Prepared for UFA Salmon Habitat Information Program (SHIP) for Pebble Mine EIS Scoping – 2018

(v1.1 – May 24, 2018)

As we assess the risk of large scale acid generating mining activities, it's important to understand what is at stake. Few individuals including Alaskans have visited the Bristol Bay region unless they live, fish or work there. To help convey the magnitude and importance of the Bristol Bay fishery resources, we have compiled publically available data from state and federal agencies and extracted key vital statistics for the commercial fisheries and salmon resource of the Bristol Bay area.

The total fishing activity and economic value to all of Alaska and the U.S. is insurmountable.

Key statistics on commercial fisheries in Bristol Bay and by area residents:

Contents

1. NOAA Rank in Value and Volume – Bristol Bay ports from 2016

NOAA "ports" methodology is different and lacks the clarity of State of Alaska sources. Nonetheless, NOAA classifies three Bristol Bay region "ports' among the top 10 in the U.S. by value of landings:

Source: https://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/other-specialized-programs/total-commercial-fishery-landings-at-major-u-s-ports-summarized-by-year-and-ranked-by-dollar-value/index

U.S. Port Rank:	U.S rank: by Dollars	by Pounds	Millions of Dollars	Millions of Pound
Naknek	4th	9th	$108 M	#170 M
Alaska Peninsula (other)	8th	7th	$85 M	#243 M
Bristol Bay (other)	10th	17th	$76 M	#54 M

2. Fishing activity by Bristol Bay local residents in Alaska statewide fisheries

The Alaska Commercial Fisheries Entry Commission (CFEC) reports fishing activity with estimated landings and income by fishermen from a given community, borough or census area, published online at https://www.cfec.state.ak.us/fishery_statistics/earnings.htm. The Bristol Bay area includes Bristol Bay Borough, Lake and Peninsula Borough, and communities of the Dillingham census. "Ex-vessel" income is the dock price paid to fishermen and does not include additional income to processors, transportation, distribution, wholesale, retail and food service industries:

Bristol Bay Borough

- 158 local permit holders own 168 permits (140 permits fished out of 140 permits in 2016).
- Estimated harvest of 7.7 million pounds for $6.9 M ex-vessel earnings (not including confidential data).
- 329 vessels home ported with 89 vessels locally owned.
- 127 local resident full-year crew.
- 30.5% of the borough population fished as skipper or crew in 2016 – the highest of all Alaska boroughs and census areas.
- $2.7 M in community and borough share of state fisheries taxes in FY 2017; the State of Alaska received an equal amount.

- $10.4 M in community and borough share of state fisheries taxes in five years FY 2013-2017; the State of Alaska received an equal amount.
- $2.1 M in local fish taxes in 2017.

Dillingham Census Area

- 598 local permit holders own 739 permits (407 permits fished out of 416 permits in 2016).
- Estimated harvest of 24.4 million pounds worth $20.1 M ex-vessel (not including confidential data).
- 410 vessels home ported with 330 vessels locally owned.
- 664 local resident full-year crew.
- 21.9% of the Dillingham census area population fished in 2016.
- $498 K in community and borough share of state fisheries taxes in FY2017; the State of Alaska received an equal amount.
- $2.2 M in community and borough share of state fisheries taxes in five years FY 2013-2017; the State of Alaska received an equal amount.
- $32.6K in additional local fish taxes in 2017 (Togiak).

Lake and Peninsula Borough

- 123 local permit holders own 154 permits (104 permits fished out of 113 permits in 2016).
- Estimated harvest of 13.7 million pounds for $10.1 M ex-vessel earnings.
- 242 vessels home ported with 139 vessels locally owned.
- 221 local resident full-year crew.
- 19.95% of borough population fished in 2016.
- $513.5K in community and borough share of state fisheries taxes in FY2017; the State of Alaska received an equal amount.
- $2.9M in community and borough share of state fisheries taxes in five years FY 2013-2017; the State of Alaska received an equal amount.
- $2.9M in additional local fish taxes in 2017 (2% Borough, 2% in Chignik and 3% in Egegik).

Totals for Bristol Bay region residents and communities:

- 879 local permit holders own 1,061 permits (651 permits fished out of 669 permits in 2016).
- Estimated harvest of 45.8 million pounds worth $37 M ex-vessel earnings.

