIGGS-A Pipeline will transect the Northern District of the UCI commercial fishing area (5 AAC 21.200). The only gear allowed in all of the Northern District for salmon is set gillnets (5 AAC 21.330). This gear is fished very close to shore (less than 0.5 miles offshore from mean high tide), even though the gear may legally be deployed in all marine waters of the Northern District (P. Shields, Fishery Biologist, ADF&G Commercial Fisheries, Soldotna, October 16, 2017, personal communication). The Tyonek Pipeline and western CIGGS-A Pipeline ROW enters the marine waters in commercial fishing statistical area 247-20, which are those waters north of Granite Point and South of Three Mile Creek (Figure 6). In 2017, there were 14 limited entry permit holders that reported commercial salmon harvest on their permits in statistical area 247-20 (Table 1).

Commercial fishing with set gillnets in the Northern District has two general seasons. The first is the early Chinook salmon fishery, guided by provisions in 5AAC 21.366 Northern District King Salmon Management Plan. This fishery is open 7:00 a.m. to 7:00 p.m. on Mondays from May 25 through June 24. The second is the general salmon fishery which opens on June 25 until closed by emergency order (5 AAC 21.310), which typically occurs in late September. Fishing periods occur on Mondays and Thursdays from 7:00 a.m. to 7:00 p.m. Shore fishery lease ADL

24318 is within the proposed Tyonek Pipeline ROW near Ladd Landing, and several other shore fishery leases are located along the shoreline north of Ladd Landing (ADL 24873, 24356, and 24357). Shore fishery leases ADL 224902 and ADL 221827 are located about 1.5 to 2 miles southwest of the CIGGS-A Pipeline ROW in west Cook Inlet.

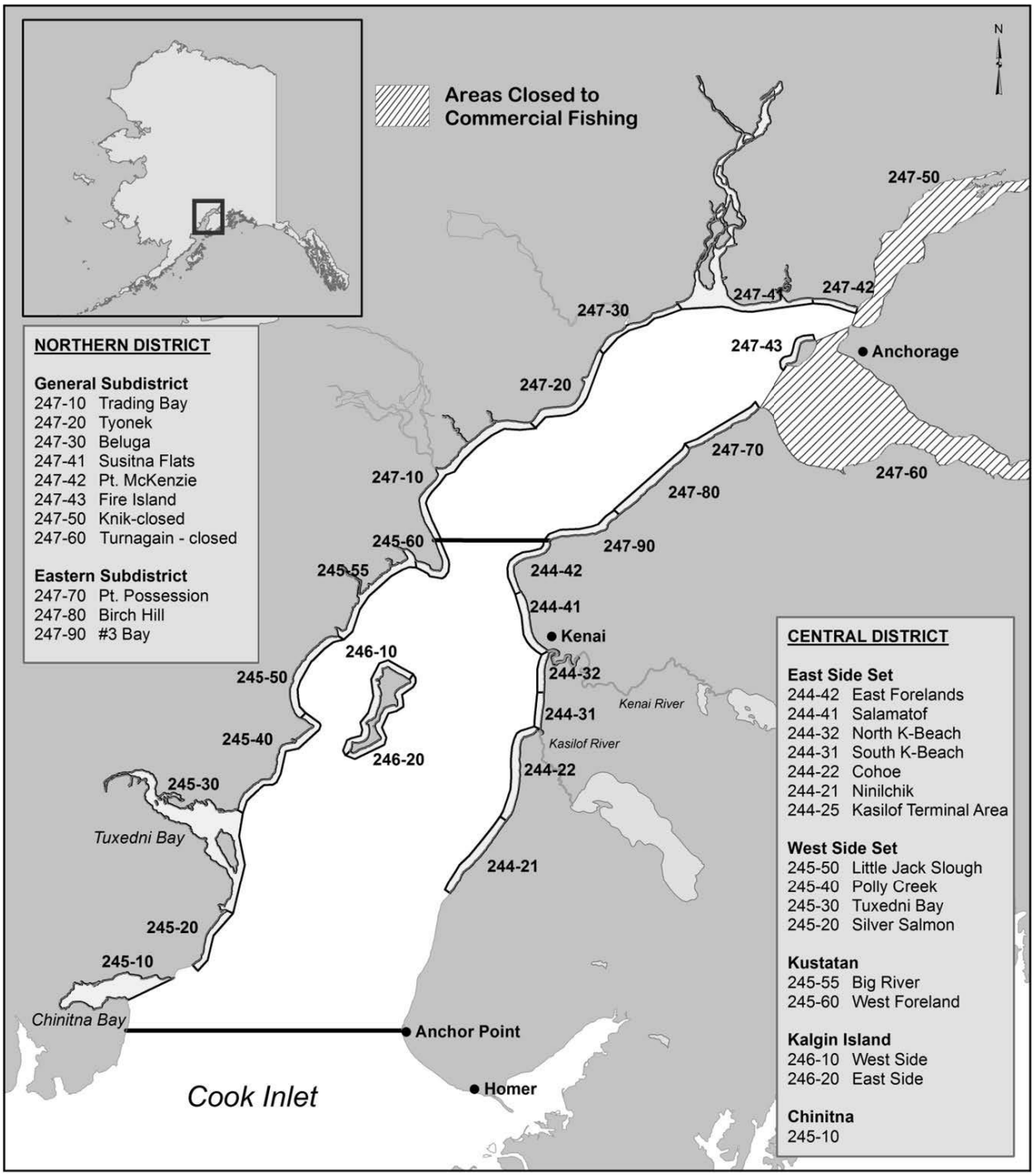


Figure 6. Upper Cook Inlet commercial set gillnet statistical areas. *Source*: Shields and Dupuis 2017.

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Table 1. No. of set gillnet commercial fishing permits reporting harvest by statistical area in the Northern District, 2017. *Source*: P. Shields, Fishery Biologist, ADF&G Commercial Fisheries, Soldotna, October 16, 2017, personal communication.

Statistical Area	Subdistrict	No. Permits Fished
247-10	Trading Bay	7
247-20	Tyonek	14
247-30	Beluga	6
247-41	Susitna Flats	8
247-42	Pt. McKenzie	7
247-43	Fire Island	6
247-70	Pt. Possession	13
247-80	Birch Hill	13
247-90	#3 Bay	9

The CIGGS-A Pipeline comes ashore on the east side of Cook Inlet in the waters of the Upper Subdistrict of the Central District (5 AAC 21.200) in the East Foreland Section (statistical area 244-42) (Figure 6). In these waters, both set and drift gillnetting gear is allowed. Set gillnetting on the east side of Cook Inlet, north of the Kenai River to Boulder Point, is limited to no further than one mile from the mean high tide mark on the Kenai Peninsula shoreline (5 AAC 21.200(b)(2)(B)). However, fishing with set gillnets in this area is largely confined to near-shore operations (within 0.5 miles of shore) due to strong tidal influence. The fishing season for set gillnets in this area is open from July 8 through August 15 (5 AAC 21.310). Regular fishing periods are from 7:00 a.m. to 7:00 p.m. on Mondays and Thursdays, but typically numerous emergency orders are issued providing more fishing opportunities in order to increase sockeye salmon harvest to meet existing escapement goals. In 2017, there were 28 set gillnet permit holders that reported harvest in statistical area 244-42 (Figure 6 and Table 2). Shore fishery lease ADL 225970 is located along the shoreline less than one mile west of the CIGGS-A Pipeline ROW as it reaches the eastern shore, and several other shore fishery leases are located along the East Foreland shoreline south of ADL 225970.

Table 2. No. of set gillnet commercial fishing permits reporting harvest by statistical area north of the Kenai River in 2017. *Source*: P. Shields, Fishery Biologist, ADF&G Commercial Fisheries, Soldotna, October 16, 2017, personal communication.

Statistical Area	Subdistrict	No. Permits Fished
244-41	Salamatof	60
244-42	East Forelands	28

The drift gillnet fishery in the Central District is open no earlier than June 19 and fishing closes in this area no later than August 15 (5 AAC 21.310). Nearly 500 vessels fish the marine waters of the Central District, although in the area where the CIGGS-A Pipeline comes ashore on the east side of Cook Inlet, fishing with drift gillnets is limited by geography and strong tidal currents.

A small commercial dip net fishery for smelt (hooligan) occurs in salt waters of the Northern District between the Chuit River and the Little Susitna River (5 AAC 21.505). This fishery is open from May 1 to June 30 and may not exceed 100 tons of smelt annually. In 2016, 4 permit holders reported a total harvest of 95.8 tons from this fishery (Shields and Dupuis 2017). During this fishery smelt is typically harvested from the Susitna River area. In 2017, the Board of Fisheries passed a proposal to increase allowed harvest in this fishery to a maximum of 200 tons (P. Shields, ADF&G Commercial Fisheries, Soldotna, October 27, 2017, personal communication).

The Pacific herring fishery in UCI is open in the Upper Subdistrict of the Central District where the CIGGS-A Pipeline ROW in eastern Cook Inlet. This fishery is not allowed closer than 600 ft of the mean high tide mark on the Kenai Peninsula and is generally concentrated in the Clam Gulch area (Shields and Dupuis 2017). Impacts by the CIGGS-A Pipeline ROW to this fishery are not anticipated. Razor clams are harvested commercially from UCI beaches on the west side of Cook Inlet, particularly from the Polly Creek/Crescent River area (Rumble et al. 2016). No commercial groundfish or shellfish fisheries occur in the vicinity of the Cross Inlet Project (J. Rumble, Fishery Biologist, ADF&G Commercial Fisheries, Homer, October 27, 2017, personal communication).

4.) Description of Subsistence Use in the vicinity.

Alaska law defines subsistence as "noncommercial, customary and traditional uses." Although most of the Cook Inlet area is designated as "nonsubsistence" (ADF&G 2017i), a subsistence set net fishery exists in the Tyonek Subdistrict, north of the project area, within the Northern District of the UCI Management Area (Shields and Dupuis 2017). A State-regulated Tier II subsistence game hunt also occurs in GMU 16B in the Beluga area, allowing the harvest of moose (ADF&G 2017a).

The MMPA allows for traditional harvest and use of marine mammals by coastal Alaska Natives. State and federal laws define subsistence uses as the "customary and traditional uses" of wild resources for food, clothing, fuel, transportation, construction, art, crafts, sharing, and customary trade. Subsistence uses are central to the customs and traditions of many cultural groups in Alaska.

Small whales traditionally hunted in Cook Inlet include the beluga whale. Since 1999, NMFS has worked cooperatively with the Cook Inlet Marine Mammal Council (CIMMC, disbanded in 2012), the Native village of Tyonek, Cook Inlet Treaty Tribes, Alaska Beluga Whale Committee, and Alaska Native beluga whale hunters to co-manage the subsistence use of beluga whales in Cook Inlet pursuant to Section 119 of the MMPA (Shelden 2011). To promote the long-term recovery of the whales while allowing for a subsistence hunt by Alaska Natives, the NMFS implemented a long-term harvest plan (NMFS 2017d). Harvest levels are established every 5 years based on the most recent 5-year average population abundance and a 10-year measure of the population growth rate (Muto et al. 2017).

The communities of Tyonek and Beluga are rural communities that utilize fish and game from the region for subsistence purposes on the west coast of Cook Inlet near the Cross Inlet Project ROW. Many residents, including the community of Nikiski, located near the CIGGS-A Pipeline ROW in eastern Cook Inlet, harvest and use wild resources.

Subsistence use by residents of Tyonek, Beluga, and Nikiski are presented below and more detailed information can be found on ADF&G's Community Subsistence Information System online database and mapper at http://www.adfg.alaska.gov/sb/CSIS/, and in the Timing Concerns, Tyonek Harvest Use Table, Beluga Harvest Use Table, and Nikiski Harvest Use Table enclosures. Information on subsistence use of a variety of resources and search areas has been included to show widespread subsistence activities in communities in the vicinity of the Cross Inlet Project. Access to harvest use areas and disturbances to wildlife during construction of the Tyonek Pipeline could impact subsistence harvest or attempted harvest activities.

