



REPLY TO
ATTENTION OF

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

January 14, 2016

CENWS-OD-TS-NR

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

Re: Statutory Response to EFH Conservation Recommendations for the Continued Use of Multi-User Dredged Material Disposal Sites in Puget Sound and Grays Harbor (Fourth Field HUCs 17110020 Dungeness-Elwha, 17110002 Strait of Georgia, 1711019 Puget Sound, and 17100105 Grays Harbor) Washington. NMFS Consultation Number: WCR-2015-2975

Dear Mr. Stelle:

This letter responds to the December 17, 2015 Essential Fish Habitat (EFH) Conservation Recommendations accompanying the National Marine Fisheries Service (NMFS) Biological Opinion on the effects of the continued use of multi-user dredged material disposal sites in Puget Sound and Grays Harbor 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 600.9200(1). This response includes a description of measures proposed to avoid, mitigate, or offset the adverse effects that the activity may have on EFH.

The conservation recommendations provided by NMFS are stated below, followed by an explanatory response to each. The cover letter from NMFS - dated December 17, 2015 – indicated that there were five EFH conservation recommendations. As can be seen in the following, there were actually three main recommendations, the last of which included five parts. In response to your request to identify the number of conservation recommendations accepted, Seattle District accepts the first two recommendations in whole and four of five parts of the third recommendation. Our detailed responses clearly indicate the acceptance status of each recommendation and subpart.

EFH Conservation Recommendations

The COE should ensure that all sediment disposal activities:

1. Take place only between June 16 and March 14 of any year in Puget Sound, or March 15 and May; and July 16 or August 1 and February 14 in Grays Harbor.

Corps of Engineers Response: Accepted as follows. 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 work periods, as designated and/or endorsed by NMFS.

Dan Tonnes of your staff clarified by email on January 5, 2016 that the work windows associated with this conservation recommendation are as follows:

- Disposal activities are allowed at the eight multiuser open-water dredged material disposal sites in Puget Sound between June 16 and March 14, inclusive of these dates.
- Disposal activities associated with hopper dredging of the outer reaches of the Grays Harbor federal navigation channel are allowed at the two multiuser open-water dredged material disposal sites in Grays Harbor between March 15 and May 31, inclusive of these dates.
- Disposal activities associated with any dredging in the inner harbor of Grays Harbor are allowed at the two multiuser open-water dredged material disposal sites in Grays Harbor between either July 16 or August 1 (depending on the reach being dredged) and February 14, inclusive of these dates.
- The work window for disposal activities associated with dredging in the inner harbor of Grays Harbor may be extended beyond February 14 if approved in advance by NMFS and USFWS.

2. Take place only within bounds of the latitudes and longitudes listed in Table 1 [attached for reference] of this opinion.

Corps of Engineers Response: Accepted as follows. 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 intended to occur at a multiuser site takes place within the designated disposal zone of the respective site. This recommendation does not apply to other in-water placement of dredged material approved by NMFS through a separate ESA consultation. Examples include the beneficial use of dredged material placed by the Corps of Engineers at South Beach in Grays Harbor or Jetty Island in Everett.

3. The COE should ensure that all sediment disposal minimizes potential bioaccumulation, by:
 - a. Continuing to conduct or support comprehensive ichthyoplankton surveys near each of the DMMP program dispersive and non-dispersive sites within the Puget Sound/Georgia Basin.

Corps of Engineers Response: Accepted as follows. The EFH conservation recommendations that accompanied the 2010 biological opinion for rockfish (NMFS, 2010) included a similar recommendation. The DMMP agencies responded to that EFH recommendation by participating in an ichthyoplankton survey (Greene, 2012) conducted by the Northwest Fisheries Science Center at six of the seven dredged material disposal sites in Puget Sound covered by the biological opinion. Juvenile and larval fish were collected monthly from April 2011 through February 2012 at the DMMP disposal sites at Anderson/Ketron Island, Commencement Bay, Elliott Bay, Port Gardner, Rosario Strait and Bellingham Bay. Results of the study were summarized in the biological evaluation submitted to NMFS in July 2015 for the continued use of the DMMP disposal sites (USACE, 2015).

