



Determinations for Data and Information Submitted for Use in the Water Quality Assessment

Water Quality Program

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Olympia, Washington

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Table of Contents

Background	4
Purpose of the Water Quality Assessment	4
Credible data laws and policies in Washington	4
Water Quality Assessment listing methodology.....	5
Submittals Used in the WQA	7
Submittals Not Used in the WQA	11
Table 1: Study location was not within, near or representative of Washington waters and/or study includes organisms not found in Washington waters.	12
Table 2: The study does not document that impairment of an existing or designated use is related to the environmental alteration on that same waterbody segment or grid.	17
Table 3: Modeled results are not appropriate to determine that standards in Washington are being met at specific waters.	50
Table 4: Submittals from third parties did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and/or study methods & data not documented or readily available.....	52
Table 5: The study submitted falls outside of the WQA cycle window of 2006 – 2017.....	56
Table 6: Data associated with a submittal was considered for listing, but did not show exceedances of the standards, or did not meet data or quality assurance requirements in accordance with credible data statutes and policies.	67
Table 7: Submittal is not a water quality study, and not related to determining ambient water conditions.....	82

Background

In 2016 and 2018 Ecology conducted a public call-for-data to seek readily available data to use in the next Water Quality Assessment (WQA) cycle. In addition to numeric data submittals to the agency's Environmental Information Management (EIM) database, Ecology also received submittals of information and data outside of EIM to consider for use in the WQA for listing decisions based on narrative standards.

Purpose of the Water Quality Assessment

To understand how the use of narrative submittals in the WQA were determined, it is important to highlight the purpose of Washington's Water Quality Assessment. The federal Clean Water Act (CWA) at sections 303(d) and 305(b) require Washington State to assess the water quality status of Washington state waters and periodically report on the status to the Environmental Protection Agency (EPA). Ecology develops the Water Quality Assessment to fulfill this requirement. The purpose of the Assessment is to determine if readily available data demonstrates that the water quality for the given waterbody supports the designated uses described in the water quality standards. Ecology accomplishes this by applying methodologies to compare available data and information to water quality standards for surface waters and sediments, following credible data protocols and requirements.

Washington's Water Quality Assessment is one of several water quality programs in the state that serve to protect uses (such as aquatic life and human health) by protecting, maintaining and restoring waterbodies. Category 5 constitutes the 303(d) list that EPA will review and approve or disapprove pursuant to federal regulations. Federal laws at 40 CFR 130.7(b)(1) state that "[AUs] must be placed in Category 5 when, based on existing and readily available data and/or information, technology-based effluent limitations required by the [Clean Water] Act, more stringent effluent limitations, and other pollution control requirements are not sufficient to implement an applicable water quality standard and a TMDL is needed."

Waters identified in Category 5 will need a TMDL, pollution control program, or other regulatory action(s) to bring the water into compliance with the water quality standards. Wastewater discharges into a Category 5 water may require stricter or additional limits to ensure the waterbody is not further polluted by the pollutant parameter it is listed for.

Credible data laws and policies in Washington

Washington State law (Water Quality Data Act codified in [RCW 90.48.570](https://app.leg.wa.gov/RCW/default.aspx?cite=90.48.570)² through 90.48.590) requires Ecology to use credible data to determine whether any water of the state is to be placed on or removed from any section 303(d) list and whether any surface water of the state is supporting its designated use or other classification. Washington's Credible Data Policy ([Policy](#))

² <https://app.leg.wa.gov/RCW/default.aspx?cite=90.48.570>

[1-11, Chapter 2](#)³) describes the Quality Assurance (QA) measures, guidance, regulations, and existing policies that help ensure the credibility of data and other information used in agency actions relating to surface water quality. This policy applies when evaluating data and information for use in agency decisions when the quality of a surface water of the state is at issue. It is also intended as guidance for all parties interested in submitting data for consideration in decisions related to water quality.

Data are considered credible data if:

- Appropriate quality assurance and quality control procedures were followed and documented in collecting and analyzing water quality samples;
- The samples or measurements are representative of water quality conditions at the time the data were collected;
- The data consist of an adequate number of samples based on the objectives of the sampling, the nature of the water in question, and the parameters being analyzed; and
- Sampling and laboratory analysis conform to methods and protocols generally acceptable in the scientific community as appropriate for use in assessing the condition of the water.

Water Quality Assessment listing methodology

Washington's assessment listing protocols are described in "Washington's Water Quality Assessment Listing Methodology to Meet Clean Water Act Requirements" ([Policy 1-11, Chapter 1](#)⁴). This policy describes the methodologies for how waterbody segments are assessed for determining the status of water quality, using the state's water quality standards as the basis. In addition to the credible data laws and policies, Ecology applies this policy when evaluating data and information for the Assessment to meet the federal Clean Water Act reporting requirements. The policy is also intended as guidance for all parties that submit data for the Assessment process or are planning data collection efforts for use in future assessments. This policy provides guidance for both numeric data submittals and submittals based on narrative standards.

Study submittals to determine impairment based on narrative standards

Studies and information submitted to Ecology for consideration of complying with narrative water quality standards were reviewed by Ecology to determine if they meet narrative listing requirements in Policy 1-11, Chapter 1. At the section under 1E. Data and Information Submittals, it states that information and data provided in the submittal must meet the following two conditions:

³ <https://ecology.wa.gov/DOE/files/3b/3bf2eaab-090b-49d1-8ff4-fd8c82960f7a.pdf>

⁴ <https://apps.ecology.wa.gov/publications/SummaryPages/1810035.html>

1. Documentation of a designated use impairment in the waterbody, AND
2. Documentation that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid.

Use of numeric data associated with study submittals to meet narrative standards

It is important to note that if a narrative submittal was considered for use in the WQA and numeric data associated with the narrative submittal has already resulted in a listing based on the numeric data, then the numeric listing will prevail as the primary reason for the listing (in other words, we did not create an additional listing based on narrative criteria).

It is also important to note that Ecology's review of narrative submittals applied the listing requirements noted above for compliance with narrative criteria in making a determination that the submittal could be used to make a listing based on narrative criteria. If numeric water quality data associated with, or related to, the study was already in EIM or the federal Water Quality Portal, it would have been accessed directly, regardless of whether or not the narrative submittal was used.

Third party data submittals

Data and information submitted by third parties for use in the WQA must include documentation addressing the accuracy and completeness of the information submitted to Ecology, including documentation from the original data submitter indicating that the required QA objectives were met. For the purpose of the WQA, a "third party" is defined as an entity outside of the organization responsible for collecting the data, and thus is not directly responsible for the collection and quality control assurances that are part of a QAPP. The decision to include data submitted by a third party will be at the sole discretion of Ecology and will only be included in the WQA if there is adequate information provided to determine that the data are of sufficient quality to meet credible data requirements and are representative of water quality conditions at the monitoring location.

Submittals Used in the WQA

Ecology considered all of the submittals to determine if they could be used in the WQA. A list of submittals that meet credible data statuses and Policy 1-11 listing requirements and are included in the WQA are listed below.

It is important to note that if a narrative submittal was considered for use in the WQA and numeric data associated with the narrative submittal has already resulted in a listing based on the numeric data, then the numeric listing will prevail as the primary reason for the listing (in other words, we did not create an additional listing based on narrative criteria).

The following submittals were determined to meet the listing requirements for use for the WQA::

- [Ecology, South Puget Sound Dissolved Oxygen Study Interim Nutrient Load Summary for 2006-2007 \(Jan 2011\)](#)⁵.

