US Fish and Wildlife Service Comments – Pebble Project Preliminary Draft EIS, Section 3.24 – Fish Values

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
USFWS	1		The chapter does not clearly describe how mainstem reaches are defined. Points on maps provided in the text are labeled A, B, C, D, etc. Does "A" begin at the point "A" on the map and extend upstream to point "B"? If so, to where does the uppermost designation, that is the upstream terminus for Reach "D", extend on the stream and map in the figure? The Service suggests clarifying the definition of mainstream reaches throughout this chapter.	See Response.	Figures revised. Stream reaches are identified.
USFWS	2		According to Table 3.24-1, beaver ponds are referenced as occurring within the upper reaches of area rivers and are also included in the definition of "other off-channel" habitats. The text indicates off-channel habitats include "*side channels, percolation channels, alcoves, isolated pools, riverine wetlands, and beaver ponds*…" Please clarify the distinction between beaver ponds occurring in upper reaches versus beaver ponds occurring in off-channel habitats.	See Response.	Footnotes have been added to Table 3.24-1 for clarification. Other off-channel habitats include beaver pond outlets, alcoves, isolated ponds, side channels, and percolation channels
	3		Descriptions of the upper river mainstem (in areas above the mine site) suggest a greater quantity of sand and silt substrate particles. Are these substrates from beaver ponds in the upper reaches, rather than from riffle, run, glide, and pool habitats?	See Response.	Text revised in several areas to clarify description of the geomorphology of affected waterbodies.
	4		There are several instances of information in tables and figures without supporting information in the	See Response.	Revisions made to several tables and figures.

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			text. Examples include: Table 3.24-2 titled "*Estimated Mileage of Habitat for Pacific Salmon and Rainbow Trout in Tributaries Draining the Mining Site*" would be strengthened if we knew what percent of total stream length each of the values represented. That is, of the total area, what portion of it "represents" spawning or rearing habitat? The text makes frequent references to this table in support of "distribution" of a given species within a river. • Table 3.24-2 suggests that habitat of a given quantity (square miles) for a particular fish species is present but does not provide a spatial relationship or scale to suggest distribution of the habitat or the fish within a given stream. Distribution is relative to scale and needs to be better quantified by watershed, stream, reach, etc. For example, Pink Salmon are widely distributed in Alaska, but they do not occur within every river or waterbody that supports Pacific Salmon. Similarly, a tributary river may be 75 miles in length yet has only 5 miles of suitable spawning or rearing habitat. • Table 3.24-2 does not have spatial relational information. It lists only a total number of miles of a given habitat type by fish species, by sub-basin. • Figure 3.24-3 only reports Reach A-E and does not indicate habitat use type		The total distances of anadromous waters in each subbasin was included in the text and in the table footnote and each species/lifestage mileage was related to its percent of the total anadromous habitat. Note the mileages listed in Table 3.24-2 are based on the definition of the Mine Site Analysis Area (which is also displayed/ highlighted on Figure 3.24-1). This was addressed by adding the % of total anadromous habitat represented by each species in Table 3.24-2 (see above) and is further addressee by adding the percent composition of anadromous species to the pie charts in Figures 3.24-2,3,4. See above The life-stage information is included in Table 3.24-2. For specific locations of species/life-stage distributions per reach see available data in the AWC database, Chapter 15 of the EBD (R2 et al. 2011), or the EFH assessment. A definition of the transportation corridor analysis area is provided. See response above regarding the percent of total mileages, also text was added to identify specific reaches which are clearly identified on revised figures. Estimated rainbow trout mileages based on highest observed.

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			(spawning or rearing). Figure 3.24-3 is titled "*Fish Distribution and Relative Abundance*." Please double-check figure and table numbers in the text to the corresponding figure and table number for consistency of use and meaning. • Figure 3.24-5 "*Transportation and Natural Gas Pipeline Corridors*" does not define the analyses area of impacts from road and pipeline construction and operations. No defined area or boundary is outlined in the referenced figure. • "*Chum spawning habitat is limited to the lower 20 miles of the river, downstream of the seasonally dry channel (Table 3.24-2)." There is no spatial reference within the table to indicate if these miles occur within the upper, middle, or lower river segments. Without citations to lend support to ground verified occurrences of spawning, this assertion is misleading.* *• Table 3.24-3 titled "Estimated Mileage of Habitat for Pacific Salmon and Rainbow Trout within Streams Crossed by the Transportation and Natural Gas Pipeline Corridor" does not include any information on Rainbow Trout. Please include Rainbow Trout information or remove the species from the title.* *• Figure 3.24-3 "South Fork Koktuli Fish Distribution and Relative Abundance" does not show stream*		Rainbow trout was added to Table 4.24-3. Figure reference was corrected. The referenced table was removed. Details regarding specific tributaries or reaches are included in the text and anadromous waters are identified within reaches and tributaries in Figures 3.24-2, 3, and 4. Table reference corrected to Table 3.24-2.

