HABITAT COMMITTEE REPORT ON HABITAT ISSUES

Klamath Dam Removal Progress Report

On June 17, 2021, the Federal Energy Regulatory Commission (FERC) formally approved the Joint PacifiCorp-Klamath River Restoration Corporation (KRRC) application to transfer the license for the four lower Klamath River Dams to the KRRC and States of California and Oregon upon completion of the National Environmental Policy Act (NEPA) process. This clears a major legal hurdle on the road to decommissioning and removal, currently scheduled to physically begin in January 2023.

FERC also formally opened the NEPA analysis scoping process, with public comment hearings July 21, 22 & 23, 2021, and a comment deadline set for August 19, 2021. FERC anticipates completing the NEPA process by September 2022, with a final expedited FERC decommissioning decision shortly thereafter. Preparation work for decommissioning is already well underway.

Klamath Juvenile Salmon *C. shasta* Crisis

Unprecedented infection levels by the warm-water salmonid parasite *Ceratanova shasta* are being observed in out-migrating juvenile salmon at screw-trap monitoring stations in the mid-Klamath river, with infection rates as high as 97 percent at almost always fatal concentrations. Many dead juveniles have also been observed. This fall Chinook cohort is already weakened by past disease losses and adverse ocean conditions. Inflow water shortfalls as a result of Klamath Basin drought mean that "flushing flows," which are usually required to reduce infection rates, could not be implemented this year. Losses of nearly all of this entire year-class of out-migrating Klamath fall Chinook will likely have major impacts on future adult fall Chinook Klamath spawner returns in three years.

National Marine Fisheries Service (NMFS) Considering Extent of Essential Fish Habitat (EFH) above Impassable Dams

National Oceanic and Atmospheric Administration (NOAA) is investigating the process for extending EFH above Chief Joseph Dam on the Columbia River in response to growing interest from tribes and stakeholders. NMFS may also reconsider the extent of EFH above dams where reservoirs and inflows are influencing yields, as well as downstream of impassable dams. This would likely be part of the Salmon EFH review over the next 2-3 years.

Nordic Aquafarms California

Nordic Aquafarms is proposing to build a land-based Atlantic salmon farm on the Samoa Peninsula near Eureka with intakes of up to 10 million gallons per day of seawater from Humboldt Bay and 2.5 million gallons per day of freshwater from the Mad River. The treated water will discharge into the ocean using the harbor district's current outfall. The project released a Draft Mitigated Negative Declaration for review in April 2021. Following review of comments, Nordic Aquafarms

has released a Notice of Preparation for a Draft Environmental Impact Report (EIR). The Draft EIR is anticipated to be released by Humboldt County for review in September 2021. The NMFS California Coastal Office Division provided a letter (June 2, 2021; attached) with EFH conservation recommendations to California's North Coast Regional Water Quality Control Board regarding their proposed National Pollutant Discharge Elimination System (NPDES) permitting of Nordic Aquafarms California's discharge into the Pacific Ocean. NMFS' letter raised concerns about the perennial ocean discharge of warm, nutrient-rich waters from the salmon farm into the shallow photic zone, which will increase the diversity of harmful algal bloom species and may seed and kickstart future harmful algal blooms in Humboldt Bay and the Pacific Ocean. The Board has pulled the NPDES permit until Humboldt County finishes the EIR. The Habitat Committee (HC) may invite Nordic Aquafarms and/or associated regulatory agencies to the September HC meeting.

Research and Data Needs

The HC had an internal discussion regarding the Research and Data Needs report and how best to inform the Council about habitat-related issues. The HC plans to review the existing plan and begin identifying research and data needs for future updates.

NOAA Draft Mitigation Policy

Matt Goldsworthy, NMFS HC member, briefed the HC on the new NOAA Draft Mitigation Policy, which is currently open for public comment. Comments are due July 30th.