Tyonek

Tyonek is a mostly Dena'ina Athabascan community with a broad array of environmental features that support a productive ecosystem and provides habitat for both marine and freshwater aquatic species as well as land mammals and birds (Jones et al. 2015).

ADF&G collected comprehensive data on the Tyonek community's 2013 subsistence harvest and use activities. Individual participation in the harvest of wild resources varied by activity: gathering plants and berries (81%), fishing activities (74%), hunting large land mammals (51%), hunting birds (15%), and hunting or trapping small land mammals (9%). The total harvest by Tyonek residents in 2013 was 24,249 pounds composed of a wide range of wild resources (Figure 7). The number of households using a resource is not always directly proportional to the top resources harvested by pounds usable weight. For instance, blueberries contributed about 3% to the overall harvest even though this species was used by 61% of households. This suggests that certain resources are important to households despite being harvested in relatively small quantities (Jones et al. 2015).

There is a subsistence setnet fishery in the Tyonek Subdistrict of the UCI Northern District, which includes those waters of the Northern District within mean lower low tide from a point one mile south of the southern edge of the Chuitna River south to the easternmost tip of Granite Point (5 AAC 01.555). Subsistence fishing for salmon in this subdistrict has occurred regularly for decades. Similar to the commercial salmon fishery in this area, there are two distinct time periods and both fisheries require a permit. The first is open from May 15 to June 15 on Tuesdays, Thursdays, and Fridays from 4 a.m. to 8 p.m. This fishery primarily targets Chinook salmon and is the more popular of the two seasons. The second is open on Saturdays from 6 a.m. to 6 p.m. between June 16 and October 15, but few permits are issued for this fishery (Shields and Dupuis 2017).

In 2015, 83 permits were issued for the Tyonek Subdistrict subsistence salmon fishery, including 60 permits issued to Tyonek residents (72%) and 23 permits issued to other Alaska residents (17%). Residents of Tyonek accounted for 84% of the estimated harvest total (2,165 salmon), including 82% of the reported Chinook salmon harvest (878 Chinook salmon) (Fall et al. *in prep*). Of the total reported subsistence salmon harvest in 2015, 744 were Chinook salmon, 331 were coho salmon, 237 were sockeye salmon, 41 were pink salmon, and 5 were chum salmon. In 2016, 60 permit

holders harvested 813 Chinook salmon, 206 coho salmon, 164 sockeye salmon, 9 pink salmon, and 4 chum salmon in the Tyonek Subdistrict subsistence salmon fisheries (Shields and Dupuis 2017).

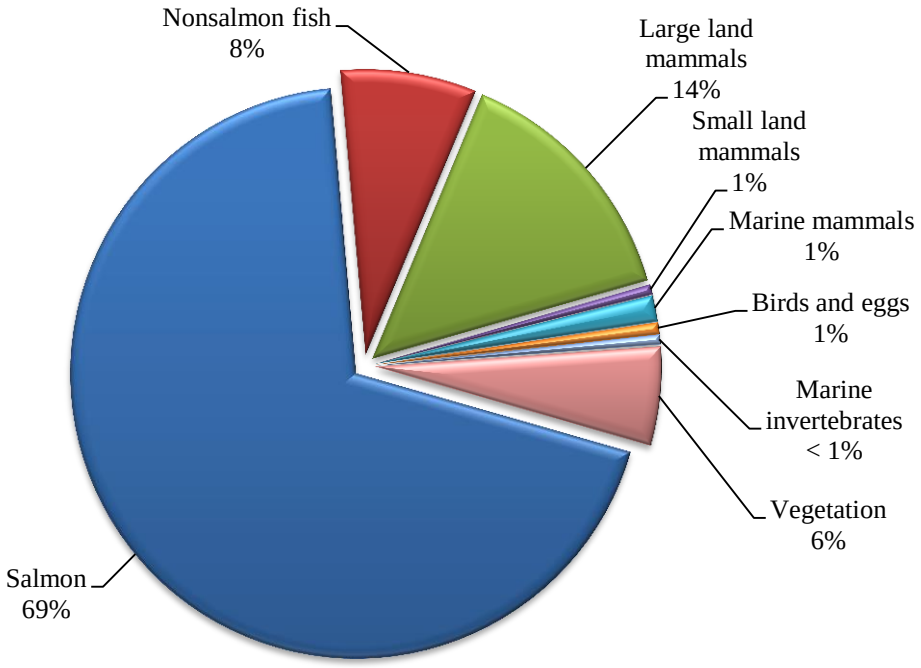


Figure 7. Composition of harvest by resource category in pounds usable weight, Tyonek, 2013 (Jones et al. 2015).

Nonsalmon fish made up 8% of the overall harvest of wild resources for the community of Tyonek in 2013 (Figure 7). About 1,863 pounds of nonsalmon fish harvested in 2013, composed of eulachon (79%), rainbow trout (12%), steelhead (3%), flounder (2%), Dolly Varden (1%), Pacific halibut (1%), northern pike (1%), unknown trout (<1%), and unknown nonsalmon fish (<1%). Although the majority of the eulachon search and harvest areas for Tyonek residents was within the Beluga River, they were also harvested using set gillnets on the beach near the community. The search and harvest areas for Dolly Varden in 2013 included several lakes and along the beach near the community. Pacific halibut were harvested in Cook Inlet from the beach near Beshta Bay, just north of Granite Point. Steelhead trout were harvested in Nikolai Creek just a few miles north of Trading Bay. Several of these harvest areas are within or in close proximity to the Cross Inlet Project ROW (Jones et al. 2015).

Hunting opportunities near Tyonek include those available in GMU 16, with opportunities for harvesting black and brown bears, caribou, Dall sheep, moose, gray wolves, and wolverines, as well as hunting and trapping for small game and furbearers. There is also a Tier II hunt for bull moose within GMU 16B from December 15 through March 31 available to Alaska residents only. Moose made up the entirety of Tyonek's large land mammal harvest in 2013, with a total harvest of 3,471 pounds. Moose are an important species for subsistence in Tyonek, and in 2013 an estimated 74% of households used moose. In 2013, moose search areas were along the roadways near the

community and extended north of the Beluga River and south to the Trading Bay mud flats and along the McArthur River (Jones et al. 2015).

Small land mammals were not frequently used or harvested by Tyonek households in 2013. Harvest included beavers, snowshoe hares, and porcupines, all of which were harvested between August and November. The search and harvest areas for small land mammals occurred close to the community (Jones et al. 2015).

A total of 360 pounds of marine mammals were harvested by Tyonek community members in 2013, all of which were harbor seals. Seals were harvested in several areas near the community of Tyonek. Search areas included about 20 miles along the Cook Inlet coast from the McArthur Flats north to the Beluga River (Jones et al. 2015). Steller sea lions do not regularly occur in upper Cook Inlet and no Steller sea lions were harvested in 2008 by Tyonek residents (Wolfe et al. 2009).

In 2013, harvest of birds and eggs totaled 166 pounds. The majority of birds (129) were harvested during the fall months; 21 birds were harvested in winter, 27 in summer, and 22 in spring. For spruce grouse, the timing of harvests was predominantly during the summer (22 birds) and fall (26 birds). Bird eggs were gathered on the beach located along the west side of the mouth of the Chuitna River. Primary search and harvest areas for upland game birds were near the center of the community and along the Tyonek road system. Tyonek residents searched for upland game birds as far north as the Beluga River. Primary hunting areas for migratory waterfowl included the beach near Granite Point, the mud flats in Trading Bay, and the area just north of the mouth of the McArthur River. Some migratory waterfowl were sought on the beach at the mouth of the Chuitna River. Besides state migratory bird hunting opportunities, residents of Tyonek are also able to participate in federal subsistence hunting regulations, including a season from April 2 to May 31 and from August 1 to 31 (Jones et al. 2015).

In 2013, marine invertebrates harvested by Tyonek households included razor clams (89%) and king crab (11%). Harvest areas were on beaches south of Tyonek, including near Clam Gulch (Jones et al. 2015).

Vegetation was used by 90% of Tyonek households in 2013, with a total of 1,352 pounds of edible plants and berries were harvested. The vast majority of the vegetation harvest was composed of berries (95%). Plants and greens made up the remaining 5% of the harvest for this resource category. Vegetation was harvested from several areas near Tyonek. Both plants and berries were harvested within the immediate area near the community and along the Chuitna River. In 2013, total estimated 789 cords of wood were harvested by the community and used by 80% of Tyonek households. Wood is considered an important resource and is part of the seasonal round of harvest of wild resources by Tyonek residents. In 2013, 58% of Tyonek households reported that a majority (76–99%) of their home heating source came from firewood and 31% said that more than one-half (51–75%) of their home heat came from firewood. Firewood was harvested near the community and also along the Tyonek roadways (Jones et al. 2015).

All wild resource search and harvest areas from the past three comprehensive surveys conducted in Tyonek, 1983–1984 , 2005–2006, and 2013, are show in Figure 8. The map data depict Tyonek residents' harvest and use areas over a 30-year span. Comparing the historical and contemporary

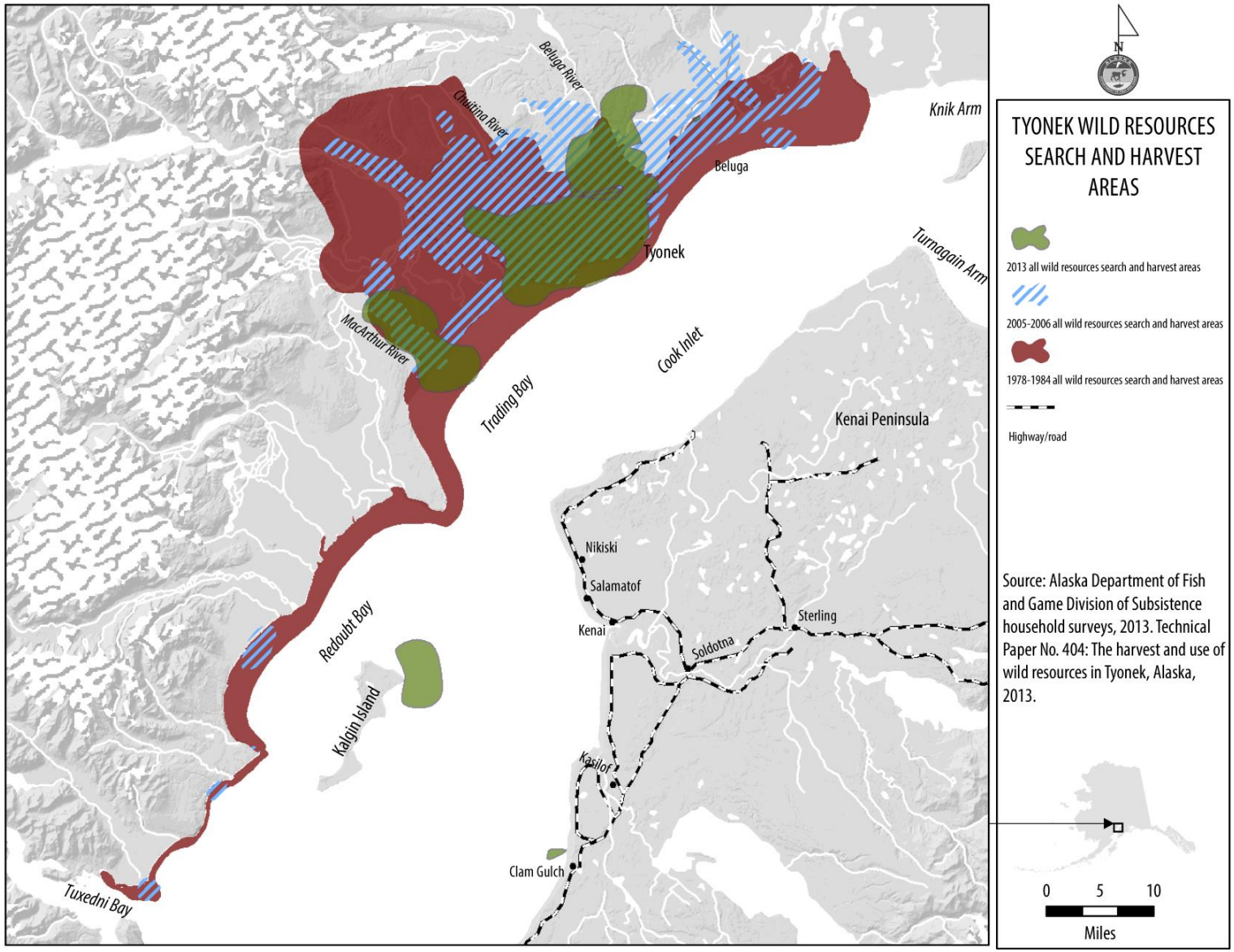


Figure 8. Tyonek wild resource search and harvest areas over a 30-year span (Jones et al. 2015).

