

## K3.9 SUBSISTENCE

This section summarizes the most recent available comprehensive subsistence harvest surveys for 13 communities that are farther away from the mine site, transportation corridor, and port site. A summary of the subsistence harvest surveys for the six communities closest to the project area can be found in Section 3.9, Subsistence. This appendix also includes additional maps for the six communities discussed in Section 3.9, Subsistence. The purpose of this appendix is to provide supplemental information for the six communities closest to the project area; this appendix also provides baseline subsistence harvest and use information for communities that are unlikely to be directly affected by the project and alternatives but could experience indirect effects or be impacted by one of the spill scenarios discussed in Section 4.27, Spill Risk. The communities included in this section that may experience indirect impacts to subsistence are: one community on Lake Clark, the more distant communities down the Kvichak River and Nushagak River drainages, and a pair of Cook Inlet communities. Communities with older data or no data were not included.

Wildlife and subsistence fish harvest data were reviewed for current and historic levels of harvest in the project area. There are no harvest monitoring programs by Alaska Department of Fish and Game (ADF&G) for subsistence harvest of non-salmon fish in areas N, S, and T. Data by Game Management Unit (GMU) for land mammal harvest of species (for the animals that ADF&G collects information for) by GMU is shown in Table K3.9-1. Specific locations of harvested animals and hunter personal information is protected; therefore, locations of harvests are not provided (ADF&G 2018-RFI 089).

**Table K3.9-1: Select Land Mammal Harvest by Game Management Unit, 2013-2017**

GMU	2013	2014	2015	2016	2017	Total
<b>Brown Bear</b>						
9A	47	0	50	2	63	162
9B	57	3	42	1	31	134
9C	27	4	45	6	33	115
15C	16	6	13	9	15	59
17B	60	47	49	37	35	228
17C	34	21	10	12	16	93
Total	241	81	209	67	193	791
<b>Black Bear</b>						
9A	5	0	3	0	2	10
9B	0	0	0	1	1	2
9C	0	0	0	0	0	0
15C	110	118	93	154	159	634
17B	4	2	4	0	6	16
17C	0	1	1	0	1	3
Total	119	121	101	155	169	665

**Table K3.9-1: Select Land Mammal Harvest by Game Management Unit, 2013-2017**

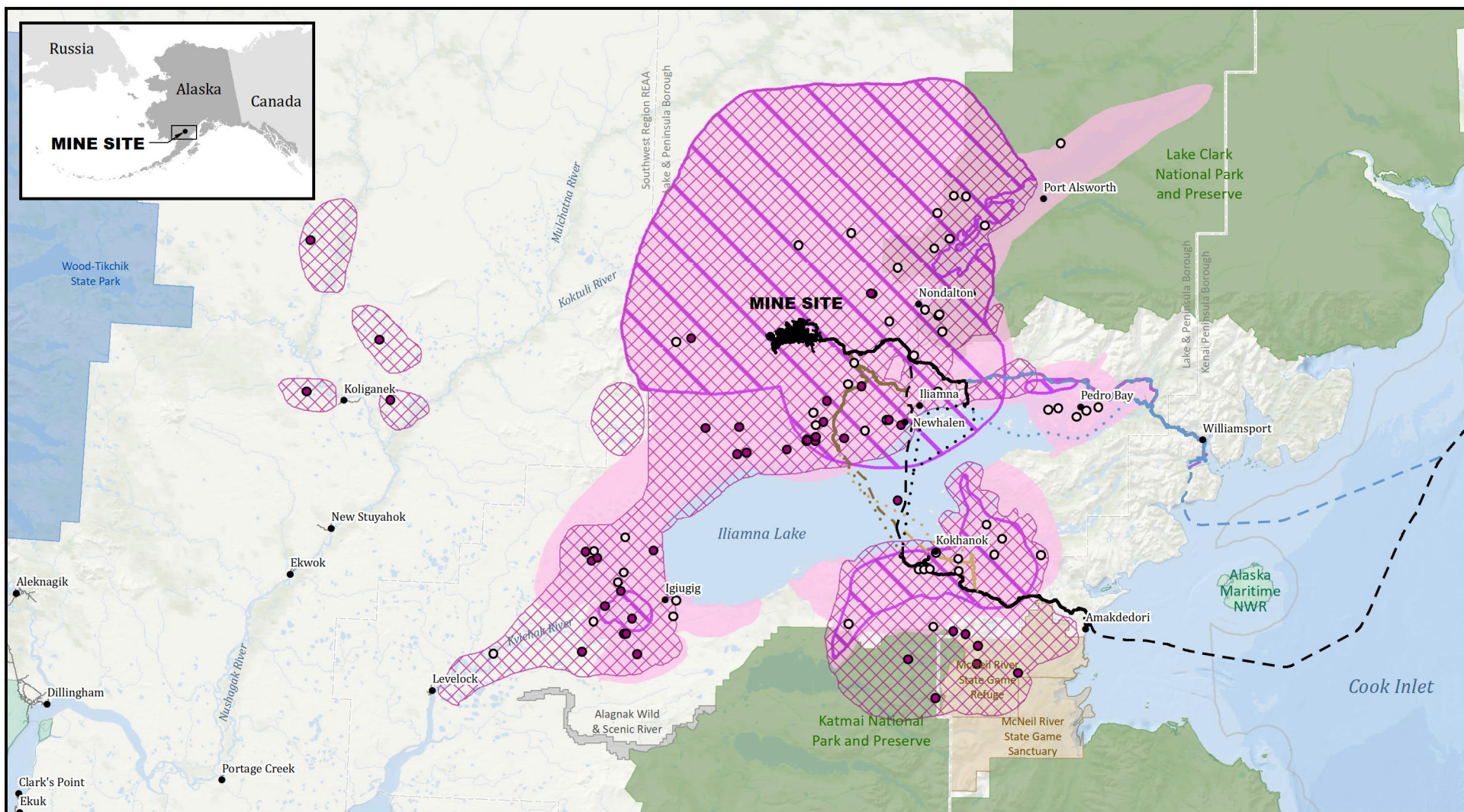
GMU	2013	2014	2015	2016	2017	Total
<b>Moose</b>						
9A	3	3	4	1	5	16
9B	28	41	26	56	42	193
9C	16	22	30	32	24	124
15C	116	116	180	202	176	840
17B	37	35	43	60	45	220
17C	148	149	162	170	160	789
Total	348	416	445	521	452	2,182
<b>Caribou</b>						
9A	0	0	0	1	2	3
9B	11	14	15	29	16	85
9C	1	2	0	36	14	53
15C	1	4	4	4	3	16
17B	38	39	60	76	74	287
17C	6	17	37	83	140	283
Total	57	76	116	229	249	727
<b>Wolf</b>						
9A	1	0	4	0	2	7
9B	10	2	3	2	9	26
9C	5	6	5	4	7	27
15C	8	6	6	14	13	47
17B	8	1	4	50	33	96
17C	13	5	20	15	51	104
Total	45	20	42	85	115	307
<b>Wolverine</b>						
9A	1	0	0	0	0	1
9B	1	2	2	19	5	29
9C	7	6	3	9	4	29
15C	7	3	7	5	7	30
17B	8	3	15	16	12	54
17C	8	3	3	16	18	50
Total	35	17	30	65	46	193
<b>Goat</b>						
15C	34	29	40	35	39	177
Total	34	29	40	35	39	177

**Table K3.9-1: Select Land Mammal Harvest by Game Management Unit, 2013-2017**

GMU	2013	2014	2015	2016	2017	Total
<b>Sheep</b>						
15C	1	1	0	0	2	4
Total	1	1	0	0	2	4

Source: ADF&G 2018-RFI 089

Below are community profiles and harvest composition for communities not discussed in Section 3.9, Subsistence, including a pie chart for the composition of subsistence harvest by estimated edible weight. Following each community group are maps that show the search and harvest areas that communities use for large land mammals, fish, vegetation, marine mammals, marine invertebrates, birds, and small mammals. Large land mammals include caribou, moose, brown bear, black bear, and sheep or goats. Fish figures are divided by salmon and non-salmon, and vegetation combines plants, wood, berries, and fungi. Marine mammals include seals, sea lions, sea otters, and whales and marine invertebrates include clams, mussels, scallops, crabs, octopus, and shrimp. Upland game birds include grouse and ptarmigan, and waterfowl refers to ducks and geese. Eggs primarily come from ducks, geese, and seabirds. The figures for small land mammals include beaver, muskrat, river otter, foxes, hares, weasels, wolf, wolverine, squirrels, porcupine, and lynx.



Sources: Sources: PLP 2020-RF1168;  
PLP 2019-RF1153; Fall et al. 2006;  
Krieg et al. 2009; (Study years 2004 and 2005)



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Miles

#### Large Land Mammal Harvest Areas

- Caribou (Point)
- Moose (Point)
- Brown bear
- Caribou
- Moose

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a
- Alternative 1
- Alternative 1 Kokhanok East
- Ferry Terminal Variant

- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

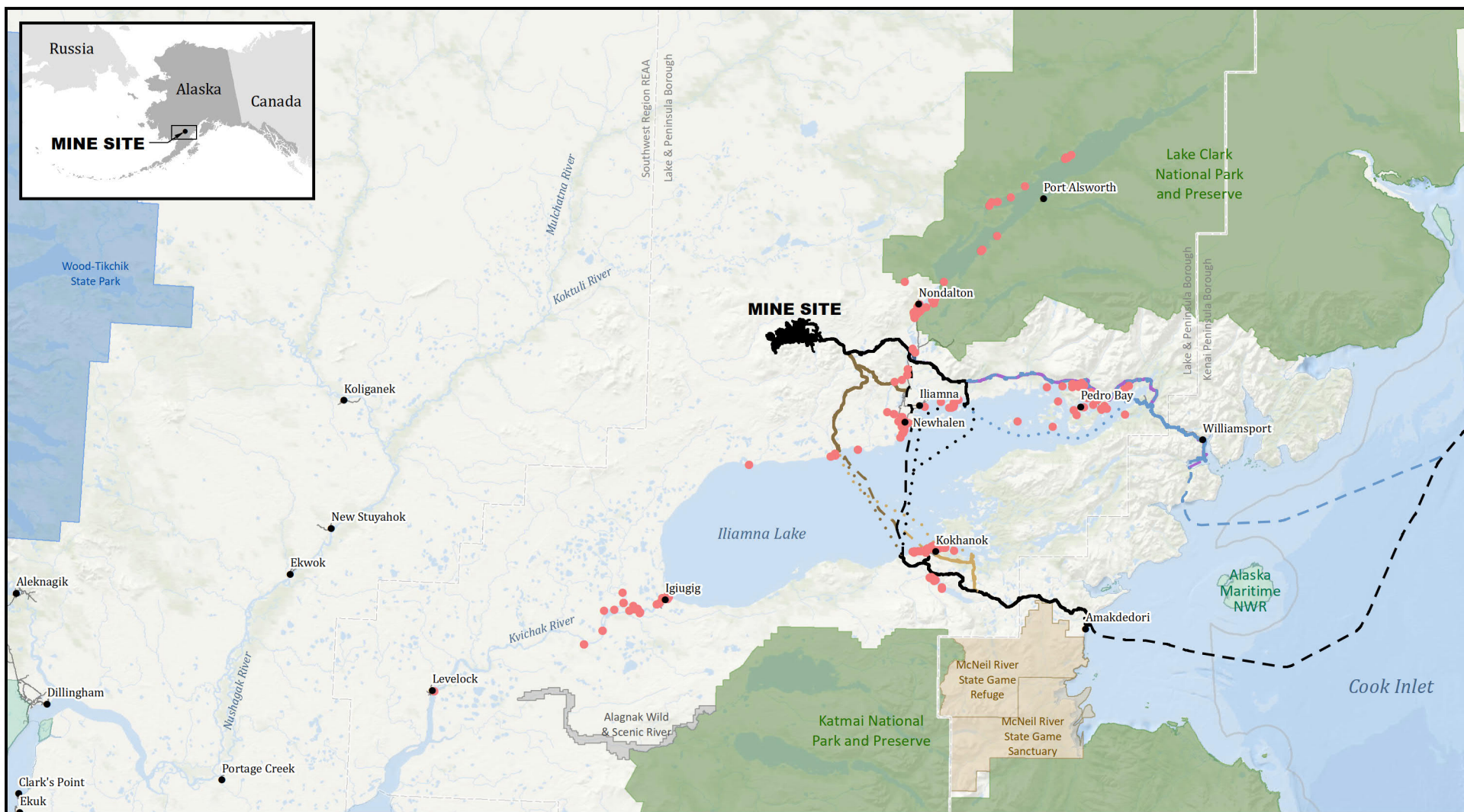
- Local Roads
- Three Nautical Mile Line

- Borough Boundary
- National Park
- National Wildlife Refuge
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

## LARGE LAND MAMMAL HARVEST AREAS: ILIAMNA, NEWHALEN, PEDRO BAY, NONDALTON, IGIUGIG, AND KOKHANOK

FIGURE K3.9-1





Sources: Sources: PLP 2020-RF1168;  
PLP 2019-RF1153; Fall et al. 2006;  
Krieg et al. 2009; (Study years 2004 and 2005)



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#### Salmon Harvest Areas

● Salmon (Point)

#### Action Alternatives

... Ferry Routes

— Natural Gas Pipelines

■ Alternative 1a

■ Alternative 1

■ Alternative 1 Kokhanok East  
Ferry Terminal Variant

■ Alternative 2

■ Alternative 2 Newhalen River  
North Crossing Variant

■ Alternative 3

#### Other Features

— Local Roads

— Three Nautical Mile Line

— Borough Boundary

■ National Park

■ National Wildlife Refuge

■ Alaska State Park

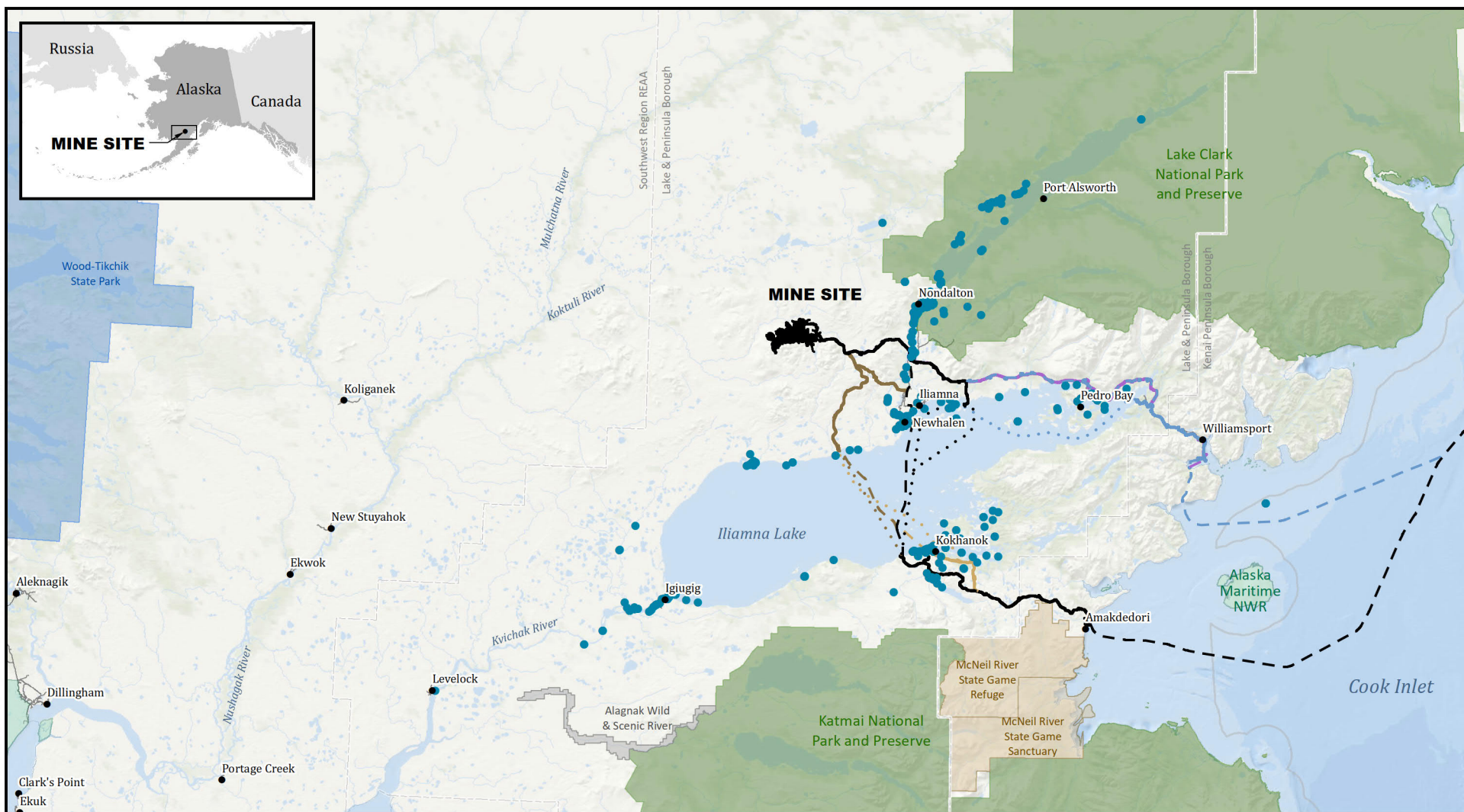
■ State Game Refuge/Sanctuary

■ Wild and Scenic River

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**SALMON HARVEST AREAS:  
ILIAMNA, NEWHALEN, PEDRO BAY,  
NONDALTON, IGIUGIG, AND KOKHANOK**

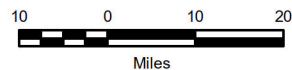
FIGURE K3.9-2



Sources: PLP 2020-RF1168; PLP 2019-RF1153;  
Fall et al. 2006; Krieg et al. 2009;  
(Study years 2004 and 2005)



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#### Non-Salmon Harvest Areas

- Non-Salmon Fish (Point)