- 242 vessels home ported with 139 vessels locally owned.
- 1,012 local resident full-year crew.
- $3.7 M in community and borough share of state fisheries taxes in FY2017; the State of Alaska received an equal amount. Over the 24 years construction and operation lifespan of the proposed mine this would project to $88.8 M to local communities, and to the State.
- $15.5 M in community and borough share of state fisheries taxes in five years FY 2013-2017; the State of Alaska received an equal amount.
- $5.0 M in additional local fish taxes in 2017 – over 24 years this would project to $120 M..

3. Fishing Activity in the Bristol Bay Region

Gross earnings in Bristol Bay by all Alaska and U.S. residents
From CFEC 2016 totals for the Bristol Bay area fisheries.

Source: https://www.cfec.state.ak.us/fishery_statistics/earnings.htm

Bristol Bay (Area T) hosts these fisheries with 2016 total harvest to fishermen from throughout Alaska and the U.S.:

- Salmon (Drift Gillnet) – 1,550 permit holders fished for 169.7 million pounds worth $158 M ex-vessel earnings.
- Salmon (Setnet) – 872 fished for 42 million pounds worth $34.3 M.
- Salmon Total – 211.9 million pounds worth $192.4 M ex-vessel value (these are 2016 final numbers – preliminary numbers from 2017 show a modest increase)
- King Crab – 62 permits fished for 7.56 million lbs. worth $74.2 M ex-vessel value.
- Herring – 20 permit holders fished for 29.6 million pounds worth $1.6 M ex-vessel value.

In total, 2,512 permit holders fished and landed 249 million pounds worth $268.3M ex-vessel value in 2016 Bristol Bay Fisheries.

There were permit holders from 48 U.S. states that fished Bristol Bay in 2016, and every U.S. state had at least one crew member who purchased their license from a local Bristol Bay vendor.

Top states for fishing earnings from Bristol Bay fisheries:

1. Alaska - $100.3 M (over 24 years = $2.4 billion).
2. WA - $105.3 M (over 24 years = $2.5 billion).
3. OR – $21.3 M

Source: https://www.cfec.state.ak.us/fishery_statistics/earnings.htm

4. CA - $9.1 M
5. Other U.S. States – $32.3 M.

4. Number of fishermen and number of Alaska communities and U.S. states represented in Bristol Bay Fisheries

CFEC 2017 permit list yearly download https://www.cfec.state.ak.us/plook/#permits

✭*Residents of 97 Alaska communities own permits to fish Bristol Bay fisheries (96 in salmon fisheries)*

Top AK communities for Bristol Bay permit holders:

	BB Salmon	BB All
1. Anchorage	213	229
2. Dillingham	205	219
3. Homer	136	143
4. Togiak	112	208
5. Naknek	111	108
6. Manokotak	62	87
7. Wasilla	61	61
8. Kodiak	56	70
9. King Salmon	36	35
10. Petersburg	34	34
11. Palmer	26	26
12. Soldotna	22	23
13. Eagle River	21	21
14. New Stuyahok	21	22
15. South Naknek	21	21
16. Fairbanks	20	20

✭*Residents of 40 U.S. states plus the District of Columbia own permits to fish Bristol Bay salmon*

Top U.S. States for Bristol Bay permit holders:

	BB Salmon	BB All
1. Alaska	1504	1684
2. WA	760	784
3. CA	147	784
4. OR	129	134
5. MN	34	35
6. MT	30	31
7. CO	25	26
8. ID	25	24
9. UT	25	25
10. AZ	14	14
11. FL	14	15
12. HI	12	13
13. NC	10	10

Number of crew and number of states for crew licenses purchased in Bristol Bay:

Many crew member purchase their crew licenses online or in their Alaska or Washington state community before leaving for Bristol Bay. These are just the numbers from crew licenses bought in Bristol Bay communities:

✶*Crew members from 83 Alaska communities bought their license in Bristol Bay communities.*

Top Alaska communities – number of crew who bought their license in Bristol Bay:

