UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

September 28, 2020

Agenda B2: NMFS EFH Consultation Report

Overview of Consultations on Actions that May Adversely Affect Essential Fish Habitat in Alaska

As part of the North Pacific Fishery Management Council's Essential Fish Habitat (EFH) consultation policy, the Council requested regular reports from the National Marine Fisheries Service (NMFS) on EFH consultations that may be of interest to the fishing industry, and/or that may affect habitats of direct concern to the Council. Our reports focus on major consultations, with a brief summary of routine activities with minor effects on EFH, and provides advance notice for those activities that could have major effects on EFH, so that the Council can decide whether to consult on the activity.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) provides a role for Fishery Management Councils in commenting on federal or state agency actions that would affect fish habitat. Under section 305(b)(3)(A) of the MSA, Councils may comment on and make recommendations to the Secretary and any federal or state agency concerning any activity or proposed activity authorized, funded, or undertaken by the agency that, in the view of the Council, may affect the habitat, including EFH, of a fishery resource under its authority. **In addition, under section 305(b)(3)(B) of the MSA, Councils must provide such comments and recommendations concerning any activity that, in the view of the Council, is likely to substantially affect the habitat, including EFH, of an anadromous fishery resource under Council authority.** The EFH regulations at 50 CFR 600.930(a) state that each Council should establish procedures for reviewing federal or state actions that may adversely affect the habitat, including EFH, of a species under its authority.

As part of the EFH consultation policy, the Council identified the following criteria to guide NMFS in determining whether an activity is likely to be of particular interest to the Council:

- The extent to which the activity would adversely affect EFH;
- The extent to which the activity would adversely affect Habitat Areas of Particular Concern or other areas established by the Council to protect sensitive habitat features;
- The extent to which the activity would be inconsistent with measures taken by the Council to minimize potential adverse effects of fishing on EFH; and
- The extent to which the activity would conflict with Council-managed fishing operations.

Every year, the NMFS Alaska Region receives in the range of 100 to 200 non-fishing actions proposed by Federal and State agencies that have the potential to affect living marine resources. The review of hundreds of actions is not feasible due to limited staff; therefore, we focus reviews on only those activities that may adversely affect EFH. In a typical year, actions include a wide range of activities such as aquaculture sites, harbor improvement, navigation dredging, offshore disposal of materials, pollutant discharges, coastal construction, mining, forestry, oil and gas exploration, Naval training exercises, hydropower development, and transportation infrastructure projects (highways, bridges, airport expansions, etc.).

Federal action agencies include the U.S. Army Corps of Engineers (USACE), the Environmental Protection Agency (EPA), the Bureau of Ocean Energy and Management (BOEM), the Bureau of Land Management (BLM), the Federal Energy Regulatory Commission (FERC), the Federal Highway Administration, the Federal Aviation Administration, the U.S. Forest Service (USFS), and others. State action agencies include Alaska Department of Natural Resources (ADNR), Alaska Department of Transportation and Public Facilities (ADOT&PF), and Alaska Department of Environmental Conservation (ADEC).

During EFH consultations between NMFS and other agencies, we strive to provide reasonable and scientifically based recommendations for reducing the loss and degradation of habitats that sustain Council managed species. The consultations serve to inform agencies with relevant jurisdiction about potential consequences of their actions on EFH and ways to minimize adverse effects to Alaska's valuable fishery resources. Our EFH Conservation Recommendations are non-binding, as specified by the MSA. However, if the Federal agency does not follow NMFS's recommendations, the MSA requires that Federal agencies describe the measures they propose for avoiding, mitigating, or offsetting the impact of the activity on habitat.

Our habitat biologists are effective at avoiding or minimizing impacts to EFH during pre-consultation coordination with project proponents and action agencies. We provide written comments at various stages of projects including: project scoping, project permitting, during environmental impact statement comment periods, and at other times as requested. The formal EFH consultation occurs when the Federal agency provides NMFS with an EFH Assessment prepared under 50 CFR 600.920(e). NMFS then has 30 or 60 days to complete the EFH consultation. Additionally, we look for efficiencies by conducting consultations at the programmatic level when appropriate.

This report contains five sections and two appendices:

1. EFH Consultations
2. Tools for EFH Consultations
3. EFH Research
4. NOAA Restoration Center and partner restoration work in Alaska
5. Staff changes in HCD

Appendices

- NMFS's EFH letter to USACE on the Pebble Project
- NMFS's early coordination letter to USACE on IPOP's mining activities near Nome

1. EFH Consultations

Since our last report to the Council in April 2019, we have completed EFH consultations on —

- The Pebble Project (USACE) – Our comments are in Appendix 1.
- 17 Pacific oyster (*Magallana gigas*) and kelp aquatic farms (ADNR & USACE)
- Construction of a new road from the Dalton Highway to the Ambler Mining District in north-central Alaska (BLM)
- Constructing a small boat harbor in Elim, Alaska (USACE)
- Willow Oil & Gas Development Project (BLM)
- Alaska Liquid Natural Gas Project (FERC)
- Grant Lake Hydropower (FERC) – NMFS provided EFH Conservation Recommendations, License Terms and Conditions under Section 10(j) of the Federal Power Act (FPA), DEIS comments, and comments on six plans associated with construction activities
- Igiugig In-river Turbine (FERC) - outmigrating juvenile salmon leaving Iliamna Lake may be affected
- Maintenance improvements to the Hoonah Seaplane Facility in Hoonah, Alaska (ADOT&PF)
- Proposed installation of a cruise ship dock in Ward Cove, approximately 5 miles north of Ketchikan, Alaska (USACE)
- The Road to Resources, transportation corridor from Fairbanks to the Ambler Mining District (BML).
- Live fire authorization for the Proposed Military Artillery Training in Eagle River Estuary (PMART, Department of Defense, Joint Base Elmendorf-Richardson).
- Pinnacle blasting in the Tongass Narrows to accommodate larger cruise ships (USACE)
- Lutak Inlet, Alaska Marine Lines Terminal (USACE)
- Northern Tongass Integrated Weed Management (USFS)
- Harbor Construction/Dredging Consultations (Juneau, Ketchikan, Sitka, Craig, Whittier, St. George, Sandpoint) (USACE)
- Auke Bay Ferry Terminal Improvements (ADOT&PF)
- Port of Nome Modification (USACE)
- Noatak Airport Relocation, Northwest Arctic Borough (ADOT&PF, FAA)
- Programmatic consultation for NOAA Restoration Center Program Activities in Alaska (NMFS)
- Proposed intake and outfall lines for the new Prince William Sound Science Center, Cordova (ADNR)
- Alaska Groundfish Harvest Specifications for 2020 and 2021 (NMFS SF)

Currently, HCD is engaging with other Federal and state agencies on the following proposed projects —

- Proposed project to mine the Bonanza Channel and tidal lagoon, near Nome (USACE)

- EPA Ocean Dumping Act Actions for the City of Kodiak and the City and Borough of Juneau - Vessel scuttling locations, as not to interfere with commercial fishing activities (coordinated with Alaska Department of Fish and Game (ADF&G))
- Marine Geophysical Survey of the Aleutian Arc (National Science Foundation)
- Proposed Nuyakuk hydropower project near Dillingham, which has the potential to affect large Sockeye and Chinook runs in the Nushagak River
- U.S. Coast Guard Programmatic Actions
- Aquaculture facility permits (ADNR & USACE)
- Kensington mine expansion (USFS)
- Greens Creek Mine Tailing North Extension Project SEIS (USFS)
- Ketchikan cruise ship dock (USACE)
- Mendenhall Visitor Center expansion (USFS)
- US Naval Training Exercises in Gulf of Alaska

We provide some additional information on the ongoing consultations that may be of interest to the Council; mining activities near Nome, ocean dumping of two vessels, and a Marine Geophysical Survey in the Aleutians.

Mining activities near Nome: This proposed project would mine the Bonanza Channel and Tidal Lagoon, near Nome, using a suction dredge that is specifically designed for shallow water estuary dredging and gold recovery. We informed the Council of this project in the June 2020 NMFS B Report and provided comments to the USACE in 2018 and 2019 on exploration activities, and in September 2020 on the Public Notice of Application for Permit POA-2018-00123 (see Appendix 2). In response to our comments, USACE notified NMFS on September 24, 2020, that they intend to conduct an EFH Assessment.

Figure 1. Photo of the Bonanza Channel and Tidal Lagoon, near Nome, Alaska.

As background, IPOP, the mining company, announced on May 15, 2020 that they hope to begin full-scale dredging on June 1, 2020, and propose to dredge and discharge 5 million cubic yards of spoils from 173 acres of estuarine and stream habitat over the next 5 years. They did not begin full scale dredging this summer. In August, they completed a model dredging program that consisted of environmental baseline studies and water quality monitoring during model dredging in the Bonanza Channel. IPOP dredged and discharged 25 cubic yards of material from the bottom of Bonanza Channel using a 6” suction dredge towards the goal of characterizing the associated turbidity plume in the Bonanza Channel, evaluating water quality, and characterizing the material down to a maximum of 5 feet below the bottom surface.

During early coordination, we reviewed IPOP’s Narrative and worked with the USACE and other resources agencies on understanding the potential impacts to fish and fish habitat. The project has the potential to impact the marine tidal estuary, including eelgrass beds and transition zones that are important to EFH for Council-managed species. EFH in and adjacent to the action area includes all five species of Pacific salmon; and EFH for red king crab and many groundfish species has been designated outside the lagoon in Norton Sound.