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map data demonstrates the continuity in Tyonek residents' search and harvest areas over the past 3 decades. The harvest locations of salmon and nonsalmon fish have remained constant over time. Similarly, search and harvest areas for birds, plants, berries, and wood encompass the same geographic area in all three study years (Jones et al. 2015).

Beluga

The present-day community of Beluga lies within the traditional territory of the Upper Inlet Dena'ina. In 2006, Beluga was a dispersed, primarily non-Alaska Native community located 12 miles north of Tyonek. A systematic household harvest survey of Beluga residents was conducted by ADF&G for the 2005-2006 study year. During this time, Beluga residents used and harvested a variety of wild resources, most of which were available close to the community (Stanek et al. 2007).

During the 2005-2006 study year, 100% of Beluga households used, attempted to harvest, and harvested at least one type of fish, wildlife, or wild plant resource. On the individual level, almost every Beluga resident (95%) participated in at least one resource harvest activity. Harvest activities most commonly pursued by Beluga residents were fishing (89%), gathering plants (76%), hunting game birds and mammals (68%), and trapping or hunting furbearers (32%). The significance of wild resources in the annual food supply of Beluga residents was demonstrated by the estimated percentages of meat, fish, and birds used annually that originated from wild sources. Almost half (49%) of households estimated that more than 50% of their annual meat, fish, and bird supply came from wild sources, and 14% more said that between 26% and 50% did so. Of all interviewed households in Beluga, 21% said that all their meat, fish, and birds came from harvests of fish and wildlife. In 2005-2006, harvest by Beluga residents totaled 8,086 pounds of usable weight, varying in composition by resource category (Figure 9) (Stanek et al. 2007).

Beluga residents harvested all five species of Pacific salmon in 2005-2006, the majority of which were coho and Chinook salmon. Subsistence salmon fishing took place beginning in May on inlet beaches near Tyonek and Beluga and continued into June. A few Beluga residents obtained subsistence salmon set net permits and fished in the Tyonek Subdistrict. Summer months, beginning in mid-June and extending through August, were busy with salmon fishing. Residents fished in local streams and rivers including the Chuitna, Threemile, Theodore, Lewis, and Beluga rivers and Lone Creek, among others (Stanek et al. 2007).

Non-salmon fish harvested by Beluga residents in 2005-06 were primarily freshwater species. Freshwater fishing includes the taking of pike and rainbow trout. In 2005-2006, Beluga residents traveled to Threemile Creek, located about two miles north of the Tyonek Pipeline ROW, to harvest pike. Other lakes outside the Threemile Creek system remain popular for the harvest of trout. Although marine species occur in the immediate vicinity of Beluga, they are usually only taken incidentally in set nets. Harvest of non-salmon fish in this study year included eulachon, rainbow trout, Dolly Varden, steelhead trout, Northern pike, and Pacific halibut. Eulachon were harvested in late spring by dip net in the rivers and set nets on inlet beaches (Stanek et al. 2007).

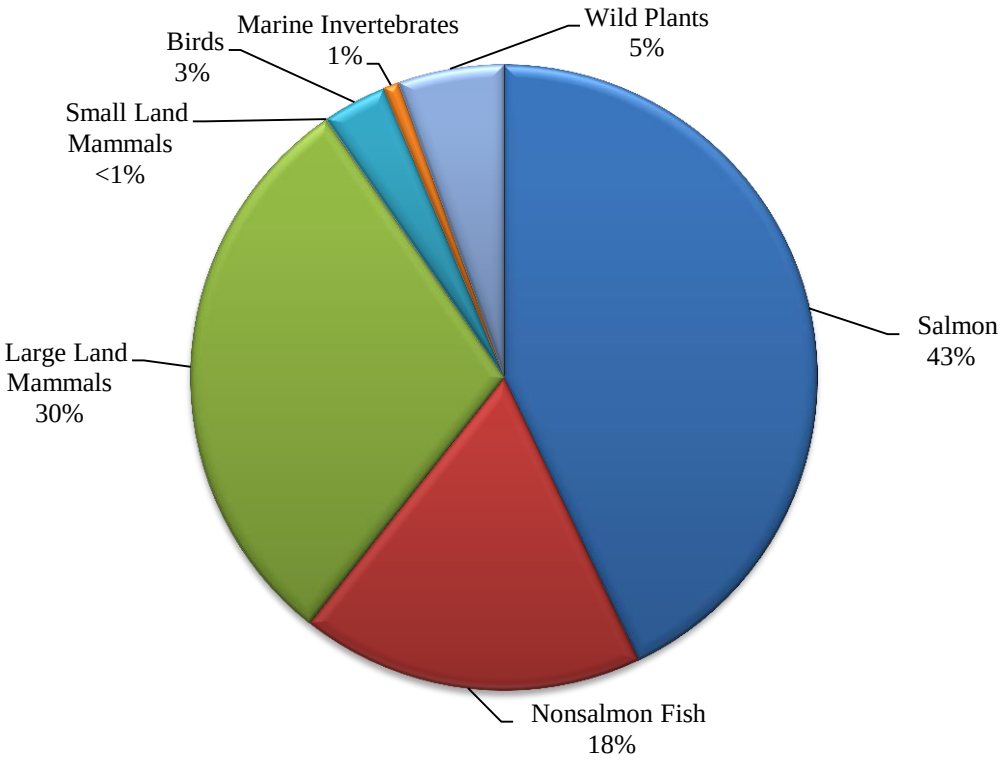


Figure 9. Wild resource harvests by category, Beluga residents, 2005-2006 (Stanek et al. 2007).

Hunting opportunities near Beluga include those available in GMU 16, with opportunities for harvesting black and brown bears, caribou, Dall sheep, moose, gray wolves, and wolverines, as well as hunting and trapping for small game and furbearers. There is also a Tier II hunt for bull moose within GMU 16B from December 15 through March 31 available to Alaska residents only. Beluga households used five species of large land mammals totaling 2,403 pounds of food in 2005/2006, including black bear, caribou, moose, muskox, and Dall sheep. All Beluga households used moose meat, which made up the largest amount of the total pounds harvested (1,736). Brown and black bear hunting took place in the spring months. Harvest areas for large land mammals were typically located within a five to ten mile radius of Beluga, expanding to a broader area in the fall and winter of the study year. In 2005-2006, small land mammals were a relatively small portion of Beluga residents' total harvest. Furbearers were important for the sale of fur, which is also used in the manufacture of crafts. Harvest included 126 marten, 38 beavers, 49 red squirrels, 12 weasels, 11 red foxes, 10 coyotes, 10 muskrats, 6 wolves, 4 land otters, and 3 mink. Spring beaver and muskrat trapping and hunting began in late winter (Stanek et al. 2007).

The hunting of abundant populations of both upland game birds and migratory waterfowl ordinarily occurs on the tidal flats, within forests, and tundra areas around Beluga during specific seasons. Upland game bird hunting for grouse and ptarmigan occurs by regulated season from August 10 through March 31. Grouse were the main species taken in early fall. Ptarmigan were taken after freeze-up and throughout the winter months. Waterfowl, including ducks, geese, cranes, and shorebirds can be legally taken by Beluga residents during the September 1 to December 16 season. Most waterfowl hunting ends by mid-October and occurs on the flats of the

Susitna Flats State Game Refuge and wetland areas near the community. Hunting of upland game birds was important to Beluga households, with 79% hunting grouse and ptarmigan (Stanek et al. 2007).

Saltwater clams were not harvested by residents in the vicinity of Beluga, but freshwater clams were harvested in sandy bottomed lakes around Beluga. Beluga households did not hunt or use marine mammals in the 2005-06 study year, and generally have not used these resources in the past (Stanek et al. 2007).

The harvest and use of wild plants and wood were significant features of the wild resource patterns among Beluga households, with 93% of households harvesting these resources in 2005-2006. During the study year, plant, berry, and wood harvest areas were located primarily along the road and trail systems around Beluga (Stanek et al. 2007).

Nikiski

The area now known as Nikiski was the traditional homeland of the Dena'ina (Tanaina) Indians and is located in proximity to many marine and terrestrial resources. ADF&G collected comprehensive data on the Nikiski community's 2014 subsistence harvest and use activities. Approximately 77% of individuals harvested at least one resource in 2014. Individual participation in the harvest or hunting of wild resources varied by resource category: vegetation (61%), fish (56%), large land mammals (19%), birds and eggs (12%), small land mammals (9%), and marine mammals (less than 1%). Total harvest of wild foods by the community was about 292,421 pounds in 2014 composed of a wide range of wild resource categories (Figure 10). Salmon is the most harvested of all the subsistence resource categories used by Nikiski households, followed by large land mammals, nonsalmon fish, and vegetation. About 95% of Nikiski households used one or more, 88% attempted to harvest, and 79% successfully harvested a wild resource (Jones and Kostick 2016).

The community of Nikiski harvested approximately 135,315 pounds of salmon in 2014, including sockeye salmon (68%), coho salmon (22%), Chinook salmon (4%), pink salmon (4%), chum salmon (4%), and unknown salmon (including landlocked salmon and harvests not specified by species) (<1%). A variety of gear types were used, including home use commercial harvest, subsistence or personal use fishing gear, and rod and reel. Nikiski residents primarily fished for salmon along the western coast of the Kenai Peninsula as well as in several river drainages emptying into Cook Inlet, including the Swanson River and Kenai River located, respectively, about 12 miles north and 18 miles south of the CIGGS-A Pipeline ROW. Some households fished for salmon in saltwater near Nikiski, in Kachemak Bay, and in offshore waters in lower Cook Inlet (Jones and Kostick 2016).

The total harvest of nonsalmon fish in Nikiski in 2014 was approximately 53,278 pounds composed of Pacific halibut (70%), rainbow trout (10%), eulachon (4%), Dolly Varden (3%), and smaller percentages of many other species. Fishing for nonsalmon fish primarily occurred in the same locations that were used to harvest salmon. Ice fishing occurs in winter and early spring when local lakes are frozen, and switches to rod and reel fishing after breakup. Some households harvested Pacific halibut from shore on the beaches near Nikiski (Jones and Kostick 2016), and harvest may occur within the CIGGS-A Pipeline ROW.