This is a new policy that aims to standardize the mitigation hierarchy that NOAA has been applying under its current mitigation program. The policy does not change or expand authorities, but does include some new provisions and definitions. Mitigation needs to be proportional to impacts and have a high likelihood of success. The intent of the policy is to improve conservation for NOAA trust resources by instigating effective mitigation hierarchy to fully offset the impacts. Principles in this policy include durability of mitigation, with a new provision for the consideration of climate change and climate resilience when evaluating and developing mitigation measures.

The HC considers the NMFS draft mitigation policy to be important for conserving EFH and habitat areas of particular concern (HAPCs) both for inland salmon habitat as well as ocean and estuary habitats. However, the HC identified several issues with the policy that may warrant Council comment, for example:

1. It is unclear what implications the landscape or seascape approach implies. At what spatial scale would mitigation be employed? The landscape/seascape approach would seem to discount small-scale impacts and appear to suggest that some areas may not warrant mitigation because of their disconnected location or perceived minor contribution to the overall seascape or landscape.
2. To provide agency reviewers with additional ability to apply the policy to protect NOAA trust resources, NOAA should develop a policy for all HAPCs similar to NOAA's California Eelgrass Mitigation Policy. This would provide guidance for avoiding habitat impacts, establishing mitigation ratios, and accounting for temporal delays in effectiveness of mitigation actions. This would be helpful in encouraging conservation of HAPCS.

The HC is **prepared to draft a letter for the July 30th deadline** if the Council wishes.

Bureau of Ocean Energy and Management (BOEM) Update on Oil Rig Decommissioning

Rick Yarde (BOEM) presented to the HC on issues related to decommissioning oil rigs off southern California. The standard by the Bureau of Safety and Environmental Enforcement is that decommissioned rig platforms should be completely removed. However, platform removal has its own environmental impacts. There are a number of studies documenting high productivity of commercial fishes using platforms, and some stakeholders have advocated converting portions of platforms to artificial reefs. BOEM is planning to initiate a Programmatic Environmental Impact Statement (PEIS) to deal with general issues regarding rig decommissioning, which would be tailored to specific decommissioning projects. The starting point for the PEIS will be the standard of complete removal vs. some alternative(s) (e.g., partial removal) and the potential environmental impacts of those alternatives. BOEM will be opening the scoping period to identify issues and potential alternatives, methodologies, and impacts to be considered in the development of the PEIS. The invitation for public comment on scoping is planned to be completed within the next month and will have a 45-day comment period. The Council may wish to comment on the PEIS. The HC could provide comments on habitat issues and track the official request for comments. However, given the scope of fishery- and fishing-related issues with decommissioning that are of interest to other advisory bodies (ABs), the HC may not necessarily be the appropriate lead for this letter. **Coordination among ABs would be needed to draft a letter for the September briefing book or the quick response process**.

Report on the California Energy Commission's Workshop June 21, 2021

BOEM plans to announce an expanded "Morro Bay 399" Call Area and will be requesting a call for comments and information. The announcement will likely occur prior to the July 13th California Offshore Wind Intergovernmental Task Force meeting; no comment deadline was provided, but the comment period may end before the September Council meeting. After the public comment period ends for the Morro Bay 399 area, BOEM will evaluate the comments and designate a "Wind Energy Area." It is likely that the Humboldt and Morro Bay areas will be combined into a single lease announcement and process. It is unknown how many leases will be granted in each Wind Energy Area. Leasing will likely occur in summer 2022. **If the Council wishes to comment, it would very likely require the quick response process. The Council's decision on the lead AB for commenting on this issue would be guided by its decision under C.4, Marine Planning.** BOEM noted that the Diablo Canyon is not being considered for offshore wind leasing at this time.