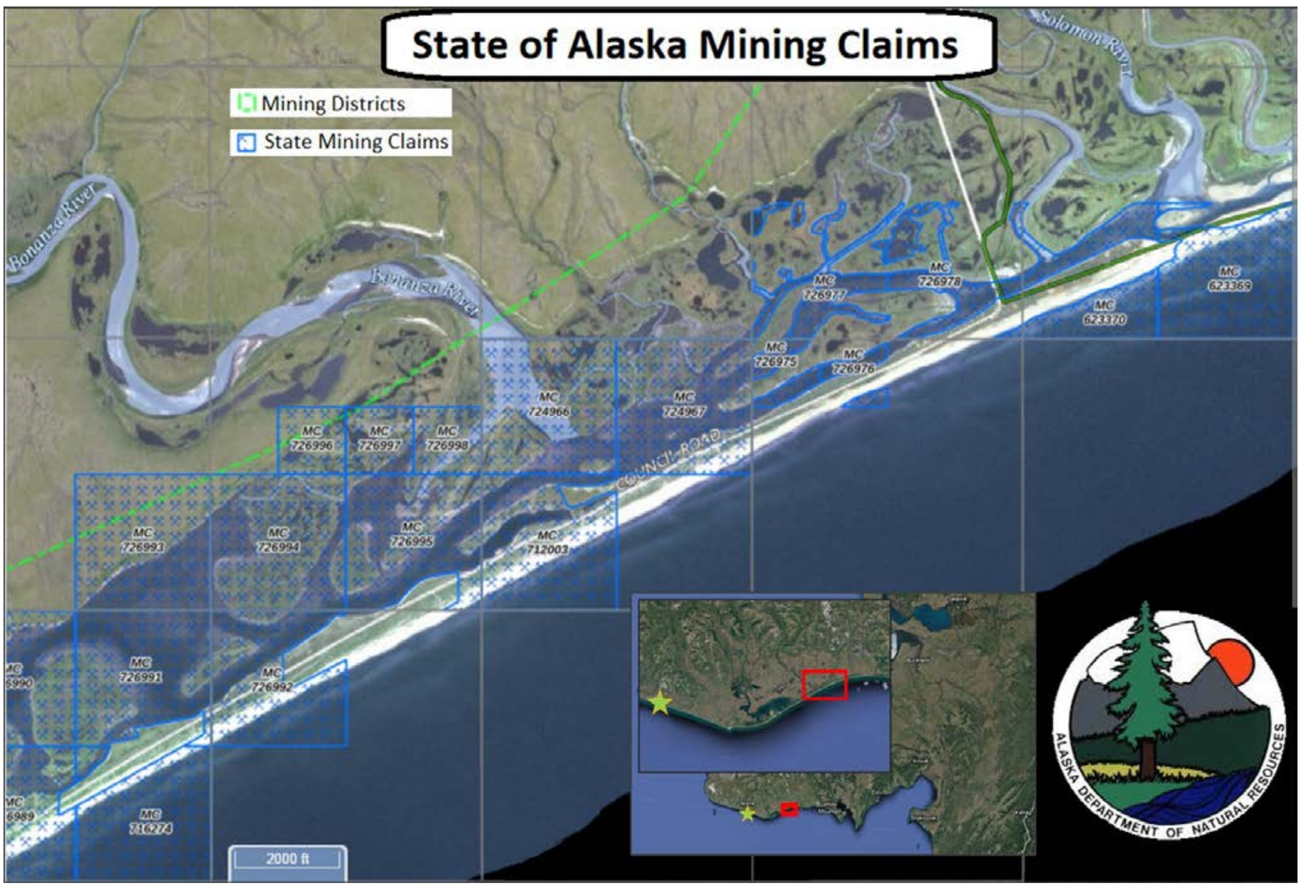

Figure 2. Map of the State of Alaska Mining Claims that IPOP proposes to mine. Insets show the IPOP Claims location (red box) with respect to Nome, Alaska (green star).

Ocean Dumping Act Actions: We are also coordinating with the EPA specific to its authorities under the Ocean Dumping Act for offshore (>12nm) vessel scuttling and discards of tainted fish. Specifically, the EPA must contact NOAA Fisheries and take into account the location of any scuttle or discard that may interfere, alter, or disrupt commercial fishing. Currently, two vessels are proposed for scuttling in offshore waters: 1) south of Kodiak Island; 2) south of the Fairweather Grounds off South Eastern Alaska. We usually recommend these actions occur offshore, are located deeper than 'fishable' depths (>1,000m), are clean of oils, and completed as to not attract birds or marine mammals. Consultation is ongoing and exact sites are still being discussed.

Marine Geophysical Survey: We reviewed National Science Foundation's Draft Environmental Assessment of a Marine Geophysical Survey by R/V Langseth of the Aleutian Arc, September-October 2020, regarding the proposed action to collect data via a high-energy (i.e., seismic) marine geophysical survey. We requested an EFH Assessment and identified the following preliminary concerns:

- The proposed action occurs in areas of EFH for several life stages of groundfish, crabs, and species of Pacific salmon.
- The proposed footprint for high-energy geophysical survey operations overlaps with some of the Aleutian Islands Coral Habitat Protection Areas (AICHPA). These areas are closed to all bottom-contacting fishing gear and are sensitive to damage from other contact and seafloor disturbances. Survey operations, including the air gun array and other equipment streaming from the vessel, may permanently damage corals and sponges in these areas.
- Atka Mackerel *Pleurogrammus monopterygius* spawn in the Aleutian Islands at depths generally < 100 m and during the months of July-October, where males guard egg masses in rocky areas. The proposed survey footprint coincides with Atka Mackerel EFH, including the timing of spawning and spawning habitat at survey stations most inshore. While potential impacts to Atka Mackerel spawning by survey activities may be of limited duration and impact, please address this concern.

2. Tools for EFH Consultations

We have developed some tools to assist Federal and State agencies in conducting their EFH Assessments and to assist in EFH consultations.

New Alaska EFH Web Application: We launched the new NOAA Fisheries Alaska EFH Web Application in December 2018. The "Alaska EFH Web App" is an ESRI-powered ArcGIS online platform that hosts the complete collection of Alaska EFH maps, including the species distribution model-based maps of EFH Level 1 and 2 information for species in the Council's Fishery Management Plans. This new online map interface is intended to provide an improved, efficient, and effective way to view, search, and query EFH map information. Alaska EFH maps are also available on the National EFH Mapper, although with reduced interactive user function to query information. We are currently conceptualizing updates to the Alaska EFH Web App to improve user function of this first launch and we are providing action agency training to successfully implement this new EFH information source for Alaska. We are also working with Council staff to include EFH maps on the Council's species profiles with links to the Alaska

EFH Web App. Alaska EFH maps are also available from our website as polygon shapefiles for GIS and R statistical software (R Core Team) users.

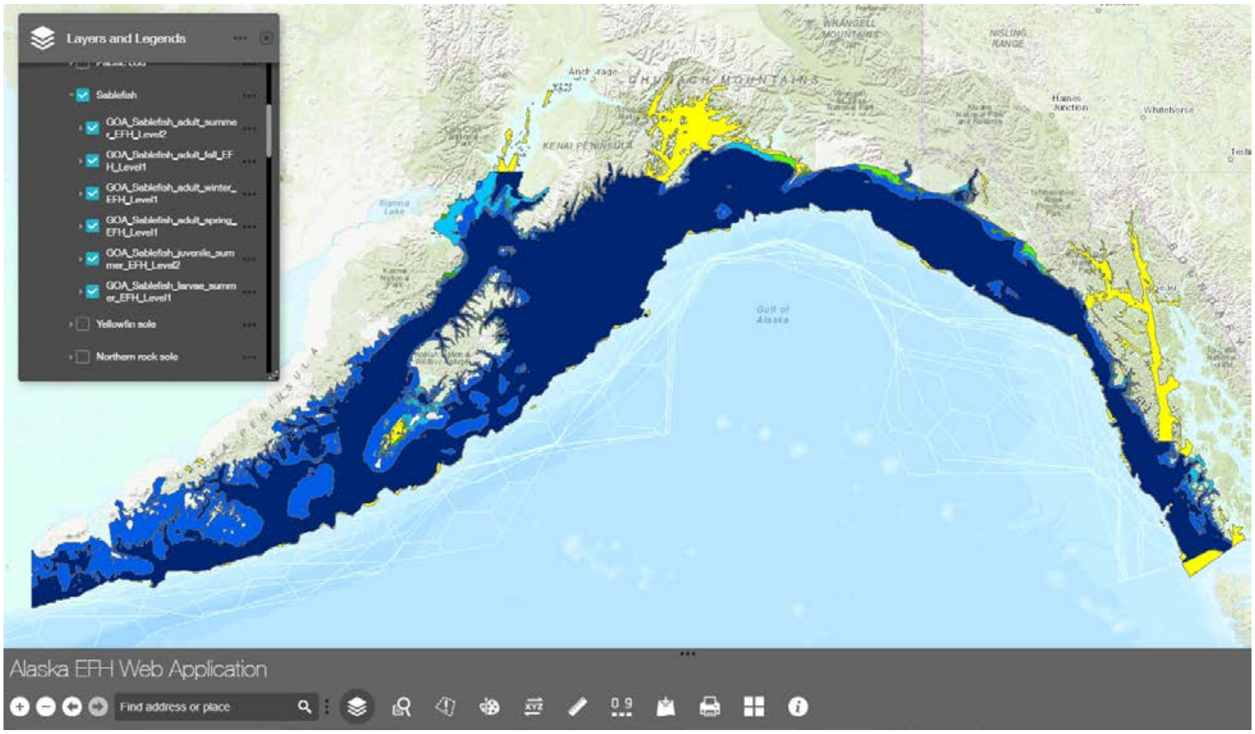

Figure 3: Sablefish EFH maps for life stages in the Gulf of Alaska, accessed from the Alaska EFH Web App.

ShoreZone**:** For the coastal-nearshore environment, we have the *ShoreZone* mapping system. *ShoreZone* has mapped more than 120,000 km of shoreline in Alaska, Oregon, Washington, and British Columbia. Approximately 95% of Alaska's extensive coastline is imaged and mapped. *ShoreZone* catalogs both geomorphic and biological resources at mapping scales of better than 1:10,000. The high resolution, attribute-rich dataset is a useful tool for extrapolation of site data over broad spatial ranges for creating a variety of habitat models and oil spill response tools. Low tide, oblique aerial imagery sets this system apart from other mapping efforts of this type. You can “fly the coastline” (aerial video), view and download still photos, and access physical and biological data using our interactive website. Technical users can download the entire *ShoreZone* geodatabase. *ShoreZone* is available at: https://www.fisheries.noaa.gov/alaska/habitat-conservation/alaska-shorezone

Figure 4: Example photo from *ShoreZone*.

Nearshore Fish Atlas: The Nearshore Fish Atlas catalogs the distribution, relative abundance, and habitat use of nearshore fishes in Alaska. Shallow, nearshore waters are some of the most productive habitats in Alaska and the most vulnerable to human disturbance. Using a beach seine as the primary sampling method, more than 100 fish species in a variety of nearshore habitats have been documented throughout Alaska in an effort to identify EFH. This collection was expanded in 2020 with 25 new fish survey data sets from 7 organizations, including and not limited to an additional 3,800 beach seine hauls (total 5,154) and 768 nearshore trawls (total 1,017) spanning from 1995-2018. The Nearshore Fish Atlas database, information, and contacts are available at https://www.fisheries.noaa.gov/alaska/habitat-conservation/nearshore-fish-atlas-alaska. NMFS will publically launch the expanded version in 2021.

The Nearshore Fish Atlas:

- Provides a quick reference for identifying species in areas designated for development or impacted by human disturbance (e.g., oil spill).
- Helps resource managers prepare biological opinions and identify habitats essential to different life stages of commercially important and forage fish species.
- Allows resource managers to track long-term and large-scale changes in fish distribution and habitat use that may result from global climate change.