#### Action Alternatives

- .... Ferry Routes

- Natural Gas Pipelines

- Alternative 1a

#### Alternative 1

- Alternative 1 Kokhanok East Ferry Terminal Variant

#### Alternative 2

- Alternative 2 Newhalen River North Crossing Variant

#### Alternative 3

#### Other Features

- Local Roads

- Three Nautical Mile Line

- Borough Boundary

- National Park

- National Wildlife Refuge

#### Alaska State Park

- State Game Refuge/Sanctuary

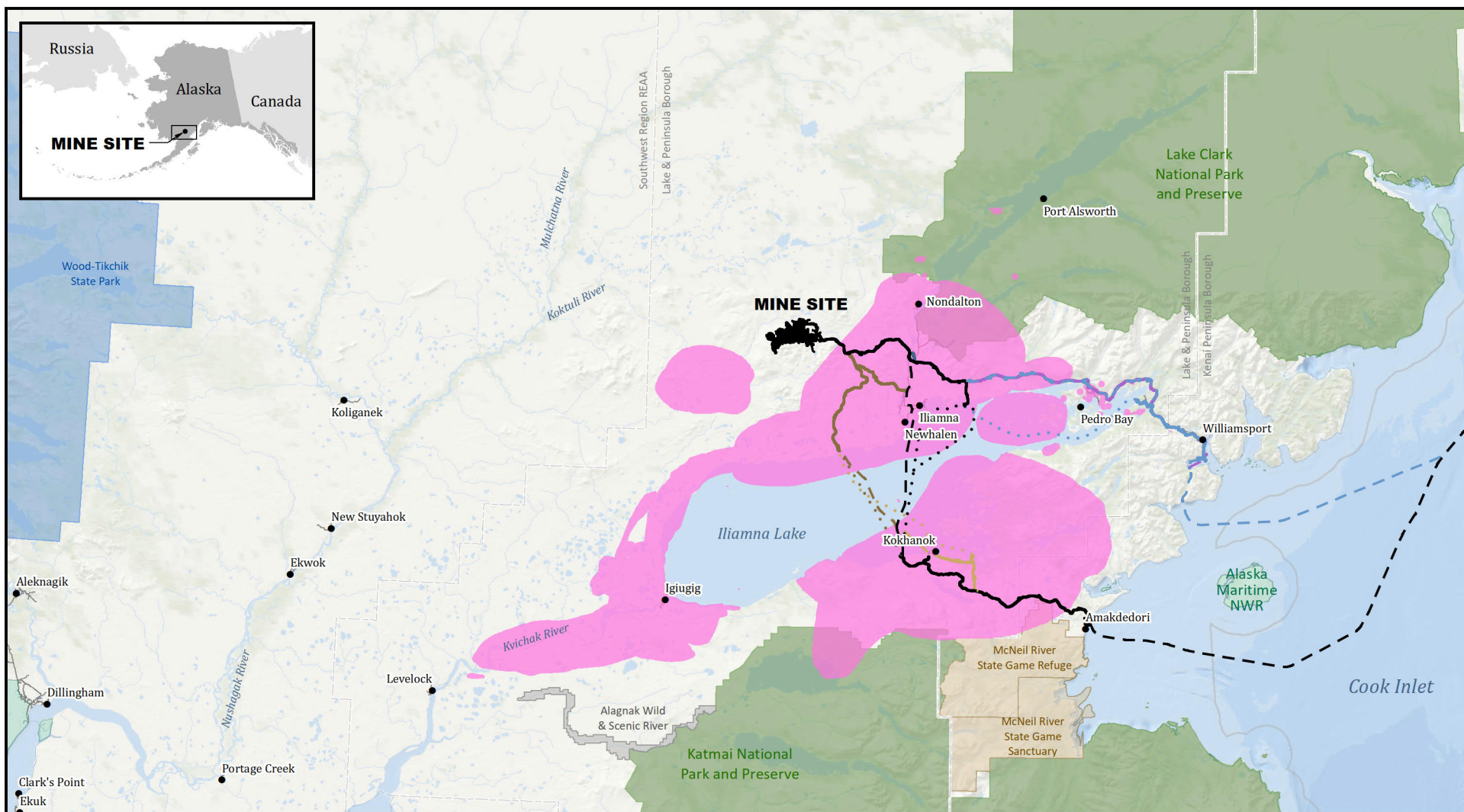
- Wild and Scenic River

**NON-SALMON HARVEST AREAS:  
ILIAMNA, NEWHALEN, PEDRO BAY,  
NONDALTON, IGIUGIG, AND KOKHANOK**

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**FIGURE K3.9-3**





Sources: PLP 2020-RF1168; PLP 2019-RF1153;  
Fall et al. 2006; Krieg et al. 2009;  
(Study years 2004 and 2005)



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#### Vegetation Harvest Areas

Plants, Wood, Berries,  
and Fungi

#### Action Alternatives

..... Ferry Routes  
— Natural Gas Pipelines  
■ Alternative 1a

#### Alternative 1

Alternative 1 Kokhanok East  
Ferry Terminal Variant

#### Alternative 2

Alternative 2 Newhalen River  
North Crossing Variant

#### Alternative 3

#### Other Features

— Local Roads  
— Three Nautical Mile Line  
— Borough Boundary  
■ National Park  
■ National Wildlife Refuge

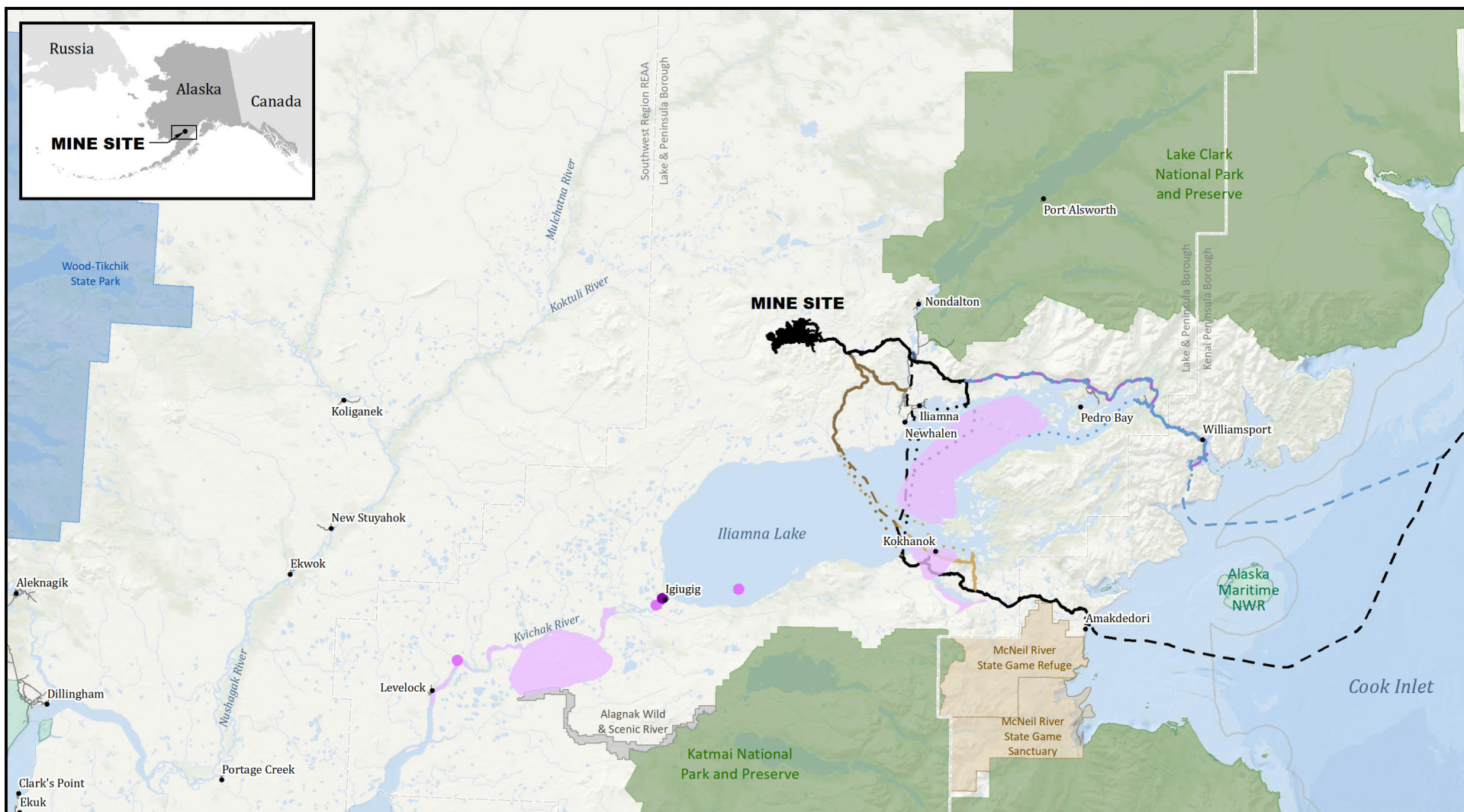
#### Alaska State Park

■ State Game Refuge/Sanctuary  
■ Wild and Scenic River

**VEGETATION (PLANTS, WOOD,  
BERRIES, FUNGI) HARVEST AREAS:  
ILIAMNA, NEWHALEN, PEDRO BAY,  
NONDALTON, IGIUGIG, AND KOKHANOK**

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FIGURE K3.9-4



Sources: PLP 2020-RF1168; PLP 2019-RF1153;  
Fall et al. 2006; Krieg et al. 2009;  
(Study years 2004 and 2005)



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**Marine Mammal and Marine  
Invertebrate Harvest Areas**

- Marine Invertebrates (Point)
- Marine Mammals (Point)
- Marine Mammals

**Action Alternatives**

- ..... Ferry Routes

**Natural Gas Pipelines**

- Alternative 1a
- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant

**Alternative 3**

**Other Features**

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge

**Alaska State Park**

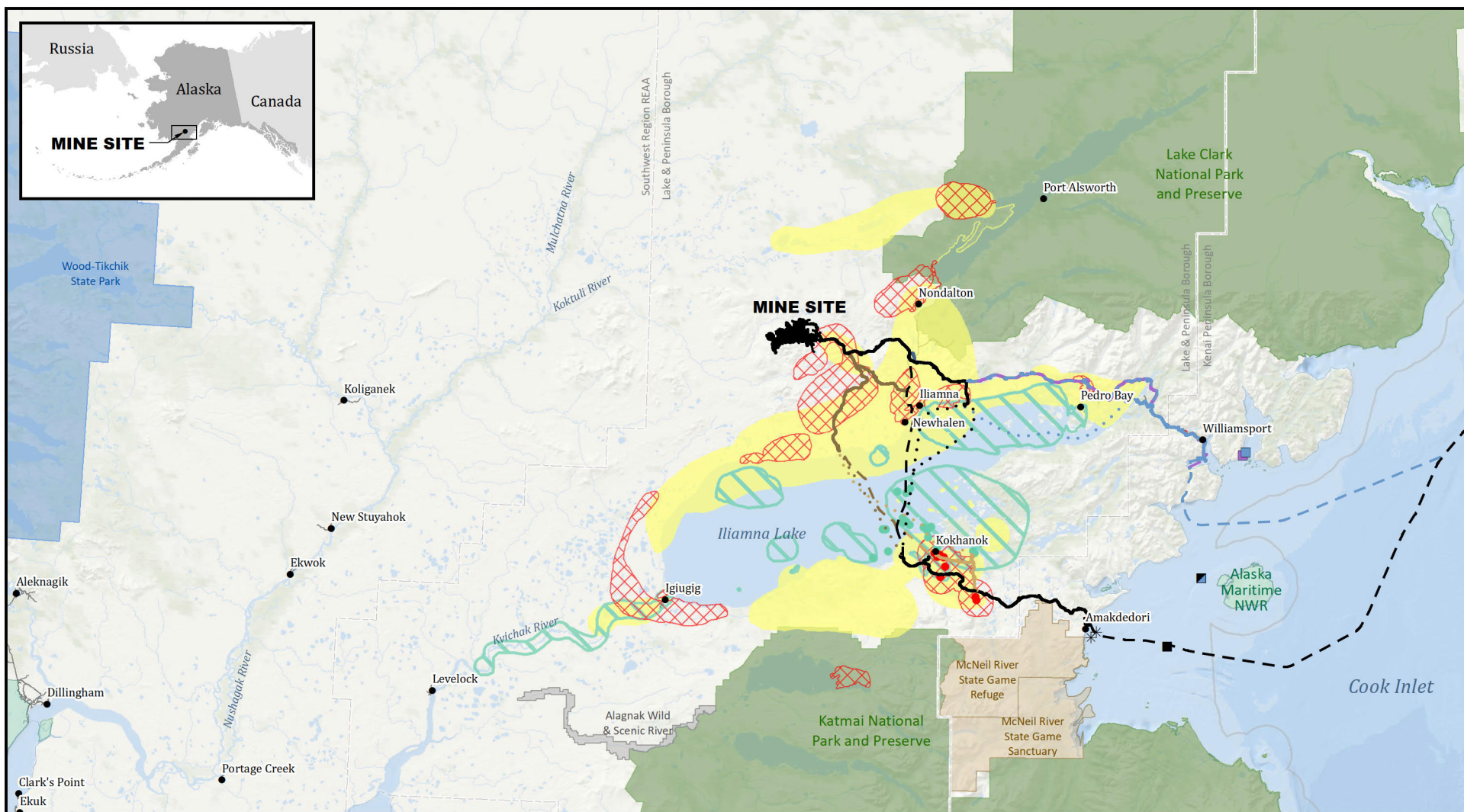
- State Game Refuge/Sanctuary
- Wild and Scenic River

**MARINE MAMMAL AND MARINE  
INVERTEBRATE HARVEST AREAS:  
ILIAMNA, NEWHALEN, PEDRO BAY,  
NONDALTON, IGIUGIG, AND KOKHANOK**

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**FIGURE K3.9-5**





Sources: PLP 2020-RF1168; PLP 2019-RF1153; Fall et al. 2006; Krieg et al. 2009; (Study years 2004 and 2005)



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#### Avian Harvest Areas

- Eggs (Point)
- Upland Game Birds (Point)
- Eggs
- Upland Game Birds
- Waterfowl (Ducks/Geese)

#### Action Alternatives

- ..... Ferry Routes

#### Natural Gas Pipelines

- Alternative 1a
- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge
- Alaska State Park
- State Game Refuge/Sanctuary

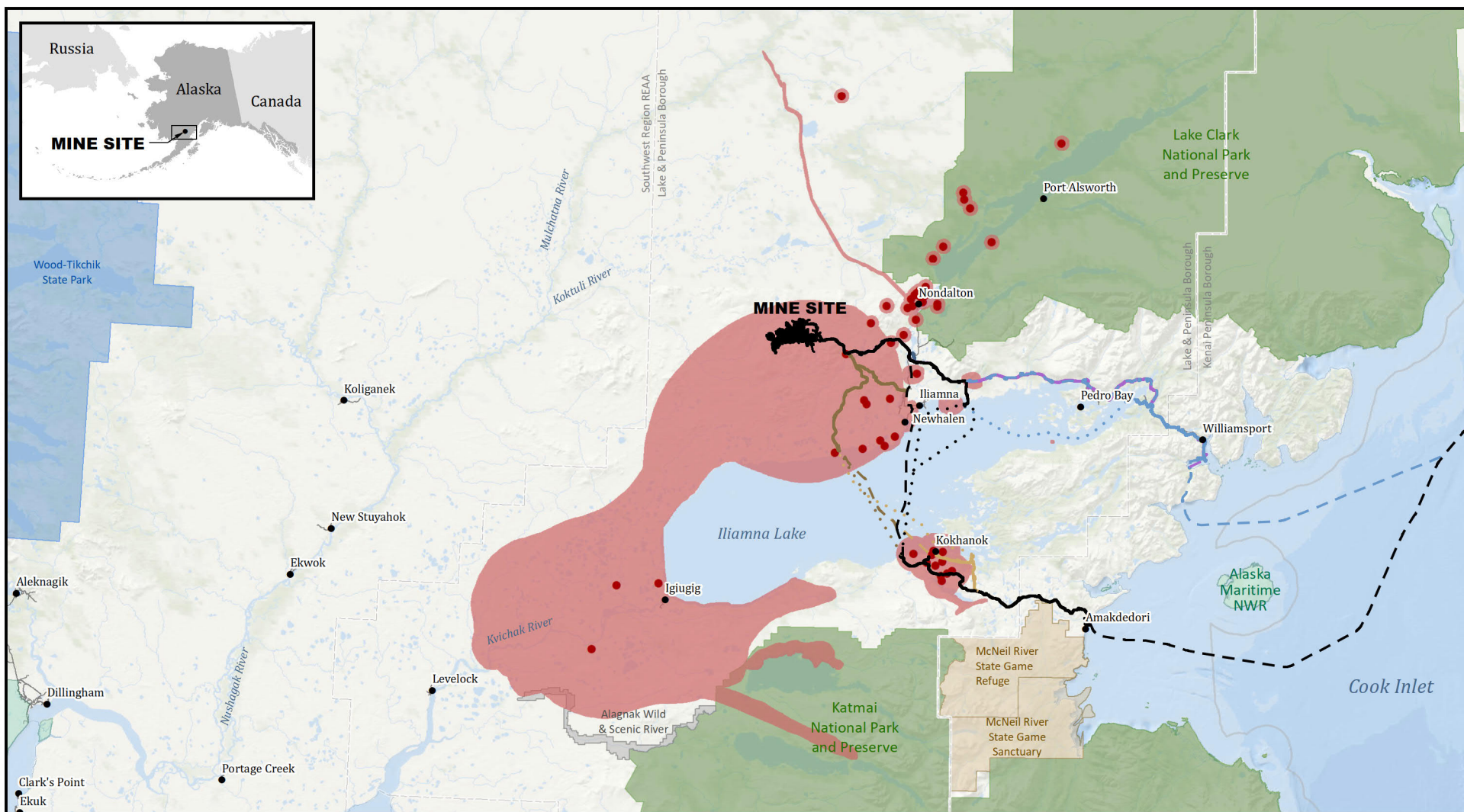
#### Wild and Scenic River



## AVIAN HARVEST AREAS: ILIAMNA, NEWHALEN, PEDRO BAY, NONDALTON, IGIUGIG, AND KOKHANOK

FIGURE K3.9-6

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Sources: PLP 2020-RF1168; PLP 2019-RF1153;  
Fall et al. 2006; Krieg et al. 2009;  
(Study years 2004 and 2005)



