

Nationwide Permit for Shellfish Aquaculture #48
 US Fish and Wildlife Comments
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These comments are being submitted under early consultation under 50 CFR 40.11 Fish and Wildlife and NOAA Endangered Species Act joint regulations, under 16 USC 661, Fish and Wildlife Coordination Act, under Bald Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 25016 U.S.C. 668-668d, 54 Stat. 250 as amended -- Approved June 8, 1940, and amended by P.L. 86-70 (73 Stat. 143) June 25, 1959; P.L. 87-884 (76 Stat. 1346) October 24, 1962; P.L. 92-535 (86 Stat. 1064) October 23, 1972; and P.L. 95-616 (92 Stat. 3114) November 8, 1978, and the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755) as amended by: Chapter 634; June 20, 1936; 49 Stat. 1556; P.L. 86-732; September 8, 1960; 74 Stat. 866; P.L. 90-578; October 17, 1968; 82 Stat. 1118; P.L. 91-135; December 5, 1969; 83 Stat. 282; P.L. 93-300; June 1, 1974; 88 Stat. 190; P.L. 95-616; November 8, 1978; 92 Stat. 3111; P.L. 99-645; November 10, 1986; 100 Stat. 3590 and P.L. 105-312; October 30, 1998; 112 Stat. 2956.

General Comments Section 7(a)(2) of the ESA:

- 1) We need a description of the scope of the action. Aside from points on a map we have no information was provided on the amount of acres under shellfish cultivation or what percent of Puget Sound (i.e., nearshore habitat) is being farmed. This information is critical to predict the extent of intertidal habitat used by listed fish, migratory birds and other important aquatic resources. This information is available from the state resource agencies and the Washington State Health Department. We also need to know the extent of overlap with forage fish spawning areas and eel grass beds.
- 2) It is unclear how a NLAA determination can be made when there is no analysis of the additive effect of how *all* the shellfish farming activities combined affect listed species and their prey. No connection has been made (beneficial or detrimental) between changes in phytoplankton and zooplankton density and ultimately effects to juvenile fish (salmonids, and forage fish). These farmed organisms also compete with native clams and oysters for food. High densities of shellfish in sheltered bays and coves may be removing significant amounts of phytoplankton, reducing this trophic level, very likely to the detriment of zooplankton and higher trophic level species. There is no discussion on the potential effects to forage fish either from a reduction in prey or reduced spawning habitat.
- 3) Too often only one citation is provided which paints a positive picture of the effects of shellfish aquaculture on the environment. We do not deny that there are positive environmental aspects of this activity on the environment, however, there are negative effects as well, and these appear to be glossed over in this analysis. We expect the Corp's information to provide an evaluation of the activities under consultation which considers all potential effects.

Under Section 7(a)(2) of the Act "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. *In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available* [emphasis added]. Jeff Fisher developed a comprehensive compilation of the current literature; we suggest you review this literature.

4) We still need clarity on what is allowed in the NWP #48 regarding expansion of aquaculture facilities? For example, if a grower owns or leases 50 acres but he/she only has 25 acres under cultivation, can he/she expand the operations to the other 25 acres under the NWP #48? In other words does expansion only apply to the acquisition and cultivation on *additional* property not under ownership or lease?

Expansion
to 26
= 1P
- Requiring
existing
25
= 1P

5) Are shellfish farmers farming their entire lease/ownership? The baseline condition includes those areas under cultivation. If a grower is only using 50% of his/her ownership that is the baseline condition, then any expansion to the other 50% of the tract should be considered in the effects analysis. Currently, we have no way to determine how many acres are under cultivation relative to the areas that *could be* under cultivation in the future.

Specific Comments: Section 7(a)(2) of the ESA

- 1) Page 2-9, line 1: What is the size range of the mussel rafts?
- 2) Page 2-9, line 7: Are fish ever trapped in these nets?
- 3) Page 2-11, line 6: How is the silt manually leveled? What equipment is used?
- 4) Page 2-14, line 27: Is this crushed shell and gravel spread over eelgrass beds?
- 5) Page 2-15, line 8: Are these growing areas on the same property or are oysters transported off site? If so, where are they taken? These offsite areas (should they exist) should be included in the action area.
- 6) Page 2-15, line 16: How often during the grow-out season is the area harrowed. Is this done where eelgrass is growing?
- 7) Page 2-17, line 12: How are the stacks de-fouled?
- 8) Page 2-18, line 13: Does other growth include eelgrass?