Non-Fishing Activities in Alaska: We published *Impacts to Essential Fish Habitat from Non-Fishing Activities in Alaska* to inform decision makers and the public on activities that may affect EFH, summaries of potential effects on fish habitat, and possible EFH Conservation Recommendations to conserve healthy fish stocks and their habitat. The Council and its Scientific and Statistical Committee reviewed this report during the Council's most recent EFH 5-Year Review, implemented in May 2018. NMFS intends to update this non-fishing report during the next 5-year review, currently scheduled for 2022. NMFS habitat biologists use the non-fishing report as a reference, along with information from many other sources, when reviewing proposed actions for potential impacts to EFH and when considering possible ways to avoid or minimize adverse effects. Federal action agencies also use this report as a reference when preparing the EFH Assessments they provide to NMFS as a part of EFH consultations.

3. EFH Research

Each year, we provide funding to the Alaska Fisheries Science Center to conduct scientific research to elevate EFH information for Council managed species' life stages from Level 1 (distribution) or Level 2 (habitat-related densities or abundance) to Level 3 (habitat-related growth, reproductive, or survival rates) and ultimately Level 4 (production rates by habitat). New to the Alaska EFH Research Plan for 2017-2022 is a strategy to entertain multi-year science investigations in the North Pacific. The multi-year approach intends to give some certainty that funds may be more readily available as a proposed project develops from start-up to directed research to conclusion and encourages proposed projects with integrated lab and/or field and modeling components to address the following two specific research objectives of the 2017-2022 plan—

- Develop EFH Level 1 or Level 2 for life stages and areas where missing
- Raise EFH information from Level 1 or Level 2 to Level 3

For Fiscal Year 2020, we have provided funds for the following research projects—

- Advancing EFH species distribution modeling (SDM) descriptions and methods for North Pacific Fishery Management Plan Species
- Evaluating seasonal habitat use and movements by juvenile age-1+ Pacific cod in the Gulf of Alaska
- Nearshore essential habitats of juvenile flatfish in the eastern and northern Bering Sea
- Condition indicators for Pacific cod and walleye pollock from the eastern Bering Sea
- Using drones to update and enhance EFH eelgrass/substrate maps

NMFS Office of Habitat Conservation also funded the following Alaska research projects in FY20—

- A pilot project using eDNA metabarcoding to improve nearshore consultations
- Spatio-temporal environmental covariates to refine salmon EFH within the Bering and Chukchi seas of the U.S. Exclusive Economic Zone off Alaska

4. NOAA Restoration Center and partner restoration work in Alaska

Over the last decade, NOAA Restoration Center work in Alaska has focused mainly on fish passage and river connectivity in our community-based program as well as in our oil spill restoration program. Improving hydrologic function and fish passage has risen as a priority as thermal refugia become increasingly important for fish rearing in river systems as well as for migrating adults. The Exxon Valdez Oil Spill (EVOS) Trustee Council provides funding support for many of these projects.

Ongoing work undertaken with partners ADF&G, U.S. Fish and Wildlife Service (USFWS), and ADOT&PF in the Kenai Peninsula aims to restore passage and hydrologic function to over 90 miles of stream, replacing 4 culverts in areas that support declining Chinook salmon populations as well as well as pink, coho, and sockeye salmon, steelhead and Dolly Varden trout, and Pacific lamprey. In June of 2019, a culvert was installed in Crooked Creek. Crooked Creek is a 46 mile-long nonglacial stream. The upper 29 miles of Crooked Creek are within Congressionally-designated Wilderness of the Kenai National Wildlife Refuge. The Crooked Creek watershed is 35,141 acres and much of the lower 16.5 miles that is outside the Federal conservation unit is surrounded by riparian wetlands. The stream flows through Johnson Lake State Recreation Site, popular for camping by both residents and tourists, and the mouth is protected within Crooked Creek State Recreation Area, a recreational area with high visitation during the angling season. The culvert was replaced using a stream simulation model to pass all life stages of salmon **opening up 33 miles of fish passage**.

In the Buskin River system, NOAA and partners USFWS, ADF&G, and Kodiak Soil and Water Conservation District have **removed over 20 fish passage barriers**. The project restored access to over **6 miles of upstream habitat and 53 acres of lakes** in the 26 square mile Buskin River drainage. This restoration work in Kodiak bolsters and enhances ecosystem function for a productive watershed. If further provides additional opportunity for impacted species populations to recover as well as commercial, recreational, and subsistence fishing. This project was completed in 2020.

In the Copper River watershed, NOAA and partners USFWS, ADF&G, USFS and Copper River Watershed Partnership plan to **restore 13 barrier culverts** benefiting salmon and trout fisheries, numerous bird species, commercial fisheries, and tourism. This work addresses the top 13 priority culverts of the 73 culverts which cross the Copper River Delta resulting in restored fish passage and access to more **than 22 miles of spawning and rearing habitat** for multiple species of anadromous fishes. This project is ongoing.

Outside of EVOS work, the NOAA Restoration Center funded and oversaw the removal of three fish passage barriers in the Tyonek area, opening up **9 upstream miles and 131 lake acres** to salmon and eulachon species in an area of importance for Cook Inlet Beluga whales. This project was completed in 2020.

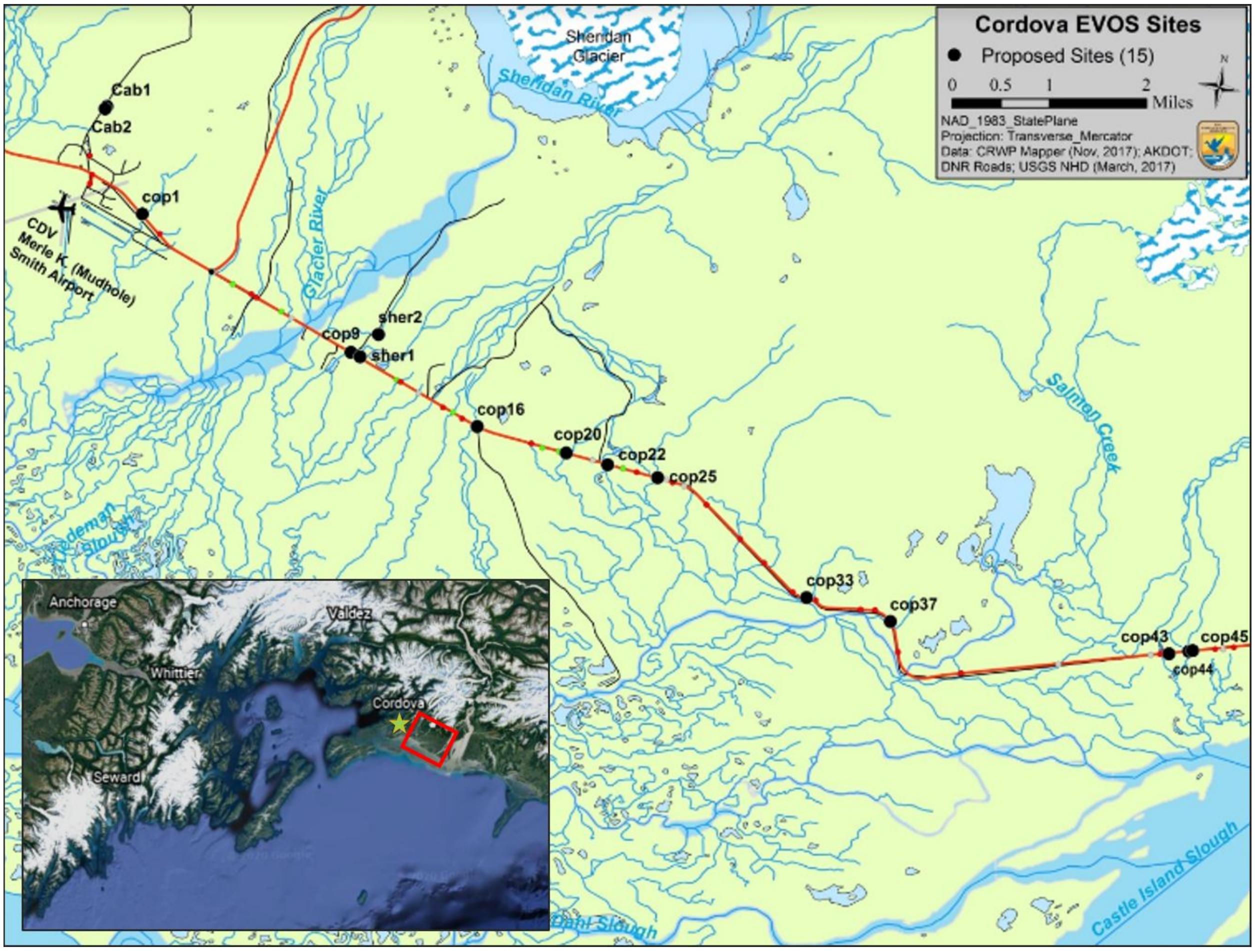

Figure 5: Copper River culverts prioritized for replacement with EVOS funds. Inset shows the location of the culvert replacement project (red box) along the Copper River Highway with respect to Cordova, Alaska (green star).

5. Staff Changes in HCD

Since our last EFH Consultation report, HCD has had some significant staff changes.

Sue Walker, our Alaska Region Hydropower Coordinator, retired after 30 years of Federal Service. **Cindy Hartmann Moore**, our *Shorezone* Coordinator, retired after 39 years of Federal Service. **Samantha Simpson**, who played a large role in our EFH Consultations and the EFH 5-year reviews, left NMFS for the private sector. We greatly miss working with these colleagues!

Sean Eagan transitioned to the role of Alaska Region Hydropower Coordinator. Sean had been working with Sue on hydropower issues since he started with us in 2015. Sean received an M.S. in Hydrologic Science from the University of California, Davis in 1998 after receiving B.S. in Forestry from the University of California, Berkeley in 1990. In between, he served in the Peace Corps in Haiti and worked for six years for the Ecological Restoration branch of Yosemite National Park. Upon completion of his M.S. he worked for seven years with U.S. Forest Service's PSW research station designing and instrumenting an experimental watershed in the Sierra Nevada. After working as Yellowstone National Park's hydrologist for two years, he became the compliance specialist for Lassen Volcanic National Park. More recently, he was the Chief of Resources for Bryce Canyon National Park and then National Park of American Samoa from 2012 to 2015.

