

**Proposed Pebble Project
Preliminary Draft Environmental Impact Statement
Review Comments**

Reviewer: NARF Technical Team
Date: December 21, 2018
Chapter: Chapter 3: Affected Environment
Section: Section 3.24 Fish Values
Document: Sec3.24_FishValues_FINAL

Comments

Section 3.24 Fish Values. It is not clear why this section is titled “Fish Values” instead of just “Fish” or “Aquatic Life” (since there is also some discussion of invertebrates). The meaning of the term Fish Values is unclear, but regardless, it is the fish themselves that are the affected element of the environment being discussed here.

The discussion in this section is organized by alternative, whereas most of the other sections in Chapter 3 are organized by affected area. A consistent organization should be used throughout Section 3, preferably by area rather than alternative. Currently, the organization of this section is poor and confusing, and the text needs substantial editing.

Section 3.24.1 Action Alternative 1 – Applicant’s Proposed Action. 3.24.1.1 Aquatic Habitat. Mine Site. Just like Section 3.23 Wildlife Values, this section is solely based on Western science and fails to consider Indigenous knowledge, values, and spirituality. USACE will need to change this section heading if they do not want to define and address “values.” This affected environment section is woefully incomplete without consideration of Alutiiq, Dena’ina, and Yup’ik knowledge of the fisheries. USACE needs to address this data gap.

Dr. Duer, Karen Evanoff, and Jamie Herbert explain Nondalton residents’ detailed knowledge of the regional watersheds in their 2018 report “*Respect the Land – It’s Like Part of Us*” A Traditional Use Study of Inland Dena’ina Ties to the Chulitna River and Sixmile Lake Basins, Lake Clark National Park and Preserve:

The salmon harvest draws on intimate knowledge of fish migrations and spawning behavior. Dena’ina fishers possess detailed traditional ecological knowledge of salmon spawning behavior, in which they can determine the movement of the fish based on water quality, temperature, and visibility. They must be familiar with dynamic bathymetry and topography of the shoreline where fishers will have to set and maneuver nets for the final harvest . . . This intricate knowledge of salmon and

their localized habitats reflects a long and enduring relationship between inland Dena'ina harvesters and the salmon runs on which they depend.

It's unfortunate USACE has chosen not to use this detailed, Indigenous knowledge to enhance their fisheries analyses.

Besides including Indigenous knowledge, USACE needs to include Indigenous values and spirituality of the fisheries. In the USEPA's 2013 *Bristol Bay Watershed Assessment* appendix *Traditional Ecological Knowledge and Characterization of the Indigenous Cultures of the Nushagak and Kvichak Watersheds, Alaska*, Dr. Boraas and Dr. Knott quote an Indigenous elder who speaks to the values and spirituality of streams and all living things this way, "Yes, they do [streams have a spirit], like everything else, all living things. Before Russian Orthodox came here, that is what we worshipped. We worshipped all the living things." Dr. Boraas and Dr. Knott go on to note that:

... all interviewees that commented on it believe that salmon have a spirit or soul and that soul is a creation of God. Further, all interviewees who responded report offering a prayer of thanks when they catch salmon, particularly the first salmon as noted in the "Voices of the People" at the beginning of this section. That prayer may be a humble "in one's mind" statement or it may be spoken thanking God for the salmon. (page 131)

As with Section 3.23, USACE needs to include Alutiiq, Dena'ina, and Yup'ik names for the fish discussed in this section. Indigenous names for fish are just as valid as Latin and common names.

This section also fails to incorporate the cultural values of these fisheries by the commercial and recreational fishers. As Sarah Braund notes in her 2017 dissertation *Set the Net: The Heritage Significance of Fish Camp and Wild Salmon in Bristol Bay, Alaska*, "Fishers comprise a tightly woven heritage community replete with unique knowledge and skill set (page 17)." It's unfortunate USACE has chosen to ignore the knowledge of the fishing community.

USACE has not clearly defined its EIS Analysis Area for fish. Please do so.

Figures 3.24-2, 3.24-3, and 3.24-4. Tables 3.24-2 and 3.24-3. Non-salmonids are mentioned in the text for the NFK and are shown as part of the pie charts in Figures 3.24-2 through 3.24-4; however, these species are not discussed in the text for the SFK or UTC or shown in either of these tables. Please provide information on the non-salmonid resident fish present in these watersheds, particularly if they are fished for recreational or subsistence use.

Transportation and Natural Gas Pipeline Corridors. The two paragraphs on Page 3.24-11 need to be edited, to correct missing words and incomplete phrases.