In conjunction with that study, the Corps of Engineers agreed to fund the genetic identification of rockfish larvae collected during the study. However, due to problems with the preservation method used by NMFS for the larval specimens, genetic identification was rendered technically infeasible. The Corps of Engineers stands by its offer to fund the genetic identification of a limited number of

rockfish larval specimens collected by NMFS at the DMMP disposal sites in Puget Sound, dependent on the availability of funds and a viable contract or funding transfer mechanism.

- b. Analyzing the dissolved and particulate PCB and PBDE in the open waters of Puget Sound. This may be accomplished through ongoing studies or new studies initiated under the DMMP.

Corps of Engineers Response: Not accepted. This conservation recommendation was also made by NMFS in association with the biological opinion for rockfish issued in 2010 (NMFS, 2010). The following response is an update to the Corps' response to the 2010 recommendation:

The Washington Department of Ecology collected PCB and PBDE data from water column samples at various sites around Puget Sound to support a mass-loading model for Puget Sound (Gries, 2011). PCBs ranged from 6.1 to 75 pg/L (0.0000061 to 0.000075 ug/L) in ambient marine whole-water samples. PBDEs were highly variable with detected concentrations ranging from 51 to 18,700 pg/L (0.000051 to 0.0187 ug/L). The detection frequency for PBDEs was less than 25%. Although not measured in this study, the concentration of PCBs and PBDEs in the freely dissolved phase would be expected to be lower than that in whole-water samples, given the hydrophobic nature of these chemicals.

Jarvinen and Ankley (1999) summarized toxicity 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 no-effect concentration for survival was 3 µg/L. Other data for embryonic/juvenile fish exposure for sensitive species included brook trout (*Salvelinus fontinalis*) eggs; a 127-day exposure to Aroclor 1254 had a no-effect concentration of 0.69 µg/L, approximately four orders of magnitude greater than the high end of the range found in whole-water samples in Puget Sound. Given that much higher concentrations over ambient conditions and long exposure durations are required to elicit toxic effects in embryonic/juvenile fish, it is unlikely that any short-term increases in water-column concentrations of PCBs associated with dredged material disposal would result in contaminant-induced impacts to embryonic/juvenile fish.

Per a review by EPA (2006), commercial mixtures of pentaBDE, octaBDE, and decaBDE demonstrated low or no acute toxicity to Japanese medaka (*Oryzias latipes*) and rainbow trout (*Oncorhynchus mykiss*) at the solubility limit. In an early life stage toxicity study conducted with *O. mykiss*, 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 effects-level concentration is nearly three orders of magnitude above the highest detected PBDE concentration in the 2011 Ecology study. Like PCBs, much higher concentrations over ambient conditions are required to elicit toxic effects in embryonic/juvenile fish. Therefore, short-term increases in water-column concentrations of PBDEs associated with dredged material disposal are unlikely to result in contaminant-induced impacts. In another study reviewed by EPA, 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 PCBs and PBDEs would not have an effect on early stage rockfish. While short-term exceedances of the background water-column concentrations found in the 2011 Ecology study might occur during dredged material disposal at DMMP sites, water-column concentrations would return to background levels within a short time following a disposal event.

The DMMP agencies consider additional analysis of the dissolved and particulate fractions 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.

- c. Initiate systematic monitoring for PBDEs at candidate dredge sites, and manage dredge disposal to reduce PBDE content within the receiving sites. Work towards inclusion of PBDEs on the list of potentially bioaccumulative substances that require testing under the DMMP.