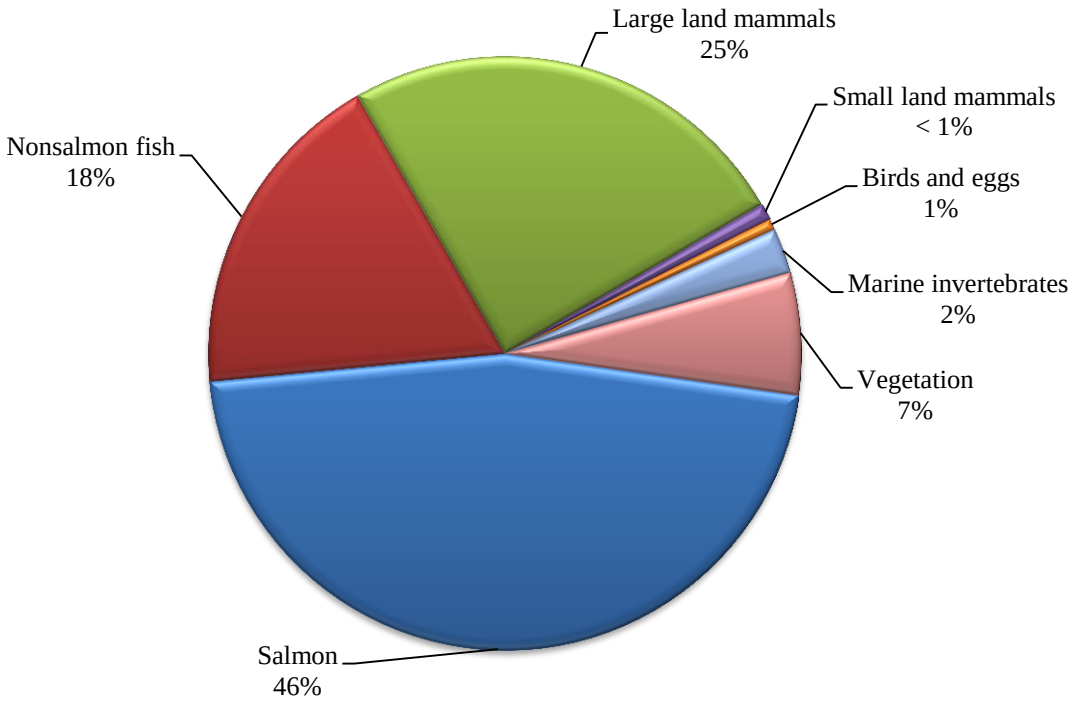


Figure 10. Composition of harvest by resource category in pounds usable weight, Nikiski, 2014 (Jones and Kostick 2016). *Note*: Categories having zero pounds of usable weight are not included.

The community of Nikiski harvested approximately 72,854 lb of large land mammals in 2014, including about 108 moose, 70 black bears, and 70 caribou. All large land mammals were harvested between May and September. Moose and caribou were harvested in August and September during the regulatory season. Black bears were harvested throughout the spring and summer. Search and harvest areas for large land mammals were primarily in proximity to the community of Nikiski in the northwestern quadrant of the Kenai Peninsula (Jones and Kostick 2016).

Small land mammal harvest by Nikiski households in 2014 included snowshoe hares, beavers, martens, muskrats, porcupines, lynx, North American river (land) otters, red (tree) squirrels, and others. The most harvested species by individual animals were snowshoe hares (502), beavers (139), and martens (139). Small land mammals were harvested throughout the year with most being harvested in the winter months. Harvests in December, January, and February accounted for 60% of the small land mammal harvest. Snowshoe hares were harvested primarily in late winter, but some harvests occurred in August and October. Porcupines and red squirrels were harvested primarily in the summer. All river otters and muskrats were harvested in November and December. Nikiski residents sought small land mammals primarily in proximity to their community on the Kenai Peninsula. In 2014, no household attempted to harvest these marine mammals in the community (Jones and Kostick 2016).

An estimated 1,782 lb of birds and eggs were harvested by the community, species included grouse, ptarmigan, waterfowl, and gulls. Birds were harvested throughout the year in Nikiski,

though about 57% of the harvests were during the fall. All waterfowl were harvested during the summer and fall. Grouses and ptarmigan were harvested throughout the year. The search and harvest areas for birds and eggs were quite diverse for Nikiski in 2014. Many households sought birds in the immediate vicinity of the community (Jones and Kostick 2016).

A large variety of marine invertebrates was harvested by the community in 2014, such as clams, shrimp, and crab. These were harvested from a variety of locations in Cook Inlet outside of the CIGGS-A Pipeline ROW (Jones and Kostick 2016).

Vegetation was used by a greater percentage of Nikiski households (81%) in 2014 than any other resource category, and a total of approximately 19,229 pounds were harvested. The vast majority of this harvest was composed of berries (83%), followed by plants and greens (12%), mushrooms (4%), and seaweeds (1%). Approximately 55% of Nikiski households used wood in 2014. Berries and greens were harvested primarily in proximity to the road system on the Kenai Peninsula, with the majority of harvests occurring near the community of Nikiski (Jones and Kostick 2016).

In Nikiski, most residents harvested wild foods in proximity to the community or in other parts of southcentral Alaska (Figure 11). The 2014 ADF&G study was the first to record comprehensive wild resource search and harvest areas for the community of Nikiski (Jones and Kostick 2016).

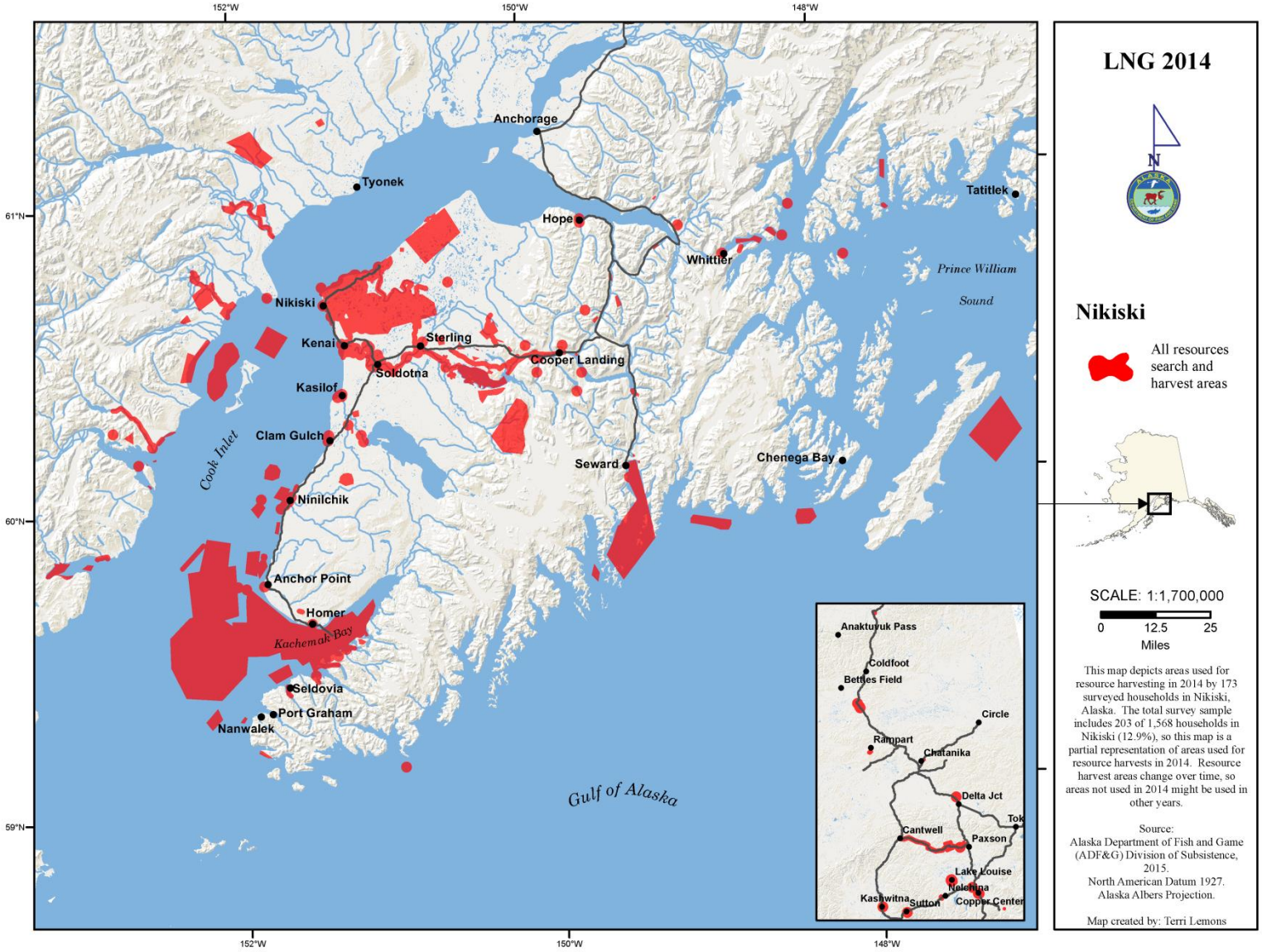


Figure 11. Wild resource search and harvest areas, Nikiski, 2014 (Jones and Kostick 2016).

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5.) ADF&G proposed mitigation measures.

Many of the proposed mitigation measures below were modified from Chapter Nine of ADNR's Cook Inlet Areawide Oil and Gas Lease Sale Final Finding of the Director, January 20, 2009, accessed at http://dog.dnr.alaska.gov/Information/DocumentLibrary. ADF&G supports the use of these mitigation measures in the Cross Inlet Pipeline ROW leases, or other similar conditions that maintain their intent. Some of the proposed mitigation measures below include comments in italics with further justification for their inclusion.

Pipelines that must cross marine intertidal waters will be constructed beneath the marine waters of the intertidal area using directional drilling techniques, unless the Pipeline Coordinator, in consultation with ADF&G and the local borough, approves an alternative method based on technical, environmental, and economic justification. Pipelines must be located and constructed to prevent obstruction to marine navigation and fishing operations.
Comment: Set and drift gillnets may legally be set to a depth of about 23 feet (maximum of 45 meshes equal to or less than 6-inches). Horizontal direction drilling is recommended to avoid impacts to commercial fishing activities at the shore fishery lease site in the ROW near Ladd Landing (ADL 24318).

Pipeline construction and maintenance activities will be restricted when necessary to prevent unreasonable conflicts between these activities and subsistence, commercial, sport, personal use, or educational harvest activities. In order to avoid conflicts with subsistence, commercial, sport and educational harvest activities, restrictions may include alternative site selection, requiring directional drilling, seasonal drilling or construction restrictions, and other technologies deemed appropriate by the Pipeline Coordinator.
Comment: see Timing Concerns (enclosed). Pipeline activities that may have far reaching impacts to subsistence activities beyond the immediate ROW should be considered and minimized to ensure subsistence activities are not disrupted at any time throughout the year.

Public access to, or use of, the lease area may not be restricted except within the immediate vicinity of the work site during construction. Areas of restricted access must be identified. The pipeline shall not be located so as to block access to or along navigable or public waters as defined in AS 38.05.965.
Comment: Public lands and waters in Alaska provide tremendous opportunities to experience our fish, wildlife, and other public resources. ADF&G works to ensure that the public's right to access publicly owned resources is protected. The public may access coastal waters of Cook Inlet for hunting, fishing, subsistence, or recreational uses, such as wildlife viewing and photography.

Traditional and customary access to subsistence or personal use harvest areas will be maintained unless reasonable alternative access is provided to subsistence or personal users. "Reasonable access" means generally available to users. Lessees will consult nearby communities, and native organizations for assistance in identifying and contacting local subsistence users.

Wildlife

Pipeline construction within Cook Inlet beluga whale critical habitat should occur from mid-August to October, or whatever time period is recommended by NMFS, to reduce disturbances to beluga whales.

Comment: Cook Inlet beluga whales were monitored from passive acoustic recorders deployed in Trading Bay and offshore of the mouth of Beluga River (i.e., on both sides of the western portion of the Cross Inlet Project location). At Beluga River, belugas were consistently detected from November through July with very minimal detections August through October. However, a mid-August start date is recommended to allow a buffer for a change is salmon run timing, which belugas are in the area feeding on at this time of year. At Trading Bay, belugas were consistently detected from December through April.

To avoid disturbance to beluga whales and other marine mammals, minimize or terminate construction and maintenance activities when belugas are present in the area of operation. Dedicated marine mammal observers are recommended to be present so that construction activities can be temporarily stopped or reduced when marine mammals are present.

Harbor seal pupping occurs May/June (peak) and molting activity occurs May – September (peaking in August). Activities that may disturb hauled-out seals in nearby harbor seal concentration areas should be avoided during these critical seasons, especially during pupping.

To minimize disturbances to harbor porpoises, construction and associated activities which may cause animals to leave the areas should be avoided during peak times when smelt (eulachon) or longfin smelt are detected (April – May and September – October) (Shelden et al. 2014).

To avoid disturbance to harbor seals hauled-out on land (Figure 3) ensure construction crews do not go onto shore in these areas and keep vessels offshore by 500 m (546 yards).

Comment: Jansen et al. (2010) noted that harbor seals were disturbed by vessels at distances up to 500 m (546 yards/1640 feet); NMFS recognizes the current guideline of 100 yards may be inadequate.