Notes on the submittal for use in the WQA: *There are over 500 listings from numerous water quality studies related to the Salish Sea Dissolved Oxygen Model, the South Puget Sound Dissolved Oxygen Study, and other studies related to The Puget Sound Nutrient Reduction Project. Ambient monitoring data collected as part of this study for ammonia, dissolved oxygen, temperature, and pH were used in the WQA in accordance with Policy 1-11 (StudyID MROB0004). See [Puget Sound Reduction Project webpage](#)⁶*

- [Ecology, South Puget Sound Dissolved Oxygen Study Key Findings on Nitrogen Sources from the Data Report \(Nov. 2008\)](#)⁷.

Notes on the submittal for use in the WQA: *This is a fact sheet associated with the South Puget Sound Dissolved Oxygen Study (StudyID MROB0004).*

- [Ecology, South Puget Sound Dissolved Oxygen Study Water Quality Model Calibration and Scenarios \(March 2014\)](#).⁸

Notes on the submittal for use in the WQA: *Ambient monitoring data collected as part of this study for ammonia, dissolved oxygen, temperature, and pH were used in the WQA in accordance with Policy 1-11 (StudyID MROB0004).*

- [Tanner, D.Q., Bragg, H.M., and Johnston, M.W., U.S. Geological Survey Open-File Report 2012-1256: Total dissolved gas and water temperature in the lower Columbia River,](#)

⁵ <https://apps.ecology.wa.gov/publications/publications/1103001.pdf>

⁶ <https://ecology.wa.gov/Water-Shorelines/Puget-Sound/Helping-Puget-Sound/Reducing-Puget-Sound-nutrients/Puget-Sound-Nutrient-Reduction-Project>

⁷ <https://apps.ecology.wa.gov/publications/publications/0810099.pdf>

⁸ <https://apps.ecology.wa.gov/publications/publications/1403004.pdf>

[Oregon and Washington, water year 2012-Quality-assurance data and comparison to water-quality standards \(2013\).](#)⁹

Notes on the submittal for use in the WQA: Listings on the Washington side of the Columbia are in Category 4A because total dissolved gas and temperature TMDLs exist for the Columbia River. Read the [TMDL for Temperature in the Columbia and Lower Snake Rivers](#)¹⁰

Read the [TMDL for the Lower Columbia River Total Dissolved Gas](#).¹¹

- [USGS, NASQAN National Stream Quality Accounting Network - Data Portal.](#)¹²
<https://nrtwq.usgs.gov/nwqn/#/>

Notes on the submittal for use in the WQA: *This data was accessed through the federal water quality portal. See StudyID: National Water Quality Assessment Program (NAWQA).*

- [Ecology, Sediment Quality Assessment of Puget Sound's Hood Canal Region, 2004](#)¹³.

Notes on the submittal for use in the WQA: *This report is associated with EIM Study ID PSAMP_SP. Data is from 1997-2014 and contains both sediment chemical and bioassay data.*

- [Ecology, Sediment Quality Assessment of the Hood Canal Region of Puget Sound, 2004 Spatial/Temporal Sediment Monitoring Element of the Puget Sound Assessment and Monitoring Program \(Feb. 2010\)](#)¹⁴

Notes on the submittal for use in the WQA: *This study was from the same data set as the study above (Ecology Publication #10-03-006). Data is associated with EIM Study ID PSAMP_SP.*

- [Carey, A.J., L.A. Niewolny, J.A. Lanksbury, and J.E. West. 2014. Toxic Contaminants in Dungeness crab \(*Metacarcinus magister*\) and Spot Prawn \(*Pandalus platyceros*\) from Puget Sound, Washington, USA. Washington Department of Fish and Wildlife; WDFW Report Number FPT 14-06. Olympia, Washington. 121pp.](#)¹⁵

Notes on the submittal for use in the WQA: *This study was included in the 2018 WQ Assessment under the EIM Study ID C1200226.*

⁹ <https://pubs.usgs.gov/of/2012/1256/pdf/ofr20121256.pdf>

¹⁰ <https://www.epa.gov/sites/production/files/2020-05/documents/r10-tmdl-columbia-snake-temperature-final-05182020-web.pdf>

¹¹ <https://apps.ecology.wa.gov/publications/SummaryPages/0203004.html>

¹² <https://nrtwq.usgs.gov/nwqn/#/>

¹³ <https://apps.ecology.wa.gov/publications/publications/1003006.pdf>

¹⁴ <https://apps.ecology.wa.gov/publications/publications/1003005.pdf>

¹⁵ <https://wdfw.wa.gov/publications/01608>

- [English Sole Species Monitored: Toxic Contaminants in Puget Sound Fish and Shellfish Washington Department of Fish & Wildlife.pdf.](#)¹⁶

Notes on the submittal for use in the WQA: *Data from this program (2007-2017 data) was included in the 2018 WQ Assessment under the EIM Study ID WDFW_TBIO_S_EngSole.*

- [Lanksbury, J.A., A.J. Carey, L.A. Niewolny, and J.E. West. 2013. Mussel Watch Pilot Expansion 2012/2013: a study of toxic contaminants in blue mussels \(Mytilus trossulus\) from Puget Sound Washington, USA. Washington Department of Fish and Wildlife. Olympia, Washington. 55pp.](#)¹⁷

Notes on the submittal for use in the WQA: *This study was included in the 2018 WQ Assessment under the EIM Study ID WDFW 11-1916.*

- [Salmon Species Monitored: Toxic Contaminants in Puget Sound Fish and Shellfish Washington Department of Fish & Wildlife.pdf.](#)¹⁸

Notes on the submittal for use in the WQA: *This submittal is a website that provides information on their salmon monitoring program. For the 2018 WQ Assessment, Resident Blackmouth Chinook Salmon data collected 2016-2017 by WDFW was used. See EIM Study ID: WDFW_TBIO_S_Chinook.*

- [Ecology, Toxics in Surface Runoff to Puget Sound Phase 3 Data and Load Estimates \(April 2011\).](#)¹⁹

Notes on the submittal for use in the WQA: *Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington. This study was part of the Phase 3 Puget Sound Toxics Loading Assessment, and was included in the 2018 WQ Assessment under the EIM Study ID PSTox001.*

- [Ecology, Control of Toxic Chemicals in Puget Sound Characterization of Toxic Chemicals in Puget Sound and Major Tributaries, 2009-10 \(Jan. 2011\).](#)²⁰

Notes on the submittal for use in the WQA: *This study was part of the Phase 3 Puget Sound Toxics Loading Assessment, and was included in the 2018 WQ Assessment under the EIM Study ID RCOO0010.*

- [Ecology, Control of Toxic Chemicals in Puget Sound: Assessment of Selected Toxic Chemicals in the Puget Sound Basin, 2007-2011 \(Nov. 2011\).](#)²¹

¹⁶ <https://wdfw.wa.gov/species-habitats/science/marine-toxics/species-monitored>

¹⁷ <http://wdfw.wa.gov/publications/01597/>

¹⁸ <https://wdfw.wa.gov/species-habitats/science/marine-toxics/species-monitored>

¹⁹ <https://apps.ecology.wa.gov/publications/publications/1103010.pdf>

²⁰ <https://apps.ecology.wa.gov/publications/publications/1103008.pdf>

²¹ <https://apps.ecology.wa.gov/publications/publications/1103055.pdf>

Notes on the submittal for use in the WQA: *This report is a synthesis of all 3 phases of the Puget Sound Toxics Loading Assessment (PSTLA) program which existed from 2007-2011. Projects where data were collected/created were only included in Phase 3. Other studies were not included in the assessment because they didn't meet data requirements.*

- [Ecology, Washington State Lake Database \(accessed February 2020\)](#)²².