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Miles

#### Harvest Areas

- Small Land Mammals (Point)
- Small Land Mammals

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a

- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge

- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

**SMALL LAND MAMMAL HARVEST AREAS:  
ILIAMNA, NEWHALEN, PEDRO BAY,  
NONDALTON, IGIUGIG, AND KOKHANOK**

**PEBBLE PROJECT EIS**

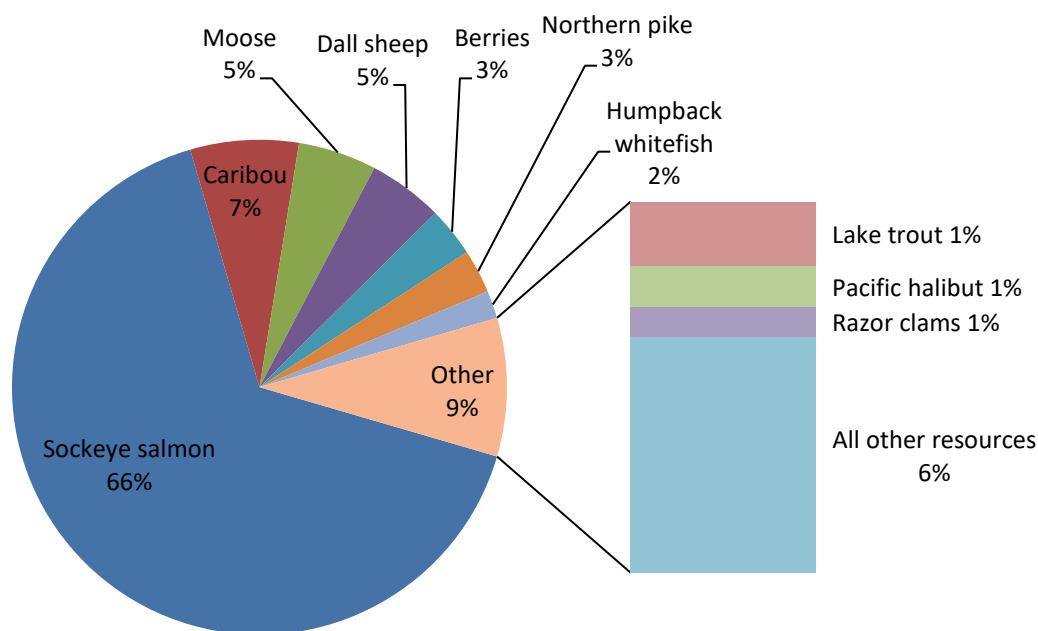
**FIGURE K3.9-7**



### K3.9.1 Port Alsworth

Port Alsworth is a majority Euro-American community on Lake Clark. It is the location of the Lake Clark National Park and Preserve headquarters and is also home to many hunting and fishing guide services and lodges. In 2004, Port Alsworth had an estimated year-round population of 109 people in 30 households. Port Alsworth residents harvested an estimated 14,489 pounds (133 pounds per capita) of wild food in 2004, a lower total compared to the Iliamna Lake area communities. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by Port Alsworth residents in 2004 in terms of edible weight are shown in Figure K3.9-8. Port Alsworth households reported high levels of participation in subsistence activities. Salmon was the most widely used resource category (100 percent of households), followed by large land mammals (91 percent), plants and fungi (86 percent), non-salmon fish (73 percent), marine invertebrates (50 percent), birds and eggs (46 percent), and small land mammals (41 percent). Sharing and distribution of subsistence foods was widespread. In 2004, 91 percent of Port Alsworth households received wild resources and 73 percent of households gave resources away. Some of the resources received by Port Alsworth residents came from non-local hunters who dropped off meat for local residents (Fall et al. 2006).

**Figure K3.9-8: Composition of Port Alsworth Subsistence Harvest by Estimated Edible Weight, 2004**

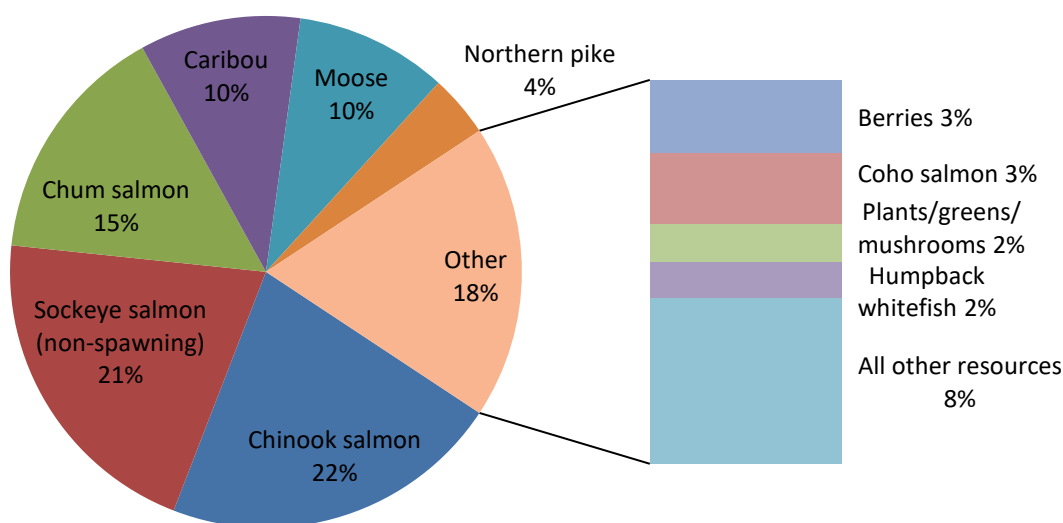


Source: Fall et al. 2006

### K3.9.2 Koliganek

Koliganek is a primarily Yup'ik community on the Nushagak River 65 miles northeast of Dillingham. In 2005, Koliganek had an estimated year-round population of 150 people in 42 households. Koliganek residents harvested an estimated total of 134,779 pounds (899 pounds per capita) of wild food in 2005; a notably high level of food production among communities in the project area. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by Koliganek residents in 2005 in terms of edible weight are shown in Figure K3.9-9. Koliganek households reported high levels of participation in subsistence activities. Salmon was the most widely used resource category (100 percent of households), followed by plants and fungi (96 percent), non-salmon fish (96 percent), large land mammals (96 percent), birds and eggs (93 percent), small land mammals (64 percent), and marine mammals (64 percent). Sharing and distribution of subsistence foods was widespread. In 2005, 89 percent of Koliganek households received at least one subsistence resource and 93 percent gave away at least one resource (Krieg et al. 2009).

**Figure K3.9-9: Composition of Koliganek Subsistence Harvest by Estimated Edible Weight, 2005**



**Notes:**

The term "spawning sockeye" refers to late-run sockeye salmon that have a distinctive red color and white meat, and are harvested in the fall.

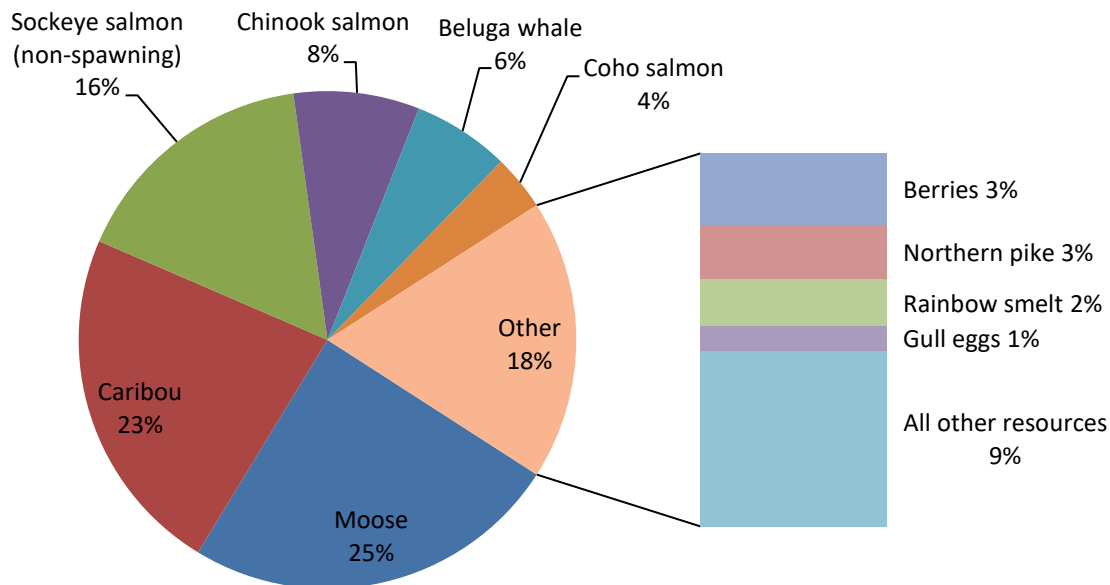
Source: Krieg et al. 2009



### K3.9.3 Levelock

Levelock is a mixed Alutiiq and Yup'ik community on the Kvichak River. In 2005, Levelock had an estimated year-round population of 34 people in 19 households. Levelock residents harvested an estimated total of 17,871 pounds (527 pounds per capita) of wild foods in 2005. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by Levelock residents in 2005 in terms of edible weight are shown in Figure K3.9-10, with a distinctively high level of reliance on large land mammals. Levelock households reported high levels of participation in subsistence activities. Large land mammals were the most widely used resource category (100 percent of households), followed by plants and fungi (93 percent), salmon (93 percent), birds and eggs (88 percent), non-salmon fish (86 percent), small land mammals (57 percent), and marine mammals (50 percent). Sharing and distribution of subsistence foods was widespread. In 2005, 93 percent of Levelock households received at least one subsistence resource and 86 percent of households gave away at least one resource (Krieg et al. 2009).

**Figure K3.9-10: Composition of Levelock Subsistence Harvest by Estimated Edible Weight, 2005**



**Notes:**

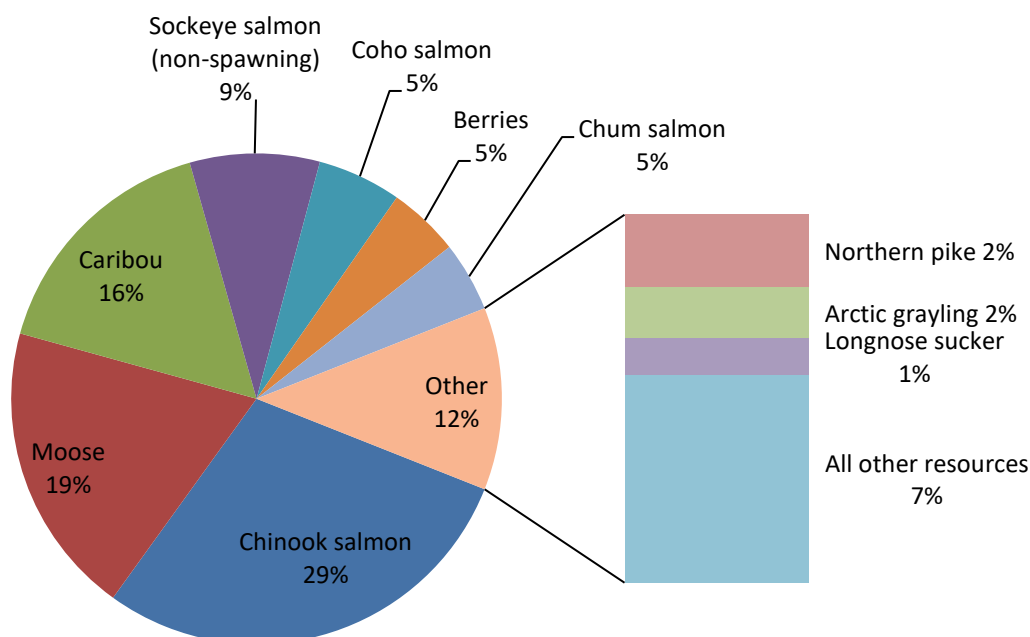
The term "spawning sockeye" refers to late-run sockeye salmon that have a distinctive red color and white meat, and are harvested in the fall.

Source: Krieg et al. 2009

### K3.9.4 New Stuyahok

New Stuyahok is a Yup'ik community on the Nushagak River 52 miles northeast of Dillingham. In 2005, New Stuyahok had an estimated year-round population of 421 people in 96 households. New Stuyahok residents harvested an estimated total of 163,927 pounds (389 pounds per capita) of wild foods in 2005. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by New Stuyahok residents in 2005 in terms of edible weight are shown in Figure K3.9-11, with a characteristically high level of reliance on salmon, but also on large land mammals. New Stuyahok households reported high levels of participation in subsistence activities. In 2005, plants and fungi, as well as large land mammals, were the most widely used resource categories (100 percent of households). Other widely used resource categories included salmon (90 percent), birds and eggs (90 percent), non-salmon fish (88 percent), small land mammals (59 percent), and marine mammals (51 percent). Sharing and distribution of subsistence foods was widespread. In 2005, 98 percent of households received at least one subsistence resource and 74 percent gave away at least one resource (Krieg et al. 2009).

**Figure K3.9-11: Composition of New Stuyahok Subsistence Harvest by Estimated Edible Weight, 2005**



**Notes:**

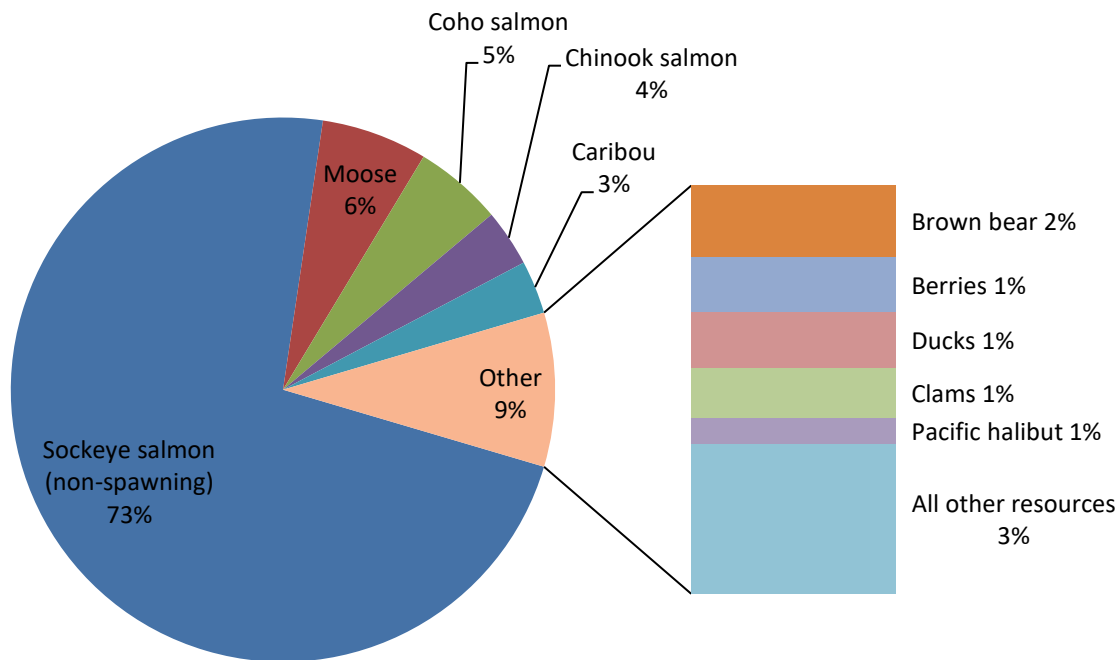
The term "spawning sockeye" refers to late-run sockeye salmon that have a distinctive red color and white meat, and are harvested in the fall.

Source: Krieg et al. 2009

### K3.9.5 King Salmon

King Salmon is a predominantly Euro-American community on the Naknek River. King Salmon's Alaska Native population is a mix of Alutiiq, Yup'ik, and Dena'ina peoples. In 2007, King Salmon had an estimated year-round population of 246 people in 88 households. Holen et al. (2011) surveyed residents about their 2007 subsistence activities and found that King Salmon residents harvested an estimated total of 77,020 pounds (313 pounds per capita) of wild foods, with a very high reliance on salmon. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by King Salmon residents in 2007 in terms of edible weight are shown in Figure K3.9-12. King Salmon households reported high levels of participation in subsistence activities. Salmon was the most widely used resource category (86 percent of households), followed by plants and fungi (78 percent), non-salmon fish (57 percent), and large land mammals (47 percent). Sharing and distribution of subsistence foods was less widespread than in most communities in the project area. In 2007, 59 percent of households received at least one subsistence resource and 53 percent gave away at least one resource (Holen et al. 2011).