Kokhanok East Ferry Terminal Variant. Cook Inlet Portion of Natural Gas Pipeline Corridor. The species identified in the third paragraph, other than octopus, belong in the invertebrate section.

Figure 3.24-6. The title of the figure in the Word file does not match the actual Figure 3.24-6 provided, which shows sockeye salmon spawning locations in Lake Iliamna.

Section 3.24.1.4 Fish Tissue Trace Element Analysis. On what basis are the concentrations of the analytes in fish tissue considered “low” or “elevated”? To what criteria or benchmarks are the concentrations being compared? Please provide a summary table of the concentrations measured and associated benchmarks rather than referring the reader to a separate report.

Section 3.24.3.3 Aquatic Invertebrates. Epibiota. Why is this the only area and alternative for which epibiota are discussed? Figure 3.24-6 is again referenced incorrectly in this section, as well as in the subsection **Infauna** below.

Section 3.24.3.5 Climate Change. This discussion of climate change is far too vague to be of any use. Please use current climate science to make baseline projections and predictions of changes in water temperature, dissolved oxygen (DO), etc. that could affect fish and other aquatic species. These projections and predictions should be provided for different scenarios including: (1) the proposed project is not permitted and (2) the proposed project is permitted, constructed, and operated.

General. The Wetlands, Wildlife, Fish, and Vegetation sections provide an incomplete, inadequate, and narrow discussion for a project of this size that spans a large landscape encompassing several watersheds and will have impacts to multiple aquatic and terrestrial species in Bristol Bay and Cook Inlet. Additionally, the use of “Values” in the titles is odd. It would be more appropriate to just use “Terrestrial Resources” to include a discussion of habitat and wildlife and instead of “Fish Values”, it would be more appropriate to use “Aquatic Resources” to include a discussion of habitat and fish and other aquatic species.

The proposed project will require intact streams, tributaries, wetlands, and ponds to be removed, altered, discharged into, dredged, and filled in a mostly pristine, wild, and functioning watershed for over 25 years, resulting in removal of an interconnected ecosystem and loss of the biodiversity and functional habitat and services provided to the watersheds that aquatic and terrestrial resource rely on. Mitigation or restoration on this scale has never been attempted.

Re-creating a functioning watershed is virtually impossible. Humans cannot improve intact ecosystems. Removing streams, tributaries, wetlands, and ponds from a watershed for over 25 years will result in loss of natural process and function and will adversely impact inputs to downstream areas, such as sediment transport, loss of interstitial spaces due to lack sediment transport, compaction of substrates, detritus, nutrients, water chemistry, macroinvertebrates, prey, high and low flow regimes, groundwater upwelling, aquifer recharge, hyporheic function, hydrological and geomorphological processes and function, temperature regimes, physical and biological processes, riparian and terrestrial habitat, soil ecology, etc.

In addition, constructing and operating a mine of this size with its associated infrastructure, combined with altering, filling, dredging, disposal of wastewater, and discharging into streams, tributaries, wetlands, and ponds in watersheds for over 25 years will impact, irrevocably damage, and will probably eradicate distinct anadromous and resident fish populations found in the smaller tributaries. These smaller and unique stocks are important to the overall health of fisheries because they provide genetic diversity that improves resiliency throughout the watershed. The proposed project would cover and otherwise adversely impact large areas of the upper watersheds, resulting in severe fragmentation of habitat that's vitally important to aquatic and terrestrial species (salmon in particular) and other anadromous and resident fish.

The EIS must evaluate direct, indirect, and cumulative impacts to all aquatic and terrestrial species. The EIS must also evaluate direct, indirect, and cumulative impacts to the prey resources that fish rely on during all life history phases. A robust evaluation of this type needs to be based on statistically sound scientific baseline data and existing conditions information as well as the Traditional Ecological Knowledge and Wisdom (TEKW) of Alaska Native communities.

Without figures and maps it is not possible to do an in-depth and specific review of these sections. Suffice it to say, aside from the proposed mine itself having a massive footprint across several watersheds, the infrastructure required to support the mine will stamp a large destructive footprint across a large mostly pristine and wild geographic areas including close to 70 miles of roads and additional spur roads with 97 river and stream crossings, 11 bridges, and 88 culverts. The roads will cross through and over several watersheds and large fish bearing rivers, streams, tributaries and through a mosaic of wetlands, lakes, ponds, bogs, marshes, riparian and upland areas.

An 18-mile ice breaking ferry route will require ferry terminals and a port with associated offices, storage facilities, power plants and extensive road causeways built over and into the marine environment. A 187-mile gas pipeline with associated fiber optics going overland and under

Cook Inlet and Iliamna Lake. The project will require extraction of major quantities of water from rivers, streams, lakes, and ponds.