Bill Hines moved from the NMFS Alaska Region Operations and Management Division to HCD in Juneau. Bill is one of the longest-serving employees in the Alaska Region. Prior to joining NMFS, Bill was a NOAA Commissioned Corps Officer and U.S. Army Officer. While with NMFS, Bill has been: Chief of Trade and Industry Services; International Affairs Coordinator; Exxon Valdez Trustee Council Alternate member; Executive Director for the Alaska Fisheries Marketing Board; Arctic Coordinator; and Acting Aquaculture Coordinator.

Molly Zaleski and **Ellen Ward** joined the HCD team in Juneau.

Prior to joining us, **Molly** worked as a marine scientist for Oceana and as a research contractor with the Alaska Fisheries Science Center's Auke Bay Laboratories. She earned her M.S. in Fisheries from the University of Alaska Fairbanks, School of Fisheries and Ocean Sciences in 2012. Her background includes data compilation of fisheries and fish habitats, bioenergetics analysis, hydrocarbon sample processing, crustacean endocrinology, fisheries monitoring as a North Pacific groundfish observer, and crustacean population surveys. She has experience working collaboratively with government, industry, and environmental organizations.

Prior to joining us, **Ellen** worked as a Water Information Specialist for the Yukon Government. Ellen earned her Ph.D. ('19) and M.Sc. ('16) degrees in Earth System Science at Stanford University, and her Bachelor's degree ('13) in Physics at Columbia University. Her graduate research used satellite remote sensing, agent-based modeling and field surveys to examine ecological impacts of rapid hydrologic change in the Peace-Athabasca Delta. In 2017-18 she served as a Stanford U.S.-Russia Forum delegate in the Climate and Environment Working Group, investigating opportunities for U.S.-Russia climate change cooperation. As a 2011 NOAA Hollings Scholar at NESDIS in Boulder, Colorado, Ellen's research examined links between climate change and ocean circulation using a global climate model. Ellen is passionate about science communication and has experience working with a variety of stakeholders, including oil and gas, shipping, mining, state and federal governments, Indigenous communities, and subsistence land users in the U.S., Canada and Russia.

Angel Leppert and **Charlene Felkley** joined the HCD team in Anchorage.

Angel is the new Administrative Assistant in our NMFS Anchorage office and keeps everyone shipshape for time and attendance, controlled correspondence, and other duties. She is branching out to do more support for the Alaska Region, including processing permits for RAM. Her recent work includes being a letter carrier for the U.S. Postal Service. Prior to this, she was an analytical wet-lab technician, a North Pacific groundfish observer (out of Anchorage), and she served our country in the U.S. Navy. Angel has Bachelor's degrees in Marine Biology and Environmental Science from Hawaii Pacific University in Kaneohe, Hawaii, and a 3rd Bachelor's in Psychology from Towson University in Baltimore, Maryland.

Prior to joining us, **Charlene** was the regional coordinator for the USDA Midwest Climate Hub in Ames, IA (2016-2019) working to connect agricultural producers to climate change information, tools and services throughout the region. Her previous work with NOAA is extensive: As a NOAA Commissioned Corps Officer (2008-2016), Charlene provided platforms for scientists to conduct research and delivered actionable science to decision-makers/stakeholders. She has been an operations officer and sailor on a fisheries research vessel, a climate change outreach officer in the U.S. Affiliated Pacific Islands for the National Weather Service, a science operations officer for the National Marine Sanctuary in American Samoa, a resources specialist for NMFS (Anchorage Office), and a working and Master SCUBA diver. Charlene holds a BS from the Ohio State University in Natural Resource Management and a MA in Sustainable Development from Hawaii Pacific University with a focus on Climate Change Denial and its mitigation in policy-making. She is also a returned Peace Corps Volunteer having served in Togo, West Africa from 2003-2005.

UNITED STATES DEPARTMENT OF COMMERCE
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August 18, 2020

Colonel David R. Hibner
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Division P.O. Box 6898
JBER, Alaska 99506-0898

Re: Pebble Mine Project, POA-2017-271

Dear Colonel Hibner,

The National Marine Fisheries Service (NMFS) has reviewed the United States Army Corps of Engineers' (USACE) Essential Fish Habitat (EFH) Assessment and updated Project Description for the proposed Pebble Project received on June 19, 2020. Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult with NMFS on all actions that may adversely affect EFH.[1] NMFS is required to make EFH Conservation Recommendations, which may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects.

In this letter, we review each major component of the proposed Pebble Project and provide EFH Conservation Recommendations to minimize adverse effects to EFH. Our EFH Conservation Recommendations should be considered in addition to the mitigation measures identified in the EFH Assessment. Our review and recommendations build on our involvement in reviewing this project and providing recommendations designed to understand and reduce impacts to EFH since 2004 (see Enclosures). In 2019, we reviewed and provided comments on the Draft Environmental Impact Statement (DEIS) and Draft EFH Assessment.

NMFS remains concerned that the proposed Pebble Project has the potential to have substantial adverse effects on salmon EFH in the vicinity of the mine site and downstream areas. Substantial adverse effects pose a relatively serious threat to EFH that cannot be alleviated through modifications to a proposed action. As discussed in detail below, the proposed mine activities would fundamentally change the freshwater habitat in the vicinity of the mine and downstream areas. These changes would result in a decrease in water volumes, habitat complexity, and water quality, and, coupled with decreasing forage opportunities and increasing water temperature, would combine to decrease available salmon EFH. These adverse impacts to salmon EFH are either not possible to mitigate or the success of mitigation is highly uncertain for a project of this magnitude that is attempting to manage tremendous volumes of water and waste.

[1] As recognized in the EFH Assessment, Essential Fish Habitat (EFH) are "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)). "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate (50 CFR 600.10). The level of detail in an EFH Assessment "should be commensurate with the complexity and magnitude of the potential adverse effects of the action" (50 CFR 600.920(e)(2).

These concerns and uncertainties apply to the proposed Pebble Project footprint and 20-year time horizon identified in the current Project Description, and would also significantly increase should the project be expanded in the future.

In reaching this conclusion, we considered the following:

- Freshwater river systems and lakes are EFH for all species of salmon within the project area and in the Bristol Bay watershed.
- The most important EFH attribute supporting the abundance of salmon within, surrounding, and downstream of the mine site are the aquatic ecosystem processes and abundant surface and groundwater regimes that currently exist in a natural pristine condition.
- Based on the experience from other large mines, we expect the proposed Pebble Project to alter watersheds and water quantity and quality, which directly affects salmon survivability. These impacts would continue to occur for an undefined and highly variable distance downstream.
- Impacts from the majority of the mine's earthworks, excavations, and infrastructure will be permanent.
- The mining action would likely expand over time and extend beyond the initially defined footprint. Expanding excavations and increasing porphyry metal processing dictate increasing water withdrawals, water treatment, and water management and release in the future with the effects to ecosystem function extending in perpetuity.

Finally, we would like to highlight that the Project Description and EFH Assessment have not fully described some project components that have the potential to substantially adversely impact salmon EFH. These include, but are not limited to, details of the water management plans that are needed to manage surface and groundwater in perpetuity, and the methods and technologies that will be used to treat the anticipated volumes of waters containing the anticipated mine wastes. Lacking this more detailed discussion adds to the uncertainty regarding whether the proposed plans would be sufficient to effectively manage and treat water and mitigate adverse impacts to water quality, over the life of the mine and after the mine closes.

1. Project Description and Project Area

According to the Project Description, the Pebble Limited Partnership (PLP) proposes to develop and operate an open-pit mine and porphyry ore processing facilities to produce copper, gold, molybdenum, and other commodities. As currently proposed, the mine would operate for 20 years, excavating a pit 6,800 feet long, 5,600 feet wide, and 1,950 feet deep. Development of this prospect would include construction and maintenance of multiple facilities to store pyritic and bulk tailings, and potentially acid-generating and metal-leaching materials. The project site would also contain multiple sediment and seepage collection ponds and materials quarries. Additional infrastructure components include the construction of an 82-mile transportation corridor connecting the mine site to a port facility with a two lane road, fiber optic cable, multiple pipelines supporting natural gas, metal concentrate slurry, and mine contact water transfer. The natural gas pipeline and fiber optic cable would run from the port facility across

Ursus Head to Ursus Cove and continue across Cook Inlet to the Kenai Peninsula. The newly constructed port facility will support shipping for extensive equipment, materials, and manpower supply chains, including an offshore lightering operation in Iniskin Bay, Cook Inlet. Additionally, power generation facilities would be constructed at the mine and port facilities. Many of these project components involve work in and discharge of fill into wetlands and waters of the United States.

As identified in the EFH Assessment, the proposed Pebble Project is located within two watersheds, Bristol Bay and Cook Inlet. The proposed mine site spans headwaters of the Nushagak River and Kvichak River, and the transportation corridor crosses tributaries that flow into Lake Iliamna, all of which flow into Bristol Bay. The port and natural gas pipeline would be located in Cook Inlet.

2. Essential Fish Habitat as Defined in the Fishery Management Plans

The EFH Assessment analyzes impacts to EFH for species managed under the Fishery Management Plan for the Salmon Fisheries in the EEZ off Alaska (Salmon FMP), the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA Groundfish FMP), and the Fishery Management Plan for the Scallop Fishery off Alaska (Scallop FMP). EFH is designated for these species life stages based on Level 1 (distribution) and Level 2 (habitat-related densities) information. The North Pacific Fishery Management Council and NMFS do not designate EFH for forage fish and other ecosystem component species included in the GOA Groundfish FMP, however forage fish are prey resources for several managed species and are thus considered an important EFH attribute.

The EFH Assessment provides a description of many of the anticipated impacts to EFH and provides mitigation measures intended to measurably reduce short-term and long-term impacts to EFH. However, the Project Description and EFH Assessment have vague descriptions of some project components that have the potential to substantially adversely impact EFH. In the discussion below, we use the best available information to assess these components and provide EFH Conservation Recommendations, recognizing that it is not possible to know exactly what will be built at this time and therefore the EFH Conservation Recommendations should be considered in developing detailed project plans.

3. Potential Impacts to Freshwater Salmon EFH

Under the Salmon FMP, EFH is designated for salmon in the freshwater river systems and lakes within the project area. The mine site and transportation corridor would impact freshwater salmon EFH in the Bristol Bay watershed.

The most important EFH attribute supporting the abundance of salmon within, surrounding, and downstream of the mine site are large volumes of nearly pristine water (Bogan et al. 2018; Zamzow 2018). Gravity moves groundwater down gradient through porous saturated substrate to eventually express in surface waters downstream (Bilby and Naimen 1998; Younger 2009; Poehles and Smith 2011). Evidence suggests many adult salmon prefer to build redds, spawn and deposit eggs on and near upwelling water sources (Geist 2000; Malcolm et al. 2003 and 2005).

