DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

REPLY TO
ATTENTION OF

JAN - 6 2011

Dredged Material Management Office

William W. Stelle, Jr., Regional Administrator
Attention: Donna Darm, Protected Resources Division
National Marine Fisheries Service, Northwest Region
7600 Sand Point Way Northeast
Seattle, Washington 98115

Re: Endangered Species Act Section 7 Formal Consultation for the Continued Use of Puget Sound Dredged Disposal Analysis Program Dredged Material Disposal Sites, Puget Sound, Washington (HUCs, 1711200306 Lower Dungeness River, 171100200403 Ennis/Tumwater Creek, 171100020204 Anacortes, 171100020104 Lower Whatcom Creek, 17100110202 Lower Snohomish River, 171100130399 Lower Green River 171100140599 Lower Puyallup River, 171100190503 Anderson Island). NMFS Consultation Number: 2010/04249

Dear Mr. Stelle:

This letter responds to the December 22, 2010 Essential Fish Habitat (EFH) Conservation Recommendations accompanying the National Marine Fisheries Service (NMFS) Biological Opinion on the effects of the Puget Sound Dredged Disposal Analysis (PSDDA) program on yellow-eye rockfish (*Sebastes ruberrimus*), canary rockfish (*S. pinniger*), and bocaccio (*S. paucispinis*) within Puget Sound/Georgia Basin requested by the Corps pursuant to Endangered Species Act (ESA) Section 7, as amended.

This letter provides a detailed response to NMFS' Essential Fish Habitat (EFH) conservation recommendations within 30 days of their receipt, as stipulated in 50 CFR 600.920(j)(1). This response includes a description of measures proposed to avoid, mitigate, or offset the adverse affects that the activity has on EFH.

The conservation recommendations provided by NMFS are stated below, followed by an explanatory response. One instance in which it would be impracticable to comply with the full measure of a conservation recommendation is noted. The DMMP agencies consider their plans and intentions to be fully consistent in each instance with the intent of the recommendations from NMFS.

EFH Conservation Recommendations

The COE should ensure that all sediment disposal activities:

- Do not take place between March 15 and June 15 of any year.

Corps of Engineers Response: Through its Regulatory permit program and its Civil Works program, the Corps intends to control the timing of disposal events through the limitation of dredging activities to the applicable in-water periods, as designated and/or endorsed by NMFS.

- Take place only within bounds of the latitude and longitudes listed in Table 1 of this opinion.

Corps of Engineers Response: Through its Regulatory permit program and its Civil Works program, the Corps intends to control the placement of sediments during aquatic disposal to ensure that all disposal takes place within the designated target zone of the respective site.

The COE should ensure that all sediment disposal continues to minimize potential bioaccumulation, by:

- Conduct or support comprehensive ichthyoplankton surveys near each of the PSDDA program dispersive and non-dispersive sites within the Puget Sound/Georgia Basin. Methodologies should follow those outlined in Weis (2004).

Corps of Engineers Response: The DMMP agencies understand the importance of comprehensive ichthyoplankton studies and intend to conduct as many site surveys as possible within budgetary constraints. The scope and cost of such studies will need to be determined before the Corps of Engineers can commit to a specific scope of work. At a minimum - funding permitting - the Corps of Engineers plans to conduct ichthyoplankton surveys at one non-dispersive and one dispersive disposal site over the next five years. Depending on the outcome of the initial studies, and if resources permit, ichthyoplankton studies at some or all of the remaining sites may be conducted. Methodologies used in this effort will follow those outlined in Weis (2004).

- Analyze the dissolved and particulate PCB and PBDEs in the open waters of Puget Sound. This may be accomplished through ongoing studies or new studies initiated under the PSDDA program.

Corps of Engineers Response: The DMMP have recently conducted testing of PBDE and PCB congeners in sediments at non-dispersive disposal sites; however, we have not conducted chemical analysis of water column levels associated with transport and disposal. The Washington Dept. of Ecology, however, has collected PCB and PBDE data from the whole and particulate fraction of the water column at various sites around Puget Sound to support a mass-loading model for Puget Sound (for more information see: http://www.ecy.wa.gov/pubs/0909069.pdf. Contact: Tom Gries 360-407-6327). Ecology expects to publish these data in the next 2 months. PCBs ranged from 6 to 75 pg/L in whole water samples. Whole water PBDEs were highly variable with detected concentrations ranging from approx. 50 to 19,000 pg/L. The detection

frequency for PBDEs was < 25%. Although not measured in this study, the concentration of PCBs and PBDEs in the freely dissolved phase would be expected to be lower still.

Jarvinen and Ankley (1999) summarized data for various PCB Aroclors. The fathead minnow (*Pimephales promelas*) was the most sensitive fish evaluated, with an Aroclor 1254 no-effect concentration for growth of 0.1 µg/L for a 240-day exposure; the associated no-effect concentration for survival was 3 µg/L. Other data for embryonic/juvenile fish exposure for species typically considered sensitive included brook trout (*Salvelinus fontinalis*) eggs; a 127-day exposure to Aroclor 1254 had a no-effect concentration of 0.69 µg/L, approximately 5 orders of magnitude greater than the low range found in whole water samples in Puget Sound. Given the exposure duration and the concentrations required to elicit toxic effects in embryonic/juvenile fish, it is unlikely that disposal site activities would result in contaminant-induced impacts to embryonic/juvenile fish.