Notes on the submittal for use in the WQA: *Ecology surveys between 2006 – 2017 were used to verify non-native aquatic plants. Listings were placed in Category 4C.*

- National Ocean and Atmosphere Administration's Pacific Marine Laboratory (NOAA/PMEL) West Coast Ocean Acidification monitoring pH data values from research surveys, submitted via 6/30/2016 correspondence to Ecology. Data were collected by jointly by University of Washington Applied Physicals Laboratory (UW/APL), Northwest Association of Networked Ocean Observing Systems (NANOOS), and Washington Ocean Acidification Center (WOAC) cruises.

Notes on the submittal for use in the WQA: *All submitted pH data collected within Washington State waters were compared against Washington's pH numeric criteria for aquatic life and incorporated into the WQA.*

²² <https://apps.ecology.wa.gov/coastalatlantools/LakeDetail.aspx>

Submittals Not Used in the WQA

Ecology considered all of the submittals to determine if they could be used in the WQA. Ecology's review of narrative submittals identified numerous submittals that were determined to not meet the listing requirements for use for the WQA because, for one or more reasons, the submittal did not meet credible data requirements described in statutes (RCW 90.48.570-590) and WQP Policy 1-11, Chapter 1: *Washington's Water Quality Assessment Listing Methodology to Meet Clean Water Act Requirements* and Chapter 2: *Ensuring Credible Data for Water Quality Management*.

It is important to note that submittals that were not used to make a listing based on narrative criteria may have numeric data associated with the submittal. If numeric water quality data associated with, or related to, the study was already in EIM or the federal Water Quality Portal, it would have been accessed directly, regardless of whether or not the narrative submittal was used.

The following tables provide a list of submittals that were determined to not meet the listing requirements for use for the WQA:

Table 1: Study location was not within, near or representative of Washington waters and/or study includes organisms not found in Washington waters (*examples: study located in another state or country, study uses species not found in Washington, study is on a global scale*).

Table 2: The study does not document that impairment of an existing or designated use is related to the environmental alteration on that same waterbody segment or grid (*examples: aquatic population comparison studies, wildlife health studies, lab studies*).

Table 3: Modeled results are not appropriate to determine that standards in Washington are being met at specific waters (Note: any numeric data on specific waterbody segments associated with the model would be used if accessible in EIM or federal WQ portal).

Table 4: Submittals from third parties did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and/or study methods & data not documented or readily available, (*examples: news articles, fact sheets, websites*).

Table 5: The study submittal falls outside of the WQA cycle window of 2006 – 2017.

Table 6: Data associated with a submittal was considered for listing, but did not show exceedances of the standards, or did not meet data or quality assurance requirements in accordance with credible data statutes and policies (*examples: quality assurance of data not provided, study does not validate exceedance of numeric or violation of narrative standards*).

Table 7: Submittal is not a water quality study, and not related to determining ambient water conditions. (*examples: vessel traffic study, fish growth comparisons, species descriptions, efficacy of research methods, endangered species declarations*).

Table 1: Study location was not within, near or representative of Washington waters and/or study includes organisms not found in Washington waters.