1. Dillingham	168
2. Anchorage	112
3. Manokotak	57
4. Wasilla	43
5. Naknek	41
6. New Stuyahok	39

7. Homer	21
8. King Salmon	19
9. Togiak	17
10. Pilot Point	16
11. Aleknagik	13
11. Chignik Lagoon	13
11. Egegik	13
11. Palmer	13
11. Toksook Bay	13
16. Eagle River	11
17. Port Heiden	11
18. Fairbanks	10

✭*Every U.S state is represented among Bristol Bay fisheries crew.*

Top U.S. states in number of residents who purchased crew licenses from vendors in Bristol Bay communities:

	Full Year	7-Day
1. WA	529	24
2. OR	154	9
3. CA	134	12
4. CO	36	3
5. FL	34	0
6. MN	31	2
7. ID	31	1
8. MT	31	1
9. UT	27	2
10. AZ	23	2
11. TX	21	0
12. ME	13	0
13. WI	13	0
14. NY	12	3

15. MA	11	1
16. HI	11	0

(This does not reflect those who purchased online or elsewhere in Alaska or Washington state where Alaska crew licenses are sold).

5. Processing Employment in Bristol Bay Region

According to ADF&G, 8 seafood processing plants filed "intent to process" in the Bristol Bay area in 2017.

Total processing employees in the Bristol Bay Region in 2016: 5,480.

- Alaska resident processing workers: 626
- Total processing wages: $45.7M - over 24 years = $1.1 billion.
- Alaska resident processing wages: $4.0M – over 24 years = $96 million.

  (Employment data obtained by request from Alaska Department of Labor)

In Addition to Commercial Fisheries…

6. Subsistence activity by Bristol Bay residents and other Alaskans

- Every resident in the Bristol Bay region is a federally qualified subsistence user based on their community's determination as rural.
- ADFG reports nearly 100% of households in Bristol Bay communities participate in subsistence for salmon, with significant proportions also using other fish, shellfish, land mammals, marine mammals, birds and eggs, and wild plants.
- Bristol Bay Area residents harvest over 200 lbs. per capita of salmon for subsistence, and over 100 lbs. of other resources.
- The mine itself as well as roads, and barging operations and facilities should be assessed for their impacts on these subsistence resources and activities by local residents.

Bristol Bay Area Estimated Subsistence Harvest - per capita 2014

Source: ADF&G Estimated harvests of Fish, Wildlife, and Wild Plant Resources by Alaska Region and Census Areas 2014 at: https://www.adfg.alaska.gov/static-sub/CSIS/PDFs/Estimated%20Harvests%20by%20Region%20and%20Census%20Area.pdf

Area	Salmon	Other fish	Shellfish	Land Mmls	Marine Mmls	Birds & eggs	Wild Plants	All resources
Bristol Bay Borough	203	12.6	4.2	31.2	9.2	4.3	12.0	276.5
Dillingham Census Area	165.4	34.3	2.9	71.3	11	10.1	21.5	316.5
Lake and Peninsula Borough	256.7	32.7	9.2	75.6	9.6	7.4	14.7	406
Bristol Bay Region Average	208.4	26.5	5.4	59.4	9.9	7.3	16.1	333.0

Subsistence use in the Bristol Bay area by other Alaskans.

While federal regulations provide for subsistence opportunity based on a rural priority, Alaska state regulations allow equal access to all state residents on state managed lands and waters. The Bristol Bay subsistence resources are utilized by Alaskans throughout the state. According to the ADF&G 2012 Subsistence Annual report at http://www.adfg.alaska.gov/techpap/tp406.pdf ,

- 92 subsistence permits for the Bristol Bay area were issued to Anchorage residents.
- The 80 permits that were returned show an estimated harvest of 4,002 salmon, with 3,618 sockeye.
- In addition, 95 subsistence permits for the Bristol Bay area were issued to residents of 25 other Alaska communities, with an average estimated harvest of over fifty salmon per permit.
- Communities represented include Fairbanks, Palmer, Wasilla, Homer, Chugiak, Kenai, Sitka and more.