Such groundwater influenced upwelling supports egg survival in freezing winter conditions (Cunjak and Power 1986; Cunjak 1996). These interactions between ground and surface waters support aquatic communities through temperature regulation (Boulton 1993; Boulton et al. 1998; Boulton and Hancock 2006). The abundance of water supports connectivity to numerous secondary, still water side channels and eddies where salmon fry and parr seek refuge and grow (Mason and Chapman 1965; Woody and O'Neal 2010).

As keystone species, Bristol Bay salmon transport significant amounts of nutrients to and from terrestrial watersheds and the eastern Bering Sea (Limpinsel and McConnaughey 2018). The Ecosystem Modeling Team at the NMFS Alaska Fisheries Science Center evaluated the contribution of Nushagak River and Kvichak River sockeye salmon to trophic dynamics in the eastern Bering Sea and North Pacific ecosystems and concluded "*salmon from these rivers rank among the top ten forage groups, comparable to Pacific herring or eulachon as a nutritional source for other marine species*" (Gaichas and Aydin 2010).

Natural resource extraction projects of this nature have the potential to induce different degrees of impacts on EFH depending on the nature, scale and scope of the project and surrounding ecosystem processes (Younger et al. 2002; Lottermoser 2010). Specific to any project, with respect to salmon EFH, we first consider the presence and abundance of water and salmon, then consider impacts in terms of duration (short or long term, temporary or permanent), with focus on aquatic ecosystem processes such as water quality that support EFH. Considering these factors, we also assess whether impacted ecosystems will recover after the disturbance; or whether the impacts of the action continue to degrade ecosystem function in a continual cumulative or synergistic manner.

3.1 Salmon Distribution and Abundance

The EFH Assessment underestimates the value and function of different types of habitat, the supporting aquatic processes, and the numbers of salmon, especially juveniles, affected by the proposed Pebble Project. As salmon migrate upstream, their numbers become fewer. However, the number of salmon in a given stream reach is highly variable among species, run timing, life stages, environmental influences, and over seasonal and annual temporal scales (Schindler et al. 2010). For example, juvenile coho salmon will voluntarily move 1,148 to 4,265 feet (350–1,300m) in a day based on prey availability and water temperature (Armstrong 2013).

The studies conducted to inform the EFH Assessment did not consider this variability in designing the fish surveys or in determining the distribution and abundance of salmon that would be impacted by the project. Conducting fish surveys using consistent methods to inform statistical analysis and provide defensible conclusions on salmon distribution and abundance is important to understand impacts to habitat and develop appropriate mitigation measures (Gunderson 1993; Cochran 2007; Johnson et al. 2007). We have provided detailed comments over the years on ways to improve study designs to more accurately and defensibly document the distribution and abundance of salmon in the project area (see Enclosures).

3.2 Mine Site

The DEIS describes the approximate acreage and linear stream miles permanently lost to the mine footprint and surrounding infrastructure. The EFH Assessment estimates that 8.5 miles of EFH would be permanently removed from mine site development and asserts that stream reaches and habitat lost within the footprint of the mine or under the influence of mine-altered water regimes are poor quality habitat, of little importance, and support low numbers of salmon. Subsequently, the EFH Assessment concludes that the loss of habitat and associated salmon pose little impact in relation to the overall salmon populations in the watersheds. As explained in detail below, we disagree with these conclusions. We are concerned that the proposed plans for removing, treating, and reintroducing water remain experimental at best, and how early life stages of salmon will respond to significantly altered freshwater habitat over time is highly uncertain.

The EFH Assessment does not provide a detailed analysis of direct and indirect impacts to salmon EFH associated with removing and altering the surface and groundwater regimes underneath and downstream of the mine site, and changing water quality throughout the watershed. While the updated Project Description does provide additional description of the mine site, mineral processing, and water treatment, neither provide a detailed analysis commensurate to the potential impacts to water, the key EFH attribute.

The Federal regulations implementing EFH requirements state that the level of detail in the EFH Assessment should be commensurate with the potential adverse effects of the action (50 CFR 600.920(e)(2)). To identify and understand the impacts to EFH, the EFH Assessment should provide more detail on (1) the methods and assumptions used in the water management models to develop the water management plans, (2) the complete removals and disruption of the ground and surface water regimes and the distance downstream where natural water regimes would resume, (3) the water storage and treatment processes, (4) the plans to reintroduce treated water back into the system, and (5) the impacts of these changes to the ground and surface water regime to the entire watershed.

3.2.1 Water Management

We appreciate the conceptual water management plans and descriptions of water management models. However, given the complexity and interaction of these surface and groundwater regimes and the project's need to manage water in perpetuity, we assume the project proponent has more detailed analysis of the model designs and assumptions, the data used to inform the model, the methods of analysis, and the model conclusions than what is presented in the EFH Assessment. Without this more detailed discussion of the water management models, it is uncertain whether the proposed water management plans would be sufficient to effectively manage mine contact water, over the life of the mine, and after the mine closes.

The EFH Assessment does not explain how the water management plans account for the fact that the climate is changing. Water management plans must be designed to accommodate the projected changes in climate in this region, including the increasing levels of precipitation, with more frequent winter rain and less snow, and more intense storms.

The abundant and nearly pristine ground and surface water regimes in the project area produce ideal conditions to support salmon populations. To the contrary, this abundance of water is challenging to manage in mining porphyry mineral deposits. We remain concerned about the continued need to manage increasingly larger volumes of water and waste, specifically; (1) the continued gradual lowering of the water table outside the pit excavation as it expands, (2) the continual increase in volumes of mine contact water to be managed, stored, treated, and discharged, and (3) during post mine closure, the inevitable need to manage and release in perpetuity large volumes of mine contact water when surrounding ground waters re-establish equilibrium and resume outflow. These actions increase the cumulative and synergistic effects on downstream habitat quality and salmon survival. We discuss each of these elements of water management below.

3.2.2 Water Removal at the Mine Site

To excavate the mine pit to the eventual dimensions projected to provide access to the mineral deposits below, a significant volume of groundwater needs to be completely removed. Using more than 50 dewatering wells to remove millions of gallons of water from the ground will alter ground and surface water flows, changing the existing hydrology for an unknown distance surrounding the mine. The groundwater and associated aquatic processes in the mine footprint would be completely removed by excavating the mine pit or buried by tailings impoundments or water storage ponds. The water quality and quantity, and aquatic processes surrounding the mine would also be significantly altered. The extent of the surrounding area and the severity of impacts remain undefined and are highly variable over time and distance from the mine footprint. Furthermore, as the pit excavation gradually expands, it becomes increasingly necessary to remove more water from the ground, decreasing available surface waters, and further increasing the dewatered area as the cone(s) of depression expand. Water quality and quantity, and aquatic processes would resume naturally downstream, though this distance remains unknown and highly variable.

Removing the projected large volumes of water from the mine site and surrounding area would alter salmon spawning and rearing habitat. Decreasing water volumes alters temperature, dissolved oxygen, and forage opportunities. Salmon depend on water availability in small tributaries during crucial time periods for spawning and juvenile rearing. The severity of the effects of these physical changes are highly variable depending on the species and life stage of the salmon, though overtime all likely diminish habitat quality and salmon survival. The impacts of water removal and water degradation to salmon are well represented in the literature (Baldwin et al. 2003 and 2011; Montgomery 2003; Hughes et al. 2006; Di Giulio and Hinton 2008; McClure et al. 2008; McIntyre et al. 2008).

3.2.3 Water Storage and Treatment at the Mine Site

We are concerned that the water storage and treatment processes narrated in the Project Description are not well described and may not be effective in treating large volumes of mine contact water in perpetuity. The lack of technical details provide little assurance that methods proposed would be successful at this scale, in a watershed of this hydraulic complexity supporting large populations of salmon. Mining operations that process higher quality ores in regions with less precipitation and lower volumes of ground and surface water interaction, often exceed predicted and permitted discharges of mine contact water (Younger 2003; Kuipers et al. 2005; Maest et al. 2005; Castendyk and Eary 2009; EPA 2018). Exceedances in metals or total dissolved solids often result from (1) error or uncertainty in the modeling used to predict metal precipitates removed versus metal precipitates remaining in solution and expelled, (2) water treatment systems that are overwhelmed by unpredicted volumes of water, (3) inadequately engineered or installed equipment for unpredicted or unanticipated water scenarios, and (4) mitigation measures and facility designs that do not perform as anticipated. We suggest more analysis of the methods and technologies proposed to treat the anticipated volumes of waters containing the anticipated mine wastes and their proven effectiveness in subarctic environments. This would provide a better understanding of the effectiveness of the water treatment plans and the impacts on water quality in salmon streams.

We are also concerned about the possible failure of tailings embankments made to contain the pyritic tailings, bulk tailings, and water management ponds. If any of the six proposed embankments catastrophically fail, EFH would be damaged for an unknown distance downstream and water quality could be negatively affected for miles. A recent example was seen in Brazil in 2015 (Queiroz et al. 2018). The Samarco tailings dam collapse released 50 million cubic meters of mine tailings into the Rio Doce. Mine tailings and waste water traveled 650 km (403.89 miles) of the Rio Doce watershed arriving in the marine estuary 17 days later. Bristol Bay is approximately 209 river miles from the mine site. Several other similar incidents are described globally in different reviews (Armstrong et al. 2019a and 2019b; Lyu et al. 2019). The influence of seasonally repeated freezing and thawing of water seepage and drainage under earthen structures should also be evaluated in the impoundment design and possible response scenarios (Doroshenko and Nevzorov 2016).

Even if mine wastes and mine contact water appear contained, potentially acid generating or metal leaching rock contact water can infiltrate groundwater in these drainages and resurface as water harmful to salmon (Younger et al. 2002; Lottermoser 2010). A recent study unequivocally demonstrates the movement of pollutants in tracers from terrestrial sources through the ground to marine waters (Glenn et al. 2013).

Low concentrations of metals have been shown to have detrimental impacts to salmon (Lundebye et al. 1999; Baldwin et al. 2003 and 2011; McIntyre et al. 2008). Heavy metals are widely recognized to persist in the environment, becoming bioavailable and bio-accumulating through freshwater and marine organisms where they magnify in concentration as they move through food chains (Di Giulio and Hinton 2008). Metals and mine contact water adversely affect salmon survival and growth to maturity, and can interrupt migrations. Similar negative responses are observed in many different fish species (Di Giulio and Hinton 2008). It remains highly uncertain how different species and life stages of salmon would adapt to the changes in ground and surface water quality resulting from the mine and the extent water quality will be changed downstream. We provide EFH Conservation Recommendation below to minimize adverse impacts from mine contact water.