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>NMFS, Lower Columbia River Conservation and Recovery Plan for Oregon Populations of Salmon and Steelhead (2010);112 https://www.fisheries.noaa.gov/resource/document/recovery-plan-lower-columbia-river-coho-salmon-lower-columbia-river-chinook</p>	<p>Focus of website, in Oregon, is unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>Incardona, J. et al. 2015. Very low embryonic crude oil exposures cause lasting cardiac defects in salmon and herring. Scientific Reports. 5:13499. DOI: 10.1038/srep13499. https://ui.adsabs.harvard.edu/abs/2015NatSR...513499I/abstract</p>	<p>This study was not specific to Washington waters. It reviews data and information from the Exxon Valdez oil spill and long term effects on salmon and herring.</p>
<p>Graham and Brun, Determining Lamprey Species Composition, Larval Distribution, and Adult Abundance in the Deschutes River, Oregon, Subbasin (2007);NMFS, Columbia River Estuary Recovery Plan Module for Salmon and Steelhead (2011);111 https://www.osti.gov/biblio/897845</p>	<p>Focus of study, in Oregon, is unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>NMFS, Conservation and Recovery Plan for Oregon Steelhead Populations in the Middle Columbia River Steelhead Distinct Population Segment (2009);113 https://www.fisheries.noaa.gov/resource/document/recovery-plan-middle-columbia-river-steelhead-distinct-population-segment</p>	<p>Focus of the plan, in Oregon, is unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>COSEWIC. 2008. COSEWIC assessment and update status report on the Killer Whale <i>Orcinus orca</i>, Southern Resident population, Northern Resident population, West Coast Transient population, Offshore population and Northwest Atlantic / Eastern Arctic population, in Canada. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/killer-whale-2008.html</p>	<p>This report from Canada is not specific to Washington waters.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Garrett, C., and Ross, P.S. 2010. Recovering resident killer whales: A guide to contaminant sources, mitigation, and regulations in British Columbia. Can. Tech. Rep. Fish. Aquat. Sci. 2894: xiii + 224 p. https://www.arlis.org/docs/vol1/D/690987332.pdf</p>	<p>This report from Canada is not specific to Washington waters. Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington. This study looks at the source, transport and fate features of contaminants in the British Columbia marine environment.</p>
<p>Alonso, M. et al. 2014. Anthropogenic (PBDE) and naturally-produced (MeO-PBDE) brominated compounds in cetaceans — A review. Science of The Total Environment. Volume 481, 15 May 2014, Pages 619-634. https://www.sciencedirect.com/science/article/abs/pii/S0048969714001843</p>	<p>This is a global comparison study that focuses on brominated compounds in cetaceans. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>U.S.G.S., Woods Hole Coastal and Marine Science Center, Didemnum vexillum, Triangle, Umpqua River mouth, Oregon, Images;98 https://www.usgs.gov/centers/whcmssc</p>	<p>The reference to the Oregon coast is outside of Washington waters. Focus of website is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Brette, F. et al. 2016. A Novel Cardiotoxic Mechanism for a Pervasive Global Pollutant. Scientific Reports. 7:41476. DOI: 10.1038/srep41476. https://www.nature.com/articles/srep41476</p>	<p>This global study based on the Deepwater Horizon disaster in the Gulf of Mexico is not specific to Washington waters. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Kidd, K. et al. 2007. Collapse of a fish population after exposure to a synthetic estrogen. PNAS. May 22, 2007. vol. 104 No. 21, 8897–8901. https://www.pnas.org/content/104/21/8897</p>	<p>This study was located off of northwestern Ontario, Canada in the Experimental Lakes Area, and is not specific to Washington waters. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>U.S.G.S., Woods Hole Coastal and Marine Science Center, Didemnum vexillum - Oregon Coast Occurrences and Images;97 https://www.usgs.gov/centers/whcmssc</p>	<p>The reference to the Oregon coast is outside of Washington waters. Focus of website is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>National Ocean and Atmosphere Administration’s Pacific Marine Laboratory (NOAA/PMEL) West Coast Ocean Acidification monitoring pH data values from research surveys, submitted via 6/30/2016 correspondence to Ecology. Submittal includes pH data collected on NOAA/PMEL-led West Coast Ocean Acidification cruises in 2007, 2011, 2012 and 2013.</p>	<p>None of the 129 monitoring locations were located within Washington State waters. All monitoring locations were several miles off the Pacific Coast, spanning from British Columbia, Canada to the southern Baja California Peninsula, Mexico. The jurisdiction of Washington’s water quality standards apply 3 miles offshore (in accordance with the provisions in the federal Clean Water Act in Section 502).</p>
<p>National Ocean and Atmosphere Administration’s Pacific Marine Laboratory (NOAA/PMEL) West Coast Ocean Acidification (WCOA) cruise, information on biological impacts on pteropods on the WOAC cruises, 2011 and 2013, submitted via 6/30/2016 correspondence to Ecology. Data consists of pteropod shell damage characterization and calculated aragonite saturation based on samples collected from 2011 and 2013 NOAA/PMEL cruises of Pacific Coast waters.</p>	<p>None of the pteropod monitoring locations from this submittal were located within Washington State waters. All monitoring locations were several miles off the Pacific Coast. The jurisdiction of the Washington’s water quality standards apply 3 miles offshore (in accordance with the provisions in the federal Clean Water Act in Section 502).</p>
<p>Center for Biological Diversity, data and information submittal to list Tatoosh Island (48.3933°N, 124.7384°W) as impaired for ocean acidification, submitted via 6/24/2016 correspondence to Ecology.</p>	<p>The monitoring site where the Wootton study was conducted is located within the boundaries of the Makah Indian reservation. The monitoring site is not subject to Washington State’s authority because it is located within a tribal boundary. Tribes have independent authority for setting water quality standards and implementing regulations for waters on reservation lands under the Clean Water Act. In addition, this dataset was reviewed by Ecology’s marine monitoring unit as part of the 2010 Water Quality Assessment and determined that the dataset did not provide any pH data showing impairments of Washington water quality criteria. The study also did not provide conclusive evidence that the cause of the pH change is due to human sources.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Center for Biological Diversity, data and information submittal to list Cape Elizabeth OA mooring (47.35°N, 124.73°W) as impaired for ocean acidification, submitted via 6/24/2016 correspondence to Ecology.</p> <p>The Cape Elizabeth station is a NOAA National Data Buoy Center Buoy off the Washington coast.</p>	<p>This mooring location is located 45 nautical miles northwest of Aberdeen, Washington and is well outside of Washington coastal waters. The jurisdiction of the Washington’s water quality standards apply 3 miles offshore (in accordance with the provisions in the federal Clean Water Act in Section 502). Further, even if the mooring were within the jurisdiction of state waters, Ecology disagrees that the human caused variation of 0.2 units within the acceptable range of 7.0 – 8.5 units are being violated. No pH data were collected at this mooring. The submitter estimated pH based on estimates of total alkalinity that were based on temperature and salinity data from the mooring. Ecology does not have an established method for the conversion of salinity measurements to total alkalinity or conversion of pCO_2 to infer pH for purposes of the WQA. Additionally, a comparison of estimated pre-industrial pH values based on assumed temporal trends to estimated current pH values is not a credible analysis for purposes of listing in the WQA.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p data-bbox="203 258 883 520">Center for Biological Diversity, data and information submittal to list La Push OA mooring (47.97°N, - 124.95°W) as impaired for ocean acidification, submitted via 6/24/2016 correspondence to Ecology. The La Push station is a permanent ocean observing array off the outer coast of Washington near La Push.</p> <p data-bbox="203 604 867 678">Submitted by the Center for Biological Diversity via 6/24/2016 correspondence to Ecology.</p>	<p data-bbox="906 258 1490 1182">The La Push OA mooring location is well outside of Washington coastal waters. The jurisdiction of the Washington’s water quality standards apply 3 miles offshore (in accordance with the provisions in the federal Clean Water Act in Section 502). Further, even if the mooring were within the jurisdiction of state waters, Ecology disagrees that the human caused variation of 0.2 units within the acceptable range of 7.0 – 8.5 units are being violated. No pH data were collected at this mooring. The submitter estimated pH based on estimates of total alkalinity that were based on temperature and salinity data from the mooring. Ecology does not have an established method for the conversion of salinity measurements to total alkalinity or conversion of pCO_2 to infer pH for purposes of the WQA. Additionally, a comparison of estimated pre-industrial pH values based on assumed temporal trends to estimated current pH values is not a credible analysis for purposes of listing in the WQA.</p>

Table 2: The study does not document that impairment of an existing or designated use is related to the environmental alteration on that same waterbody segment or grid.

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Columbia Basin Bulletin, Study Details Toxic Accumulation in Puget Sound Seabirds Eating Fish, Including Columbia Chinook (Oct. 31, 2014) citing study by Northwest Fisheries Science Center²¹</p> <p>https://www.cbulletin.com/study-details-toxic-accumulation-in-puget-sound-seabirds-eating-fish-including-columbia-chinook/</p>	<p>Intent of the article was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The article is on comparison of seabirds that consume fish on the outer Washington coast compared with seabirds nesting in Puget Sound.</p>
<p>Ecology, A Toxics-Focused Biological Observing System for Puget Sound; Developed by the Washington Department of Fish and Wildlife and NOAA Fisheries for the Puget Sound Partnership (Jan. 2010)²³</p> <p>https://apps.ecology.wa.gov/publications/publications/1010004.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study looks at biologically-based monitoring as an important component of efforts to protect estuaries from toxic chemicals.</p>
<p>Ecology, Control of Toxic Chemicals in Puget Sound Phase 2: Sediment Flux/Puget Sound Sediments Bioaccumulation Model – Derived Concentrations for Toxics Final Summary Technical Report (May 2009)²⁵</p> <p>https://apps.ecology.wa.gov/publications/publications/0909069.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The goal of the project was to inform a source control strategy to reduce the loading of toxics into Puget Sound.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Ecology, Phase 1: Initial Estimate of Toxic Chemical Loadings to Puget Sound (Oct. 2007)26</p> <p>https://apps.ecology.wa.gov/publications/publications/0710079.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This effort was initiated by a team of toxic contamination experts from various governmental entities around Puget Sound to assess toxic contaminant loading to Puget Sound so that agencies can select how and where to target toxics reduction efforts to provide the most benefit for Puget Sound.</p>
<p>Ecology, Persistent Organic Pollutants in Marine Plankton from Puget Sound (March 2011)32</p> <p>https://apps.ecology.wa.gov/publications/publications/1110002.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This project was designed to evaluate the extent and magnitude of Persistent Organic Pollutant (POP) exposure in organisms that occupy the lowest trophic levels in the pelagic ecosystem of Puget Sound, and to gain a better understanding of the pathways of contaminants within this food web.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>O'Neill, S., et. al. 2015. Toxic contaminants in juvenile Chinook salmon (<i>Oncorhynchus tshawytscha</i>) migrating through estuary, nearshore and offshore habitats of Puget Sound. Washington Department of Fish and Wildlife, Report FPT 16-02.</p> <p>https://wdfw.wa.gov/publications/01796</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The study addresses the general hypothesis that chemicals released into Puget Sound from human activities and development reduces the health and productivity of salmon and their food supply. Data associated with this study was considered for use in the WQA.</p>
<p>Ecology, Control of Toxic Chemicals in Puget Sound Evaluation of Loading of Toxic Chemicals to Puget Sound by Direct Groundwater Discharge (April 2011)35</p> <p>https://apps.ecology.wa.gov/publications/publications/1103023.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This project relates to work done from 2010-2011, when the Washington State Department of Ecology developed quantitative estimates of the annual toxic chemical load delivered to Puget Sound by direct groundwater discharge.</p>
<p>Puget Sound Ecosystem Monitoring Program Toxics Work Group. 2017. 2016 Salish Sea Toxics Monitoring Review: A Selection of Research. C.A. James, J. Lanksbury, D. Lester, S. O'Neill, T. Roberts, C. Sullivan, J. West, eds. Puget Sound Ecosystem Monitoring Program. Tacoma, WA.</p> <p>https://pspwa.app.box.com/s/0luxyi979sz3d9cx90o1vr4ot6axqwk8/file/391719053529</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This work group review provided a summary of toxics research in the Salish Sea.</p>