When aerial support is used, pilots should be advised to maintain a 1,500-foot minimum altitude when flying over marine mammals (including animals hauled-out on land). Buzzing, hovering, landing, taking off, and taxiing near marine mammals on land or in the water is likely to cause disturbances.

The use of lights should be limited to areas where work is occurring; all other lights should be extinguished. Lights should be downshielded to illuminate the work area to minimize impacts to wildlife.

Operations involving excessively noisy equipment should "ramp-up" sound sources, allowing marine mammals a chance to leave the area before sounds reach maximum levels.

Marine mammal comments: Pipeline construction, maintenance activities, and associated activities (e.g. vessel and helicopter use) may adversely affect marine mammals in the water or hauled out on land, through noise, vibration, and disruption of movements. These elevated sound levels may cause some species to temporarily disperse from or avoid construction areas. Marine mammals most likely to be present and therefore impacted include the critically

endangered Cook Inlet beluga whale, harbor porpoise, and harbor seal in the water and possibly to harbor seals hauled-out on land in concentration areas recognized by the NMFS.

Belugas rely on the use of sound to communicate, navigate, and find prey as do harbor porpoises. High levels of human-generated noise may interfere with the ability to carry out these functions in beluga whales (ADF&G 2017d). Harbor porpoise have an apparent sensitivity to anthropogenic sounds of various types which has resulted in avoidance behaviors (Forney et al. 2017). Anthropogenic noise can impact communication, breeding and other life functions of marine mammals (Firestone and Jarvis 2007).

Construction of the new pipeline will likely affect marine mammal habitat in several ways: seafloor disturbance, increased turbidity, and generation of additional underwater sound in the area. Marine mammals also could be indirectly affected if benthic prey species were displaced or destroyed by construction activities.

Permits and authorizations are required under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) to conduct activities that may result in the "take" of a protected species. All marine mammals are protected under the Marine Mammals Protection Act (MMPA) of 1972. The MMPA prohibits the "take" of marine mammals in U.S. waters. Take is defined as hunting, harassing, capturing, and killing marine mammals. Exceptions include incidental harassment and take authorizations for certain activities such as Alaska Native subsistence harvest, commercial fishing operations, and scientific research.

As such, a federal government Special 'take' Permit may be required for harbor seals, harbor porpoises, beluga whales and species that may occur in the project area. 'Take' is defined as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill." Harassment includes any act which disrupts behavioral patterns, including but not limited to, migration, breathing, nursing, feeding, or sheltering (i.e. hauling out). A 'take' that results in disruption of behavioral patterns includes a disturbance that causes hauled out pinnipeds to enter the water.

Questions about the MMPA and authorized activities should be directed to NOAA Fisheries Alaska Region Protected Resources Division at 907-586-7235 or NOAA Fisheries Small Take Program at 301-713-2322.

Timing Concerns

Use/Timing Concern	General Timing	Notes
Activity/Sensitive Life Stage		
UCI Northern District Chinook salmon set gillnets	May 25–June 24	0700-1900 Mondays
UCI Northern District Salmon set gillnets	June 25–EO (usually late Sept)	0700-1900 Mondays and Thursdays
CI Beluga Susitna Delta Sensitive Area	Mid-April–mid-Oct	
CI beluga whales – feeding in shallow, coastal waters and river mouths	spring–summer	
Harbor seal pupping	May/June–peak	
Harbor seal molting	May–Sept	Peaks in Aug
Harbor porpoise feeding	Apr–May	
Harbor porpoise feeding	Sept–Oct	
UCI Central District salmon set gillnets	July 8–Aug 15	0700-1900 Mondays and Thursdays, usually additional openings by EO
UCI Central District salmon drift gillnets	~June 19–EO (no later than Aug 15)	
Tyonek Subsistence Seasonal Use/Activity		
Eulachon fishing	April–May	Depends on weather and tidal conditions
Spring federal subsistence waterfowl season	Apr 2–May 31	
Tyonek Subdistrict Chinook salmon fishing	May 15–June 15	0400-2000 Tuesdays, Thursdays, and Fridays
Tyonek Subdistrict Subsistence salmon	June 16–Oct 15	0600-1800 Saturdays
Rainbow trout and Dolly Varden rod and reel fishing	July	In nearby rivers and lakes
Berry picking	late July–weather permitting	
GMU 16B moose hunt	Aug 20–Sept 25	
Moose, beaver, and porcupine hunting	Aug 20–Sept 25	Travel by boat to McAurthur River
Upland game bird season (spruce grouse, ptarmigan)	Aug 10–Mar 31	Grouse are usually taken in the fall and ptarmigan after freeze-up and throughout winter
Federal subsistence waterfowl season	Aug 1–31	
General waterfowl season	Sept 1–Dec 16	Most waterfowl hunting is over by mid to late Oct
Tier II moose hunting	Dec 15–Mar 31	
Harvesting fresh greens	spring–weather permitting	

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Digging for clams	spring	
Harvest firewood	winter	
Ice fishing (trout and Dolly Varden)	winter–lake thaw	
Beaver trapping	late winter	
Beluga Subsistence Seasonal Use/Activity		
Eulachon fishing	late spring	
Brown and black bear hunting	spring	
Ice fishing (rainbow trout and Northern pike)	winter–lake thaw	
Beaver and muskrat trapping and hunting	late winter–spring	
Spring subsistence salmon fishing	May–June	On inlet beaches near Tyonek and Beluga
Tyonek Subdistrict Chinook salmon fishing	May 15–June 15	0400-2000 Tuesdays, Thursdays, and Fridays
Salmon fishing	mid-June–Aug	
Plant and berry gathering	mid-June–weather permitting	
GMU 16B moose hunt	Aug 20–Sept 25	
Upland game bird season (spruce grouse, ptarmigan)	Aug 10–Mar 31	Grouse are usually taken in the fall and ptarmigan after freeze-up and throughout winter
General waterfowl season	Sept 1–Dec 16	Most waterfowl hunting is over by mid to late Oct
Tier II moose hunting	Nov 15–Feb 28	
Nikiski Subsistence Seasonal Use/Activity		
Moose and caribou hunting	August–late Sept	
Ice fishing; hunting and trapping small mammals	winter/early spring–lake thaw	
Rod and reel fishing	spring/post-breakup–weather permitting	
Harvest of vegetation and mushrooms	spring/post-breakup–weather permitting	
Harvest of salmon and nonsalmon	throughout summer	
Berry picking	late summer–weather permitting	
Upland game bird harvest	Aug–Mar	
Firewood harvest	winter	
Brown and black bear hunting	spring–summer	

Note: This table is a general reference for timing concerns, not a definitive listing of strict timing windows (i.e., regulatory season may change, subsistence activities may be modified depending on weather and wildlife, etc.). UCI=upper Cook Inlet; CI=Cook Inlet; EO=emergency order; GMU=Game Management Unit.

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	Percentage of households					Harvest weight (lb)			Harvest amount[a]			confidence
Resource	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	limit (±) harvest
All resources	**100.0**	**100.0**	**100.0**	**85.7**	**77.6**	**24,248.9**	**384.9**	**169.9**				**14.4**
Salmon	**89.8**	**85.7**	**81.6**	**49.0**	**59.2**	**16,765.5**	**266.1**	**117.5**				**17.5**
Chum salmon	8.2	8.2	8.2	0.0	2.0	101.5	1.6	0.7	18.0	ind	0.3	53.9
Coho salmon	65.3	63.3	59.2	32.7	40.8	3,169.4	50.3	22.2	691.6	ind	11.0	20.8
Chinook salmon	85.7	77.6	75.5	40.8	55.1	10,246.9	162.6	71.8	1,096.4	ind	17.4	15.5
Pink salmon	12.2	12.2	12.2	0.0	8.2	150.8	2.4	1.1	66.6	ind	1.1	73.7
Sockeye salmon	46.9	42.9	42.9	22.4	26.5	3,088.3	49.0	21.6	667.7	ind	10.6	55.0
Landlocked salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spawning sockeye salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown salmon	2.0	2.0	2.0	0.0	0.0	8.5	0.1	0.1	1.3	ind	0.0	94.8
Nonsalmon fish	**53.1**	**40.8**	**40.8**	**34.7**	**22.4**	**1,863.2**	**29.6**	**13.1**				**64.3**
Pacific herring	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring roe/unspecified	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring sac roe	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring spawn on kelp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Eulachon (hooligan, candlefish)	30.6	18.4	18.4	20.4	16.7	1,468.1	23.3	10.3	451.4	gal	7.2	81.9
Unknown smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific (gray) cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown flounder	2.0	2.0	2.0	0.0	0.0	38.6	0.6	0.3	12.9	ind	0.2	94.8
Lingcod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown greenling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific halibut	14.3	6.1	4.1	10.2	0.0	25.6	0.4	0.2	25.6	lb	0.4	90.0
Black rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sablefish (black cod)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shark	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown sole	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Stickleback (needlefish)	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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Resource	Percentage of households: Use %	Attempt %	Harvest %	Receive %	Give %	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	confidence limit (±) harvest
Nonsalmon fish, continued												
Wolffish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Dolly Varden	8.2	8.2	8.2	0.0	0.0	27.8	0.4	0.2	30.9	ind	0.5	48.3
Arctic grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pike	4.1	2.0	2.0	4.1	0.0	14.4	0.2	0.1	5.1	ind	0.1	94.8
Sheefish	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Longnose sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rainbow trout	28.6	24.5	24.5	10.2	10.2	230.4	3.7	1.6	164.6	ind	2.6	30.3
Steelhead	2.0	2.0	2.0	0.0	2.0	54.0	0.9	0.4	12.9	ind	0.2	94.8
Unknown trout	2.0	2.0	2.0	0.0	0.0	1.8	0.0	0.0	1.3	ind	0.0	94.8
Unknown whitefishes	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown nonsalmon fish	2.0	2.0	2.0	0.0	0.0	2.6	0.0	0.0	2.6	ind	0.0	94.8
Large land mammals	**73.5**	**61.2**	**12.2**	**67.3**	**24.5**	**3,471.4**	**55.1**	**24.3**				**36.6**
Black bear	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Brown bear	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Caribou	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Moose	73.5	59.2	12.2	67.3	24.5	3,471.4	55.1	24.3	7.7	ind	0.1	36.6
Dall sheep	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**12.2**	**10.2**	**6.1**	**6.1**	**4.1**	**139.5**	**2.2**	**1.0**				**53.6**
Beaver	8.2	6.1	4.1	4.1	0.0	77.1	1.2	0.5	5.1	ind	0.1	66.3
Coyote	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red fox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Snowshoe hare	2.0	2.0	2.0	0.0	0.0	10.3	0.2	0.1	5.1	ind	0.1	94.8
North American river (land) otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Lynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marmot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mink	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Muskrat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Porcupine	6.1	6.1	4.1	2.0	4.1	52.1	0.8	0.4	11.6	ind	0.2	84.7