**Figure K3.9-12: Composition of King Salmon Subsistence Harvest by Estimated Edible Weight, 2007**



**Notes:**

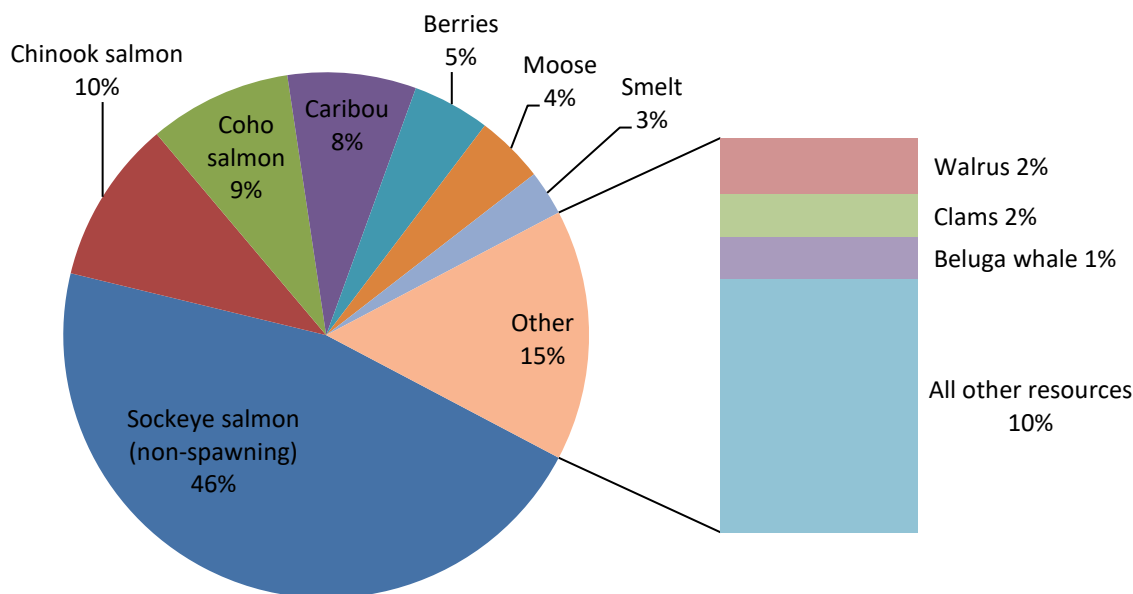
The term "spawning sockeye" refers to late-run sockeye salmon that have a distinctive red color and white meat, and are harvested in the fall.

Source: Holen et al. 2011

### K3.9.6 Naknek

Naknek is on the northern bank of the Naknek River and is a mix of Yup'ik, Alutiiq, Dena'ina, and non-Native peoples. Naknek's economy is largely driven by the salmon industry (Deur 2008). In 2007, Naknek had an estimated year-round population of 533 people in 206 households. Just over half of the population was Alaska Native. Naknek residents harvested an estimated total of 140,757 (264 pounds per capita) pounds of wild foods in 2007. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by Naknek residents in 2007 in terms of edible weight are shown in Figure K3.9-13. Naknek households reported high levels of participation in subsistence activities. Salmon was the most widely used resource category (93 percent of households), followed by plants and fungi (92 percent), non-salmon fish (76 percent), large land mammals (60 percent), birds and eggs (57 percent), and marine invertebrates (51 percent). Sharing and distribution of subsistence foods was widespread. In 2007, 91 percent of households received at least one subsistence resource and 73 percent gave away at least one resource (Holen et al. 2011).

**Figure K3.9-13: Composition of Naknek Subsistence Harvest by Estimated Edible Weight, 2007**



**Notes:**

The term "spawning sockeye" refers to late-run sockeye salmon that have a distinctive red color and white meat, and are harvested in the fall.

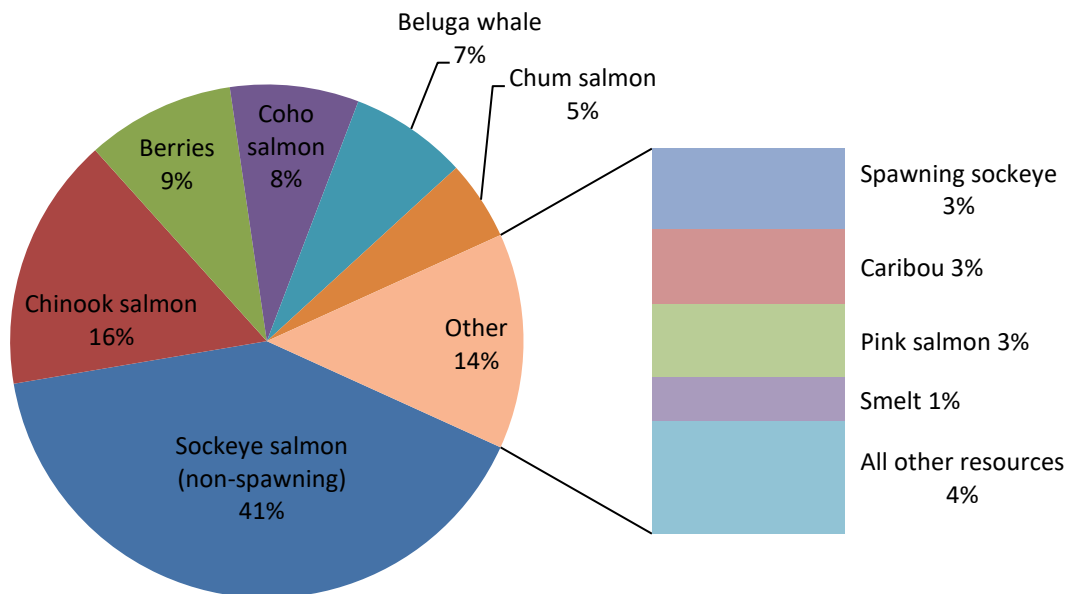
Source: Holen et al. 2011



### K3.9.7 South Naknek

South Naknek is on the southern bank of the Naknek River across from the community of Naknek. South Naknek is predominantly a mixture of Alutiiq and Yup'ik peoples. Today, many of the Alutiiq people who reside in South Naknek are descendants of people displaced by the Mount Katmai and Novarupta volcanic eruptions of 1912. In 2007, South Naknek had an estimated year-round population of 52 people in 26 households. South Naknek residents harvested an estimated total of 13,909 pounds (278 pounds per capita) of wild foods in 2007, with a characteristically high reliance on salmon, but a distinctive level of reliance on beluga whales. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by South Naknek residents in 2007 in terms of edible weight are shown in Figure K3.9-14. South Naknek households reported high levels of participation in subsistence activities. Salmon was the most widely used resource category (95 percent of households), followed by plants and fungi (91 percent), non-salmon fish (86 percent), large land mammals (67 percent), and marine mammals (48 percent). Sharing and distribution of subsistence foods was widespread. In 2007, 91 percent of households received at least one subsistence resource and 76 percent of households gave away at least one resource (Holen et al. 2011).

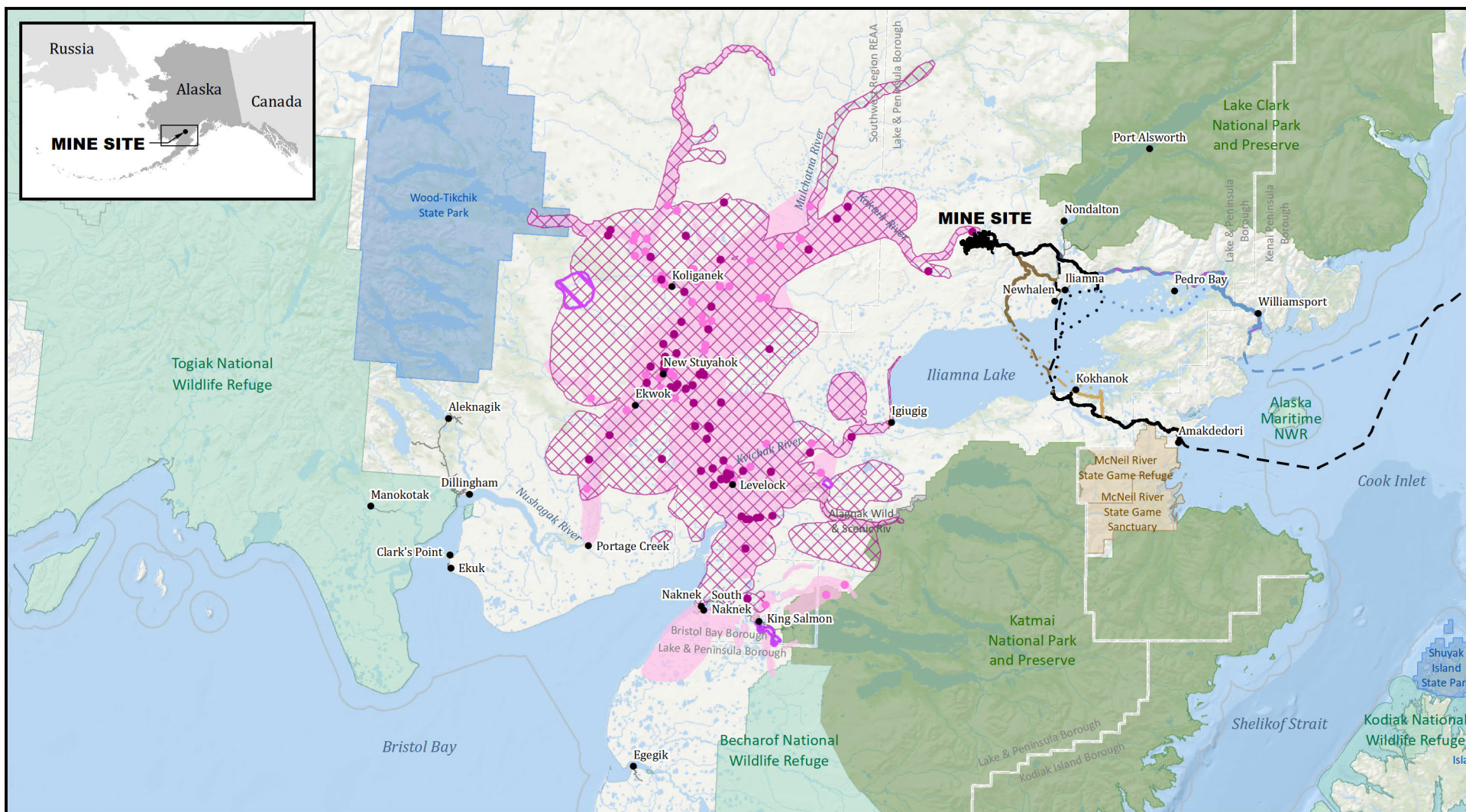
**Figure K3.9-14: Composition of South Naknek Subsistence Harvest by Estimated Edible Weight, 2007**



**Notes:**

The term "spawning sockeye" refers to late-run sockeye salmon that have a distinctive red color and white meat, and are harvested in the fall.

Source: Holen et al. 2011



Sources: PLP 2020-RFI168; PLP 2019-RFI153; Krieg et al. 2009; Holen et al. 2011 (Study years 2005 and 2007)



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15 0 15 30  
Miles

#### Large Land Mammals Harvest Areas

- Caribou (Point)
- Moose (Point)
- Brown bear
- Caribou
- Moose

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a
- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2

- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park

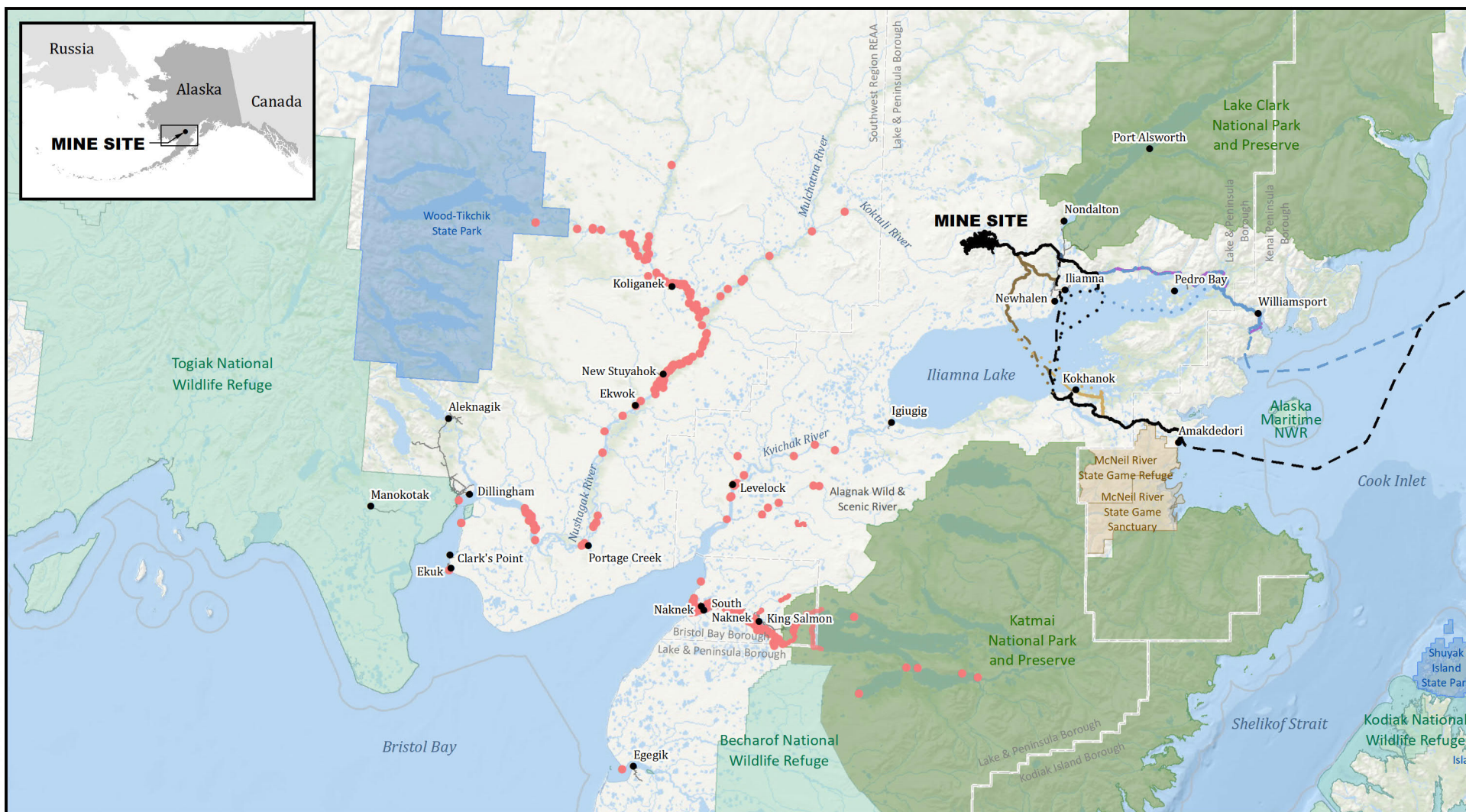
- National Wildlife Refuge
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

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**LARGE LAND MAMMAL HARVEST AREAS: KOLIGANEK, LEVELOCK, NEW STUYAHOK, KING SALMON, NAKNEK, AND SOUTH NAKNEK**

FIGURE K3.9-15





Sources: PLP 2020-RF1168; PLP 2019-RF1153;  
Krieg et al. 2009; Holen et al. 2011  
(Study years 2005 and 2007)



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15 0 15 30  
Miles

#### Salmon Harvest Areas

- Salmon (Point)
- Salmon (Line)

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a

- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge

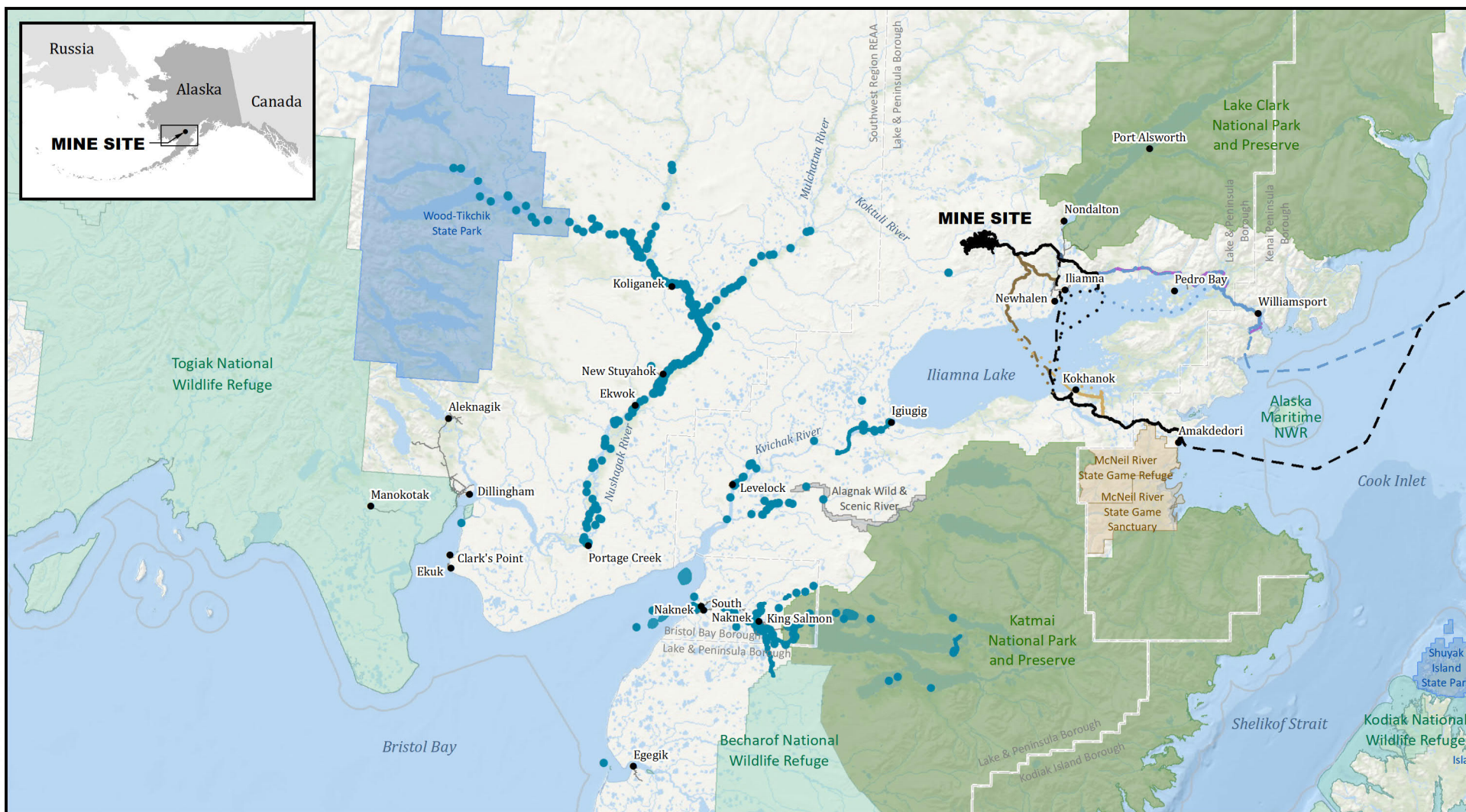
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