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<p>USFWS, Impacts of Stormwater Runoff on Coho Salmon in Restored Urban Streams (2007)74</p> <p>https://your.kingcounty.gov/dnrp/library/water-and-land/science/seminars/October-2007/Pre-Spawn-Mortality-of-Coho-Salmon-in-Restored-Urban-Streams.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study focused on impacts to coho salmon in restored urban streams.</p>
<p>USFWS, Information Sheet, Summary of Kootenai River White Sturgeon Studies Upper Columbia Fish and Wildlife Office (2007/2008)73</p> <p>https://www.fws.gov/idaho/promo.cfm?id=177175835</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The studies focus specifically on white sturgeon, and evaluate potential effects to the fish from chlorine and copper in the Kootenai and Columbia Rivers, as well as three herbicides proposed for control of Eurasian watermilfoil in the Kootenai River.</p>
<p>NMFS, Landscape Ecotoxicology of Coho Salmon Spawner Mortality in Urban Streams (Aug. 17, 2011)76</p> <p>https://www.fws.gov/wafwo/documents/PR_LandscapeEcotoxofCohoSalmonSpawner.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study found that spawner mortality was most closely and positively correlated with the relative proportion of local roads, impervious surfaces, and commercial property within a basin.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Ecology, Relationships Between Sediment Quality, Dissolved Oxygen, and Benthic Invertebrates in Hood Canal (Dec. 2007)85</p> <p>https://apps.ecology.wa.gov/publications/documents/0703048.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. Any D.O. and sediment data in EIM was considered and used for the WQA. As part of the Hood Canal Dissolved Oxygen Program, scientists analyzed data from Hood Canal studies conducted from 1932 to 2005. These data were examined to evaluate their relationship to each other and to respond to the question “How do low dissolved oxygen levels affect the benthic infauna in Hood Canal?”</p>
<p>Ecology, Relationships between the Composition of the Benthos and Sediment and Water Quality Parameters in Hood Canal Task IV – Hood Canal Dissolved Oxygen Program (Dec. 2007)87</p> <p>https://apps.ecology.wa.gov/publications/documents/0703040.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. Any D.O. and sediment data in EIM was considered and used for the WQA.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Ecology, Chemical Contamination and Toxicity in Sediments from Hood Canal, WA (1952 – 2005) 88</p> <p>https://apps.ecology.wa.gov/publications/documents/1003006.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. Any D.O. and sediment data in EIM was considered and used for the WQA. This document is a summary for scientists of the findings of the study "Relationships between the Composition of the Benthos and Sediment and Water Quality Parameters in Hood Canal". Analysis of Hood Canal data collected from 1932 to 2005 revealed that sediment texture was the most important factor controlling invertebrate community composition, followed by dissolved oxygen, organic carbon content of the sediments, and station depth.</p>
<p>Ecology, Relationships between Dissolved Oxygen Levels and Benthos in Hood Canal90</p> <p>https://apps.ecology.wa.gov/publications/documents/0703040.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. Any D.O. and sediment data in EIM was considered and used for the WQA. This document is a summary for the general public of the findings of the study "Relationships between the Composition of the Benthos and Sediment and Water Quality Parameters in Hood Canal". Steps were taken in this report to develop initial critical dissolved oxygen thresholds used to determine when benthic infauna are at risk.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>NMFS, Recurrent Die-Offs of Adult Coho Salmon Returning to Spawn in Puget Sound Lowland Urban Streams (Dec. 14, 2011)77</p> <p>https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0028013</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. Several Seattle-area streams in Puget Sound were the focus of habitat restoration projects in the 1990s. Post-project effectiveness monitoring surveys revealed anomalous behaviors among adult coho salmon returning to spawn in restored reaches.</p>
<p>O'Neill, S.M., A.J. Carey, J.A. Lanksbury, L.A. Niewolny, G.M. Ylitalo, L.L. Johnson, J.E. West. 2015. Toxic contaminants in juvenile Chinook salmon (<i>Oncorhynchus tshawytscha</i>) migrating through estuary, nearshore and offshore habitats of Puget Sound. Washington Department of Fish and Wildlife; WDFW Report Number FPT 16-02. Olympia, Washington. 132pp.</p> <p>https://wdfw.wa.gov/publications/01796</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study was designed to provide a synoptic WQA of contaminant exposure for major populations of juvenile Chinook salmon from Puget Sound as the fish migrate from their freshwater to marine habitats.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>West, J.E., J.A. Lanksbury, and S.M. O'Neill. 2011. Control of Toxic Chemicals in Puget Sound Phase 3: Persistent Organic Pollutants in Marine Plankton from Puget Sound. Washington Department of Fish and Wildlife. Olympia, Washington. 70pp</p> <p>https://wdfw.wa.gov/publications/01363</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This project was designed to evaluate the extent and magnitude of Persistent Organic Pollutant (POP) exposure in organisms that occupy the lowest trophic levels in the pelagic ecosystem of Puget Sound, and to gain a better understanding of the pathways of contaminants within this food web.</p>
<p>O'Neill, S.M. and J.E. West. 2007. Persistent Bioaccumulative Toxics in the Food Web. Pages 140-148; 151-156 in Puget Sound Action Team, editors. 2007 Puget Sound Update: Ninth Report of the Puget Sound Assessment and Monitoring Program. Washington Department of Fish and Wildlife; Publication Number PSAT 07-02. Olympia, Washington. 276pp.</p> <p>https://wdfw.wa.gov/publications/01038</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This is a summary technical report of the conditions of Puget Sounds as measured by ongoing monitoring and research activities of the Puget Sound Assessment and Monitoring Program (PSAMP).</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>West, J.E., and S.M. O'Neill. 2007. Thirty years of persistent bioaccumulative toxics in Puget Sound: time trends of PCBs and PBDE flame retardants in three fish species. 2007 Research in the Georgia Basin and Puget Sound Conference. Puget Sound Action Team. Vancouver, B.C. Washington Department of Fish and Wildlife, Olympia, Washington</p> <p>https://wdfw.wa.gov/publications/01038</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. In order to better understand the fate and transport of PCBs in the Puget Sound ecosystem, and to assess the recent trends this project observed PSAMP monitoring within a larger historical context, and combined and analyzed PSAMP monitoring data with a number of previously published studies and unpublished data dating back to 1975.</p>
<p>O'Neill, S.M., G.M. Ylitalo, J.E. West., J. Bolton, C.A. Sloan, and M.M. Krahn. 2006. Regional patterns of persistent organic pollutants in five Pacific salmon species (<i>Oncorhynchus</i> spp.) and their contributions to contaminant levels in northern and southern resident killer whales (<i>Orcinus orca</i>). Presentation at 2006 Southern Resident Killer Whale Symposium. Seattle, Washington. Washington Department of Fish and Wildlife, Olympia, Washington.</p> <p>https://wdfw.wa.gov/publications/01034</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The main objective of this study was to determine if Pacific salmon had species specific regional body burdens of contaminants that could differentially affect contaminant levels in northern and southern residents.</p>