Corps of Engineers Response: Accepted as follows. The DMMP agencies added PBDE testing to the chemical monitoring program for non-dispersive disposal sites in response to EFH conservation recommendations from NMFS (NMFS, 2010). Since 2010, chemical monitoring – including PBDEs – has been conducted at the Port Gardner (2010) and Elliott Bay (2013) sites. The Corps of Engineers has also analyzed PBDEs in sediment samples collected from three federal navigation projects, including the Duwamish turning basin and adjacent navigation channel (2011); the Hylebos Waterway (2013); and the Kenmore navigation channel (2014).

The DMMP agencies have not implemented PBDE analysis for routine dredging projects because we do not yet have numerical guidelines for this group of chemicals. Development of such guidelines would involve a resource-intensive multi-year comprehensive evaluation similar to that completed by the DMMP agencies for dioxins/furans (DMMP, 2010). PBDEs, as a class of chemicals, are not amenable to the toxic equivalent (TEQ) approach used for 2,3,7,8-substituted dioxins/furans and dioxin-like PCB congeners because they do not have the AhR agonist properties associated with dioxins/furans (Van den Berg, 2006). Therefore, development of evaluation guidelines for PBDEs would likely be even more complex than it was for dioxins/furans. Due to resource constraints and other competing priorities, work on development of bioaccumulation triggers and evaluation guidelines for PBDEs has not been possible.

The DMMP agencies acknowledge that regulation of bioaccumulative compounds is of critical importance for the protection of human health and aquatic species. Since the implementation of the Puget Sound Dredged Disposal Analysis program in the 1980s, the DMMP agencies have taken a number of steps to address bioaccumulatives, including development of evaluation guidelines for tributyltin (Michelsen, 1996); prioritization of bioaccumulative compounds for dredged material evaluation (Hoffman, 2007); development of a bioaccumulation trigger for dioxins/furans in Puget Sound (DMMP, 2010); and revision of target tissue levels for tributyltin, chlordane, PCBs and DDT.

Development of bioaccumulation guidelines for the protection of aquatic species is anticipated to be a focal point for the Regional Sediment Evaluation Team (RSET) in the near- to mid-term. The DMMP agencies will continue to work with NMFS and the other RSET agencies on the development of dredged material evaluation guidelines for bioaccumulatives.

With regard to PBDEs, the DMMP agencies will continue to analyze PBDEs during chemical monitoring surveys at non-dispersive sites, and Seattle District will continue to do limited PBDE analysis at federal navigation projects in urban areas of Puget Sound. Development of dredged material evaluation guidelines for PBDEs will be undertaken as funding and staffing levels permit. This work will continue until it is either determined that PBDEs are not present at concentrations in dredged material at levels of concern, or until evaluation guidelines have been established for some or all of the 209 PBDE congeners, at which time the congeners of concern would become part of the standard list of chemicals analyzed in dredged material.

- d. Annually assessing new scientific research for bioaccumulative compounds, including new and existing literature regarding effect thresholds (that include synergistic and sublethal effects) for aquatic species.

Corps of Engineers Response: Accepted as follows. As funding and staffing resources permit, the DMMP agencies will continue to assess scientific research for bioaccumulative compounds as they relate to dredged material management. The chemicals targeted for this assessment will be prioritized by the DMMP agencies based on such factors as risk to human health and potential impacts on ESA-listed species.

- e. Assessing and considering the recommendations to improve sediment PAH values when evaluating dredging and disposal activities (Buck and Johnson, 2014).

Corps of Engineers Response: Accepted as follows. The DMMP agencies are working with NMFS on the resolution of technical issues associated with research cited in Buck and Johnson (2014) and will consider adoption of a PAH screening level for the protection of salmonids based on the recommendations from NMFS. The status of this work will be presented at the 2016 Sediment Management Annual Review Meeting.

References Cited:

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Buck, J. and L. Johnson, 2014. *Proposed Sediment Screening Level for PAHs for Protection of Salmonids*. An Issue Paper prepared the Regional Sediment Evaluation Team.

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EPA, 2006. *Polybrominated Diphenyl Ethers (PBDEs) Project Plan*. U.S. Environmental Protection Agency. <http://www.epa.gov/sites/production/files/2015-09/documents/proj-plan32906a.pdf>.