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Resource	Percentage of households: Use %	Attempt %	Harvest %	Receive %	Give %	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	confidence limit (±) harvest
Small land mammals, continued												
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red (tree) squirrel	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Least weasel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gray wolf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine mammals	**14.3**	**10.2**	**6.1**	**14.3**	**6.1**	**360.0**	**5.7**	**2.5**				**55.8**
Harbor seal	6.1	8.2	6.1	2.0	6.1	360.0	5.7	2.5	6.4	ind	0.1	55.8
Unknown seal	2.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sea otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Steller sea lion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Beluga whale	10.2	2.0	0.0	10.2	2.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	**32.7**	**30.6**	**28.6**	**8.2**	**16.3**	**165.9**	**2.6**	**1.2**				**40.4**
Bufflehead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Canvasback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Gadwall	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Goldeneye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	8.2	6.1	6.1	4.1	2.0	34.7	0.6	0.2	34.7	ind	0.6	72.9
Common merganser	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red-breasted merganser	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pintail	12.2	10.2	10.2	2.0	6.1	22.6	0.4	0.2	28.3	ind	0.4	52.3
Unknown scaup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown scoter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern shoveler	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Green-winged teal	2.0	2.0	2.0	0.0	2.0	7.7	0.1	0.1	25.7	ind	0.4	94.8
American wigeon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown ducks	4.1	4.1	2.0	2.0	0.0	5.4	0.1	0.0	7.7	ind	0.1	94.8
Canada goose	4.1	4.1	4.1	0.0	2.0	7.7	0.1	0.1	6.4	ind	0.1	77.8
Snow goose	2.0	2.0	2.0	0.0	0.0	7.7	0.1	0.1	2.6	ind	0.0	94.8
White-fronted goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown goose	2.0	4.1	2.0	0.0	2.0	25.7	0.4	0.2	5.1	ind	0.1	94.8
Unknown swan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sandhill crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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	Percentage of households					Harvest weight (lb)			Harvest amount[a]			confidence
Resource	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	limit (±) harvest
Birds and eggs, continued												
Common snipe	2.0	2.0	2.0	0.0	0.0	1.3	0.0	0.0	12.9	ind	0.2	94.8
Unknown loon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spruce grouse	14.3	16.3	14.3	2.0	6.1	35.1	0.6	0.2	50.1	ind	0.8	39.0
Ruffed grouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown grouse	4.1	4.1	4.1	0.0	2.0	4.5	0.1	0.0	9.0	ind	0.1	72.4
Unknown ptarmigan	4.1	4.1	4.1	0.0	4.1	12.6	0.2	0.1	18.0	ind	0.3	82.1
Unknown duck eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull eggs	2.0	2.0	2.0	0.0	2.0	0.8	0.0	0.0	2.6	ind	0.0	94.8
Unknown tern eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine invertebrates	**16.3**	**12.2**	**10.2**	**8.2**	**4.1**	**131.9**	**2.1**	**0.9**				**67.7**
Butter clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Freshwater clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Horse clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
(steamers)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pinkneck clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Razor clams	14.3	10.2	8.2	6.1	4.1	117.1	1.9	0.8	39.0	gal	0.6	75.6
Unknown clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown cockles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Dungeness crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown king crab	4.1	2.0	2.0	2.0	0.0	14.8	0.2	0.1	6.4	ind	0.1	94.8
Tanner crab, bairdi	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown Tanner crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown mussels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Octopus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown scallops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Shrimp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	lb	0.0	0.0
Vegetation	**89.8**	**89.8**	**83.7**	**46.9**	**44.9**	**1,351.5**	**21.5**	**9.5**				**33.7**
Blueberry	61.2	73.5	59.2	18.4	24.5	617.9	9.8	4.3	154.5	gal	2.5	40.4
Lowbush cranberry	16.3	16.3	14.3	6.1	8.2	63.6	1.0	0.4	15.9	gal	0.3	48.3
Highbush cranberry	49.0	44.9	44.9	14.3	22.4	536.5	8.5	3.8	134.1	gal	2.1	35.4
Crowberry	4.1	4.1	4.1	2.0	0.0	5.5	0.1	0.0	1.4	gal	0.0	89.3

-continued-

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Resource	Percentage of households: Use %	Attempt %	Harvest %	Receive %	Give %	Harvest weight (lb): Total	Mean per household	Per capita	Harvest amount[a]: Total	Unit	Mean per household	confidence limit (±) harvest
Vegetation, continued												
Currants	14.3	16.3	14.3	2.0	2.0	21.7	0.3	0.2	5.4	gal	0.1	44.2
Raspberry	12.2	12.2	12.2	2.0	6.1	14.7	0.2	0.1	3.7	gal	0.1	67.6
Salmonberry	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Strawberry	12.2	12.2	12.2	4.1	2.0	20.6	0.3	0.1	4.8	gal	0.1	53.5
Twisted stalk berry (watermelon berry)	2.0	2.0	2.0	0.0	0.0	0.4	0.0	0.0	0.1	gal	0.0	94.8
Other wild berry	2.0	2.0	2.0	0.0	0.0	0.5	0.0	0.0	0.1	gal	0.0	94.8
Devil's club	2.0	2.0	2.0	0.0	0.0	2.6	0.0	0.0	2.6	gal	0.0	94.8
Fiddlehead ferns	2.0	2.0	2.0	0.0	0.0	1.3	0.0	0.0	1.3	gal	0.0	94.8
Hudson's Bay (Labrador) tea	14.3	16.3	14.3	2.0	6.1	27.6	0.4	0.2	27.6	gal	0.4	58.9
Wild celery	10.2	10.2	10.2	0.0	4.1	17.4	0.3	0.1	17.4	gal	0.3	46.3
Yarrow	2.0	2.0	2.0	0.0	0.0	1.3	0.0	0.0	1.3	gal	0.0	94.8
Other wild greens	6.1	6.1	6.1	0.0	2.0	20.1	0.3	0.1	20.1	gal	0.3	92.8
Unknown mushrooms	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Other wood	79.6	71.4	71.4	30.6	10.4	0.0	0.0	0.0	788.8	cord	12.5	38.4

Source ADF&G Division of Subsistence household surveys, 2014.

Note Where the percentage of households using a resource is greater than the combined receiving and harvesting households indicates use from resources obtained during a previous year.

Note For small land mammals, species that are not typically eaten show a non-zero harvest amount with a zero harvest weight. Harvest weight is not calculated for species harvested but not eaten.

a. Summary rows that include incompatible units of measure have been left blank.

Beluga Harvest Use Table. Estimated harvest and use of fish, game, and plant resources, Beluga, 2005-2006

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested*		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Per capita	Total	Mean HH	Harvest
All Resources	100.0%	100.0%	100.0%	100.0%	85.7%	8085.8	539.1	204.0			13.5%
Fish	92.9%	92.9%	85.7%	85.7%	85.7%	4905.7	327.0	123.7			13.3%
Salmon	92.9%	92.9%	85.7%	64.3%	85.7%	3471.8	231.5	87.6	583.0 Ind	38.9	14.2%
Chum Salmon	7.1%	7.1%	7.1%	0%	7.1%	112.5	7.5	2.8	21.4 Ind	1.4	58%
Coho Salmon	92.9%	78.6%	78.6%	42.9%	71.4%	1534.1	102.3	38.7	325.7 Ind	21.7	11.5%
Chinook Salmon	92.9%	92.9%	85.7%	42.9%	71.4%	1271.6	84.8	32.1	106.2 Ind	7.1	22.1%
Pink Salmon	21.4%	21.4%	21.4%	0%	0%	62.1	4.1	1.6	24.6 Ind	1.6	49.9%
Sockeye Salmon	57.1%	42.9%	35.7%	21.4%	35.7%	491.4	32.8	12.4	105.0 Ind	7.0	26.3%
Landlocked Salmon	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Spawnouts	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Spawning Sockeye	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Nonsalmon fish	85.7%	71.4%	71.4%	64.3%	42.9%	1433.9	95.6	36.2			22.1%
Herring	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Herring Roe	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Herring Sac Roe	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Herring Spawn on Kelp	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Eulachon (hooligan, candlefish)	57.1%	50.0%	50.0%	14.3%	35.7%	160.2	10.7	4.0	49.3 Gal	3.3	24.3%
Cod	7.1%	0%	0%	7.1%	0%	0	0	0	0 Ind	0	0%
Pacific Cod (gray)	7.1%	0%	0%	7.1%	0%	0	0	0	0 Ind	0	0%
Pacific Tom Cod	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Walleye Pollock (whiting)	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Flounder	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Greenling	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Lingcod	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Halibut	57.1%	7.1%	7.1%	57.1%	7.1%	53.6	3.6	1.4	53.6 Lbs	3.6	58%
Rockfish	7.1%	0%	0%	7.1%	0%	0	0	0	0 Ind	0	0%
Sablefish (black cod)	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Sculpin	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Shark	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Sole	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Stickleback (needlefish)	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Wolffish	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Blackfish	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Burbot	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
[continued]											
Char	35.7%	35.7%	35.7%	0%	7.1%	73.5	4.9	1.9	52.5 Ind	3.5	27.4%
Dolly Varden	28.6%	28.6%	28.6%	0%	7.1%	70.5	4.7	1.8	50.4 Ind	3.4	28.8%
Dolly Varden-saltwater	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Grayling	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%

ATTACHMENT C

Beluga Harvest Use Table. Estimated harvest and use of fish, game, and plant resources, Beluga, 2005-2006

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested*		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Per capita	Total	Mean HH	Harvest
Northern Pike	71.4%	57.1%	57.1%	21.4%	21.4%	549.6	36.6	13.9	183.2 Ind	12.2	20.5%
Sucker	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Trout	71.4%	57.1%	57.1%	14.3%	21.4%	597.0	39.8	15.1	426.4 Ind	28.4	30.5%
Rainbow Trout	71.4%	57.1%	57.1%	14.3%	21.4%	594.0	39.6	15.0	424.3 Ind	28.3	30.7%
Steelhead	7.1%	7.1%	7.1%	0%	0%	3.0	0.2	0.1	2.1 Ind	0.1	58%
Unknown Trout	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Whitefish	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Land Mammals	100.0%	64.3%	42.9%	92.9%	57.1%	2409	161	61			27.7%
Large Land Mammals	100.0%	64.3%	35.7%	92.9%	50.0%	2403.2	160.2	60.6			27.7%
Black Bear	42.9%	28.6%	28.6%	28.6%	28.6%	372.9	24.9	9.4	6.4 Ind	0.4	27.2%
Brown Bear	0%	21.4%	0%	0%	0%	0	0	0	0 Ind	0	0%
Caribou	29%	0%	0%	29%	0%	0	0	0	0 Ind	0	0%
Moose	100.0%	64%	21%	85.7%	43%	1735.7	115.7	43.8	3.2 Ind	0.2	30.7%
Muskox	14.3%	7.1%	7.1%	7.1%	7.1%	295	20	7	1.1 Ind	0.1	22%
Dall Sheep	7.1%	7.1%	0%	7.1%	0%	0	0	0	0 Ind	0	0%
Small Land Mammals	42.9%	42.9%	35.7%	7.1%	14.3%	5.4	0.4	0.1			57.7%
Beaver	28.6%	28.6%	21.4%	7.1%	0%	0.0	0.0	0.0	37.5 Ind	2.5	49.2%
Coyote	21.4%	21.4%	21.4%	0%	0%	0	0	0	9.6 Ind	0.6	36.0%
Fox	28.6%	28.6%	28.6%	0%	7%	0	0	0	10.7 Ind	0.7	26.0%
Red Fox	28.6%	28.6%	28.6%	0%	7.1%	0	0	0	10.7 Ind	0.7	26.0%
Hare	7.1%	7.1%	7.1%	0%	0%	4.3	0	0	2.1 Ind	0.1	58%
Snowshoe Hare	7.1%	7.1%	7.1%	0%	0%	4.3	0.3	0.1	2.1 Ind	0.1	58%
Land Otter	14.3%	14.3%	7.1%	0%	0%	0	0	0	4.3 Ind	0.3	57.7%
Lynx	0%	7.1%	0%	0%	0%	0	0	0	0 Ind	0	0%
Marmot	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Marten	35.7%	35.7%	28.6%	7.1%	0%	0	0	0	126.4 Ind	8.4	42.9%
Mink	7.1%	7.1%	7.1%	0%	0%	0	0	0	3.2 Ind	0.2	58%
Muskrat	7.1%	7.1%	7.1%	0%	0%	0	0	0	10.7 Ind	0.7	58%
Porcupine	7.1%	7.1%	7.1%	0%	0%	0	0	0	6.4 Ind	0.4	58%
Squirrel	21.4%	21.4%	21.4%	0%	0%	1.1	0.1	0.0	49.3 Ind	3.3	57.7%
Parka Squirrel (ground)	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
[continued]											
Tree Squirrel	21.4%	21.4%	21.4%	0%	0%	1.1	0.1	0.0	49.3 Ind	3.3	57.7%
Weasel	14.3%	14.3%	14.3%	0%	0%	0	0	0	11.8 Ind	0.8	52.3%
Wolf	28.6%	35.7%	28.6%	0%	7.1%	0	0	0	6.4 Ind	0.4	27.2%
Wolverine	7.1%	21.4%	0%	7.1%	0%	0	0	0	0 Ind	0	0%
Marine Mammals	0%	0%	0%	0%	0%	0	0	0			0%
Seal	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Harbor Seal (saltwater)	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Sea Otter	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%