US Fish and Wildlife Service Comments – Pebble Project Preliminary Draft EIS, Section 3.24 – Fish Values

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			crossings for the South Access Road, as referenced in the text on Page 3.24-13 under South Access Road. Similarly, the South Access Road as referenced in the text does not appear labeled as such within Figure 3.24-5 "Transportation Corridor Fish Stream Crossings." *• As referenced within the text, there are no unique streams identified within Table3.24-3.* *• Table 3.24-5 as referenced on Page 3.24-14 does not provide stream miles for life stage of fish species found within the North Fork Koktuli as stated in the text.*		
	5		There are insufficient literature citations to support assertions made within Chapter 3.24 Fish Values. For example, Page 3.24-5 Paragraph 4, Lines 6-8 states, "The low-gradient and gravel-dominated substrate of the mainstem South Fork Koktuli below the mine site provides spawning and rearing habitat for resident and anadromous salmonids." What literature or study supports this claim?	Add supporting references.	References to the EBD data (R2 et al 2011) were added where necessary to support baseline descriptions.
	6		In-text citations are not consistent with citations within the works cited list. As examples: • In text citation, R2 et al. (2011) does not appear in the works cited list. However, R2 et al. 2011a and R2 et al. 2011b may be found. • The full citation for NMFS (1977), as	See Response.	Citations have been corrected.

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			first appears in Section 3.24 on Page 3.24- 13, does not appear in the provided works cited list. • ADFG 2018. Chinook Salmon Research Initiative citation within the works cited list contains a link to a webpage that is only a summary of the project and not specific findings to support the assertion within the text. • ADFG 2018i does not appear in the Works Cited list; however, ADFG 2018h and ADFG 2018j are present. • SEBD (2018) does not appear within the works cited list.		
	7		There does not appear to be a discussion of geospatial scale most relevant to fish populations. The USACE does indicate within this latest draft the proportion of the affected watershed(s) (e.g., the South Fork Koktuli River) as related to the total watershed area that contributes to Bristol Bay. However, there is no discussion of this in either Affected Environment or Environmental Consequences. Please see Service comment submitted by letter dated July 13, 2018: "Include discussion and later analyses of identified resources at scales relevant to fish populations, impacted sub-watersheds (i.e., North Fork Koktuli, South Fork Kotktuli, and Upper Talarik Creek) and within the context of the entire Bristol Bay watershed."	See Response.	Comment acknowledged. The description of baseline conditions is limited to the EIS analysis area where potential impacts from the project are likely to occur. Resources outside this analysis area are not discussed in detail. This information is not necessary to disclose the reasonably foreseeable significant impacts of the proposed project. Additionally, the requested information would not be essential to make a reasoned choice among alternatives.

US Fish and Wildlife Service Comments – Pebble Project Preliminary Draft EIS, Section 3.24 – Fish Values

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	8		Sections within the Affected Environment chapter remain missing, which makes it difficult review to review the Environmental Consequences. For example, fish distribution data is pending review of 2018 field data, and will be included in the DEIS.	See Response.	The DEIS contains updated baseline information currently available including the 2018 field data.
	9		Much of the chapter uses old data and sampling analyses. Environmental Baseline Data (2008) used for analysis at the Mine Site and the North Fork Koktuli River is outdated. Given a changing climate and warming temperatures occurring at higher latitudes, organism response appears to be causing some flowers to bloom earlier than usual and seems to be altering some wildlife migration and hibernation patterns. Changes in fish distribution may also occur as individuals and populations seek out thermal conditions most suitable for completion of their life stages. Understanding how fish species are responding to these changes is critical for analyses of effects to populations occurring in the affected project area. Examples include: • Periphyton samples collection occurred in 2005 and 2007, more than 10 years ago. Current information is needed for further evaluation. • Beach seining results were published in 2005; these results are more than 13 years old.	See Response.	Comment acknowledged. Sampling data from the EBD studies occurred several years ago, and sampling was intensive and conducted over a multi-year period and it is sufficient to represent pre-mine conditions, and to assess the reasonably foreseeable significant impacts of the proposed project. Additionally, the requested information would not be essential to make a reasoned choice among alternatives.

US Fish and Wildlife Service Comments – Pebble Project Preliminary Draft EIS, Section 3.24 – Fish Values