Greene, C. and A. Godersky, 2012. *Larval Rockfish in Puget Sound Surface Waters*. Northwest Fisheries Science Center, Seattle, Washington.

Gries, T. and D. Osterberg, 2011. *Control of Toxic Chemicals in Puget Sound; Characterization of Toxic Chemicals in Puget Sound and Major Tributaries, 2009-10*. Toxics Studies Unit, Environmental Assessment Program, Washington State Department of Ecology.

Hoffman, E., 2007. *The Technical Basis for Revisions to the Dredged Material Management Program's Bioaccumulative Contaminants of Concern List*. Prepared by Erika Hoffman (EPA) for the DMMP Agencies.

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).

Michelsen, T., T. Shaw and S. Stirling, 1996. *Testing, Reporting and Evaluation of Tributyltin Data in PSDDA and SMS Programs*. An Issue Paper prepared for the PSDDA/SMS Agencies.

NMFS, 2010. *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, 171100200306 Lower Dungeness River, 171100200403 Ennis/Tumwater Creek, 171100020204 Anacortes, 171100020104 Lower Whatcom Creek, 171100110202 Lower Snohomish River, 171100130399 Lower Green River, 171100140599 Lower Puyallup River, 171100190503 Anderson Island)*. NNIFS Consultation Number: 2010/04249. National Marine Fisheries Service, Northwest Region, Seattle, Washington.

Van den Berg, M. et al., 2006. *The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds*. Toxicological Sciences 92(2), 223-241.

If you have any questions about our response to the conservation recommendations for Essential Fish Habitat, please contact either our ESA Coordinator, Jeff Laufle at 206-764-6578 or jeffrey.c.laufle@usace.army.mil, or David Fox, in the Dredged Material Management Office at 206-764-6083 or david.f.fox@usace.army.mil.

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

Sincerely,



David Fox, P.E.
Chief, Dredged Material Management Office
Corps of Engineers Seattle District

cc:
OC (Juckniess)
EN-ER (Laufle)
OD-TS (Reese)
OD-RG (Walker)
OD-NS (Anderson)
OD-TS-NR-DMMO files

MFR: This letter has been coordinated with
DMMP agencies EPA, WDNR, and WDE.

Table 1. Puget Sound and Grays Harbor disposal site descriptions (Table 1 in COE 2015).

Site	Type	Area (Acres)	Depth in Feet (Meters)	Disposal Coordinates (NAD83)
Bellingham Bay	Non-Dispersive	260	96 (29)	48° 42.82' North; -122° 33.11' West
Port Gardner	Non-Dispersive	318	420 (128)	47° 58.85' North; -122° 16.74' West
Elliott Bay	Non-Dispersive	415	300-360 (91-110)	47° 35.91' North; -122° 21.45' West
Commencement Bay	Non-Dispersive	310	540-560 (165-171)	47° 18.145' North; -122° 27.815' West
Anderson Island	Non-Dispersive	318	360-460 (110-140)	47° 09.42' North; -122° 39.47' West
Port Angeles	Dispersive	884	435 (133)	48° 11.67' North; -123° 24.94' West
Port Townsend	Dispersive	884	361 (110)	48° 13.61' North; -122° 59.03' West
Rosario Strait	Dispersive	650	97-142 (30-43)	48° 30.87' North; -122° 43.56' West
Point Chehalis	Dispersive	230	>50 (15)	Corners of rectangle: 46° 55'00.51" North; -124° 08'06.94" West 46° 55'17.09" North; -124° 06'59.10" West 46° 54'41.91" North; -124° 07'57.26" West 46° 54'58.50" North; -124° 06'49.42" West
South Jetty	Dispersive	55	>40 (12)	Corners of rectangle: 46° 54'34.82" North; -124° 09'30.67" West 46° 54'32.06" North; -124° 08'47.65" West 46° 54'26.96" North; -124° 09'31.74" West 46° 54'24.20" North; -124° 08'48.72" West