- 9) Page 2-24: Line 17: If shellfish are taken to other areas for “grow-out” this should be considered interdependent and analyzed in this section.
- 10) Page 2-24 line 20: This sentence beginning with “Such facilities...” is unclear.
- 11) Page 2-24, line 28: Have you contacted the Washington State Department of Health? Since they have a database with the location and size of the commercial shellfish companies in Washington it would simply require a download of their database into a GIS. I suggest you do this and provide us with the information so that we can determine the scale of the action.
- 12) Page 2-25, line 16: The double negative makes this sentence very confusing, please clarify.
- 13) Page 2-25, Line 20: We expect that the area (total acres) were shellfish growing is allowed to be provided in the BA. At this point we have not seen such information. We need to understand the scope of the action (amount of area under cultivation relative to bull trout critical habitat). The other component of the action area that needs to be considered are any and all grow-out areas.
- 14) Page 3-2, Table 3-1: Please add the Olympic Peninsula DPS for bull trout as shellfish are grown within this DPS and designated critical habitat.
- 15) Page 3-37, line 14: Please move the word trout in front of in.
- 16) Page 3-37, line 29: Actually, in February 2002 a bull trout was captured by a WDFW technician at river mile 29 in the Willapa River.
- 17) Page 3-38, line 4: These are not the correct bull trout critical habitat PCEs that apply to marine near-shore waters. They are 1) water temperatures...2) migratory corridor.... 3) abundant food base...and 4) permanent water quality...(see page 56266 of 70 FR 56212)
- 18) Page 4-9, line 3: This sentence beginning with “The organic contaminants...” is incomplete.
- 19) Page 4-11, Line 3: It doesn't appear that you used WDNRs Shore zone inventory to characterize eel grass. We ask that you use it and create a map with the shellfish farm and an eelgrass layer for the final BA.
- 20) Page 5-6, line 21: Are forage fish surveys conducted prior to spreading oyster shell?
- 21) Page 5-7, Line 11: What is the source of the contamination?
- 22) Page 5-8, Lines 14-17: Please provide support (analysis and or citations) for this assertion. How much biomass is consumed by all of the shellfish operations in

Washington? What percent relative to the ecosystem productivity is consumed by the shellfish covered under NWP 48? How did you determine that the "...biomass of organisms supported by these operations is too small to represent a measurable fraction of the ecosystem productivity"?

23) Page 5-9, line 8: The Simenstad 1999 paper is not in the literature cited section.

24) Page 5-9, Line 13: What is your conclusion? Are piscivorous birds going to perch on such structures while foraging for juvenile salmonids or forage fish since "in theory" it could happen?

25) Page 5-12, Lines 12-17: There are significant bacteria growing under the mussel rafts cited by APHETI 2006. I assume that mussel rafts are placed in quiescent waters. Correct? Are mussel rafts located in bull trout critical habitat, if so how many? We need to know the amount of nearshore taken up by mussel rafts.

26) Page 5-12, Line 29 – 30: What is your conclusion?

27) Page 5-13, Line 2: So your best professional judgment is?

28) Page 5-15, Line 23: There is no mention of the use of carbaryl to eradicate ghost shrimp from oyster beds. This is an interrelated action which must be evaluated for its direct and indirect effects on listed species.

29) Page 5-16, Line 25: How much is most? Please provide a citation for this phenomenon in Puget Sound. Newell 2005 is cited often yet it isn't in the literature cited section.

30) Page 5-16, Lines 34 -39: This is perhaps true for the regions where the Olympia oyster was found. However, oyster culture occurs all over the Puget Sound region and so aerobic/anaerobic sediment stratification is likely occurring on a much greater scale. This is one reason why it is critical that we know the scale of the action under consultation.

31) Page 5-17, line 24: Please see the Puget Sound Nearshore Partnership report on Kelp and Eelgrass in Puget Sound page 3 at the following link:

http://pugetsoundnearshore.org/technical_reports.htm

It is highly unlikely that oyster bottom culture provides more species abundance, biomass and diversity than an eelgrass meadow or the same functions.