7. Environmental Aspects – Fisheries Habitat in Harm's Way

ADF&G maintains the Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes, online at https://www.adfg.alaska.gov/sf/SARR/AWC/

In the immediate footprint of the proposed mine, transportation corridor and facilities are four named and 18 un-named streams known to support anadromous fish that need to be considered for direct impacts of mine construction and working lifespan:

Stream name	Anadromous Catalog & Atlas reference
Koktuli River	325-30-10100-2202-3080
Newhalen River	324-10-10150-2207
North Fork Koktuli River	325-30-10100-2202-3080-4083
Upper Talarik Creek	324-10-10150-2183

(unnamed)	243-40-10010-2008
(unnamed)	324-10-10150-2183-3003
(unnamed)	324-10-10150-2183-3010
(unnamed)	324-10-10150-2183-3050
(unnamed)	324-10-10150-2183-3054
(unnamed)	324-10-10150-2183-3057
(unnamed)	324-10-10150-2183-3307
(unnamed)	324-10-10150-2183-3307-0010
(unnamed)	324-10-10150-2183-3310
(unnamed)	324-10-10150-2183-3311
(unnamed)	324-10-10150-2196
(unnamed)	325-30-10100-2202-3080-0050
(unnamed)	325-30-10100-2202-3080-4083-5215
(unnamed)	325-30-10100-2202-3080-4083-5215-6001
(unnamed)	325-30-10100-2202-3080-4083-5215-6001-7012
(unnamed)	325-30-10100-2202-3080-4083-5215-6006
(unnamed)	325-30-10100-2202-3080-4083-5215-6007
(unnamed)	325-30-10100-2202-3080-4225

In addition, should a major impact occur, fish bearing habitat downstream and connected subsurface would be directly affected. Fish in the egg, alevin, fry and smolt life stages that are both upstream or downstream, and all fish that pass through or rear in Lake Iliamna could be affected and should be included for analysis.

There are 176 additional cataloged anadromous waterbodies that are upstream or downstream from the above listed waters, and 249 tributaries of Lake Iliamna. The salmon of these waters may be affected by potential effects of events in the mine's construction, life span or retirement phases.

Table: Additional cataloged anadromous waterbodies that are upstream or downstream of waters in the Pebble footprint or transportation corridor (176) and cataloged tributaries to Lake Iliamna (249)

Studies have shown that the salmon of the Bristol Bay region may differ from year to year in their use of the habitat of the area. One cannot assume that tributaries and small waters might not be of importance because researchers did not find large numbers in a particular time span. For more info see reports posted by the Bristol Bay Regional Seafood Development Association:

Using strontium in otoliths to determine the natal origin and habitat use of sockeye salmon in the Nushagak River, Schindler & Fernandez, 2017

Long Term Monitoring Plan for Wadeable Streams, Lime Hills Ecoregion, Kvichak and Nushagak River Watersheds, Woody, Shaftel, Rinella & Bogan, 2014

8. Aspects to consider

(This section is in progress)

A short list of topics that come to mind that should be considered in the EIS:

- It is well known that the geology of the area is permeated with underground water flow beyond what is observed above ground. Subsurface flows and effects should be included for analysis.
- Effects of year round vessel traffic in Lake Iliamna and Lower Cook Inlet.
- Effects on winter use of Lake Iliamna ice as transportation corridor for local residents – we expect they will need to detour off the lake with the year round ice-free channel maintained for Pebble project barging.
- Effects on local environment for barge facilities and docks, dredging –Lake Iliamna and Cook Inlet facilities.
- Risk of year round truck traffic.
- Risk of year round barge traffic – note USCG RADM Ostebo memo of January 2014 on the Modu Kulluk oil platform marine casualty investigation – "..an inadequate determination of risk occurred, demonstrating a lack of respect for the unique risks inherent in Alaska operations".
- Impact of 2000 workers to the area over four years – construction phase.
- Impact of 800 workers to the area – for the 20 year operating life span of the mine.
- Air quality –impacts to habitat, fish, and wildlife.
- Noise – impacts to fish, wildlife, and residents.

Worst case scenarios to prepare for and analyze foreseeable effects from:

- Tailings dam failure.
- Tailing and storage facilities – liner or containment failure.
- Barge sink or capsize – Iliamna and Cook Inlet.
- Fuel spill – transportation and storage.
- Other chemicals spill - transportation and storage.

We invite fishing groups, fishermen and others to share their comments as we prepare comments on behalf of UFA. Send to habitat@ufafish.org