Newport Bay *Caulerpa Prolifera*

In March 2021 an invasive algae species, *Caulerpa prolifera*, was discovered in Newport Bay, California. The invasive subtropical algae can grow quickly and rapidly out-compete native species, including native eelgrass, and may be inedible to native marine herbivorous fish and invertebrates. Federal, state, and local agencies immediately reconvened the Southern California Caulerpa Action Team (SCCAT) to address the infestation. The SCCAT consists of several state, local, and Federal partners. California Department of Fish and Wildlife scientists and divers were deployed in April and May 2021 to map and confirm the location of the infestation. The SCCAT

worked with experts to create the Newport Bay Rapid Response Eradication Plan to address the immediate need to remove the invasive algae *Caulerpa prolifera* from Newport Bay in the vicinity of China Cove. (Rapid identification and response is seen as the most effective way of keeping invasive species controlled). The plan has three phases that include initial removal, monitoring of the infected site, and surveys to identify other potential areas where *Caulerpa prolifera* has occurred. The initial removal will be done by handheld suction dredge and is estimated to begin July 6, 2021.

Eelgrass Restoration Synthesis Paper

In 2018, the Pacific Marine and Estuarine Fish Habitat Partnership (PMEP) published *Eelgrass Habitats on the U.S. West Coast: State of the Knowledge of Eelgrass Ecosystem Services*. The report documents eelgrass extent and includes a geodatabase of eelgrass presence/absence and current and historic extent of eelgrass in 444 estuaries along the West Coast. In June 2021, PMEP published a report that synthesizes eelgrass restoration project successes (from 51 eelgrass restoration projects) along the West Coast to identify best practices for eelgrass restoration and mitigation. They identified those methods and approaches that resulted in successful restoration. The report is available at: *https://www.pacificfishhabitat.org/eelgrass-restoration-synthesis/* .
This may be of interest in light of the draft NOAA mitigation policy.

Summary of possible actions:

- **NOAA Draft Mitigation Policy**: The HC is prepared to draft a letter for the July 30th deadline if the Council wishes.
- **BOEM Update on Oil Rig Decommissioning:** The HC could track the request for comments on this topic and provide comments on habitat issues. However, given the scope of fishery- and fishing-related issues with decommissioning that are of interest to other ABs, the HC may not be the appropriate lead for this letter. Coordination among ABs would be needed to draft a letter for the September briefing book or the quick response process.
- **BOEM's expanded "Morro Bay 399" Call Area**: If the Council wishes to comment, it would very likely require the quick response process. The Council's decision on the lead AB for commenting on this issue would be guided by its decision under C.4, Marine Planning.

PFMC
06/23/21

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1655 Heindon Road
Arcata, California 95521-4573

June 2, 2021 **Refer to NMFS #:** 10012WCR2021AR00040

Mr. Matthias St. John
North Coast Regional Water Quality Control Board
5550 Skylane Blvd. Suite A
Santa Rosa, California 95403

Re: Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Recommendations for the North Coast Regional Water Quality Control Board regarding NPDES Permit for Nordic Aquafarms California, LLC

Dear Mr. St. John,

This letter communicates the National Marine Fisheries Service's (NMFS) essential fish habitat (EFH) conservation recommendations regarding the North Coast Regional Water Quality Control Board's (NCRWQCB) approval and permitting of the discharge of effluents into the Pacific Ocean associated with Nordic Aquafarms California, LLC's land-based aquaculture facility in Samoa, California. NMFS is the lead federal agency responsible for the stewardship of the nation's offshore living marine resources and their habitats, and implements the Endangered Species Act and the Magnuson Stevens Fishery Conservation and Management Act (MSA) to fulfill its mission of promoting healthy ecosystems. Federally-managed living marine resources provide an important source of food and recreation for the nation, as well as thousands of jobs and a traditional way of life for many coastal communities. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10). EFH has been designated in the area by the Pacific Fishery Management Council (PFMC) for four Federal Fishery Management Plans or FMP's: Pacific Coast Salmon FMP (PFMC 2016); Pacific Coast Groundfish FMP (PFMC 2019b); Coastal Pelagic Species FMP (PFMC 2019a); and Highly Migratory Species FMP (PFMC 2018).