32) Page 5-29, Line 1: Are the growers required to prepare a spill plan? When a spill occurs it must be reported to DOE. Have any spills been reported to DOE; this information will give an indication of the frequency of this event.

33) Page 5-29, Line 12: The growers in Willapa used crushed rock rather than gravel. Is this same substrate that Thom et al., (1994) used in his experiment? Does crushed rock compact differently than gravel forming a relatively impermeable surface?

34) Page 5-35, Line 1 on: Is there any grey literature or non-peer reviewed studies available? Since it is plausible that geoducks will compete for prey resources (particularly in sheltered bay and coves and when they are planted in high densities) and dominate as a consumer of the local food web, and then you must assume that juvenile salmonids and forage fish will have less to eat which will lower their growth and survival. This translates into a reduction in prey for bull trout and marbled murrelets and may constitute an adverse effect. I think it would be prudent to alleviate this uncertainty (Line 6) *prior* to the Corp allowing more widespread geoduck culture given the tenuous condition of salmonid and bull trout populations in Puget Sound. It is difficult to see how given the substantial uncertainty how issuance of the NWP#48 would result in minimal individual adverse environmental effects either separately or cumulatively on the aquatic environment.

35) Page 5-36, Line 19: According to the Conservation measure on page 6-1 "Activities in spawning area (e.g., forage fish spawning areas) during spawning seasons must be avoided to the maximum extent possible". So how is it that eggs of herring, sand lance and surf smelt will be trampled during geoduck harvest if this conservation measure is being enforced?

36) Page 5-36, Line 30: Many of the photographs I've seen show lots of activity along the beach therefore these eggs could be trampled as well.

37) Page 5-36, Line 26: According to the WDFW Website:
<http://wdfw.wa.gov/fish/forage/smelt.htm#sbiology>
"Spawning occurs in the summer months on beaches along Washington's coast and the Strait of Juan de Fuca. Many additional suspected spawning areas and possible extensions of the documented spawning seasons await investigation, and previously unreported areas continue to found". Thus, surf smelt spawning could occur when tube placement, seeding and net installation are being done (Line 38) if geoducks are grown in these areas.

38) Page 5-37, Line 12: Therefore, predator exclusion netting is a potential hazard to marbled murrelets as well as bald eagles.

39) Page 5-38, Line 15: The harvest of geoducks does not invasively disturb sediments?

40) Page 6-1, Line 8: There is no discussion herein regarding the overlap between forage fish spawning areas and shellfish aquaculture. Where does this overlap exist? At a minimum you should overlay the approved and conditional shellfish growing areas (available from the DOH website) with the location of spawning and holding areas for all forage fish species, this includes eelgrass beds. We expect an analysis of the indirect effects to the prey base of forage fish (epibenthic invertebrates and zooplankton) and bull trout forage fish and juvenile salmonids. If conservation measure number 2 (spawning areas) is to be enforced there should be no shellfish aquaculture allowed in forage fish spawning areas. According to Pentilla (2007) "Standard aquaculture practices may have

profound effects of the benthic ecology of Washington State's tidelands and the conservation of forage fish spawning areas, especially for herring. In many areas, herring spawning grounds are coincident with shellfish culture areas, particularly on tideflats occupied by beds of the native eelgrass". I suggest you review Pentilla (2007) and conduct an analysis on the effects of shellfish aquaculture on forage fish. Please see the Puget Sound Nearshore Partnership report on Marine Forage Fishes on Puget Sound. Kelp and Eelgrass in Puget Sound at the following link:
http://pugetsoundnearshore.org/technical_reports.htm

41) We are not just concerned about herring but also sand lance and surf smelt who's spawning areas and prey species composition may be affected through modification of the beach substrate for clam and oyster bottom culture; we expect to see an analysis of these effects as well.

42) Page 6-1, Line 15: There is no analysis of the overlap between bull trout critical habitat and shellfish aquaculture activities please include this in the BA. How is the reporting of listed species and critical habitat a conservation measure? What is done with this information and how is implemented to benefit or promote the recovery of listed species?

43) Section 7.2.1: Are brown pelicans and snowy plovers feeding in areas where carbaryl is used to eradicate ghost shrimp? If not, please demonstrate this with literature citations and if so, then please include an analysis of the effects of this insecticide of birds through the ingestion pathway.