ATTACHMENT C

Beluga Harvest Use Table. Estimated harvest and use of fish, game, and plant resources, Beluga, 2005-2006

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested*		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Per capita	Total	Mean HH	Harvest
Steller Sea Lion	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Whale	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Belukha	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Birds and Eggs	78.6%	78.6%	78.6%	14.3%	21.4%	266.7	17.8	6.7			21.4%
Migratory Birds	35.7%	35.7%	35.7%	7.1%	7.1%	82.2	5.5	2.1	58.9 Ind	3.9	27.9%
Ducks	28.6%	28.6%	28.6%	7.1%	0%	35.9	2.4	0.9	40.7 Ind	2.7	32.1%
Bufflehead	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Canvasback	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Gadwall	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Goldeneye	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Mallard	28.6%	28.6%	28.6%	7.1%	0%	24.6	1.6	0.6	24.6 Ind	1.6	31.2%
Merganser	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Northern Pintail	14.3%	14.3%	14.3%	0%	0%	6.9	0	0	8.6 Ind	0.6	40.6%
Scaup	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Scoter	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Northern Shoveler	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Teal	7.1%	7.1%	7.1%	7.1%	0%	0.6	0	0	2.1 Ind	0.1	58%
Green Winged Teal	7.1%	7.1%	7.1%	7.1%	0%	0.6	0	0	2.1 Ind	0.1	58%
Wigeon	7.1%	7.1%	7.1%	0%	0%	3.8	0	0	5.4 Ind	0.4	58%
American Wigeon	7.1%	7.1%	7.1%	0%	0%	3.8	0.3	0.1	5.4 Ind	0.4	58%
Unknown Ducks	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Geese	28.6%	35.7%	28.6%	0%	7.1%	28.3	1.9	0.7	16.1 Ind	1.1	33.7%
Canada Geese	21.4%	35.7%	21.4%	0%	0%	10.3	0.7	0.3	8.6 Ind	0.6	33.0%
Lesser Canada Geese (taverner/parvipes)	21.4%	35.7%	21.4%	0%	0%	10.3	0.7	0.3	8.6 Ind	0.6	33.0%
Unknown Canada Geese	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Snow Geese	0%	7%	0%	0%	0%	0	0	0	0 Ind	0	0%
White-fronted Geese	14.3%	14.3%	14.3%	0%	7.1%	18.0	1.2	0.5	7.5 Ind	0.5	39.7%
[continued]											
Swan	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Crane	7.1%	29%	7.1%	0%	0%	18.0	1.2	0.5	2.1 Ind	0.1	57.7%
Sandhill Crane	7.1%	28.6%	7.1%	0%	0%	18.0	1.2	0.5	2.1 Ind	0.1	57.7%
Shorebirds	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Common Snipe	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Seabirds & Loons	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Other Birds	78.6%	78.6%	78.6%	7.1%	21.4%	184.5	12.3	4.7	263.6 Ind	17.6	23.3%
Upland Game Birds	78.6%	78.6%	78.6%	7.1%	21.4%	184.5	12.3	4.7	263.6 Ind	17.6	23.3%
Grouse	78.6%	78.6%	78.6%	0%	21.4%	158.3	10.6	4.0	226.1 Ind	15.1	26.6%
Spruce Grouse	78.6%	78.6%	78.6%	0%	21.4%	156.0	10.4	3.9	222.9 Ind	14.9	26.5%
Ruffed Grouse	14.3%	21.4%	14.3%	0%	0%	2	0	0	3.2 Ind	0.2	41.7%
Unknown Grouse	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%

ATTACHMENT C

Beluga Harvest Use Table. Estimated harvest and use of fish, game, and plant resources, Beluga, 2005-2006

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested*		95% Conf Limit (+/-)
	Use	Att	Harv	Recv	Give	Total	Mean HH	Per capita	Total	Mean HH	Harvest
Ptarmigan	42.9%	50.0%	35.7%	7.1%	0%	26.3	1.8	0.7	37.5 Ind	2.5	27.0%
Bird Eggs	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Marine Invertebrates	50.0%	35.7%	35.7%	21.4%	21.4%	65.6	4.4	1.7			42.0%
Clams	50.0%	35.7%	35.7%	21.4%	21.4%	64.3	4.3	1.6	150.0 Gal	10.0	42.9%
Butter Clams	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Freshwater Clams	7.1%	7.1%	7.1%	0%	0%	3	0	0	1.1 Gal	0.1	58%
Horse Clams (Gaper)	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Pacific Littleneck Clams (Steamers)	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Pinkneck Clams	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Razor Clams	50.0%	28.6%	28.6%	21.4%	21.4%	61.1	4.1	1.5	148.9 Gal	9.9	45.4%
Unknown Clams	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Cockles	7.1%	7.1%	7.1%	0%	0%	1.3	0.1	< 0.1	0.4 Gal	0.0	58%
Crabs	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Mussels	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Octopus	0%	0%	0%	0%	0%	0	0	0	0 Ind	0	0%
Scallops	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Shrimp	0%	0%	0%	0%	0%	0	0	0	0 Gal	0	0%
Vegetation	92.9%	92.9%	92.9%	35.7%	50.0%	439.3	29.3	11.1			11.4%
Berries	92.9%	92.9%	92.9%	35.7%	50.0%	325.7	21.7	8.2	81.4 Gal	5.4	11.7%
Plants/Greens/Mushrooms	42.9%	42.9%	42.9%	7.1%	21.4%	113.6	7.6	2.9	28.4 Gal	1.9	29.2%
Wood	78.6%	78.6%	78.6%	7.1%	28.6%	0	0	0	66.4 Crd	4.4	13.6%

* Amount of resource harvested is individual units (Ind), unless otherwise specified. Wood is estimated in cords (crd).
SOURCE: Alaska Department of Fish and Game, Division of Subsistence Household Surveys, 2006.

ATTACHMENT C

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
All resources	**95.0**	**88.1**	**78.7**	**64.4**	**51.0**	**292,421.1**	**186.5**	**68.6**	**292,421.1**	**lb**	**186.5**	**22.9**
Salmon	**80.2**	**60.4**	**55.4**	**40.1**	**27.7**	**135,314.5**	**86.3**	**31.7**	**135,314.5**	**lb**	**86.3**	**21.1**
Chum salmon	4.5	4.5	4.5	0.5	2.0	2,241.8	1.4	0.5	409.4	ind	0.3	67.7
Coho salmon	34.2	31.2	27.2	7.9	8.4	29,348.6	18.7	6.9	6,373.2	ind	4.1	37.2
Chinook salmon	10.9	10.4	7.4	4.5	1.0	5,639.3	3.6	1.3	510.3	ind	0.3	83.7
Pink salmon	12.4	11.4	10.9	1.5	2.5	5,419.8	3.5	1.3	2,062.3	ind	1.3	49.6
Sockeye salmon	72.8	52.5	49.5	32.7	24.3	91,901.9	58.6	21.6	20,493.7	ind	13.1	20.8
Landlocked salmon	1.0	1.0	1.0	0.0	0.5	486.6	0.3	0.1	324.4	ind	0.2	167.7
Unknown salmon	4.0	1.5	1.0	2.5	1.0	276.5	0.2	0.1	61.8	ind	0.0	161.4
Nonsalmon fish	**55.0**	**42.6**	**39.1**	**24.3**	**16.3**	**53,278.3**	**34.0**	**12.5**	**53,278.3**	**lb**	**34.0**	**31.7**
Pacific herring	1.0	1.0	1.0	0.0	0.5	1,183.3	0.8	0.3	197.2	gal	0.1	180.6
Pacific herring roe (unspecified)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring sac roe	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Pacific herring spawn on kelp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Eulachon (hooligan, candlefish)	4.5	4.0	4.0	1.0	2.5	2,133.8	1.4	0.5	656.6	gal	0.4	83.9
Unknown smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Sea bass	1.5	1.5	1.5	0.0	0.0	92.7	0.1	0.0	92.7	ind	0.1	112.5
Pacific (gray) cod	3.0	3.0	3.0	0.0	0.0	939.3	0.6	0.2	293.5	ind	0.2	103.3
Pacific tomcod	0.5	0.5	0.5	0.0	0.0	11.6	0.0	0.0	23.2	ind	0.0	184.4
Walleye pollock (whiting)	1.0	1.0	1.0	0.0	0.0	216.3	0.1	0.1	154.5	ind	0.1	145.6
Eel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Starry flounder	1.5	1.0	1.0	0.5	0.0	185.4	0.1	0.0	61.8	ind	0.0	145.6
Unknown flounder	0.5	0.5	0.5	0.0	0.0	46.3	0.0	0.0	15.4	ind	0.0	184.4
Lingcod	3.5	4.5	3.0	1.0	0.0	741.5	0.5	0.2	185.4	ind	0.1	94.7
Unknown greenling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Pacific halibut	43.1	30.2	26.7	21.8	11.4	37,278.2	23.8	8.7	37,278.2	lb	23.8	36.2
Black rockfish	2.0	2.0	1.5	0.5	0.0	301.2	0.2	0.1	200.8	ind	0.1	113.9
Red rockfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Yelloweye rockfish	1.0	1.0	1.0	0.0	0.0	69.5	0.0	0.0	23.2	ind	0.0	137.2

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ATTACHMENT C

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Nonsalmon fish, continued												
China rockfish	0.5	0.5	0.5	0.0	0.0	46.3	0.0	0.0	15.4	ind	0.0	184.4
Unknown rockfish	1.5	1.5	1.5	0.0	0.5	347.6	0.2	0.1	115.9	ind	0.1	130.4
Sablefish (black cod)	1.5	1.5	1.5	0.0	0.5	455.0	0.3	0.1	146.8	ind	0.1	125.8
Unknown Irish lord	0.5	0.5	0.5	0.0	0.5	46.3	0.0	0.0	92.7	ind	0.1	184.4
Unknown sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown shark	1.0	1.0	1.0	0.0	1.0	625.7	0.4	0.1	69.5	ind	0.0	137.2
Skates	1.0	1.0	1.0	0.0	0.0	193.1	0.1	0.0	38.6	ind	0.0	151.9
Unknown sole	1.0	1.0	1.0	0.0	0.0	231.7	0.1	0.1	231.7	ind	0.1	151.9
Wolffish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Arctic char	0.5	0.5	0.5	0.0	0.0	7.0	0.0	0.0	7.7	ind	0.0	184.4
Dolly Varden	6.9	6.4	5.9	1.0	2.0	1,881.6	1.2	0.4	1,344.0	ind	0.9	86.5
Lake trout	4.5	5.0	4.5	0.5	0.0	832.7	0.5	0.2	594.8	ind	0.4	86.8
Unknown char	0.5	0.5	0.5	0.0	0.0	21.6	0.0	0.0	15.4	ind	0.0	184.4
Arctic grayling	2.5	2.0	2.0	0.5	0.5	119.0	0.1	0.0	169.9	ind	0.1	118.7
Northern pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown sturgeon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Cutthroat trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Rainbow trout	18.8	18.3	17.3	2.0	3.5	5,244.7	3.3	1.2	3,746.2	ind	2.4	44.0
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown whitefishes	1.0	0.5	0.5	0.5	0.0	27.0	0.0	0.0	15.4	ind	0.0	184.4
Large land mammals	**32.7**	**28.2**	**10.9**	**21.8**	**9.9**	**72,854.1**	**46.5**	**17.1**	**72,854.1**	**lb**	**46.5**	**43.9**
Black bear	4.5	7.9	3.5	1.5	1.5	4,032.0	2.6	0.9	69.5	ind	0.0	72.9
Caribou	5.9	5.0	4.0	2.5	2.0	10,427.6	6.7	2.4	69.5	ind	0.0	66.9
Deer	1.0	0.5	0.0	1.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mountain goat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Moose	28.7	24.8	6.4	19.8	7.4	58,394.5	37.2	13.7	108.1	ind	0.1	51.2
Dall sheep	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Small land mammals	**7.9**	**9.4**	**6.4**	**2.0**	**2.0**	**2,705.4**	**1.7**	**0.6**	**2,705.4**	**lb**	**1.7**	**74.8**
Beaver	2.0	1.5	1.0	1.0	0.5	1,149.0	0.7	0.3	139.0	ind	0.1	130.3
Coyote	1.0	2.5	1.0	0.0	0.0	0.0	0.0	0.0	23.2	ind	0.0	137.2
Red fox	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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ATTACHMENT C