The EIS Analysis Area must include not just the areas of actual ground disturbance but all adjacent and connected areas. The EIS Analysis Area must include all areas of the four major projects (mine, roads, gas pipeline/utilities, port/ferry terminals) and their components in the Bristol Bay and Cook Inlet Watersheds as well as those areas bordering these watersheds including nearby national parks and refuges (particularly Katmai bears and McNeil River bears) that will be impacted by impaired migratory routes, reduced populations of fish and wildlife, etc. The EIS Analysis Area must be expanded to include aquatic and terrestrial migratory corridors for all aquatic and terrestrial species in fresh, estuarine and marine waters.

Bristol Bay and Cook Inlet support important salmonid species that will be irrevocably impacted by the proposed project including Chinook salmon, coho salmon, chum salmon, pink salmon, sockeye salmon, and steelhead trout (Chambers et al., 2012; USEPA, 2014a). Other important fish species that are used by local people include rainbow trout, arctic char, Dolly Varden, grayling, and whitefish. Important non-salmonid species, like pike and suckers, are also used by local people. These fisheries are an integral part of the aquatic food web and provide an abundant biomass and prey resource for several aquatic and terrestrial species in the freshwater and marine areas of Bristol Bay and Cook Inlet watersheds as well as in the other waters including the Pacific Ocean. The EIS must quantify and evaluate the impacts related to the loss of this large prey resource that sustains aquatic and terrestrial species within the project area and across all areas of their adult migratory routes.

The baseline information in these sections is inadequate and at times contradicts itself (as in the case of caribou populations). The documents state that caribou are not in the area so won't be impacted, but then it goes on to say that ADFG culls wolves to protect the caribou herds and that the tribes are concerned with caribou populations and have seen a reduction in numbers.

The EIS must provide sufficient baseline data and existing conditions information. Relying on the insufficient baseline data collected by the project proponent and presented in the 2004-2008 environmental baseline report and the 2009-2013 supplemental baseline data reports does not provide sufficient information for the aquatic and terrestrial species that rely on this large landscape. These reports alone do not provide adequate information to establish baseline conditions for the area to evaluate direct, indirect and cumulative impacts to natural resources.

Baseline studies conducted for this project in 2004-2008, including the methods used to collect and analyze data for fish use and presence more than likely differ greatly from the methods that are being used now in 2018. The EIS must use up-to-date methods to adequately evaluate aquatic and terrestrial resources. Extensive habitat models exist to evaluate the presence and habitat use of aquatic resources. These methods must be used to further evaluate the direct, indirect and cumulative impacts of the proposed project to aquatic resources and fish and fish productivity in the watersheds. Additionally, it is unclear what fish tissue criteria were used. This information should be provided so that the reviewer can determine if the appropriate criteria were used.

These watersheds and geographic regions and their aquatic and terrestrial species have been and continue to be studied by local, private, and nonprofit entities, and resource agencies at the state and federal level including tribes. The EIS must incorporate information from these other sources and studies, new data collected as part of the EIS evaluations and from models that evaluate species, habitat, biological and physical watershed processes. The EIS must also incorporate Traditional Ecological Knowledge and Wisdom (TEKW) in all evaluations and when developing the information for baseline and existing conditions.

Additionally, extensive habitat models exist from the Kenai Peninsula using resource selection functions to evaluate the effect of development on brown bears. The EIS must use these methods to further evaluate the direct, indirect and cumulative impacts of the proposed project to wildlife and terrestrial resources.

The climate change discussion in these sections is far too general for a project of this size and timeframe. The discussion should be far more specific and include information from the new Intergovernmental Panel on Climate Change (IPCC) report that was recently issued. Information on the impacts of sea level rise should be included. Catastrophic events such as landslide, flood, avalanche, major weather should be discussed. Loss of carbon sequestration due to major removal of vegetation and how this impacts greenhouse gas (GHG) emissions should be included. Loss of habitats and shifting migration patterns should be discussed for both aquatic and terrestrial species.

It seems that the whole affects analyses for both aquatic and terrestrial species and habitats is aimed at trivializing the impacts a project of this size will have. Most information is reduced to a paragraph or two. It is misleading to say this is a 20-year project when the buildout will occur over 78 years. And several other mining projects would use the proposed Pebble Project infrastructure. Based on probable ultimate size of the proposed project and other projects that

intend to use the Pebble infrastructure, this project will be there forever. It is unclear how the EIS can claim that a project of this size will result in an increase of rearing habitat for juvenile salmonids.