44) Page 7-3 Line 29: Please provide an overlay with the Western Snowy plover, brown pelican and marbled murrelet occurrence data.

45) Page 7-4, Line 13: Do aquaculture activities occur where snowy plovers will be feeding at low tide in the inter-tidal areas?

46) Page 7-4, Line 17: Does clam culture occur in snowy plover critical habitat?

47) Page 7-4, line 24: Marbled murrelets generally forage in shallow waters within 1.25 miles of shore (Strachan et al. 1995). Traditional feeding areas (nurseries) are used consistently on a daily and yearly basis (Carter and Sealy 1990). Foraging locations include physical processes that concentrate prey. In general, small schooling fish and large pelagic crustaceans are the main prey items thus they tend to forage in eel grass beds. Since eelgrass and oyster culture co-occur it is likely that feeding birds may be disturbed by aquaculture activities and reduction in eelgrass would lead to a reduction in forage fish.

Carter, H.R., and S.G. Sealy. 1990. Daily foraging behavior of marbled murrelets. *Studies in Avian Biology* 14:93-102.

Strachan, G., M. McAllister, and C.J. Ralph. 1995. Marbled Murrelet Food Habits and Prey Ecology. *In*: C.J. Ralph, G.L. Hunt, M.G. Raphael, and J. F. Piatt (tech. eds.). Ecology and conservation of the marbled murrelet. General Technical Report PSW-GTR-152. Pacific Southwest Experiment Station, U.S. Forest Service, Albany, California. U.S. Dept. of Agriculture. 420 pp.

48) Page 7-5 Line 14: Please evaluate the transport of carbaryl to snowy plover habitat as the insecticide will deplete prey resource should concentrations be elevated. Please provide data for the Washington State Department of Ecology and citations for your conclusions.

49) Page 7-13, Line 19: Rather than referring us to the effects section for salmon and steelhead please prepare a separated effects section for bull trout. Additionally, the effects documents in this section address specific action in isolation. This analysis needs to consider the entire action of permitting all shellfish aquaculture throughout the Puget Sound and the additive effects of all activities on the species. Additionally, "take" under the Act occurs on the individual level.

50) Page 7-13, Line 20: See comment Page 3-37, line 29.

51) Page 7-13, Line 29 on: This section is poorly written and difficult to understand please re-write it. Also, please refer to all of the general comments.

52) Page 7-14, Line 22: These are not the marine PCEs for bull trout. See CFR 70 part 17 56266 and prepare an analysis of these PCEs. Please prepare a thorough analysis documented with citations as to why or why not a PCE is adversely affected.

Comments under other Statutes:

- 1) Page 2-18, line 20: Do ducks get caught in these nets? How else are predators "controlled"?
- 2) Page 5-27, Line 7: Please see the report: Washington State Exotics Expedition 2000: A rapid survey of Exotic Species in the Shallow Waters of Elliott Bay, Totten and Eld Inlets and Willapa Bay Link : <http://faculty.washington.edu/cemills/WSX2000.pdf>
This report highlights the introduction of exotic species associated with ballast water and aquaculture. You will note that a greater number of exotic species have been introduced in shellfish growing areas than Elliott Bay (location of the Port of Seattle). This will likely continue to occur in the future therefore, please provide an evaluation of the effects from introduction of invasive species.
- 3) Page 5-31, Line 1: This there any predator control of non-listed species (e.g., migratory birds)? What interactions are you referring to in Line 11?

4) Page 5-39, Line 24: As mentioned previously the use of carbaryl is an interrelated activity with direct and indirect effects to aquatic organisms and birds and will need to be analyzed in the BA.

5) Page 7-4, Line 31: According to the information presented in the slideshow (see link: http://www.protectourshoreline.org/slideshow/POS_ShellfishAquacultureConcerns.pdf) There have been 3 documented occurrences of bald eagles trapped in predator exclusion netting. Although bald eagles have been de-listed, they are still protected under the Bald and Golden Eagle protection Act. It is very likely that other birds get caught in anti-predator netting even though it is not reported (I wouldn't expect these incidents to be reported often). Therefore, anti-predator netting is a hazard for avian species and should be considered such in the effects analysis.