3.2.4 Reintroducing Treated Mine Contact Water

The EFH Assessment briefly suggests a method to mitigate the impacts of dewatering the groundwater aquifers, by reintroducing treated mine contact water to the remaining tributaries somewhere outside the mine footprint to maintain instream flows. Overall, tributaries receiving water will change from natural upwelling groundwater fed systems to systems fed treated mine contact water. Though models were used to predict and recreate instream flow velocities in main stem channels, the analysis does not indicate side channel rearing habitat or other important habitat attributes were included in the analysis (e.g. groundwater upwelling, temperature, dissolved oxygen, and nutrition). More advanced models are being developed in an attempt to represent these important EFH attributes (Wheaton et al. 2017).

As previously provided in comments (JASR 2009; NMFS-CM 2019), there are several EFH attributes that need to be considered in analyzing, monitoring, and recreating or restoring aquatic processes in salmon watersheds; (1) upwelling groundwater sources that support the survival of overwintering salmon embryos in hyporheic gravel substrates, (2) slow water eddies and side channels that are important habitat for juvenile salmon (fry and parr), rearing and resting from higher velocity water, (3) relatively consistent cold water temperatures and adequate dissolved oxygen that are crucial for early life stages of salmon, (4) environmental conditions that promote feeding and forage opportunity, and (5) upwelling groundwater where adult salmon que in on to spawn and deposit eggs.

We remain concerned that the EFH Assessment and proposed mitigation measures overlook many of these EFH attributes when reintroducing mine contact water to maintain instream flows. Additionally, we are aware and remain concerned that PLP's water rights reservations, filed in 2006, suggest decreases in water volumes several miles downstream of the mine site (ADNR 2006 and 2019; EBS 2019). Seasonally altering water volumes, temperatures, levels of dissolved oxygen, and forage opportunities all decrease the probability of salmon survival. It also remains highly uncertain how each species at different life stages will respond to these changes and the distance these changes will extend downstream. Reintroducing treated mine contact water to any remaining surface waters downstream without accounting for these EFH attributes increases uncertainty and impact severity. We provide EFH Conservation Recommendations below to minimize impacts of reintroducing mine contact water.

3.3 Transportation Corridor

The proposed transportation corridor would extend 82 miles from the port at Diamond Point to the mine site along the north shore of Lake Iliamna. The corridor consists of the road and bridges, and three different pipelines; a natural gas pipeline, a pipeline carrying concentrate slurry to the port, and a return water pipeline to carry mine contact water back to the mine site.

As described in the Project Description, all pipelines would be buried adjacent to the access road and attached to 11 bridge structures that transect larger river crossings. Culverts would be prescribed at rivers identified as having fish and designed and sized for fish passage in accordance with Alaska Department of Transportation and Public Facilities (ADOT&PF)

standards and US Fish and Wildlife Service (USFWS) Culvert Design Guidelines for Ecological Function (USFWS 2020).

We appreciate PLP's commitment to follow guidelines detailed in the USFWS Culvert Design Guidelines over tributaries listed in the Anadromous Waters Catalogue. Poorly designed and constructed fish passage facilities can have population scale impacts to salmon (Pess et al. 2005; Mc Clure et al. 2008). We offer caution identifying water bodies as not supporting salmon because there may be tributaries that support different life stages of salmon that have not been adequately surveyed for the Anadromous Waters Catalogue. It is well established that adult salmon move significant distances through various streams and river reaches daily and seasonally, depending on life history stage and watershed of origin (Schindler et al. 2010; Armstrong and Schindler 2013).

For the pipelines, our primary concern is the risk that the concentrate slurry pipeline or the return water pipeline could rupture and release the concentrate slurry or mine contact water into rivers and streams. According to the EFH Assessment, the concentrate slurry pipeline will have manual isolation and drain safety valves proposed at intervals no greater than 20 miles apart. The distance between manual safety valves suggests that potentially 27 tons of concentrate slurry could be released if the pipeline failed. Manual safety valves in the concentrate slurry pipeline imply response personnel need to drive several miles to manually close shutoff valves. The EFH Assessment does not describe if the return water pipeline would have safety valves, and it is also not clear if the mine contract water would be treated before returning in the pipeline or how the water and metals would be separated at the plant. Therefore, we do not know if the return water in the pipeline would contain high concentrations of heavy metals.

Rupture of either pipeline would release contaminants into salmon streams. As discussed above, low concentrations of heavy metals have detrimental impacts to salmon, persist in the environment, and move through food chains. We provide EFH Conservation Recommendations below to minimize impacts of a potential rupture to either the concentrate slurry pipeline or the return water pipeline.

4. Potential Impacts to Marine EFH

EFH is designated for salmon, groundfish, and scallops in marine waters within the project area. The EFH Assessment identifies impacts to marine EFH for species managed under the GOA Groundfish FMP and the Salmon FMP. We anticipate no potential adverse effects to scallop EFH as the current natural gas pipeline and fiber optic cable crossing Cook Inlet do not intersect known scallop beds. The project components that would adversely impact marine EFH for salmon and groundfish include a natural gas pipeline, the port facility at Diamond Point, dredging a vessel basin and access channel, the lightering operation, and vessel traffic.

Though we are less concerned about the short term impacts to benthic substrates from the physical trenching and burying of a 72 mile natural gas pipeline across Cook Inlet, we remain highly concerned about the potential for ruptures in the natural gas pipeline. Cook Inlet recently experienced a prolonged natural gas pipeline leak which released methane into the water column. While the upward cascading effects of these events on fish and the marine ecosystem are not completely understood, natural gas leaks adversely impact marine organisms. Additionally, natural gas leaks are difficult to detect and repair in Cook Inlet. If safety precautions and response measures are not planned for and incorporated in the design and construction phase, these low probability events could have substantial adverse impacts, especially under severe winter ice conditions.

The Project Description provides the projected marine footprint disturbance: port over 21 acres; shore based facilities over 15 acres; caissons over 6 acres; dredged navigation channels over 71 acres. The port will include shore-based facilities to dewater, store, and load metal slurry concentrate, a pumping station for the water return pipeline, facilities to receive and store containers and fuel, as well as natural gas-powered generators, maintenance facilities, employee accommodations, and offices. The marine component includes a causeway consisting of concrete caissons covered with a concrete deck where fuel and concentrate will be exchanged from the storage units, to approximately two miles of conveyor belts, and finally to barges. Dredging will provide adequate depth (-18 feet below mean lower low water) for the access channel and vessel turning basin. We recognize the need to dredge Iliamna Bay to construct a port facility for this project and that lightering operations will eliminate the need for dredging a deep-water channel in Iliamna Bay.

We agree that most of the impacts from these components are limited to temporary and/or short-term impacts from construction and include disturbance and disruption of nearshore habitat and migratory zones. However, these project components impose an increased risk of concentrate/oil spills, possible leaks in the fuel and metal slurry concentrate storage units located at the port, and possible spills during lightering of concentrate or other fueling operations. Additionally, increased vessel traffic has the potential to introduce invasive species. The adverse impacts from these events would be more long-term.

These actions and their associated impacts, specific to these infrastructure components, may be greatly reduced by implementing the proposed mitigation measures in the EFH Assessment and adherence to the EFH Conservation Recommendations below.

5. EFH Conservation Recommendations

NMFS offers the following EFH Conservation Recommendations to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH. We recommend these measures in addition to the mitigation measures identified in Chapter 6 of the EFH Assessment.

Mine Site

1. Complete the post-closure plan for mine pit water treatment and management and then make it available for comment, as every indication suggests mine contact water will need to be treated in perpetuity to prevent pollution.
2. Develop a plan for recharging the aquifer surrounding the mine site with water injection wells while simultaneously keeping the pit dry. Use MIKESHE or a similar model that integrates surface flow, groundwater flow, and precipitation in a single model to demonstrate that the recharge plan is feasible.

   a. The model should correctly represent: 1) point source water extraction like dewatering wells and seeps; 2) point source water inputs such as injection wells or pipe discharges; and 3) diffuse water inputs like, snowmelt, and regional inflows into deep stratum.
   b. Collect more data specifically targeted to address surface and groundwater interaction with the intent to provide better results, predictions, and to use in designing measures to reduce impacts to EFH.
   c. Collect more data on the lowest three geologic stratum so that they interact accurately with the unconsolidated gravel/sand stratum which provides water for upwelling and EFH.
3. Establish specific methods and procedures to identify and separate potentially acid generating from non-acid generating rock, and metal leaching from non-metal leaching rock.
4. Implement and continually monitor the effectiveness of the three-tiered system for capturing toxic water outside of the pyritic tailings and bulk tailings storage facilities and water management ponds. This recommendation is warranted because leakage of only a small percentage of water from the pyritic tailings or water management pond has the ability to harm EFH miles from the source.
   a. Liners used in pyritic tailings facilities and water management ponds should be typed and fitted for freeze/thaw conditions.
   b. Water seepage extraction wells should be located to capture all leakage above the natural baseline.
   c. Water quality monitoring wells should be placed lower in the watershed to evaluate effectiveness of the liners and extraction wells.
5. To avoid groundwater infiltration of mine contact water, the pyritic tailings liner should be built to last an additional 50 years, beyond the current 20-year project timeline. This is recommended in case future operations include mining the ore in the deeper Pebble East deposit. In this expanded scenario, the pyritic tailings cannot be returned to the mine pit as that would prevent continued operation. It would not be possible to replace the original pyritic tailings liner at that time because it will be buried under pyritic tailings.
6. Position the pyritic tailings facility and main water management plan uphill of the pit and construct them such that if the embankments fail, sludge and untreated water will flow into the pit.
7. All mine pit water and mine contact waters should be tested prior to discharge and meet all state and federal water quality standards. Regardless of the source of the mine contact water, mixing zones and site specific water quality standards should not be considered a feasible approach for discharging mine contact waters.
8. Ensure that instream flows in the South Fork Koktuli and Upper Talarik remain at pre-project levels during every month of the year.

9. Use climate scenario planning that incorporates rising winter temperatures, more frequent storms, and increased precipitation for future water management plans. NMFS recommends using the SNAP data (UA 2015) to ensure sufficient water is available during all stages of salmon life in a future climate.

Transportation Corridor

Road and Bridges

10. Conduct fish surveys to assess seasonal salmon distribution in rivers and streams transected by the transportation corridor to ensure all salmon streams receive the appropriate fish passage.
11. Design, construct, and install anadromous water crossings, such as bridges and culverts, according to the methods and recommendations found in the report "Culvert Design Guidelines for Ecological Function, Alaska Fish Passage Program" (USFWS 2020).
12. Evaluate road alignments to minimize the total road footprint within floodplains along the entire 82 miles. Transect streams at right angles and where the floodplain is narrowest.
13. Avoid gravel and sand extraction from rivers and streams known to support salmon.
14. Do a thorough evaluation of borrow pit locations along the road to minimize wetland impacts.