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Small land mammals, continued												
Snowshoe hare	5.0	5.4	4.5	0.5	1.0	1,004.1	0.6	0.2	502.1	ind	0.3	92.2
North American river (land) otter	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	38.6	ind	0.0	184.4
Lynx	1.0	1.0	1.0	0.0	0.0	92.7	0.1	0.0	46.3	ind	0.0	184.4
Marten	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	139.0	ind	0.1	156.6
Mink	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Muskrat	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	77.2	ind	0.0	184.4
Porcupine	0.5	1.0	0.5	0.5	0.5	432.6	0.3	0.1	54.1	ind	0.0	184.4
Arctic ground (parka) squirrel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Red (tree) squirrel	0.5	0.5	0.5	0.0	0.0	19.3	0.0	0.0	38.6	ind	0.0	184.4
Unknown squirrel	0.5	0.5	0.5	0.0	0.0	7.7	0.0	0.0	15.4	ind	0.0	184.4
Weasel	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	7.7	ind	0.0	184.4
Gray wolf	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Wolverine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Marine mammals	**2.5**	**0.0**	**0.0**	**2.5**	**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**lb**	**0.0**	**0.0**
Harbor seal	2.0	0.0	0.0	2.0	0.5	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown seal	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sea otter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Steller sea lion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Bowhead whale	1.0	0.0	0.0	1.0	0.5	0.0	0.0	0.0	0.0	ind	0.0	0.0
Birds and eggs	**16.3**	**18.3**	**14.4**	**2.0**	**1.5**	**1,782.0**	**1.1**	**0.4**	**1,782.0**	**lb**	**1.1**	**59.7**
Bufflehead	0.5	0.5	0.5	0.0	0.0	15.4	0.0	0.0	38.6	ind	0.0	184.4
Unknown eider	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Goldeneye	1.0	1.0	1.0	0.0	0.0	43.3	0.0	0.0	54.1	ind	0.0	160.1
Harlequin duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Mallard	2.0	3.0	2.0	0.0	0.0	152.9	0.1	0.0	169.9	ind	0.1	115.1
Unknown merganser	0.5	0.5	0.5	0.0	0.0	13.9	0.0	0.0	15.4	ind	0.0	184.4
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern pintail	0.5	0.5	0.5	0.0	0.0	37.1	0.0	0.0	46.3	ind	0.0	184.4
Unknown scaup	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Birds and eggs, continued												
Black scoter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Surf scoter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
White-winged scoter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Northern shoveler	0.5	0.5	0.5	0.0	0.0	23.2	0.0	0.0	38.6	ind	0.0	184.4
Unknown teal	1.0	1.5	1.0	0.0	0.0	46.3	0.0	0.0	154.5	ind	0.1	132.7
Unknown wigeon	1.0	1.0	1.0	0.0	0.0	18.5	0.0	0.0	61.8	ind	0.0	145.6
Unknown ducks	1.5	0.5	0.5	1.0	0.0	13.2	0.0	0.0	15.4	ind	0.0	184.4
Unknown Canada/ cackling geese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
White-fronted goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown geese	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Sandhill crane	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown cormorant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Black-legged kittiwake	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown murre	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown puffin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Spruce grouse	5.4	5.9	5.4	0.0	0.5	600.2	0.4	0.1	857.4	ind	0.5	92.5
Ruffed grouse	1.5	1.5	1.5	0.0	0.0	37.8	0.0	0.0	54.1	ind	0.0	114.4
Unknown grouse	7.4	8.9	6.4	1.0	0.0	373.1	0.2	0.1	533.0	ind	0.3	89.2
Unknown ptarmigan	2.5	3.0	2.5	0.0	1.0	351.4	0.2	0.1	502.1	ind	0.3	113.2
Unknown duck eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown goose eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Black oystercatcher eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown gull eggs	1.0	0.5	0.5	0.5	0.0	55.6	0.0	0.0	185.4	ind	0.1	184.4
Unknown tern eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown eggs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0

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	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Marine invertebrates	**19.3**	**14.9**	**13.9**	**5.9**	**3.5**	**7,258.2**	**4.6**	**1.7**	**7,258.2**	**lb**	**4.6**	**59.8**
Red (large) chitons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Black (small) chitons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Butter clams	6.4	5.4	5.4	1.0	0.0	945.0	0.6	0.2	315.0	gal	0.2	80.1
Horse clams	0.5	0.5	0.5	0.0	0.0	69.5	0.0	0.0	23.2	gal	0.0	184.4
Pacific littleneck clams (steamers)	2.0	2.0	2.0	0.0	0.0	208.6	0.1	0.0	69.5	gal	0.0	113.6
Pinkneck clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Razor clams	10.9	8.4	7.4	3.0	2.5	3,470.1	2.2	0.8	1,156.7	gal	0.7	79.5
Unknown clams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown cockles	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Dungeness crab	0.5	0.5	0.5	0.0	0.0	135.2	0.1	0.0	193.1	ind	0.1	184.4
Unknown king crab	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Unknown Tanner crab	1.5	1.0	1.0	0.5	0.0	667.4	0.4	0.2	417.1	ind	0.3	135.7
Unknown crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Limpets	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown mussels	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Octopus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ind	0.0	0.0
Weathervane scallops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown sea cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Unknown sea urchin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Shrimp	4.5	2.5	2.5	2.0	1.0	1,762.5	1.1	0.4	881.3	lb	0.6	151.8
Snails	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Whelk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Vegetation	**80.7**	**78.7**	**78.7**	**24.3**	**27.2**	**19,228.6**	**12.3**	**4.5**	**19,228.6**	**lb**	**12.3**	**34.2**
Blueberry	44.6	43.6	42.1	8.4	7.4	5,849.1	3.7	1.4	1,462.3	gal	0.9	45.8
Lowbush cranberry	20.3	18.8	18.3	2.5	3.5	2,386.8	1.5	0.6	596.7	gal	0.4	72.5
Highbush cranberry	15.8	15.8	15.8	1.0	1.5	1,736.5	1.1	0.4	434.1	gal	0.3	63.6
Crowberry	6.9	5.9	5.9	1.0	1.5	297.9	0.2	0.1	74.5	gal	0.0	70.7
Gooseberry	2.0	2.0	2.0	0.0	0.5	115.9	0.1	0.0	29.0	gal	0.0	112.9
Currants	6.4	6.4	6.4	0.0	1.0	390.6	0.2	0.1	97.7	gal	0.1	96.0
Cloudberry	0.5	0.5	0.5	0.0	0.0	3.9	0.0	0.0	1.0	gal	0.0	184.4

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ATTACHMENT C

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Vegetation, continued												
Nagoonberry	1.0	0.5	0.5	0.5	0.5	3.9	0.0	0.0	1.0	gal	0.0	184.4
Raspberry	23.3	20.8	20.8	4.0	2.5	1,919.4	1.2	0.5	479.9	gal	0.3	47.1
Salmonberry	10.9	9.4	9.4	2.0	1.0	1,260.0	0.8	0.3	315.0	gal	0.2	95.9
Strawberry	13.4	12.9	12.9	2.0	2.5	1,110.0	0.7	0.3	277.5	gal	0.2	63.0
Twisted stalk berry (watermelon berry)	5.9	5.9	5.9	0.5	1.5	764.7	0.5	0.2	191.2	gal	0.1	88.5
Other wild berry	0.5	0.5	0.5	0.0	0.0	23.2	0.0	0.0	5.8	gal	0.0	184.4
Beach asparagus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	gal	0.0	0.0
Wild rhubarb	0.5	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	gal	0.0	0.0
Devil's club	1.5	1.0	1.0	0.5	0.5	38.6	0.0	0.0	38.6	gal	0.0	132.7
Fiddlehead ferns	8.4	7.9	7.9	1.5	1.5	415.8	0.3	0.1	415.8	gal	0.3	73.5
Nettle	1.5	1.5	1.5	0.0	0.5	34.8	0.0	0.0	34.8	gal	0.0	117.3
Hudson's Bay (Labrador) tea	1.0	1.0	1.0	0.0	1.0	77.2	0.0	0.0	77.2	gal	0.0	151.9
Dandelion greens	2.5	2.5	2.5	0.0	0.0	50.2	0.0	0.0	50.2	gal	0.0	111.7
Sourdock	0.5	0.5	0.5	0.0	0.5	30.9	0.0	0.0	30.9	gal	0.0	184.4
Spruce tips	2.0	2.0	2.0	0.0	0.5	115.9	0.1	0.0	115.9	gal	0.1	128.0
Wild celery	1.0	1.0	1.0	0.0	0.0	13.5	0.0	0.0	54.1	gal	0.0	131.4
Wild parsley	0.5	0.5	0.5	0.0	0.5	7.7	0.0	0.0	7.7	gal	0.0	184.4
Wild rose hips	11.4	11.4	11.4	0.0	3.0	1,004.7	0.6	0.2	251.2	gal	0.2	61.7
Yarrow	1.0	1.0	1.0	0.0	0.0	23.2	0.0	0.0	23.2	gal	0.0	137.2
Other wild greens	3.5	3.5	3.5	0.0	0.5	378.0	0.2	0.1	378.0	gal	0.2	152.0
Unknown mushrooms	10.9	10.9	10.4	1.5	0.5	739.2	0.5	0.2	739.2	gal	0.5	94.1
Fireweed	4.0	2.5	2.5	1.5	0.5	85.1	0.1	0.0	85.1	gal	0.1	108.6
Plantain	1.0	1.0	1.0	0.0	0.0	31.4	0.0	0.0	31.4	gal	0.0	181.6
Stinkweed	1.0	1.0	1.0	0.0	0.0	23.2	0.0	0.0	23.2	gal	0.0	137.2
Puffballs	1.0	1.0	1.0	0.0	0.0	15.4	0.0	0.0	15.4	gal	0.0	130.1
Chaga	0.5	0.5	0.5	0.0	0.5	7.7	0.0	0.0	7.7	gal	0.0	0.0
Sea chickweed	0.5	0.5	0.5	0.0	0.0	23.2	0.0	0.0	23.2	gal	0.0	184.4
Bull kelp	0.5	0.5	0.5	0.0	0.0	61.8	0.0	0.0	15.4	gal	0.0	184.4
Unknown seaweed	0.5	0.5	0.5	0.0	0.5	146.8	0.1	0.0	36.7	gal	0.0	184.4

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ATTACHMENT C

	Percentage of households					Harvest weight (lb)			Harvest amount			95% confidence limit (±) harvest
Resource	Use %	Attempt %	Harvest %	Receive %	Give %	Total	Mean per household	Per capita	Total	Unit	Mean per household	
Wood	54.5	52.5	52.0	8.4	14.9	–	–	–	–		–	–
Roots	0.5	0.5	0.5	0.0	0.0	–	–	–	–		–	–
Spruce pitch	0.5	0.5	0.5	0.0	0.0	–	–	–	–		–	–
Alder	0.5	0.5	0.5	0.0	0.0	–	–	–	–		–	–
Birch sap	1.5	1.5	1.5	0.0	0.0	42.5	0.0	0.0	347.6	gal	0.2	130.9

Source ADF&G Division of Subsistence household surveys, 2015.

Note Resources where the percentage using is greater than the combined received and harvest indicate use from resources obtained during a previous year.

Note For small land mammals, species that are not typically eaten show a non-zero harvest amount with a zero harvest wight. Harvest weight is not calculated for species harvested but not eaten.

Note "–" indicates the harvest amount for the resource was not collected during the survey.

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