<p>Meador, J. 2013. Perspective: Do chemically contaminated river estuaries in Puget Sound (Washington, USA) affect the survival rate of hatchery-reared Chinook salmon? <i>Can. J. Fish. Aquat. Sci.</i> 71: 162–180 (2014) dx.doi.org/10.1139/cjfas-2013-0130</p> <p>https://cdnsiencepub.com/doi/10.1139/cjfas-2013-0130</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This was a comparative study of hatchery-reared, ocean-type juvenile Chinook salmon with coho salmon from the same hatcheries.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Meador, J., A. Yeh, G. Young, and E. Gallagher. 2016. Contaminants of emerging concern in a large temperate estuary. <i>Environ Pollut.</i> 2016 June ; 213: 254–267. doi:10.1016/j.envpol.2016.01.088.</p> <p>https://www.sciencedirect.com/science/article/abs/pii/S0269749116300884</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study focused on studying contaminants of emerging concern (CECs) in effluent from two wastewater treatment plants and whole-body juvenile Chinook salmon (<i>Oncorhynchus tshawytscha</i>) and Pacific staghorn sculpin (<i>Leptocottus armatus</i>) in estuaries receiving effluent, to gain information on detection of CECs.</p>
<p>Meador, J, A. Yeh, and E. Gallagher. 2018. Adverse metabolic effects in fish exposed to contaminants of emerging concern in the field and laboratory. <i>Environmental Pollution</i>, Volume 236, May 2018, Pages 850-861.</p> <p>https://pubmed.ncbi.nlm.nih.gov/29471284/</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study focused on studying contaminants of emerging concern (CECs) in effluent from two wastewater treatment plants and whole-body juvenile Chinook salmon (<i>Oncorhynchus tshawytscha</i>) and Pacific staghorn sculpin (<i>Leptocottus armatus</i>) in estuaries receiving effluent, to gain information on detection of CECs.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Gockel, C. and T. Mongillo. 2013. Potential Effects of PBDEs on Puget Sound and Southern Resident Killer Whales: A Report on the Technical Workgroups and Policy Forum.</p> <p>https://www.eopugetsound.org/sites/default/files/features/resources/PBDEs_Puget_Sound_Report.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. In coordination with NMFS, EPA Region 10's Office of Water and Watersheds hosted a series of technical workgroups during spring 2013 to study potential effects of PBDEs on Puget Sound and Southern Resident Killer Whales.</p>
<p>NOAA Fisheries. 2014. Southern Resident Killer Whales: 10 Years of Research and Conservation.</p> <p>https://www.noaa.gov/media-release/noaa-fisheries-10-year-study-highlights-threats-to-southern-resident-killer-whales</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. NOAA Fisheries used new findings to increase protections for killer whales. These include developing new rules for boat operations in the vicinity of the whales, evaluating how fishing and habitat loss affects whales through changes in prey abundance, and developing proactive plans to protect whales in the event of a major oil spill.</p>
<p>NMFS, PBDEs and Killer Whales in Puget Sound (July 23, 2013)47</p> <p>https://www.eopugetsound.org/articles/report-potential-effects-pbdes-puget-sound-and-southern-resident-killer-whales</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The report is on the pathways and effects of PBDEs on Killer Whales in Puget Sound.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>EPA, Potential Effects of PBDEs on Puget Sound and Southern Resident Killer Whales: A Report on the Technical Workgroups and Policy Forum (July 24, 2013)48</p> <p>https://www.eopugetsound.org/articles/report-potential-effects-pbdes-puget-sound-and-southern-resident-killer-whales</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. In coordination with NMFS, EPA Region 10's Office of Water and Watersheds hosted a series of technical workgroups during spring 2013 to study potential effects of PBDEs on Puget Sound and Southern Resident Killer Whales.</p>
<p>NMFS, Puget Sound Ecosystem Monitoring Program (PSEMP) Puget Sound Marine Waters: 2013 Overview (2013)50</p> <p>https://repository.library.noaa.gov/view/noaa/28038</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The objective of this report is to collate and distribute the valuable physical, chemical, and biological information obtained from various marine monitoring and observing programs in Puget Sound.</p>
<p>NMFS, Puget Sound Ecosystem Monitoring Program (PSEMP) Puget Sound Marine Waters: 2011 Overview (2011)56</p> <p>https://www.psp.wa.gov/downloads/psemp/PSmarinewaters_2011_overview.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The report reveals patterns and trends in numerous environmental parameters, including plankton, water quality, climate, and marine life.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Puget Sound Ecosystem Monitoring Program, Monitoring Priorities and Gaps: Puget Sound Ecosystem Monitoring Program Toxics Workgroup (Jan. 15, 2014)58</p> <p>https://pspwa.app.box.com/s/0luxyi979sz3d9cx90o1r4ot6axqwk8/file/425859476728</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. In this project, PSEMP aimed to use a risk-based approach to identify those CECs which might be most likely to harm fish and other aquatic species.</p>
<p>Rayne, S. et al. 2004. PBDEs, PBBs, and PCNs in Three Communities of Free-Ranging Killer Whales (Orcinus orca) from the Northeastern Pacific Ocean. Environ. Sci. Technol. 2004, 38, 4293-4299.</p> <p>https://www.zoology.ubc.ca/~barrett/documents/PBDEsPBBsandPCNsEnviron.Sci.Technol2004_000.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. Polybrominated diphenyl ethers (PBDEs), polybrominated biphenyls (PBBs), and polychlorinated naphthalenes (PCNs) were quantified in blubber biopsy samples collected from free-ranging male and female killer whales (Orcinus orca) belonging to three distinct communities (southern residents, northern residents, and transients) from the northeastern Pacific Ocean.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Ecology and King County, 2011. Control of Toxic Chemicals in Puget Sound: Assessment of Selected Toxic Chemicals in the Puget Sound Basin, 2007-2011. Washington State Department of Ecology, Olympia, WA and King County Department of Natural Resources, Seattle, WA. Ecology Publication No. 11-03-055.</p> <p>https://apps.ecology.wa.gov/publications/documents/1103055.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The study included an assessment of major delivery pathways such as surface water runoff, groundwater, publicly owned treatment works (POTWs), and direct air deposition. An assessment of the relative hazards posed by target chemicals was also performed. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>Johnson, L. et al. 2008. The Effects of Polycyclic Aromatic Hydrocarbons in Fish from Puget Sound, Washington. The Toxicology of Fishes, Chapter 22, 878 – 912.</p> <p>https://www.researchgate.net/publication/279723988_The_Effects_of_Polycyclic_Aromatic_Hydrocarbons_in_Fish_from_Puget_Sound_Washington</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This article reviewed field and laboratory data on flatfish in Puget Sound that indicate that exposure to PAHs is associated with increases in disease and alterations in growth and reproductive function that could potentially reduce the productivity of fish subpopulations residing at contaminated sites. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Scholtz NL, Myers MS, McCarthy SG, Labenia JS, McIntyre JK, et al. (2011) Recurrent Die-Offs of Adult Coho Salmon Returning to Spawn in Puget Sound Lowland Urban Streams. PLoS ONE 6(12): e28013. doi:10.1371/journal.pone.0028013</p> <p>https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0028013</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study focused on restoration projects in urban watersheds to improve salmon abundance and survival, and their successes or challenges. It does not in fact demonstrate impaired watersheds but looks at improvements based on restoration, and challenges that are present.</p>