PEBBLE PROJECT EIS

**SALMON HARVEST AREAS:  
KOLIGANEK, LEVELOCK, NEW  
STUYAHOK, KING SALMON,  
NAKNEK, AND SOUTH NAKNEK**

FIGURE K3.9-16

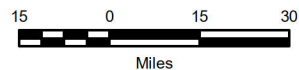




Sources: PLP 2020-RF1168; PLP 2019-RF1153;  
Krieg et al. 2009; Holen et al. 2011  
(Study years 2005 and 2007)



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#### Non-Salmon Harvest Areas

- Non-Salmon Fish (Point)
- Non-Salmon Fish (Line)

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a

- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge

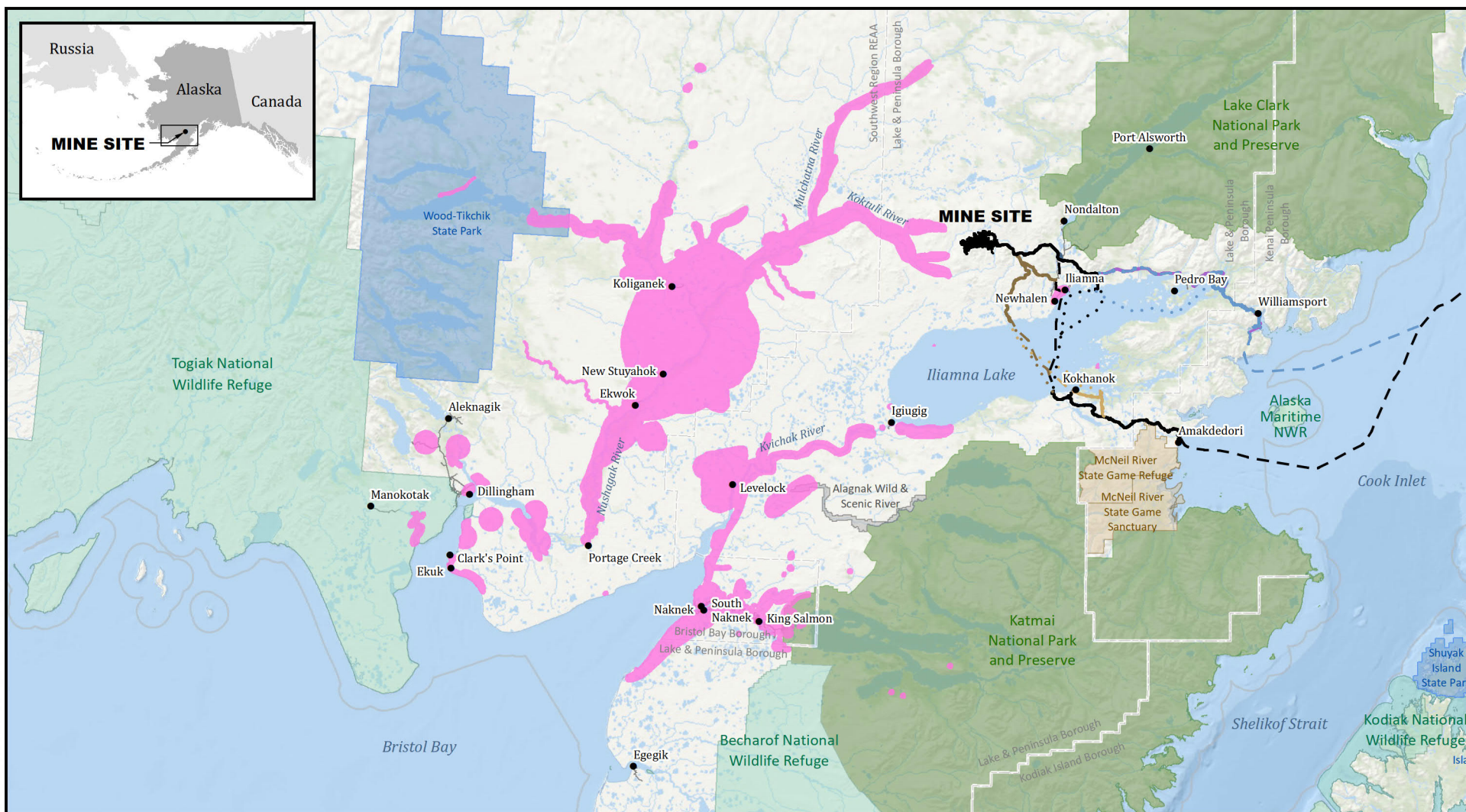
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

PEBBLE PROJECT EIS

**NON-SALMON HARVEST AREAS:  
KOLIGANEK, LEVELOCK, NEW  
STUYAHOK, KING SALMON,  
NAKNEK, AND SOUTH NAKNEK**

FIGURE K3.9-17





Sources: PLP 2020-RFI168; PLP 2019-RFI153; Krieg et al. 2009; Holen et al. 2011 (Study years 2005 and 2007)



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15 0 15 30  
Miles

#### Vegetation Harvest Areas

Plants, Wood, Berries, and Fungi

#### Action Alternatives

Ferry Routes

Natural Gas Pipelines

Alternative 1a

#### Alternative 1

Alternative 1 Kokhanok East Ferry Terminal Variant

#### Alternative 2

Alternative 2 Newhalen River North Crossing Variant

#### Alternative 3

#### Other Features

Local Roads

Three Nautical Mile Line

Borough Boundary

National Park

National Wildlife Refuge

#### Alaska State Park

State Game Refuge/Sanctuary

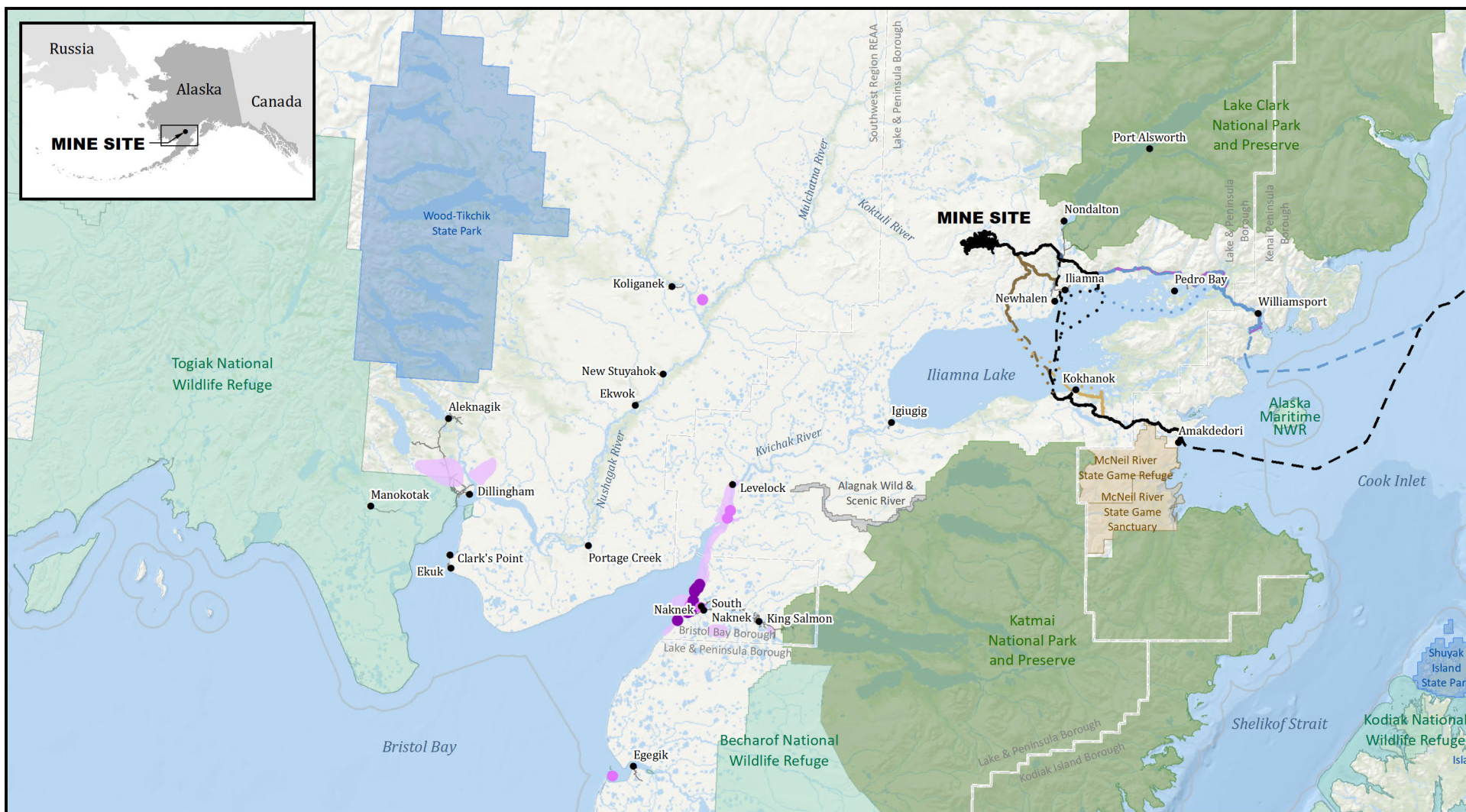
Wild and Scenic River

PEBBLE PROJECT EIS

**VEGETATION (PLANTS, WOOD, BERRIES, FUNGI) HARVEST AREAS: KOLIGANEK, LEVELOCK, NEW STUYAHOK, KING SALMON, NAKNEK, AND SOUTH NAKNEK**

FIGURE K3.9-18

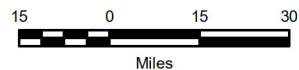




Sources: PLP 2020-RF1168; PLP 2019-RF1153; Krieg et al. 2009; Holen et al. 2011 (Study years 2005 and 2007)



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#### Marine Mammal and Marine Invertebrate Harvest Areas

- Marine Invertebrates (Point)
- Marine Mammals (Point)
- Marine Mammals

#### Action Alternatives

- ... Ferry Routes
- Natural Gas Pipelines

- Alternative 1a
- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge

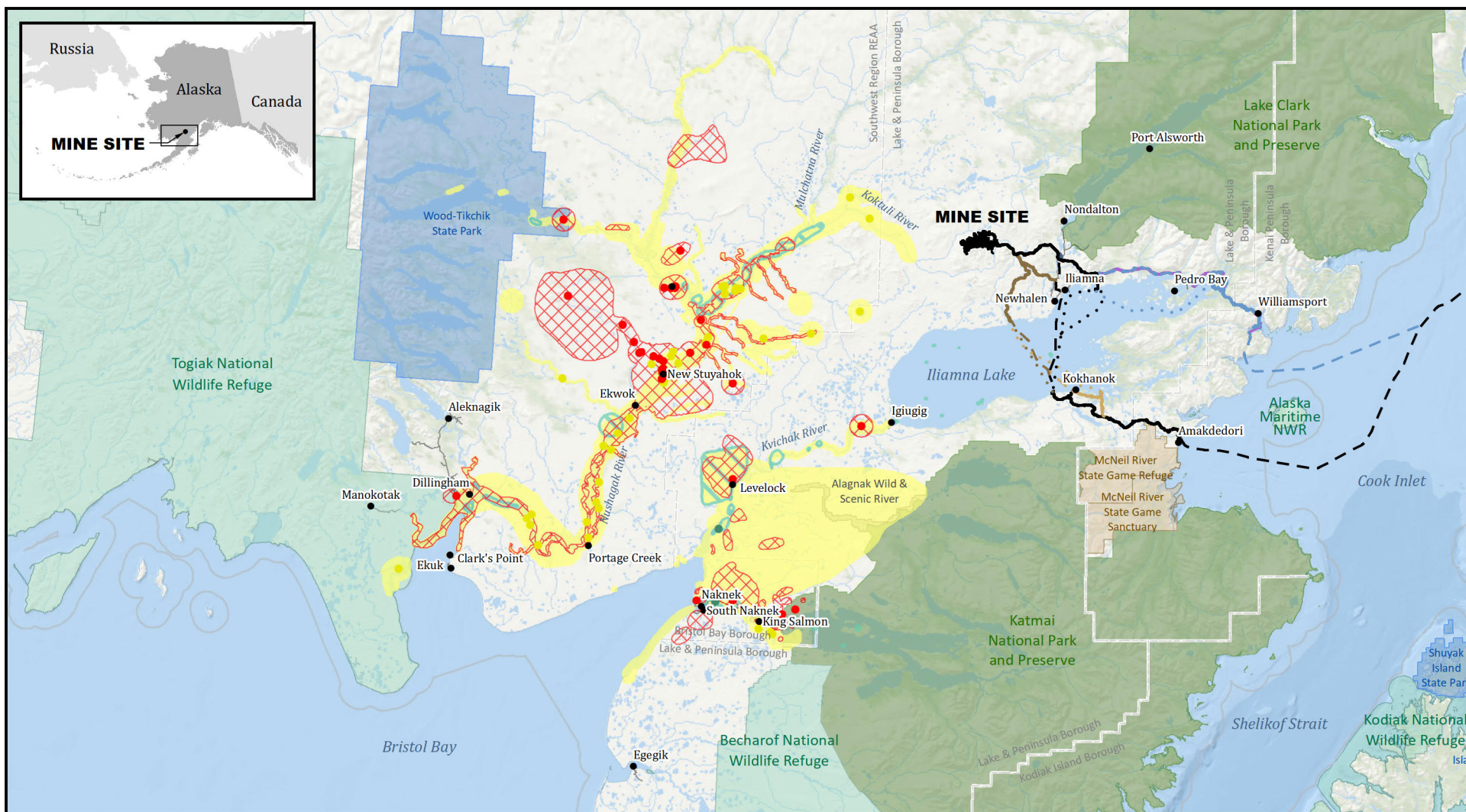
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

PEBBLE PROJECT EIS

**MARINE MAMMAL AND MARINE INVERTEBRATE HARVEST AREAS: KOLIGANEK, LEVELOCK, NEW STUYAHOK, KING SALMON, NAKNEK, AND SOUTH NAKNEK**

FIGURE K3.9-19





Sources: PLP 2020-RF1168; PLP 2019-RF1153;  
Krieg et al. 2009; Holen et al. 2011  
(Study years 2005 and 2007)



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Miles

#### Avian Harvest Areas

- Eggs (Point)
- Upland Game Birds (Point)
- Waterfowl (Ducks/Geese) (Point)
- Eggs
- Upland Game Birds
- Waterfowl (Ducks/Geese)

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a
- Alternative 1
- Alternative 1 Kokhanok East
- Ferry Terminal Variant
- Alternative 2

- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park

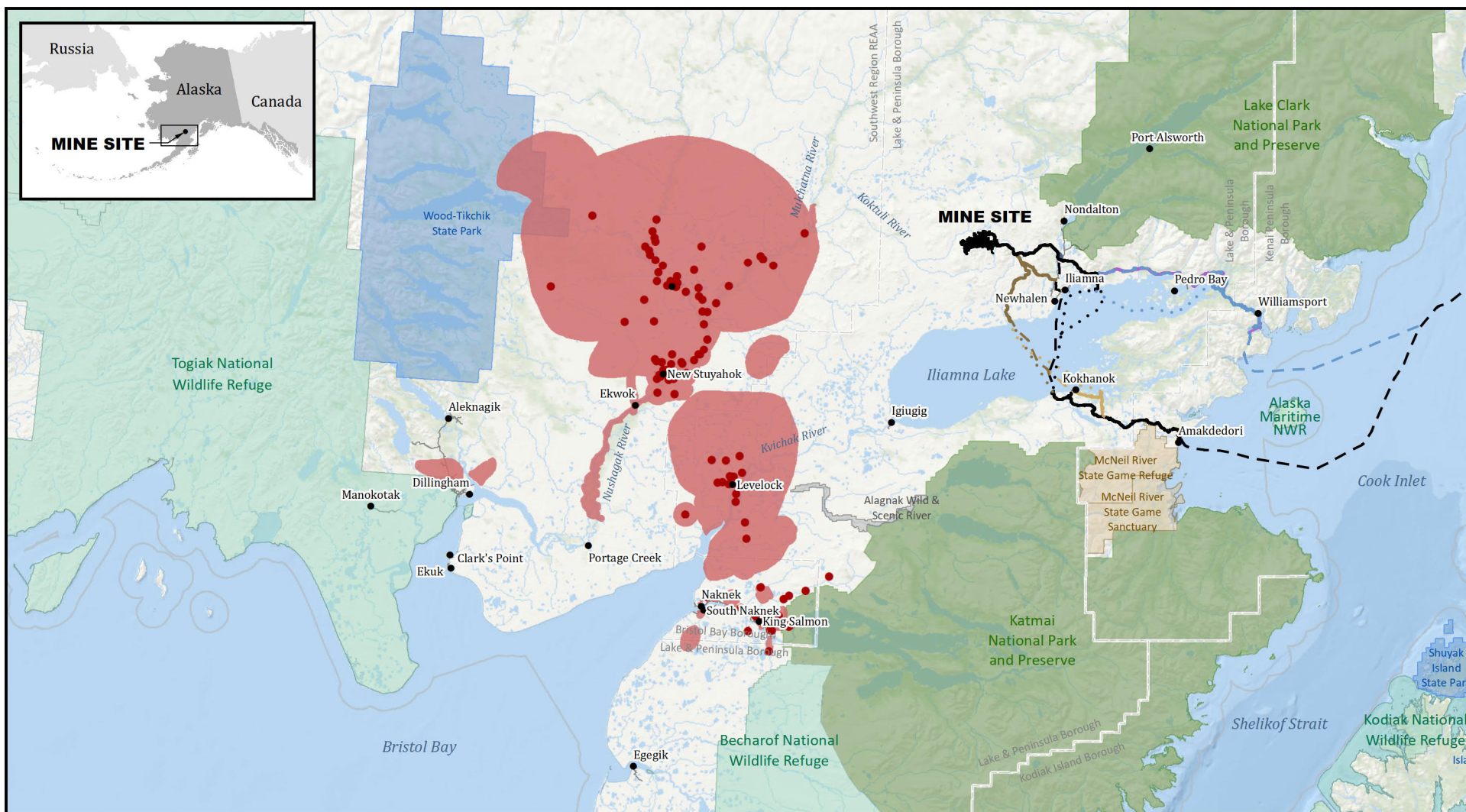
- National Wildlife Refuge
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