Concentrate Slurry and Return Water Pipelines

15. Prepare a hazardous materials spill response for the concentrate slurry pipeline given the length of the pipeline, volume of concentrate, and receiving and shipping facilities.
16. Prepare a hazardous materials spill response for the return water pipeline given the length of the pipeline, volume of contaminated water, and receiving and shipping facilities.
17. Place automated pressure-sensitive isolation valves on both the concentrate slurry pipeline and the return water pipeline on both sides of all anadromous streams. This will reduce volumes of concentrate slurry and mine contact water between valve stations.
18. Place the concentrate slurry pipeline and return water pipeline on the uphill side of the road prism and away from Lake Iliamna so that the road prism will provide initial containment in the event of a pipe rupture.
19. Stage hazardous spill response equipment at several locations along the 82 mile transit route to facilitate improved response times and further reduce impacts.

Natural Gas Pipeline

20. Prepare emergency response plans to prevent prolonged release of natural gas in marine waters of Cook Inlet, between the Kenai Peninsula and Iliamna Bay.
21. Incorporate automated emergency shutoff mechanisms and valves into the pipeline design and structure.

22. Develop emergency response plans and incorporate emergency response measures, such as subsurface shut off valves, to reduce the volume of natural gas discharge into marine waters subsequently reducing potential impacts to EFH.

Port Facility

23. Incorporate best management practices to avoid impacts to submerged aquatic vegetation and invertebrates.
24. Include plans for nearshore fish passage in construction of the Diamond Point port. Any proposed mitigation should be adequate to allow unfettered nearshore movement between Iliamna Bay and Cook Inlet for all life stages of salmon.
25. Avoid in-water work during time periods when larval and juvenile stages of FMP species are present. Additional nearshore surveys may be needed to understand the time periods when juvenile and larval life stages are present.
    a. Develop spill responses strategies for potential diesel oil spills in the port and accidental discharges of metal concentrate slurry.
    b. Ensure stakeholders are familiar with updated Alaska's Geographical Response Strategies (GRSs) to reduce and minimize risk of an oil and hazardous materials spill.
    c. Harbor facilities should be designed to include practical measures for reducing, containing, and cleaning up hazardous material spills.
26. Stage oil and hazardous spill response equipment at adequate capacities to respond based on projected volumes of materials stored or handled at the port.
27. Monitor turbidity during dredging operations and cease operations if turbidity exceeds predetermined threshold level. Use methods similar to silt curtains to limit the spread of suspended sediments.

Vessel Traffic and Lightering Operation

28. Vessel operators should be familiar with GRSs describing sensitive areas of Alaska's coastline.
29. Prepare spill response strategies for larger spills or accidental discharges of metal concentrate slurry.
30. Consult with the US Coast Guard and Environmental Protection Agency to identify and design practical mitigation measures to reduce the probability of foreign vessels introducing non-native species or pathogens into Alaska's waters.
31. Ensure vessel carriers are equipped with current technologies to further reduce the probability of vessels introducing non-native species or pathogens into Alaska's waters.
32. Ensure vessel carriers and operators are familiar with the BMPs and measures to reduce water pollution under authorities of the Nonindigenous Aquatic Nuisance Prevention and Control Act, National Invasive Species Act, and the Clean Water Act.

33. Encourage vessels to perform a ballast water exchange in marine waters (in accordance with the U.S. Coast Guard's voluntary regulations) to minimize the possibility of introducing invasive estuarine species into similar habitats. Discourage vessels that have not performed a ballast water exchange from discharging their ballast water into nearshore and state estuarine-receiving waters.

Under section 305(b)(4)(B) of the MSA, the federal action agency is required to respond to NMFS EFH Conservation Recommendations in writing within 30 days. The response must include a description of measures USACE proposes for avoiding, mitigating, or offsetting the impact of the activity on EFH. If your response is inconsistent with our recommendations, USACE must explain the reasons for not following our recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)). Should the project, or specific components of the project identified above, change substantially in a manner that may adversely affect EFH or if new information becomes available that affects the basis for our EFH Conservation Recommendations, USACE must reinitiate the EFH consultation (50 CFR 600.920(l)).

Sincerely,

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Enclosures: References Below

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

September 14, 2020

Colonel Damon Delarosa
U.S. Army Corps of Engineers
P.O. Box 6898
JBER, Alaska, 99506-0898

Re: Public Notice of Application for Permit POA-2018-00123, Bonanza Channel/Safety Sound

Dear Colonel Delarosa:

The National Marine Fisheries Service (NMFS) has reviewed IPOP's application to the U.S. Army Corps of Engineers (USACE) to produce gold from their mining claims in the Bonanza Channel/Safety Sound area near Nome, Alaska. IPOP plans to discharge 4,973,992 cubic yards of material into 172.7 acres of waters of the U.S. to construct and maintain an access channel, dredge disposal areas, mining channel, and a mine camp and staging area. Equipment to be used includes a single engine dredge vessel with a 36" diameter cutterhead, a 10" diameter dredge nozzle, two small tender boats, and a processing barge.

Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires Federal agencies to consult with NMFS on all actions that may adversely affect Essential Fish Habitat (EFH). NMFS is required to make EFH Conservation Recommendations, which may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects. This consultation is officially initiated by the action agency with the submission of an EFH Assessment to NMFS.

We have reviewed the Draft EFH Assessment included with IPOP's application and provided preliminary early coordination comments to USACE on June 16, 2020. We have also raised EFH concerns during interagency teleconferences initiated by USACE and correspondence with USACE staff. The Draft EFH Assessment is not complete or accurate in its description of the project, analysis of impacts, or identification of EFH and federally managed species impacted. To initiate EFH consultation for these actions, we request a revised EFH Assessment that meets the requirements in Federal regulations (50 CFR 600.920(e)).

Further, we are concerned that this proposed Federal action to permit these mining activities has the potential for significant environmental impacts, and therefore request that USACE consider preparing an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA).

As part of early coordination, we are providing comments to assist USACE and the applicant in preparing an EFH Assessment.

1. EFH Assessment

Any action that may adversely affect EFH requires a clearly referenced EFH Assessment in either a separate document or a support document (50 CFR 600.920(e)). The Federal action agency completes the EFH Assessment and submits it to NMFS. Once an EFH Assessment is received by NMFS, we will then review it and offer EFH Conservation Recommendations, if applicable. The level of detail in an EFH Assessment should be commensurate with the complexity and magnitude of the potential adverse effects of the action.

The Draft EFH Assessment (Exhibit 3) is from 2018 and analyzes suction dredge activity, proposing to remove approximately 484,000 cubic yards of unconsolidated sediments per year from the nearshore. However, the current proposed activity is for suction dredging activities to remove approximately 900,000 cubic yards per year. Thus, the analysis provided in the Draft EFH Assessment is for an action that is very different from the currently proposed action. The species list in the Draft EFH Assessment is also not accurate, and the EFH maps are obsolete. Additionally, the lifetime of the project is described as 5 years in some parts of the application, and 10 years in other parts. In order to accurately assess the project's potential impacts on marine resources, we request the applicant clarify the anticipated lifetime of the project. It is not possible to assess the effects of the project without an accurate description of the size, scope, or duration of the action. We provide detailed suggestions to improve the EFH Assessment below.

1.1 Mandatory Contents of an EFH Assessment

The mandatory contents of an EFH Assessment should be labelled accordingly and include:

A. A description of the action;
B. An analysis of the potential adverse effects of the action on EFH and the managed species;
    - Note: in addition to EFH maps and ADF&G's Anadromous Waters Catalogue, text Descriptions from Fishery Management Plans should be used in EFH analyses (link provided in Section 1.2)
C. the Federal agency's conclusions regarding the effects of the action on EFH;
    - Note: The assessment of impacts to EFH needs to include the nearshore areas adjacent to the impact area.
D. Proposed mitigation, if applicable.

1.2 EFH References

- Essential Fish Habitat - Alaska Fact Sheet
    - provided to USACE and applicant
- Impacts to EFH from Non-fishing Activities in Alaska
    - https://repository.library.noaa.gov/view/noaa/17256
- Frequently Asked Questions: Essential Fish Habitat in Alaska
    - https://www.fisheries.noaa.gov/alaska/habitat-conservation/frequently-asked-questions-essential-fish-habitat-alaska
- NOAA National EFH Mapper
    - https://www.habitat.noaa.gov/protection/efh/efhmapper/
- NOAA Alaska EFH Mapper
    - https://www.fisheries.noaa.gov/resource/map/alaska-essential-fish-habitat-efh-mapper

- Alaska Anadromous Waters Catalog
  - https://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=main.interactive
- Text Descriptions in NPFMC's Fishery Management Plans (FMPs) - under 'Fisheries'
  - https://www.npfmc.org/

2. Resources Affected - More Information Needed
NMFS has preliminarily determined the proposed mining activities have the potential to adversely affect EFH and are likely to have substantial adverse effects on federally managed marine resources. The EFH Assessment should, at a minimum, analyze impacts, including but not limited, to:

A. Nearshore settling red king crab and potential for impacts such as entrainment of juvenile fish and crab in mining gears.
B. Significant alterations, loss, or disruption of submerged aquatic vegetation (SAV) due to the deposition of dredged material, disruption of plants, and resuspension of fine sediments.
C. Disruption of estuarine and riverine migratory corridors used by juvenile and adult salmon.
D. Disruption or removal of prey resources, including herring, important to federally managed fish species and other marine resources, such as marine mammals.
   a. More information is available on prey resources at http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareanortonsound.main

2.1 Juvenile Crab
The draft EFH Assessment did not include an analysis of potential impacts to red king crab. Red king crab are found as juvenile settling crab nearshore and as adults, in spawning aggregations, offshore in Norton Sound marine waters. In early spring (as ice retreats), female red king crabs release thousands of crab larvae. Larvae remain pelagic and drift with ocean and wind-driven currents. Red king crab larvae settle as tiny crab enstars along the nearshore of Norton Sound (driven there from net northerly currents). Red king crabs are associated with benthic sediments composed of silt, sand, sandy mud, muddy sand, and gravels. Juvenile red king crabs prefer high-relief habitats and nearshore areas with extensive biogenic assemblages. Additionally, sediment sampling is sparse in Norton Sound and are locally variable in northern areas along the coast (NPFMC 2011). Eventually, red king crab molt several times (a sensitive time for crab) and grow to become adult crab and migrate into deeper waters (Jewett 1999).

To assess impacts to red king crab, we request the EFH Assessment:

- Analyze any potential impacts to nearshore crab habitat adjacent to the project area.
- Assess the presence or absence of red king crab in the nearshore with eDNA sampling.
- Survey project area and adjacent nearshore crab habitat for baseline abundance as well as periodically during and after the project.