NMFS is concerned that the discharge of 12.5 million gallons per day (MGD) into the Pacific Ocean will cause significant adverse effects to EFH, that include the following: the increase in temperatures of up to 4 degrees Celsius represents a significant change in local water temperatures that would likely disrupt the natural species composition in the area, favoring warmer water species; the NCRWQCB assumes in the National Pollutant Discharge Elimination System (NPDES) permitting that Humboldt Bay is enclosed and receives no ocean water, which is largely incorrect and the effluent would likely enter and affect water quality within Humboldt Bay during certain conditions; the perennial discharges of nutrients will support increases in the local population of algae species and likely contribute to increased frequency of future harmful algal blooms and corresponding toxins and depressed dissolved oxygen conditions. Per Section

305(b) of the (MSA), NMFS is required to provide conservation recommendations to avoid, minimize, mitigate or otherwise offset adverse effects to EFH.

Harmful Algal Blooms

NMFS is concerned that the draft permit does not require receiving water monitoring, particularly for nutrient related impacts to algal populations and to establish the distribution patterns of the effluent plume (e.g. does it consistently move in one direction and dilute or do local currents cause it to be retained in the area where concentrations can build up and potentially cause harmful algal blooms (HABs) to develop for prolonged periods, does it enter Humboldt Bay where it could affect wildlife and other aquaculture operations, etc.). NMFS looked for this information in the California Environmental Quality Act (CEQA) related documents available on-line for the project and for information generated for the outfall's historic use for a large sawmill discharge, but could not readily locate useful information.

The lack of receiving water monitoring in the proposed permit seems to be based on an antiquated notion that the discharge of nutrients, particularly nitrogen, do not have potentially negative consequences to ocean waters even at localized scales and that only large scale events such as upwelling can cause related impacts such as HABs. This is the conclusion of the accessible CEQA related documentation available that you have likely reviewed (GHD 2021). However, the potential impacts, explained below, have been recognized and are being addressed by the other Regional Water Quality Control Boards that regulate facilities with ocean discharges in California. The North Coast Board should do the same.

Nitrogen is the primary nutrient limiting phytoplankton production in coastal waters (Booth 2015, Howard et al. 2014) and additions of nitrogen cause phytoplankton production to increase, potentially reaching levels so high that they become HABs. HABs off the California coast are most commonly composed of diatoms or dinoflagellates, or a combination of several of these species and the zooplankton which graze upon them (Smith et al., 2018, Trainer et al. 2010). There are many known species in the California Current which may develop into HAB levels, but the most prevalent seem to be two diatoms, *Pseudo-nitzschia australis* and *P. multiseries,* and dinoflagellates of the *Alexandrium tamarense* complex (*A. catenella* being most prominent*), Akashiwo saguinea* and/or *Lingulodinium polyedrum. Pseudo-nitzschia autralis* and *P. multiseries* (P. spp. when referenced together) produce domoic acid which is responsible for well documented toxic events to marine mammals and birds and amnesiac shellfish poisoning in humans. *L. polyedrum* produces a yessotoxin, a large family of toxins whose presence have been linked to impacts on various invertebrate species (De Wit et. al 2014). The *A. tamarense* complex can produce saxitoxin, which is responsible for paralytic shellfish poisoning and fish kill determinations (Backer and Miller 2016, Gosselin et al. 1989, Kudela et al. 2010, Lefebvre et al. 2004, Trainer et al. 2010). Domoic acid and saxitoxins are responsible for the shellfish consumption warnings frequently posted in coastal counties including Humboldt county.

HAB occurrences appear to be increasing in frequency, duration, size, and severity throughout the California Current system and the world in the last 10-15 years (Booth 2015, Howard et al. 2012, Nezlin et al. 2012). Anderson et. al. (2012) notes that there are multiple reasons for this increasing bloom trend – natural dispersion of algal species, dispersal via human activities such

as ballast water, improved detection of HABs and their toxins, increased aquaculture operations, stimulation due to cultural eutrophication and climate change.