**AVIAN HARVEST AREAS:  
KOLIGANEK, LEVELOCK, NEW  
STUYAHOK, KING SALMON,  
NAKNEK, AND SOUTH NAKNEK**

FIGURE K3.9-20

PEBBLE PROJECT EIS

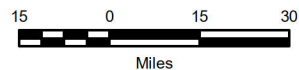




Sources: PLP 2020-RFI168; PLP 2019-RFI153; Krieg et al. 2009; Holen et al. 2011 (Study years 2005 and 2007)



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#### Harvest Areas

- Small Land Mammals (Point)
- Small Land Mammals

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a

#### Alternative 1

- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge

#### Alaska State Park

- State Game Refuge/Sanctuary
- Wild and Scenic River

**PEBBLE PROJECT EIS**

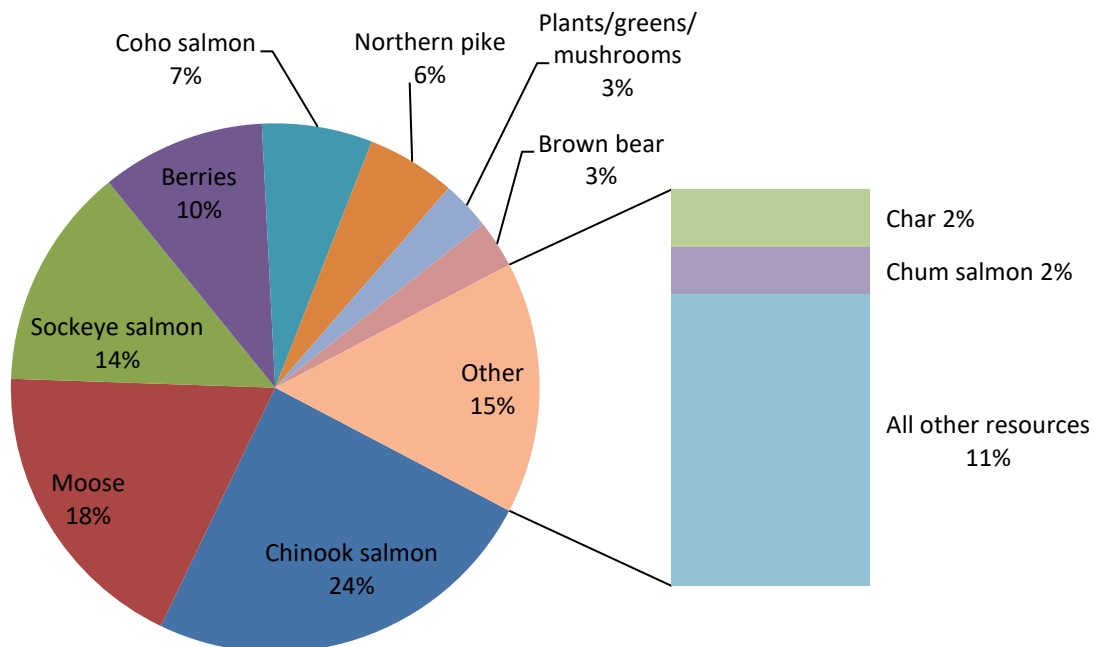
**SMALL LAND MAMMAL  
HARVEST AREAS:  
KOLIGANEK, LEVELOCK, NEW  
STUYAHOK, KING SALMON,  
NAKNEK, AND SOUTH NAKNEK**

**FIGURE K3.9-21**

### K3.9.8 Aleknagik

Aleknagik is a predominantly Yup'ik community at the head of the Wood River on the southeast end of Aleknagik Lake. In 2008, Aleknagik had an estimated year-round population of 175 people in 47 households. Holen et al. (2012) surveyed residents about their 2008 subsistence activities and found that Aleknagik residents harvested an estimated total of 51,738 pounds (296 pounds per capita) of wild foods. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by Aleknagik residents in 2008 in terms of edible weight are shown in Figure K3.9-22. Aleknagik households reported high levels of participation in subsistence activities. Plants and fungi, as well as salmon, were the most widely used resource categories in Aleknagik (100 percent of households). Other widely used resource categories included large land mammals (94 percent), birds and eggs (88 percent), non-salmon fish (78 percent), and marine mammals (56 percent). Sharing and distribution of subsistence foods was widespread. In 2007, 97 percent of households received at least one subsistence resource and 84 percent gave away at least one resource (Holen et al. 2012).

**Figure K3.9-22: Composition of Aleknagik Subsistence Harvest by Estimated Edible Weight, 2008**

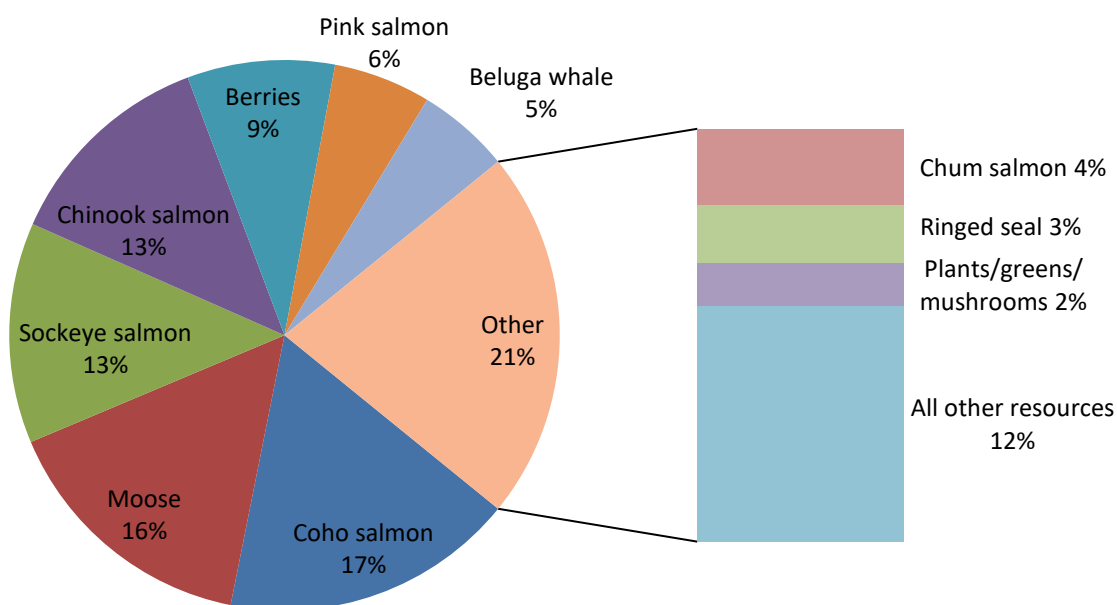


Source: Holen et al. 2012

### K3.9.9 Clark's Point

Clark's Point is a predominantly Yup'ik community on Nushagak Bay, 15 miles from Dillingham. In 2008, Clark's Point had an estimated year-round population of 38 people in 18 households. Clark's Point residents harvested an estimated total of 45,543 pounds (1,210 pounds per capita) of wild foods in 2008, a notably high level of subsistence food production among communities in the project area. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by Clark's Point residents in 2008 in terms of edible weight are shown in Figure K3.9-23. Clark's Point households reported high levels of participation in subsistence activities. The most widely used resources in Clark's Point were salmon, non-salmon fish, birds and eggs, and large land mammals (100 percent of households). Other widely used resource categories included plants and fungi (91 percent), small land mammals (82 percent), marine mammals (73 percent), and marine invertebrates (46 percent). Sharing and distribution of subsistence foods was widespread. Every household received and gave away at least one subsistence resource (Holen et al. 2012).

**Figure K3.9-23: Composition of Clark's Point Subsistence Harvest by Estimated Edible Weight, 2008**



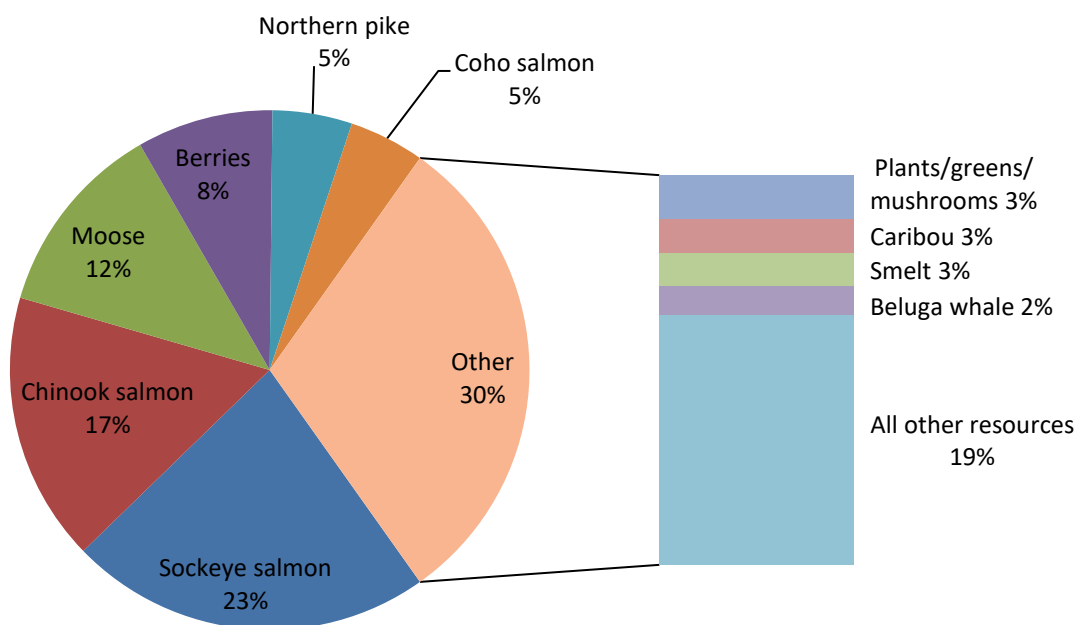
Source: Holen et al. 2012



### K3.9.10 Manokotak

Manokotak is a Yup'ik community on the Igushik River. In 2008, Manokotak had an estimated year-round population of 379 people in 96 households. Manokotak residents harvested an estimated total of 113,196 pounds (298 pounds per capita) of wild foods in 2008. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by Manokotak residents in 2008 in terms of edible weight are shown in Figure K3.9-24. Manokotak households reported high levels of participation in subsistence activities. Salmon was the most widely used resource category (97 percent of households), followed by plants and fungi (95 percent), birds and eggs (95 percent), non-salmon fish (93 percent), large land mammals (87 percent), marine invertebrates (82 percent), marine mammals (75 percent), and small land mammals (54 percent). Sharing and distribution of subsistence foods was widespread. In 2008, 93 percent of Manokotak households received at least one subsistence resource and 90 percent of households gave away at least one resource (Holen et al. 2012).

**Figure K3.9-24: Composition of Manokotak Subsistence Harvest by Estimated Edible Weight, 2008**

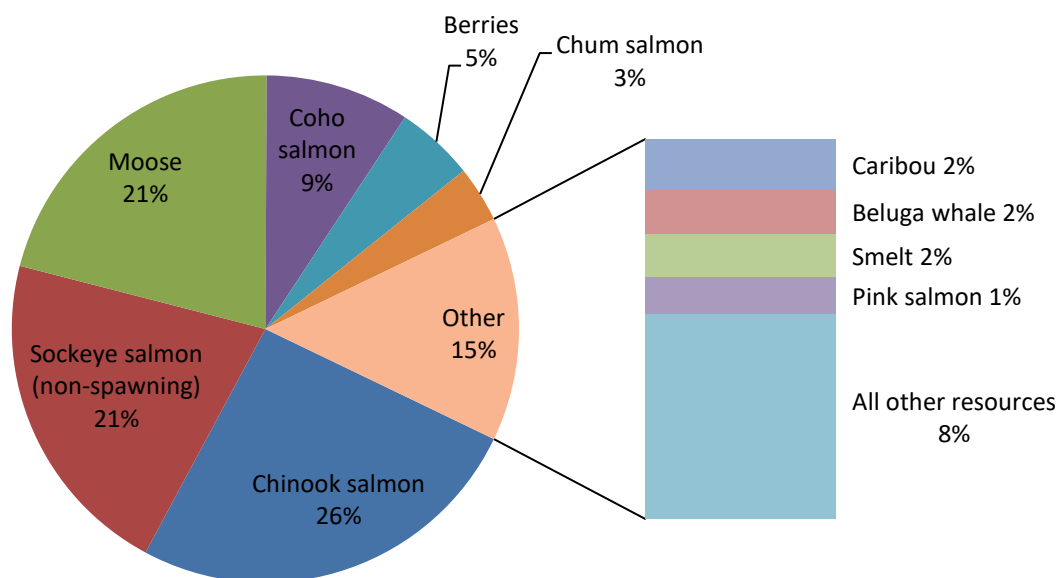


Source: Holen et al. 2012

### K3.9.11 Dillingham

Dillingham is at the northern end of Nushagak Bay at the confluence of the Wood and Nushagak rivers. Historically a Yup'ik area with Russian influences, Dillingham is now a diverse community with a mix of non-Native and Native peoples. In 2010, Dillingham had an estimated year-round population of 2,294 people in 726 households. Evans et al. (2013) surveyed residents about their 2010 subsistence activities and found that Dillingham households harvested an estimated total of 486,533 pounds (212 pounds per capita) of wild foods. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by Dillingham residents in 2010 in terms of edible weight are shown in Figure K3.9-25. Dillingham households reported high levels of participation in subsistence activities. Salmon was the most widely used resource category (91 percent of households), followed by plants and fungi (89 percent), large land mammals (77 percent), birds and eggs (73 percent), and non-salmon fish (69 percent). Sharing and distribution of subsistence foods was widespread. In 2010, 91 percent of Dillingham households received at least one subsistence resource and 79 percent of households gave away at least one resource (Evans et al. 2013).

**Figure K3.9-25: Composition of Dillingham Subsistence Harvest by Estimated Edible Weight, 2010**



**Notes:**

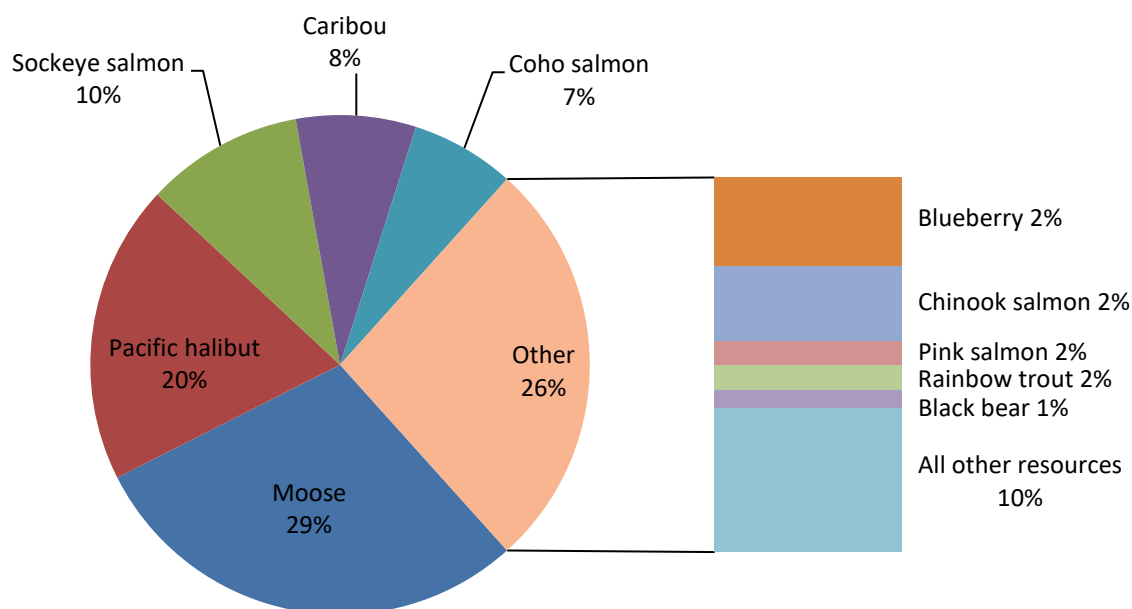
The term "spawning sockeye" refers to late-run sockeye salmon that have a distinctive red color and white meat, and are harvested in the fall.

Source: Evans et al. 2013

### K3.9.12 Ninilchik

Ninilchik is a predominately Euro-American community on the eastern shore of Cook Inlet on the Sterling Highway. The Alaska Native population of Ninilchik is a mix of Alutiiq, Aleut, and Dena'ina peoples. Recent data is limited for this community (a comprehensive harvest survey has not been conducted since 1998) (Fall et al. 2000). In 1998, Ninilchik had an estimated population of 1,075 people in 400 households. Ninilchik residents harvested an estimated total of 175,817 pounds (164 pounds per capita) of wild foods in 1998. See Section 3.9, Subsistence, for per capita harvest by resource category. The top 10 resources harvested by Ninilchik residents in 1998 in terms of edible weight are shown in Figure K3.9-26. Non-salmon fish was the most widely used resource category (92 percent of households), followed by salmon (90 percent), plants and fungi (83 percent), marine invertebrates (78 percent), and large land mammals (63 percent). Sharing and distribution of subsistence foods was widespread. In 1998, 92 percent of households received at least one subsistence resource and 73 percent of households gave away at least one resource (Fall et al. 2000).