2.2 Submerged Aquatic Vegetation
'Exhibit 2 - Eelgrass Study' from IPOP's application describes drone footage from 2018 and 2019 of the project area that "*leaves no doubt that these areas have minimal to no vegetation, being extremely shallow.*" However, the report 'Bonanza Channel Bathymetric Mapping and Seagrass Study' from August 13, 2020 states that "*the submerged aquatic vegetation community*

is robust in the study area." According to that study, approximately 86.2 percent of the study area contains three dominant species of SAV, including the areas where the applicant intends to dispose dredged material - in the mining channel as well as around the access channel in the middle of Bonanza Channel. The applicant believes that their plan to mine with concurrent reclamation would "*establish an environment where wild eelgrass beds may take root.*" We are unaware of evidence to support this assertion.

SAV provides key EFH attributes of food, shelter, oxygen, and protection for spawning and rearing. These important ecological functions are especially vulnerable to coastal development and water quality degradation, and are difficult to replace. In general, we recommend avoiding disposing of dredged material in wetlands, SAV, and other special aquatic sites whenever possible.

To assess impacts to SAV, we request the EFH Assessment:

- Describe how the overall species distribution of SAV is expected to change throughout the life of the project.
- Provide science-based evidence that the applicant's proposed mining and reclamation process will allow SAV to "*take root.*"
- Incorporate plans for annual monitoring and mapping throughout the life of the project to compare with pre-mining conditions. This includes consistent, scientific SAV surveys that can be repeated annually for comparable data.

2.3 Salmon Migratory Channels

The application states that "*there will be no dredging in, or impacts on, anadromous streams by the proposed mining operation. There are no anadromous fish spawning beds in the Bonanza Channel.*" However, the State of Alaska Anadromous Waters Catalog (AWC) shows anadromous points for coho presence and chum and pink salmon spawning in the project area in Bonanza Channel and upstream in Bonanza River; chum, coho, and pink spawning and coho presence and rearing in Solomon River; and presence of all 5 species of Pacific salmon, including chum and pink spawning, within Safety Sound. The application states: "*There is no evidence that turbidity events in the estuary would form a barrier to the migration of anadromous fish in and out of the River or otherwise adversely affect them, and the scope of operations will leave large undisturbed corridors adequate for passage of salmon and resident fish to bypass the operation, undisturbed.*" However, NMFS asserts that salmon migration is likely to be severely impeded by the applicant's mining and dredged material disposal plan: Juveniles that usually migrate close to shore are likely to be entrained in mining equipment or otherwise impeded by activity (Wenger et. al 2017), and adults migrating between Safety Sound and Bonanza Channel (returning to natal spawning areas) could be blocked from migration by dredged material disposal near the middle of Bonanza Channel, as well as noise and activity from the mining operation.

The application also states that "*Alaska's Department of Fish & Game acknowledges a dearth of scientific studies or data concerning the effects of estuarine or marine turbidity on salmonid species and whether or not turbidity would interfere with the migration of anadromous fish (Green, 2019). IPOP notes that even if turbidity did periodically impair migration, suction dredging enhances the food supply and water oxygenation.*" In addition to the increased turbidity's effect on salmon migration in freshwater streams, NMFS notes that increased turbidity also has the potential to impede physiological processes (e.g., photosynthesis, respiration) to aquatic organisms (Arruda et al. 1983, Cloern 1987, Dennison 1987, Barr 1993, Benfield and Minello 1996, Nightingale and Simenstad 2001), thus having adverse impacts on salmon EFH.

We request the EFH Assessment:

- Assess the impacts of the proposed mining activities on salmon migration.
- Provide a plan for nearshore fish passage that could accommodate migration between Safety Sound and Bonanza Channel by adult and juvenile salmonids.
- Provide evidence that supports the applicant's assertion that "*suction dredging enhances food supply and water oxygenation.*"
- Provide evidence and/or or scientific studies that relate to the project area for the proposed efficacy of the applicant's proposed turbidity curtain. The information provided is a case study from Maine and seems to be part of a sales brochure.

2.4 Disruption or removal of prey resources

Prey species, such as herring and invertebrates, are critical for EFH species and marine mammals throughout their life history. The physical impacts of the proposed project may result in:

A. The removal of substrates that serve as habitat for fish and invertebrates
B. Habitat creation or conversion in less productive or uninhabitable sites, such as anoxic holes or silt bottom
C. The burial of productive habitats, such as in nearshore disposal sites
D. The release of harmful or toxic materials either in association with actual mining or in connection with machinery and materials used for mining
E. The creation of harmful turbidity levels
F. Adverse modification of hydrologic conditions so as to cause erosion of desirable habitats.
G. Alteration of behavior of marine organisms as a result of the disposal of mine tailings in or adjacent to the nearshore.

We request the EFH Assessment:

- Assess the impacts of the proposed mining activities on prey species in, or adjacent to, the project area.

3. Impacts from mining operations

The process for mineral extraction involves exploration, mine development, mining (extraction), processing, and reclamation. Each step of this process requires a plan that includes an analysis of potential and likely impacts: tailings and reclamation, dredge material and sedimentation processing, the construction of a boat launch and support facilities, and oil spill prevention, and hazardous materials control plan. Without an adequate analysis of potential adverse impacts to EFH, it is difficult to determine if a mining operation will alter the channel morphology, hydraulics, lateral migration, or natural channel meanders; increase the channel incision and bed degradation; disrupt the pre-existing balance of suspended sediment transport and turbidity; cause direct impacts to fish spawning, nesting habitats, and migrations; disrupt or remove prey resources; simplify in-channel fluvial processes and deposition; alter surface and groundwater regimes and hydrogeomorphic and hyporheic processes; or cause destruction of the riparian or estuary zones during extraction/construction operations.

3.1 Tailings/ Reclamation Plan
The Applicant's plan is to mine "*with concurrent reclamation, re-establishing the estuary as close to the original pre-mining extent and depth as possible, with temporary dredge material disposal sites reclaimed by the end of the project.*" Tailings from the dredging operation will be re-deposited into the bottom of the estuary.

To assess impacts of the tailings/reclamation plan, we request the EFH Assessment:

- State how long dredged material will remain in 'temporary' material disposal sites.
- Provide science-based evidence and/or precedence that an estuary can be re-established to pre-mining conditions with this type of mining and reclamation process.
    - Consider SAV and other benthic organisms such as juvenile crab and prey species.
- Develop a thorough reclamation plan that describes how the storage and reclamation will affect the benthic environment.

3.2 Dredged Material / Sedimentation Plan
Material disposal and filling activities can directly remove important habitat, alter the habitat surrounding the developed area, and generally have adverse effects on benthic and water column habitats. The discharge of dredged materials or the use of fill material in aquatic habitats can result in the covering or smothering of existing submerged substrates, loss of habitat function, alteration of water quality parameters (i.e., temperature, oxygen concentration, turbidity, and flow), and adverse effects on benthic communities (Limpinsel et al. 2017). The applicant's proposed plan discharges dredged material into an area with SAV and would significantly alter the bathymetry and flow regime of Bonanza Channel.

To assess impacts of dredged materials and sedimentation, we request the EFH Assessment:

- Assess all options, including upland disposal sites, for the disposal of dredged materials and select disposal sites that minimize adverse effects to EFH.
- Conduct a thorough analysis on how the dredged material disposal site in the middle of Bonanza Channel will affect:
    - Bathymetry and flow regimes
    - Benthic environment
    - Salinity - consider saltwater intrusion
- Include a plan to test sediment compatibility for open-water disposal per Environmental Protection Agency and USACE requirements for inshore and offshore, unconfined disposal.
- Include a plan to ensure that disposal sites are properly managed (e.g., disposal site marking buoys, inspectors, the use of sediment capping and dredge sequencing) and monitored (e.g., chemical and toxicity testing, benthic recovery) to minimize impacts associated with dredged material.
- Acquire and maintain disposal sites for the entire project life when long-term maintenance dredging is anticipated.

- Encourage beneficial uses of dredged materials. Consider using dredged material for beach replenishment and construction. When dredging material is placed in open water, consider the possibilities for enhancing marine habitat.
- Develop a thorough erosion control plan.
- Develop models and descriptions for size and duration of sediment plumes caused by dredging and how effective the applicant expects silt curtains to be in reducing plumes.
- Describe long-term impacts on oxygen and other physical characteristics within estuaries.
- Develop a plan for catastrophic failure of silt curtains as a result of storm, storm surge, or other event.

3.3 Boat Launch / Support Facilities

Some maps included in the application include a location for 'Camp and Boat Launch' near an offshore upland berm, but no detailed plans are included for construction of a boat launch. The EFH Assessment should include an analysis of the impacts of this facility on EFH.

To assess impacts of the boat launch facility, we request the EFH Assessment:

- Consider use of the boat ramp at Solomon River (included in Action Alternative 2) over construction of a new boat launch facility.
- Provide detailed construction plans for any boat launch facility or other facilities the applicant plans to build.

3.4 Oil Spill Prevention and Response/ Hazardous Materials Contingency Plans

The application does not consider mitigation measures such as an oil spill response plan or hazardous material contingency plan. The EFH Assessment must include an analysis of the potential for oil spills or hazardous material spills and the impacts of a spill on EFH.

To minimize the adverse impacts from oil spills or hazardous material spills, we request the EFH Assessment consider the following measures:

- Develop spill responses strategies for potential oil spills and accidental discharges of metal concentrates or any other mining-related materials in the project area.
- Ensure operators are familiar with updated Alaska's Geographical Response Strategies (GRSs, https://dec.alaska.gov/spar/ppr/response-resources/grs/nw-arctic/) to reduce and minimize risk of an oil and hazardous materials spill.
- Ensure mining facilities are designed to include practical measures for reducing, containing, and cleaning up hazardous material spills.
- Stage oil and hazardous spill response equipment at adequate capacities to respond based on projected volumes of materials stored or handled in the project area.
- Monitor turbidity during dredging operations and cease operations if turbidity exceeds predetermined threshold levels.

4. Conclusion

NMFS looks forward to reviewing the environmental analyses prepared by IPOP and USACE. NMFS is concerned about moving forward without adequate analysis of the impacts of the proposed mining activities on the marine resources in the action area, and we request USACE incorporate these and our previously submitted early coordination comments into the EFH Assessment.

If you have any questions regarding our comments, please contact Lydia Ames at lydia.ames@noaa.gov or (907) 271-5002 or Seanbob Kelly at seanbob.kelly@noaa.gov or (907) 271-5195.

Sincerely,

for
James W. Balsiger
Administrator, Alaska Region

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