The impacts of nutrient inputs from outfalls have been noted and subject to increased study for some time in the Southern California Bight (SCB). There is a compelling weight of evidence that nutrients are affecting algal dynamics in the SCB with chronic HAB outbreaks in areas that receive anthropogenic nutrient inputs (Booth 2015, Howard et al. 2014, 2012). Nitrogen inputs from anthropogenic sources can be significant compared to nitrogen inputs from upwelling at the spatial scales relevant to the formation of HABs (Booth 2015, Pondella et al. 2016, Howard et al. 2017).

Nezlin et al. (2012) found that all four examined wastewater treatment plants (WWTPs) in the SCB had "hot spots" of high offshore chlorophyll- α (CHL- α), which is indicative of high phytoplankton production, and that these conditions occurred throughout most of the year (i.e. outside of the upwelling season). In the SCB, where the WWTPs discharge at deeper depths and generally further offshore, these subsurface populations of *P. spp.* can then be uplifted into the surface waters and are a probable explanation for the occurrence of "instant" domoic acid events immediately following upwelling rather than a typical delayed bloom development (Smith et al. 2018, Seegers et al. 2015).

The proposed discharge will supply nutrients year round into the photic zone outside of Humboldt Bay. The discharge may have the effect of fertilizing or kick-starting HABs by sustaining or even increasing the duration or population size of HAB species at the surface or in subsurface water "lenses" associated with the effluent plume during periods of stratification (Cochlan et al. 2008, Kudela et al. 2010, Nezlin et al. 2012, Seeyave et al. 2009, Seegers et al. 2015, Trainer et al. 2007) and by providing nitrogen to the upper water column. In the shallow receiving waters of this project, which are always in the photic zone, populations of HABs brought into the near shore area by upwelling or from Humboldt Bay could become entrenched by the year round availability of nitrogen and establish a year round presence. Monitoring of the receiving water is necessary to determine if this happens and to inform corrective actions that result from it.

There are several sources which summarize numerous studies and conclude that reduced forms of nitrogen (ammonium, urea) significantly shift the phytoplankton community toward the development of HABs (Booth 2015, Howard et al. 2012, Reifel et al. 2013, Seegers et al. 2015). Schnetzer et al. (2007) cites several studies that examined *P-spp*. and noted that their effective toxicity can be highly variable. These diatom species seem to produce higher levels of domoic acid when under silica or phosphate stress (i.e. the N:P and/or N:Si ratios are higher than or altered from natural conditions) (Schnetzer et al. 2013, Anderson et al. 2006). The discharge of large amounts of nitrogen could have the effect of unbalancing these ratios at the local level. Urea has been found to produce especially high domoic acid concentrations in *P. autralis* (Howard et al. 2007).

Due to a lack of monitoring in the discharge area, we do not know the algal species composition in the project area although the California Department of Public Health (CDPH) has frequently prohibited shellfish harvesting due to the presence of domoic acid and saxitoxins (see their Toxic

Phytoplankton Observations Map website for access to data layers). As noted previously, *P. spp.* are domoic acid producing diatoms, with *P. autralis* being the most frequently noted HAB species in the SCB and Monterey areas. Domoic acid is a water soluble neutrotoxin that accumulates in shellfish and planktivorous fish such as anchovy and sardine (Smith et al. 2018, Lefebvre et al. 2012).

As mentioned previously, *L. polyedrum* is another dinoflagellate that is frequently associated with red tide events in the Caifornia Current (Trainer et al. 2010) and blooms can occur outside of the upwelling season (Kudela et al. 2010). It can produce yessotoxins and this large family of toxins has been identified as the major causative agent in the largest invertebrate mass mortality event recorded in coastal Northern California, in Sonoma County in 2001, which impacted red abalone, sea urchins and crab species from Bodega Bay to Anchor Bay (De Wit et. al 2014). Similar to all dense HABs, its effect to EFH likely comes from impacts to dissolved oxygen levels at the scale of the algal bloom resulting in fish kills (Anderson et al. 2012, Backer and Miller 2016, Trainer et al. 2010) and presumably impacts to other species which cannot escape the HAB area. Algal masses are known to rapidly deplete available dissolved oxygen in the water column due to high respiration by the algae or increased respiration by bacteria during algal decay and this decrease can potentially be to hypoxic levels for periods of time (Backer and Miller 2016, Booth et al. 2015). HAB biomass is believed to be contributing to the overall decline of dissolved oxygen levels in coastal waters (Booth et al. 2015, Capone et al. 2013, McLaughlin et al. 2017).