<p>McIntyre, J. et al. 2012. Low-level copper exposures increase visibility and vulnerability of juvenile coho salmon to cutthroat trout predators. Ecological Applications, 22(5), 2012, pp. 1460–1471.</p> <p>https://pubmed.ncbi.nlm.nih.gov/22908706/</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This is a laboratory study that involved capturing wild salmon and exposing them to elevated copper, then observing effects.</p>
<p>Sloan, C. et al. 2009. Polybrominated Diphenyl Ethers in Outmigrant Juvenile Chinook Salmon from the Lower Columbia River and Estuary and Puget Sound, Washington. Arch Environ Contam Toxicol (2010) 58:403–414. DOI 10.1007/s00244-009-9391-y.</p> <p>https://link.springer.com/article/10.1007/s00244-009-9391-y</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This article presents the concentrations of PBDEs measured in gutted bodies and stomach contents of outmigrant juvenile Chinook salmon.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Cullon, D. et al. 2009. PERSISTENT ORGANIC POLLUTANTS IN CHINOOK SALMON (ONCORHYNCHUS TSHAWYTSCHA): IMPLICATIONS FOR RESIDENT KILLER WHALES OF BRITISH COLUMBIA AND ADJACENT WATERS. Environmental Toxicology and Chemistry, Vol. 28, No. 1, pp. 148–161, 2009.</p> <p>https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/sfwc/spprt_docs/sfwc_exh3_cullon.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This is a study focused on the relationship of chinook salmon POP levels to those in killer whales who prey on them.</p>
<p>Krahn, et al. 2007. Persistent organic pollutants and stable isotopes in biopsy samples (2004/2006) from Southern Resident killer whales. Marine Pollution Bulletin 54 (2007) 1903–1911.</p> <p>https://pubmed.ncbi.nlm.nih.gov/17931664/</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study, using blubber/epidermis biopsy samples, contributes contemporary information about potential factors (i.e., levels of pollutants or changes in diet) that could adversely affect Southern Residents.</p>
<p>Cullon, D.L., M.B. Yunker, C. Alleyne, N.J. Dangerfield, S. O'Neill, M.J. Whitar, and P.S. Ross. 2009. Persistent organic pollutants (POPs) in Chinook salmon (<i>Oncorhynchus tshawytscha</i>): Implications for resident killer whales of British Columbia and adjacent waters. Environ. Toxicol. Chem. 28:148-161.</p> <p>https://setac.onlinelibrary.wiley.com/doi/full/10.1897/08-125.1</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The study measured persistent organic pollutant (POP) concentrations in chinook salmon (<i>Oncorhynchus tshawytscha</i>) in order to characterize dietary exposure in the highly contaminated, salmon-eating northeastern Pacific resident killer whales.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Johnson, L.L., D.P. Lomax, M.S. Myers, O.P. Olson, S.Y. Sol, S.M. O'Neill, J.E. West, and T. K. Collier. 2008. Xenoestrogen exposure and effects in English sole (<i>Parophrys vetulus</i>) from Puget Sound, WA. <i>Aquatic Toxicology</i> 88(1):29-38.</p> <p>https://wdfw.wa.gov/publications/01042</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. In 1997-2001, as part of the Washington State's Puget Sound Assessment and Monitoring Program, this study surveyed English sole from a number of sites for evidence of xenoestrogen exposure, using vitellogenin production in males as an indicator.</p>
<p>USFWS, Migratory Birds and Contaminants along the Lower Columbia River Estuary60</p> <p>https://www.fws.gov/oregonfwo/Contaminants/FieldStudies/BaldEagle/LCR-BaldEagleFactSheet.pdf</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This is a fact sheet on bald eagles in the lower Columbia River and indications that they have rebounded since the 1970s.</p>
<p>USFWS, FY13 - Environmental Contaminants Program Off-Refuge Investigations Sub-Activity WA - Investigation of Contaminants in Feeds and Fish at FWS Pacific Region National Fish Hatcheries and the Ramifications to Human and Ecological Health (Aug. 2012)69</p> <p>https://www.fws.gov/wafwo/pdf/fish_feed_final_report.pdf</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. For this project, returning adult salmon and steelhead were sampled at three National Fish Hatcheries for contaminants. The levels of the contaminants varied by fish species and could be a result of migration route, diet, taxa-specific physiology and age at return. Feeds were collected throughout the rearing period for each species sampled and analyzed for the same contaminants as those in the fish.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>NMFS, Chemical Contaminants, Pathogen Exposure and General Health Status of Live and Beach-Cast Washington Sea Otters (<i>Enhydra lutris kenyoni</i>) (Feb. 2009)70</p> <p>https://www.fws.gov/wafwo/pdf/ONMS_Final_Sea_Otter_Report.pdf</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. Analyses of blood and liver samples from live captured sea otters and liver samples from beach-cast sea otter carcasses off the remote Washington coast indicate relatively low exposure to contaminants, but suggest that even at the low levels measured, exposure may be indicated by biomarker response.</p>
<p>USGS, Assessment of Contaminant Exposure and Effects on Ospreys Nesting along the Lower Duwamish River, Washington, 2006–07 (2009)71</p> <p>https://www.fws.gov/wafwo/pdf/Final_Report_2009_1255.pdf</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid.</p>
<p>USGS, Assessing reproductive and endocrine parameters in male largescale suckers (<i>Catostomus macrocheilus</i>) along a contaminant gradient in the lower Columbia River, USA (2014)158</p> <p>https://www.sciencedirect.com/science/article/abs/pii/S0048969713011352</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study evaluated the effects of contaminants on osprey (<i>Pandion haliaetus</i>) nesting along the lower Duwamish River (LDR), Washington, and used the upper reach of the Willamette River (WR), Oregon, as a reference site. Further investigations are necessary to determine the key factors driving the observed cellular differences and to assess the biological significance of these determinations.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>USGS, Contaminants of legacy and emerging concern in largescale suckers (<i>Catostomus macrocheilus</i>) and the foodweb in the lower Columbia River, Oregon and Washington, USA (2014)159</p> <p>https://www.sciencedirect.com/science/article/abs/pii/S0048969713004336</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study investigated occurrence, transport pathways, and effects of polybrominated diphenyl ether (PBDE) flame retardants and other endocrine disrupting chemicals (EDCs) in aquatic media and the food web in the lower Columbia River.</p>
<p>USGS, Health status of Largescale Sucker (<i>Catostomus macrocheilus</i>) collected along an organic contaminant gradient in the lower Columbia River, Oregon and Washington, USA (2014)160</p> <p>https://www.sciencedirect.com/science/article/abs/pii/S0048969713008966</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. For this study the health of Largescale Sucker (<i>Catostomus macrocheilus</i>) in the lower Columbia River (USA) was evaluated using morphometric and histopathological approaches, and its association with organic contaminants accumulated in liver was evaluated in males.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>C Benson, A. J. New Zealand mudsnail sightings distribution (2014)99</p> <p>https://www.fws.gov/columbiariver/publications/2014 NZMS progress report.pdf</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The Columbia River Fisheries Program Office has been intermittently monitoring the New Zealand mudsnail at six lower Columbia River Basin National Fish Hatcheries since 2006. This is a tiny exotic snail species that has invaded brackish and freshwater habitats of at least ten states in the western U.S. including a number of private, state and federal fish hatcheries.</p>