PBDEs are of low solubility in water: at 20°C, decabromobiphenyl is considered insoluble, and hexa- and octabromobiphenyls range from 3 to 30 µg/L (ATSDR 2004, table 6-4); in the presence of particulate organic matter, the realized solubility of PBDEs would be less due to the hydrophobic nature of the compounds. Per a review by EPA (2006), commercial mixtures of pentaBDE, octaBDE, and decaBDE demonstrated low or no acute toxicity to Japanese medaka and rainbow trout at the solubility limit. In an early life stage toxicity study conducted with rainbow trout, no effects were observed on hatching, swim-up or larval and fry survival following 21 days exposure to an aqueous pentaBDE mixture. At 60 days post-hatch, statistically significant effects on juvenile fish length and weight were observed only at the highest concentration tested (16 µg/L). This effect-level concentration is 2 orders of magnitude above the highest detected PBDE concentration in the Ecology study, and 5 orders of magnitude above the lowest value quantified result. Single congeners BDE-47, BDE-85, and BDE-99 were assessed using an egg injection bioassay developed to assess the toxicity of dioxin-like chemicals in early life stages of rainbow trout. Although this bioassay has great sensitivity for detecting dioxin-like toxicity, none of the PBDE congeners tested caused similar early life stage toxicity.

These data for sensitive freshwater fish species are relevant to marine species such as rockfish, and suggest that ambient open-water Puget Sound concentrations of PBDE and PCB would not have an effect on early stage rockfish. We believe that changes from the water column background represented by the Ecology data that might occur due to transport and disposal of dredged material at DMMP sites will be of short duration and comparable to Puget Sound background shortly following the dredge disposal event. The DMMP intends to continue to follow the water column data being generated by Ecology and other agencies as part of their effort to develop a model of contaminant flux within Puget Sound. As more information is made available, the DMMP will consider the programmatic implications, if any. The DMMP agencies consider additional analysis of the dissolved fraction of PCBs and PBDEs in the water column to be of severely limited value because of the considerable difference between Puget Sound background values and no-effects values for sensitive surrogate species.

- Initiate the administrative and scientific steps to facilitate the inclusion of PBDEs on the list of potentially bioaccumulative substances that require testing under the PSDDA program.

Corps of Engineers Response: The DMMP agencies intend to initiate the administrative and scientific steps to facilitate the inclusion of PBDEs as a chemical of concern requiring testing under the PSDDA/DMMP program. The DMMP agencies have already begun evaluating sediment PBDE concentrations at non-dispersive sites during disposal site monitoring. The most recent and highest quality data for PBDEs were collected at the Port Gardner disposal site in 2010. The DMMP has not implemented PBDE analysis for routine dredging projects because we do not yet have numerical guidelines for this chemical group. Developing guidelines would involve a multi-year and multi-agency comprehensive evaluation similar to that recently completed for dioxin guideline development. While the timing for initiating a similar effort for PBDEs is uncertain, the DMMP intends, subject to the availability of funding of the pertinent member agencies, in the near term to include PBDE congener analysis for federal maintenance dredging project evaluations. In this way, we can begin to develop a PBDE data set from dredging areas within Puget Sound, which will support future guideline development.

- Develop a model or conduct field tests to determine the trajectory of drift, concentrations and deposition of sediment disposed at the dispersive sites.

Corps of Engineers Response: The DMMP agencies are currently conducting a modeling study of the Rosario Strait and Port Townsend dispersive sites to determine the fate of dredged material placed at those sites. Subject to the availability of funding, the Corps plans to field-validate the model using an Acoustic Doppler Current Profiler (ADCP).

- Continue to assess new scientific research for bioaccumulative compounds, including new literature regarding effect thresholds (that include synergistic and sublethal effects) for aquatic species.

Corps of Engineers Response: The DMMP agencies concur, and intend to review an appropriate sampling of the relevant technical literature to the maximum extent that staffing resources permit.

References Cited:

Agency for Toxic Substances and Disease Registry (ATSDR). 2004. TOXICOLOGICAL PROFILE FOR POLYBROMINATED BIPHENYLS AND POLYBROMINATED DIPHENYL ETHERS. http://www.atsdr.cdc.gov/ToxProfiles/tp68.pdf

Jarvinen, Alfred W. and Gerald T. Ankley. 1999. Linkage of Effects to Tissue Residues: Development of a Comprehensive Database for Aquatic Organisms Exposed to Inorganic and Organic Chemicals (SETAC Technical Publications Series)

U.S. Environmental Protection Agency. 2006. Polybrominated Diphenyl Ethers (PBDEs) Project Plan. http://www.epa.gov/oppt/pbde/pubs/proj-plan32906a.pdf

If you have any questions about our response to the conservation recommendations for Essential Fish Habitat, please contact either our acting ESA Coordinator, Jeff Laufle at (206) 764-6578 or jeffrey.c.laufle@usace.army.mil), or David Kendall, in the Dredged Material Management Office (206) 7645-3768 or david.r.kendall@usace.army.mil).

A copy of this correspondence was also sent to Dan Tonnes, National Marine Fisheries Service, Dave Vagt, Washington Department of Natural Resources, Dr. Laura Inouye, Washington Department of Ecology, and Erika Hoffman, Environmental Protection Agency, Region 10.

Sincerely,

for/ Anthony O. Wright
Colonel, Corps of Engineers
District Commander

cc:
OC (Juckniess)
OD (Cook)
OD-TS (Wagner)
OD-RG (Walker)
OD-NB (Hicks)
PM-PL-ER (Laufle)
OD-TS-DM (Kendall)
OD-TS-DM files

MFR: This letter has been coordinated with NMFS staff, with help from DMMP agencies EPA, WDNR, and WDE. Counsel has reviewed and provided input. (LAUFLE)

Per direction of Commander, letter signed for Commander by Ch, DMMO.

6 Jan 2011
Kendall/3768

KENDALL/OD-TS-DM

LAUFLE/PM-PL-ER

JUCKNIESS/OC

HICKS/OD-TS-NS

WAGNER/OD-TS

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