The *P. spp.* are also known to flocculate and form masses large enough to sink to the ocean floor, carrying domoic acid with them which may be ingested by benthic species spreading the toxin within the benthic food web (Smith et al. 2021, 2018, Schnetzer et al. 2013, Trainer et al. 2010). Rapid transport is likely due to subduction by eddies (Kessouri et al. 2020) and can lead to benthic hot spots. The SCB 2018 Regional Marine Monitoring Program found widespread domoic acid contamination in the sediments of the SCB (Smith et al. 2021). In all, the toxin was detected in 54% of the SCB shelf habitats sampled and was more prevalent in coastal areas with nutrient enriched discharges such as those proposed as part of the permitted project. Domoic acid concentrations in the sediments ranged from 0.57 to 168.0 ng/g sediment over two years of sampling. Marine worms were found to have high levels of contamination compared to other benthic infauna, indicating that this reservoir of domoic acid poses a risk for transfer into the food web including fish species managed under the MSA and marine mammals listed under the ESA.

In addition to requiring receiving water monitoring for nutrient related impacts such as phytoplankton concentrations and typing, NMFS also requests that the discharger use the intervening time before operation to establish baseline information for the discharge area by monitoring plankton populations and HAB related toxins in the receiving water and sediments in the discharge area, conducting the baseline biological survey required in the draft NPDES permit, and establish seasonal current information in the discharge area so that seasonal patterns of plume distribution are established to inform future study needs and decision making. If information exists for any of these items associated with the previous facility's use of the outfall, the Water Board should make this information available for consideration in the permitting and study design process.

Essential Fish Habitat Conservation Recommendations

NMFS believes that the proposed discharge will cause significant adverse effects to EFH for all FMP's occurring off the coast of California (Pacific Coast Salmon, Pacific Coast Groundfish, Coastal Pelagic Species, and Highly Migratory Species). Implementing these conservation recommendations would protect EFH and fulfill the obligations of Section 305(b) of the MSA.

1. The NCRWQCB should require the Applicant to explore the feasibility of incorporating additional denitrification steps into the effluent treatment process in order to convert remaining ammonia into nitrogen gas, rather than the current proposal of converting much of the ammonia in the near final effluent into nitrate, which is then discharged into the Pacific Ocean.

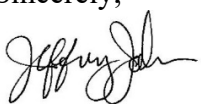
2. The NCRWQCB should direct the Applicant to monitor oceanic conditions to establish baseline information about the receiving water that includes algal species population information and seasonal patterns of currents that will affect the behavior of the discharge plume. This is in addition to the biological monitoring already called for in the draft permit

3. The draft permit should include receiving water monitoring in order to ensure that the discharge is not causing or contributing to HAB's, and if so, provide the NCRWQCB information to revisit the requirements related to the treatment and disposal of effluent.

4. The NCRWQCB should require the Applicant to offset and compensate for the unavoidable effects caused to the local nearshore areas during HAB's, and for the disruption of native fish communities caused by artificially increasing temperature regimes in the nearshore environment. The NCRWQCB should require the Applicant to provide compensatory funding to a tidelands restoration project in Humboldt Bay, such as the City of Eureka's Elk River Estuary Restoration Project, in order to compensate for impacts associated with the effects caused by the discharges.

Please let us know how we can assist the NCRWQCB, as well as fulfill our obligations to provide EFH conservation recommendations to the State as required by the MSA. Please contact Matt Goldsworthy at Matt.Goldsworthy@noaa.gov and Joe Dillon at Joseph.Dillon@noaa.gov.

Sincerely,



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