**Figure K3.9-26: Composition of Ninilchik Subsistence Harvest by Estimated Edible Weight, 1998**



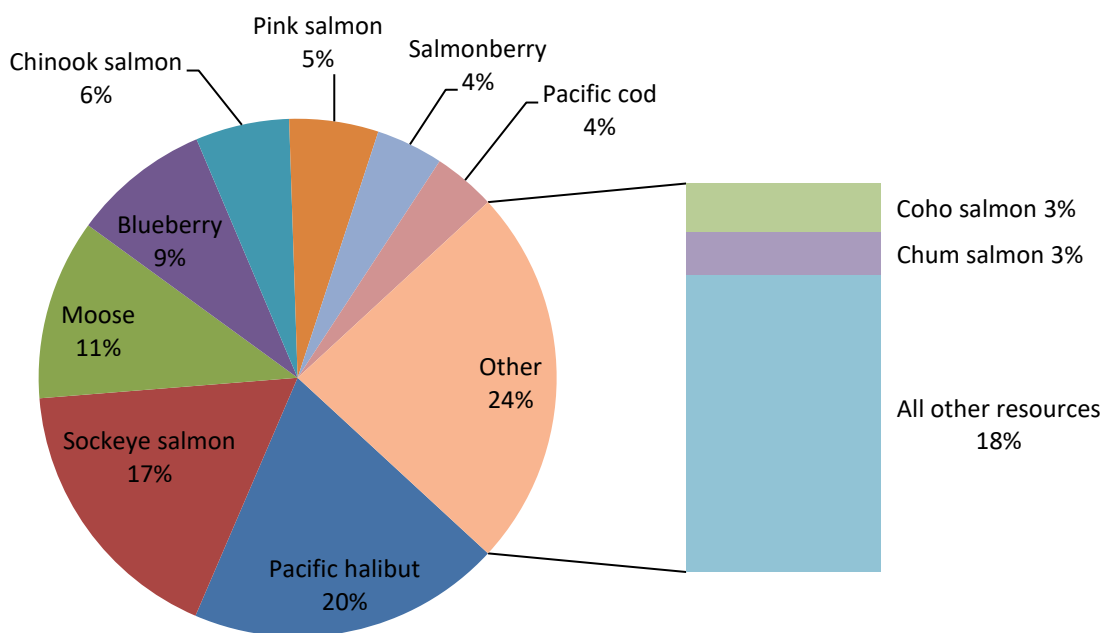
Source: ADF&G 2018I



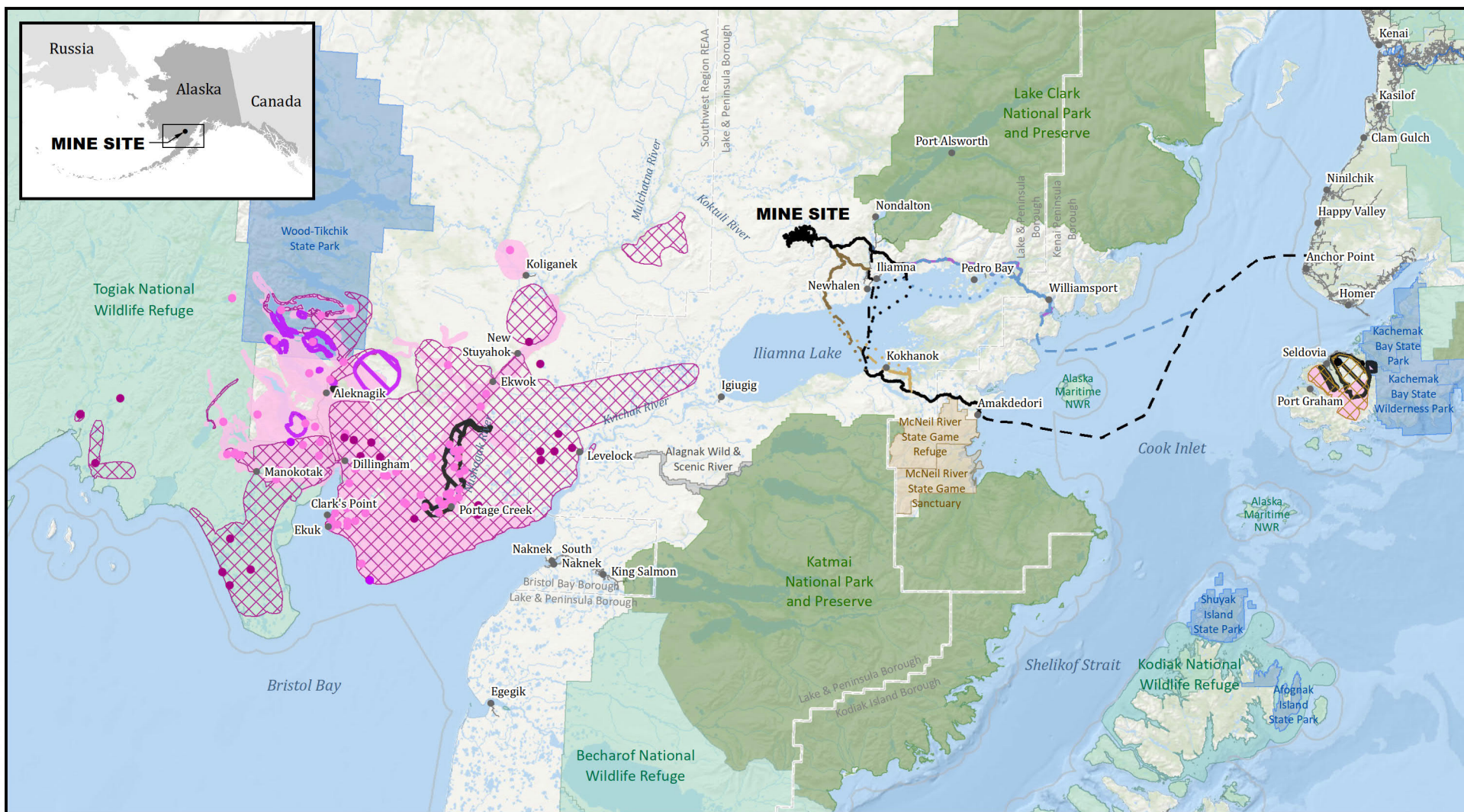
### K3.9.13 Seldovia

Seldovia is a majority Euro-American community on the Kenai Peninsula on the south shore of Kachemak Bay. The Alaska Native population of Seldovia is a mix of Alutiiq, Dena'ina, and Aleut peoples. In 2014, Seldovia (including the city of Seldovia and Seldovia Village) had an estimated year-round population of 278 people in 126 households. Seldovia residents harvested an estimated total of 38,455 pounds (138 pounds per capita) of wild foods in 2014, a comparatively low level among communities in the project area. See Section 3.9, Subsistence, for per capita harvests by resource category. The top 10 resources harvested by Seldovia residents in 2014 in terms of edible weight are shown in Figure K3.9-27. Seldovia households reported high levels of participation in subsistence activities. Plants and fungi were the most widely harvested resource category (95 percent of households), followed by salmon (94 percent), non-salmon fish (90 percent), marine invertebrates (68 percent), and large land mammals (61 percent). Sharing and distribution of subsistence foods was widespread. In 2014, 97 percent of Seldovia households received at least one subsistence resource and 76 percent of households gave away at least one resource (Jones and Kostick 2016). Although located on the Kenai Peninsula, harvest areas used by the Seldovia Village Tribe include Kachemak Bay, Chinitna Bay, Tuxedni Bay, and the western side of Cook Inlet, including Kamishak Bay.

**Figure K3.9-27: Composition of Seldovia Subsistence Harvest by Estimated Edible Weight, 2014**



Source: Jones and Kostick 2016



Sources: PLP 2020-RF1168; PLP 2019-RF1153; Holen et al. 2012; Evans et al. 2013; Jones and Kostick 2016 (Study years 2008, 2010, and 2014)



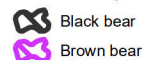
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Miles

#### Large Land Mammal Harvest Areas

- Black bear (Point)
- Brown bear (Point)
- Caribou (Point)
- Moose (Point)



#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a
- Alternative 1

- Caribou
- Moose
- Sheep or goats

- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

- Other Features
- Local Roads
- Three Nautical Mile Line

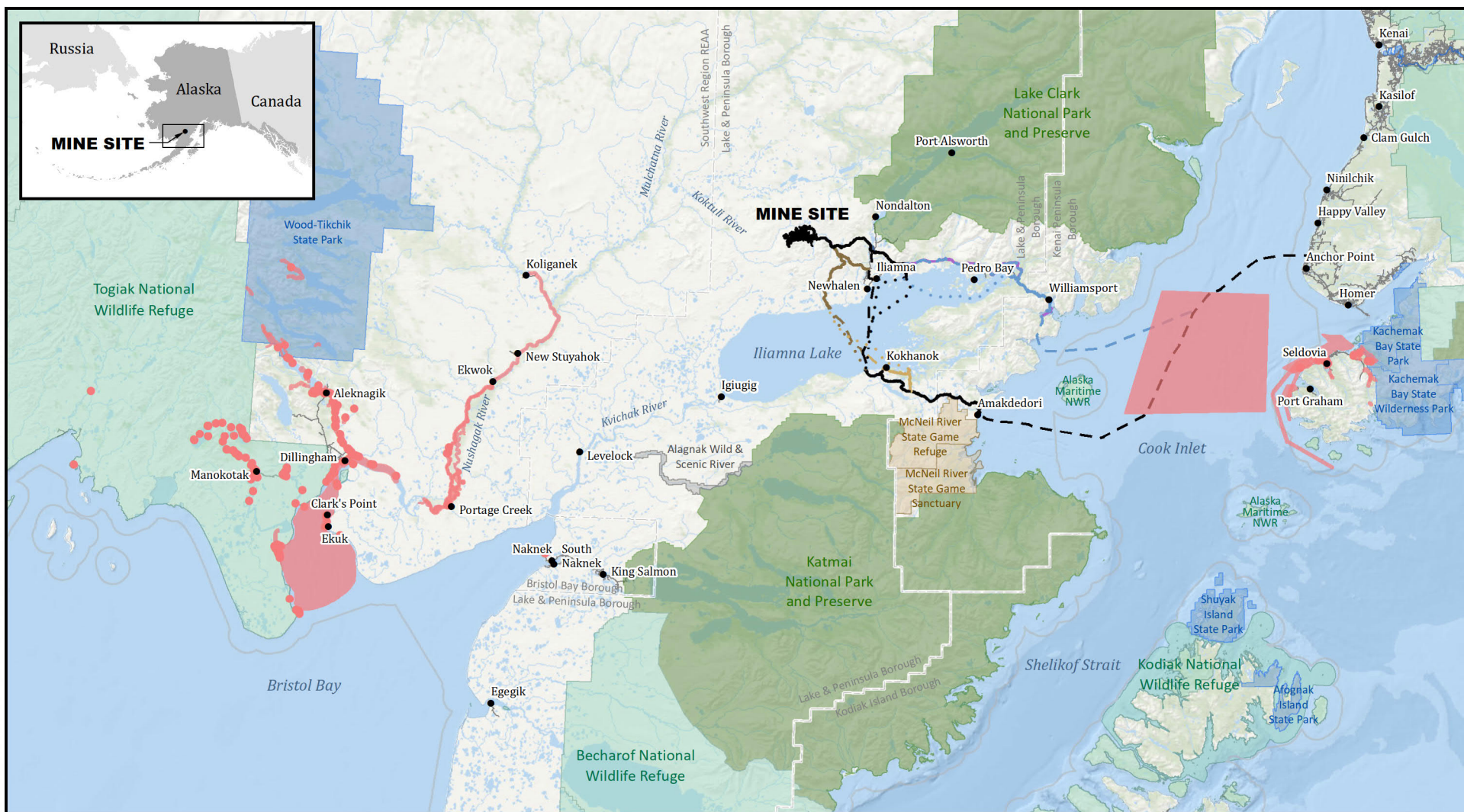
- Borough Boundary
- National Park
- National Wildlife Refuge
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

PEBBLE PROJECT EIS

**LARGE LAND MAMMAL HARVEST AREAS: ALEKNAGIK, CLARK'S POINT, MANOKOTAK, DILLINGHAM, AND SELDOVIA**

FIGURE K3.9-28





Sources: PLP 2020-RF1168; PLP 2019-RF1153; Holen et al. 2012; Evans et al. 2013; Jones and Kostick 2016 (Study years 2008, 2010, and 2014)



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Miles

#### Salmon Harvest Areas

- Salmon (Point)
- Salmon

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a

- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge

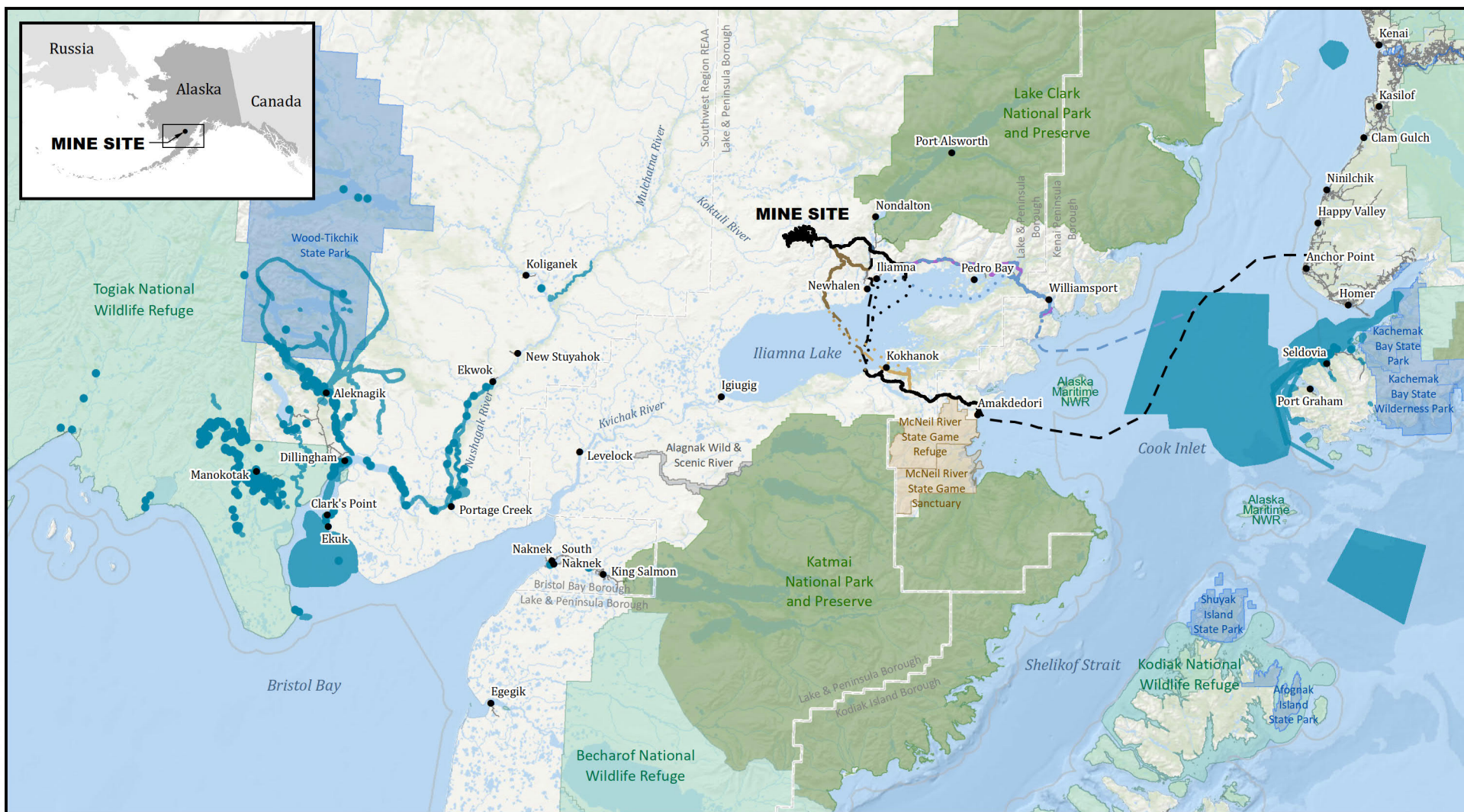
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

PEBBLE PROJECT EIS

**SALMON HARVEST AREAS:  
ALEKNAGIK, CLARK'S POINT,  
MANOKOTAK, DILLINGHAM,  
AND SELDOVIA**

FIGURE K3.9-29





Sources: PLP 2020-RF1168; PLP 2019-RF1153; Holen et al. 2012; Evans et al. 2013; Jones and Kostick 2016 (Study years 2008, 2010, and 2014)