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	10		We recommend more clearly defining how available habitat is quantified for fish. The DEIS refers to miles of spawning or rearing habitat; however it is unclear how habitat miles were determined or calculated. Text frequently refers to the Anadromous Waters Catalog (AWC) in reference to available habitat; however, using miles of habitat reported in the AWC as a metric of total suitable habitat will likely result in inaccurate estimates of available habitat for critical stages of salmon life history. The AWC calculates miles of habitat by identifying the upper most point within a stream segment based on the extent of fish surveys or known anadromous fish use in a particular waterbody, rather than the actual limit of anadromous fish occurrence or habitat use. The resultant "miles of habitat" is not reflective of the extent of suitable spawning or rearing habitat that exists throughout the waterbody below the uppermost point documented in the AWC. Discrete habitat units used by fish for completion of their life history are typically distributed in a fragmented and patchy manner within a river system. Furthermore, reporting "Stream miles" is an inadequate measure to quantify fish habitat in a biological meaningful manner. We recommend that fish habitat be quantified as a measure of area (e.g., meters square, square miles). For an example elsewhere in Alaska, the 17-	See Response.	Comment acknowledged. The use of stream mileages, as used in the AWC database, is sufficient to assess the existing conditions and potential impacts associated with this project. Similarities in sub-basin area, stream lengths, flow characteristics, and habitat conditions among the three principal tributaries also allows for reasonable comparisons among the tributaries. Consequently, we feel that additional information is not necessary to disclose the reasonably foreseeable significant impacts of the proposed project. Additionally, the requested information would not be essential to make a reasoned choice among alternatives.

US Fish and Wildlife Service Comments – Pebble Project Preliminary Draft EIS, Section 3.24 – Fish Values

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			mile stretch of the Kenai River between Kenai Lake and Skilak Lake has more substrate area, and thus more available spawning and rearing habitat, than the lowest 17 miles of Eagle River. To accurately assess the habitat available in the project area and then assess the potential impacts of the project, the analyses should be based on a more robust unit of measure of habitat than simply miles of river.		
	11		We request adding a discussion of baseline surface flow pathways. Please provide citations for the hydrographic components when referencing specific data in the context of temperature and water chemistry effects. Water quality parameters discussed would be easier to understand within table format in addition to where it is written within the text.	See Response.	Surface flows are discussed in detail in Section 3.16, Surface Water. Water quality is addressed in Section 3.18, Water Quality. Text revised in some areas of Section 3.24 to clarify information and discussion.
	12		Chapter sections are missing, precluding our ability to evaluate all of the information. Examples include: • Page 3.24-22 and Page 3.24-28: Kokhanok East Ferry Terminal • Page 3.24-30 Transportation Corridor and Natural Gas Pipeline Corridor • Page 3.24-36 Table 3.24-8 Fish Stream Summary Table	"See Response"	Data Gaps are acknowledged in Section 3.1 A description of baseline conditions is provided based on regional information. The 2018 field data has been incorporated in this section

US Fish and Wildlife Service Comments – Pebble Project Preliminary Draft EIS, Section 3.24 – Fish Values

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	13		The DEIS should include a discussion on the physical properties of Iliamna Lake, including vertical profile analysis of temperature and dissolved oxygen by season, and lake turnover rates (timeline) and stratification. These are important factors affecting diel vertical migrations by juvenile salmonids (e.g., Sockeye Salmon) rearing in Iliamna Lake.	See Response.	Comment acknowledged. This information is not necessary to disclose the reasonably foreseeable significant impacts of the proposed project. Additionally, the requested information would not be essential to make a reasoned choice among alternatives.
	14		The DEIS should include a table that summarizes information for all anadromous streams crossed or affected by the proposed action for each alternative. The current format does not allow review of at-a-glance information. Rather, the reader must skip through to various sections and subsections of the chapter to gather this information.	See Response.	Summary Table 3.24-6 lists comparative number of crossing by fish status (present vs. absent, resident vs. anadromous).
	15		The DEIS should describe how fish values (e.g., spawning, rearing) are assigned to a proposed stream crossing. Many figures indicate fish information comes from the AWC, but it is unclear how fish values are assigned at a particular proposed road crossing. Please provide clarification.	See Response.	Text revision made in this section and inserted table footnotes to describe how life stages are assigned (either via AWC or sampling from 2018 field data at crossing locations).
	16		The DEIS should describe how the USACE has addressed the following comments, submitted in our letter dated July 13, 2018: • “Include a separate discussion of baseline functions and values of	See Response.	Wetlands functions and values are discussed in Section 3.22 and Section 4.22 Surface water hydrology is discussed in Sections 3.16 and 4.26, Surface Water. Water quality is

US Fish and Wildlife Service Comments – Pebble Project Preliminary Draft EIS, Section 3.24 – Fish Values

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			wetlands that may be impacted by the project. For example, quantified baseline wetland habitat functions and values relevant to fish habitat (e.g., rearing, overwintering, refugia) should be presented to streamline future analysis of losses from project impacts." • "Include a discussion of water quality (including temperature and chemistry) that can be analyzed with respect to mine discharge receiving waters. Include a discussion of watershed hydrography, including the seasonal hydrograph, for later use to determine potential project impacts to water quantity and availability for fishery resources. Include a discussion of surface flow pathways." • Please analyze "relative contributions of marine-derived nutrient input and transport from anadromous fish carcasses brought into the freshwater environment from the marine environment; this should include timing, extent, distribution, delivery, and location."		discussed in Sections 3.18 and 4.18, Water Quality. Potential impacts associated with changes in surface flow and water quality are discussed in 4.24, Fish Values. Potential impacts from changes in marine-derived nutrients are discussed in Section 4.24., Fish Values.