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15 0 15 30  
Miles

#### Non-Salmon Harvest Areas

- Non-Salmon Fish (Point)
- Non-Salmon Fish

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a

- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge

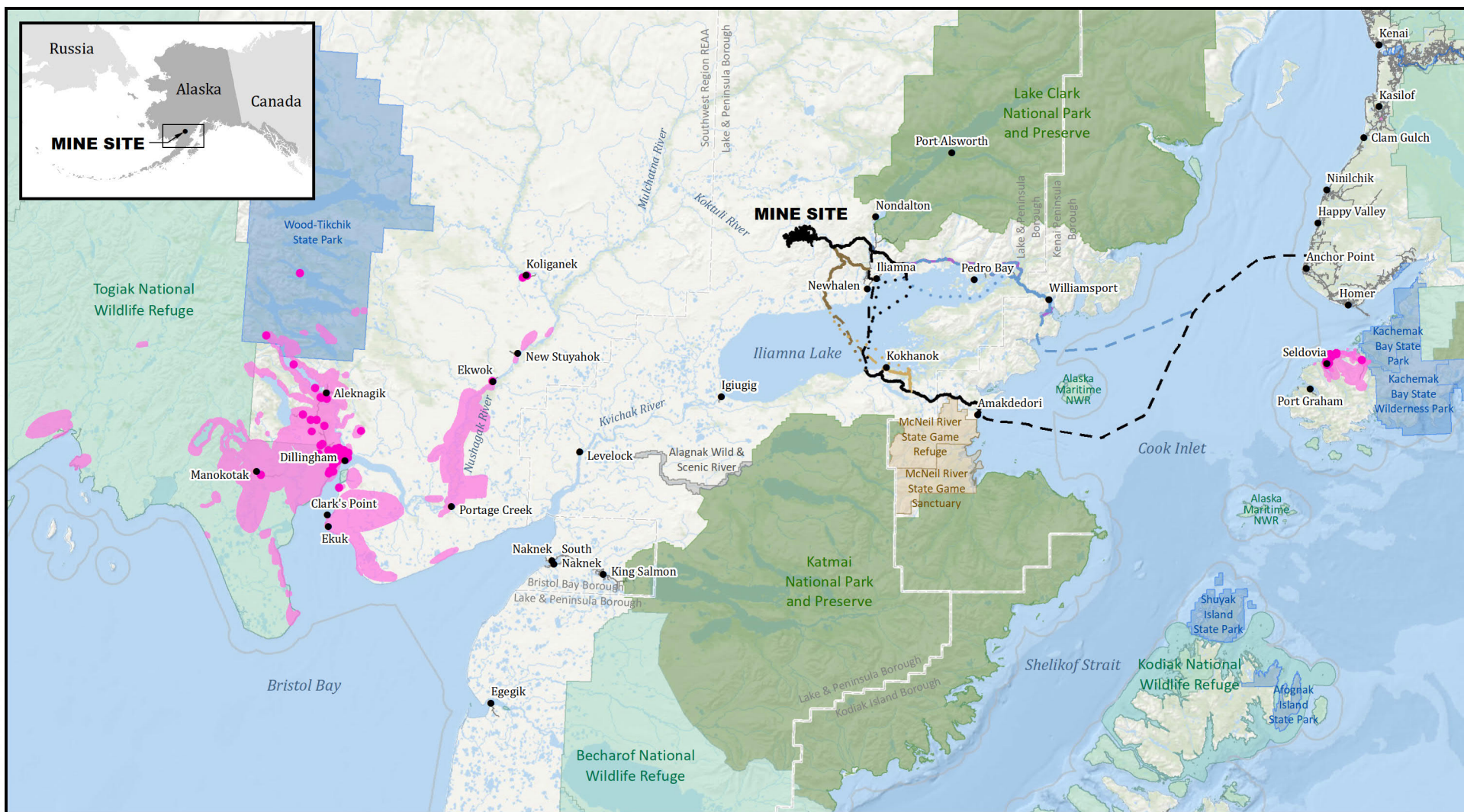
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

PEBBLE PROJECT EIS

**NON-SALMON HARVEST AREAS:  
ALEKNAGIK, CLARK'S POINT,  
MANOKOTAK, DILLINGHAM,  
AND SELDOVIA**

FIGURE K3.9-30





Sources: PLP 2020-RF1168; PLP 2019-RF1153; Holen et al. 2012; Evans et al. 2013; Jones and Kostick 2016 (Study years 2008, 2010, and 2014)



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15 0 15 30  
Miles

#### Vegetation Harvest Areas

- Plants, Wood, Berries, and Fungi (Point)
- Plants, Wood, Berries, and Fungi

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines

- Alternative 1a
- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge

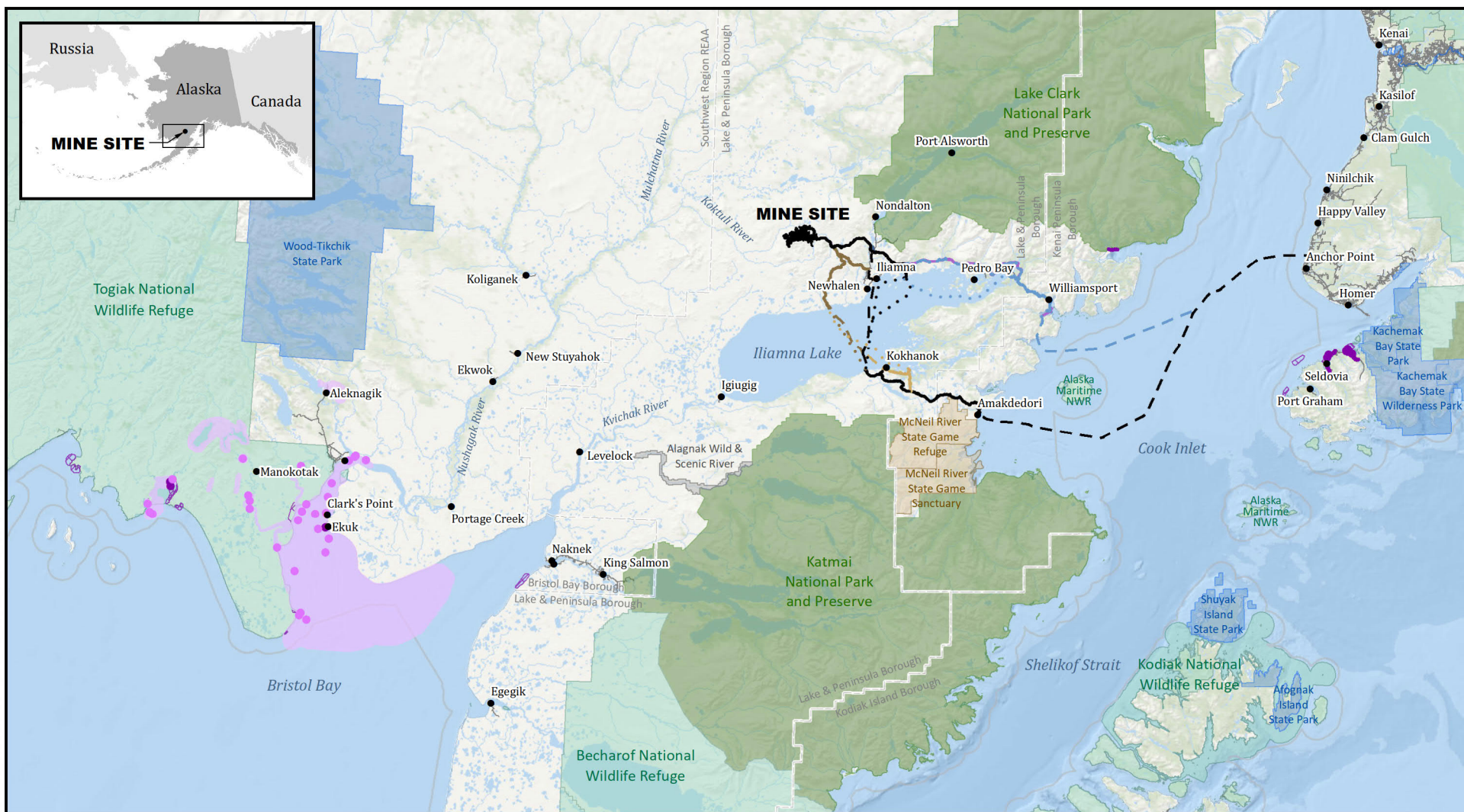
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

PEBBLE PROJECT EIS

**VEGETATION (PLANTS, WOOD, BERRIES, FUNGI) HARVEST AREAS: ALEKNAGIK, CLARK'S POINT, MANOKOTAK, DILLINGHAM, AND SELDOVIA**

FIGURE K3.9-31





Sources: PLP 2020-RF1168; PLP 2019-RF1153; Holen et al. 2012; Evans et al. 2013; Jones and Kostick 2016 (Study years 2008, 2010, and 2014)



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Miles

#### Marine Mammal and Marine Invertebrate Harvest Areas

- Marine Invertebrates (Point)
- Marine Mammals (Point)
- Marine Invertebrates
- Marine Mammals

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a
- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant

#### Alternative 2

- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line

#### Borough Boundary

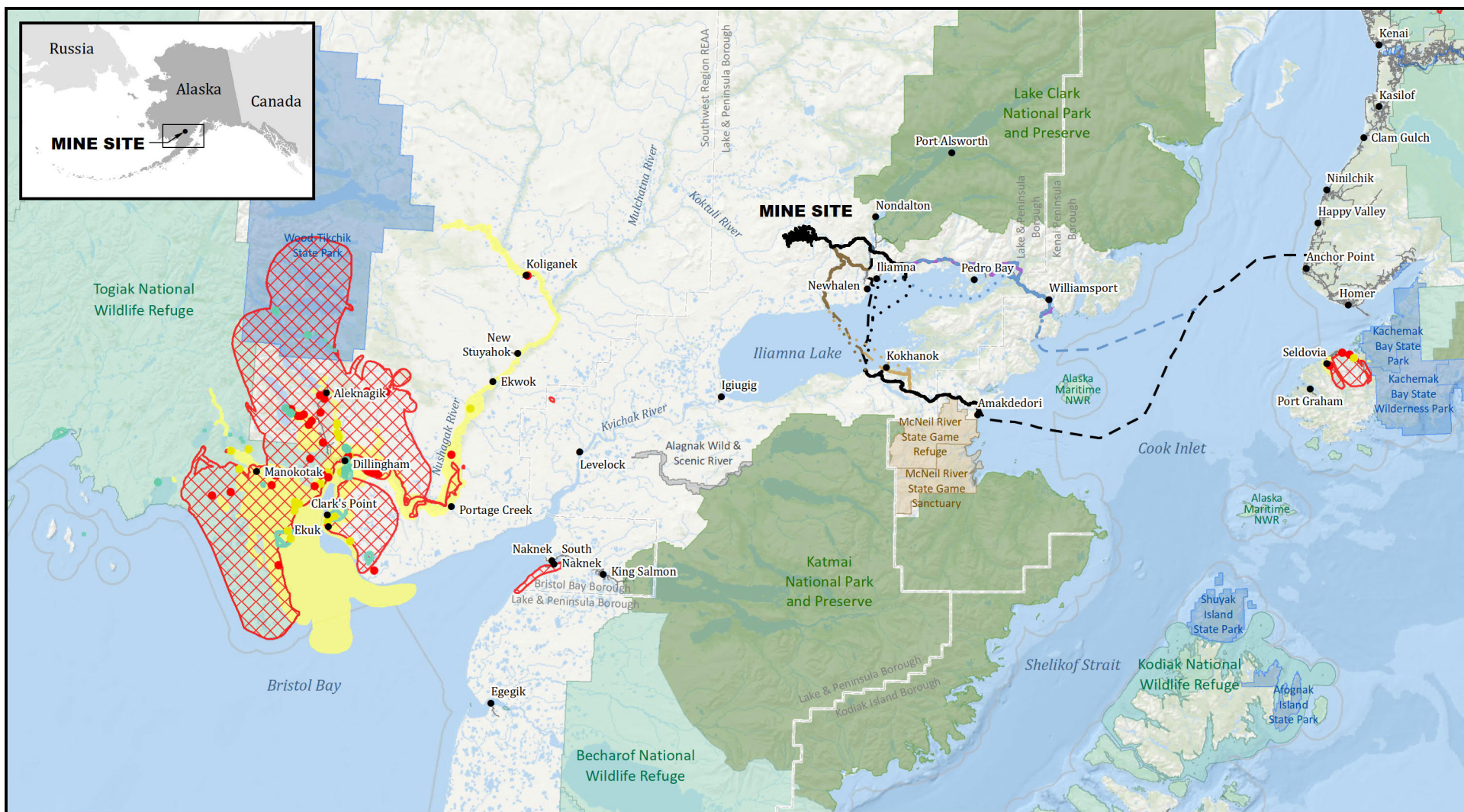
- National Park
- National Wildlife Refuge
- Alaska State Park
- State Game Refuge/Sanctuary
- Wild and Scenic River

### MARINE MAMMAL AND MARINE INVERTEBRATE HARVEST AREAS: ALEKNAGIK, CLARK'S POINT, MANOKOTAK, DILLINGHAM, AND SELDOVIA

FIGURE K3.9-32

PEBBLE PROJECT EIS





Sources: PLP 2020-RF1168; PLP 2019-RF1153; Holen et al. 2012; Evans et al. 2013; Jones and Kostick 2016 (Study years 2008, 2010, and 2014)



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15 0 15 30  
Miles

#### Avian Harvest Areas

- Eggs (Point)
- Upland Game Birds (Point)
- Waterfowl (Ducks/Geese) (Point)
- Eggs
- Upland Game Birds

Waterfowl (Ducks/Geese)

#### Action Alternatives

- ..... Ferry Routes
- Natural Gas Pipelines
- Alternative 1a
- Alternative 1
- Alternative 1 Kokhanok East Ferry Terminal Variant

Alternative 2

Alternative 2 Newhalen River North Crossing Variant

Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary

National Park

National Wildlife Refuge

Alaska State Park

State Game Refuge/Sanctuary

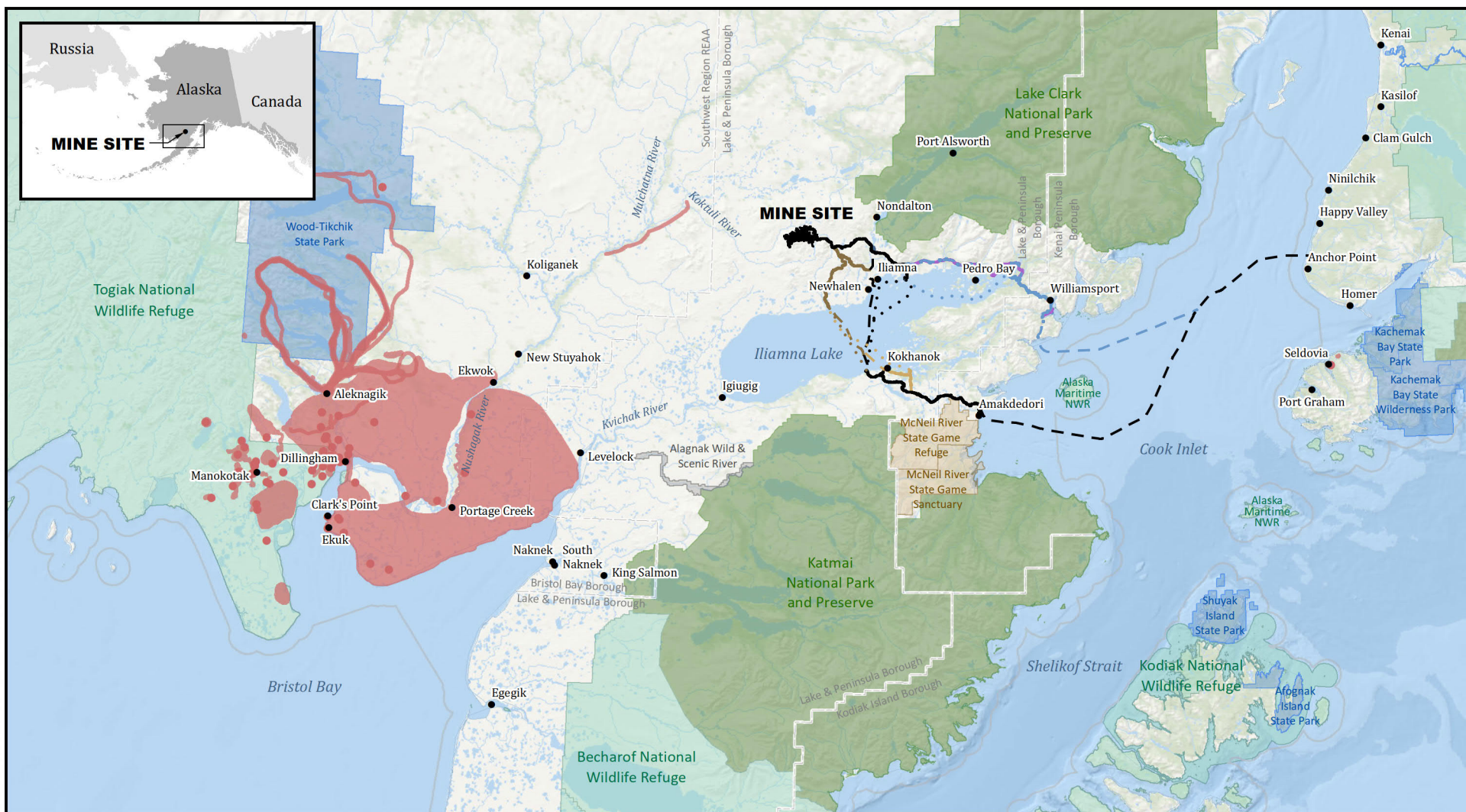
Wild and Scenic River

### AVIAN HARVEST AREAS: ALEKNAGIK, CLARK'S POINT, MANOKOTAK, DILLINGHAM, AND SELDOVIA

FIGURE K3.9-33

PEBBLE PROJECT EIS

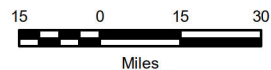




Sources: PLP 2020-RF1168; PLP 2019-RF1153; Holen et al. 2012; Evans et al. 2013; Jones and Kostick 2016 (Study years 2008, 2010, and 2014)



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#### Harvest Areas

- Small Land Mammals (Point)
- Small Land Mammals

#### Action Alternatives

- Ferry Routes
- Natural Gas Pipelines
- Alternative 1a

#### Alternative 1

- Alternative 1 Kokhanok East Ferry Terminal Variant
- Alternative 2
- Alternative 2 Newhalen River North Crossing Variant
- Alternative 3

#### Other Features

- Local Roads
- Three Nautical Mile Line
- Borough Boundary
- National Park
- National Wildlife Refuge

#### Alaska State Park

- State Game Refuge/Sanctuary
- Wild and Scenic River

PEBBLE PROJECT EIS

**SMALL LAND MAMMAL  
HARVEST AREAS:  
ALEKNAGIK, CLARK'S POINT,  
MANOKOTAK, DILLINGHAM,  
AND SELDOVIA**

FIGURE K3.9-34