<p>NMFS, 10 Years of Research & Conservation: Southern Resident Killer Whales (June 2014)45</p> <p>https://www.noaa.gov/media-release/noaa-fisheries-10-year-study-highlights-threats-to-southern-resident-killer-whales</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This paper is a culmination of research into recovery of the killer whale populations and steps that need to be taken.</p>
<p>NMFS, Recovery Plan for Southern Resident Killer Whales (Orcinus orca) (Jan. 17, 2008)46</p> <p>https://www.fisheries.noaa.gov/resource/document/recovery-plan-southern-resident-killer-whales-orcinus-orca</p>	<p>This study does not focus on ambient water quality conditions in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This paper is a recovery plan for the killer whale populations and steps that need to be taken.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>EPA, Recommendations on a Monitoring Scheme for Polybrominated Diphenyl Ethers (PBDEs) in Puget Sound⁴⁹</p> <p>https://www.eopugetsound.org/sites/default/files/PBDE_Recommendations.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. EPA provides forward thinking recommendations for monitoring PBDEs in Puget Sound.</p>
<p>Lanksbury, J.A., and B. Lubliner. 2015. Quality Assurance Project Plan for Status and Trends Monitoring of Marine Nearshore Mussels for the Regional Stormwater Monitoring Program and Pierce County. Washington Department of Fish and Wildlife; WDFW Publication Number FPT 15-04. Olympia, Washington. 76pp.</p> <p>https://wdfw.wa.gov/publications/01760</p>	<p>The QAPP submittal does not represent study results that demonstrate ambient water conditions at specific locations in Washington; the QAPP does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. We do note that WDFW submitted all relevant tissue data associated with their studies to Ecology for consideration in the technical assessment of data.</p>
<p>O'Neill, S.M., J.E. West, L.L. Johnson, J.A. Lanksbury, L.A. Niewolny, and A.J. Carey. 2013. Quality Assurance Project Plan: Toxic Contaminants in Outmigrating Juvenile Chinook Salmon (<i>Oncorhynchus tshawytscha</i>) From River Mouths and Nearshore Saltwater Habitats of Puget Sound. Washington Department of Fish and Wildlife; WDFW Publication Number FPT 14-07. Olympia, Washington. 51pp.</p> <p>https://wdfw.wa.gov/publications/01609</p>	<p>The QAPP submittal does not represent study results that demonstrate ambient water conditions at specific locations in Washington; the QAPP does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. We do note that WDFW submitted all relevant tissue data associated with their studies to Ecology for consideration in the technical assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>West, J.E., J.A. Lanksbury, L.A. Niewolny, and A.J. Carey. 2013. Quality Assurance Project Plan: Effectiveness Monitoring for a Creosote-piling Removal Project: Embryos of Pacific Herring (<i>Clupea pallasii</i>) as Sentinels for the Presence of Polycyclic Aromatic Hydrocarbons (PAHs). Washington Department of Fish and Wildlife; WDFW Publication Number FPT 13-11. Olympia, Washington. 38pp.</p> <p>https://wdfw.wa.gov/publications/01598</p>	<p>The QAPP submittal does not represent study results that demonstrate ambient water conditions at specific locations in Washington; the QAPP does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. We do note that WDFW submitted all relevant tissue data associated with their studies to Ecology for consideration in the technical assessment of data.</p>
<p>Lanksbury, J.A., J.E. West, and L.A. Niewolny. 2012. Quality Assurance Project Plan: Mussel Watch Pilot Expansion Project. Washington Department of Fish and Wildlife; WDFW Publication Number FPT 13-08. Olympia, Washington. 80pp.</p> <p>https://wdfw.wa.gov/publications/01596</p>	<p>The QAPP submittal does not represent study results that demonstrate ambient water conditions at specific locations in Washington; the QAPP does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. We do note that WDFW submitted all relevant tissue data associated with their studies to Ecology for consideration in the technical assessment of data.</p>
<p>West, J.E., L.A. Niewolny, S.R. Quinnell, and J.A. Lanksbury. 2012. Quality Assurance Project Plan: Toxic Contaminants in Dungeness crab (<i>Cancer magister</i>) and Spot Prawn (<i>Pandalus platyceros</i>) from Puget Sound, Washington, USA. Washington Department of Fish and Wildlife; WDFW Publication Number FPT 13-10. Olympia, Washington. 88pp.</p> <p>https://wdfw.wa.gov/publications/01436</p>	<p>The QAPP submittal does not represent study results that demonstrate ambient water conditions at specific locations in Washington; the QAPP does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. We do note that WDFW submitted all relevant tissue data associated with their studies to Ecology for consideration in the technical assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>West, J.E., J.A. Lanksbury, S. Jeffries, and M. Lance. 2009. Quality Assurance Project Plan: Persistent organic pollutants in three guilds of pelagic marine A Toxics-focused Biological Observation Program for the Salish Sea species from the Puget Sound. Washington Department of Fish and Wildlife; WDFW Publication Number 09-10-099. Olympia, Washington. 35pp</p> <p>https://wdfw.wa.gov/publications/01130</p>	<p>The QAPP submittal does not represent study results that demonstrate ambient water conditions at specific locations in Washington; the QAPP does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. We do note that WDFW submitted all relevant tissue data associated with their studies to Ecology for consideration in the technical assessment of data.</p>
<p>Moser, M.L., M.S. Myers, J.E. West, S.M. O'Neill, and B.J. Burke. 2013. English Sole Spawning Migration and Evidence for Feeding Site Fidelity in Puget Sound, U.S.A., with Implications for Contaminant Exposure. Northwest Science. 87 (4), 317-325.</p> <p>https://bioone.org/journals/northwest-science/volume-87/issue-4/046.087.0403/English-Sole-Spawning-Migration-and-Evidence-for-Feeding-Site-Fidelity/10.3955/046.087.0403.short</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study used acoustic telemetry to assess the potential for contaminant exposure during spawning migrations and to track the localized movements of adult English sole in the vicinity of Eagle Harbor.</p>
<p>Pacific Herring Biomass of spawning Pacific herring, Washington Department of Fish & Wildlife.pdf</p> <p>https://www.pugetsoundinfo.wa.gov/ProgressMeasure/Detail/36/VitalSigns</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study is on herring biomass.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>West, J. E., S.M. O'Neill, G.M. Ylitalo, J.P. Incardona, D.C.Doty, and M.E. Dutch. 2014. An evaluation of background levels and sources of polycyclic aromatic hydrocarbons in naturally spawned embryos of Pacific herring (<i>Clupea pallasii</i>) from Puget Sound, Washington, USA. <i>Science of the Total Environment</i> 499: 114-124</p> <p>https://www.sciencedirect.com/science/article/abs/pii/S0048969714012212</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study compared concentrations of polycyclic aromatic hydrocarbons, or PAHs, in naturally spawned herring embryos from five spawning areas across Puget Sound.</p>
<p>Ecology, Sensitivity to Eutrophication of the Southern Puget Sound Basin (2001)43</p> <p>https://apps.ecology.wa.gov/publications/documents/0203059.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This paper summarized three years of PSAMP data for mercury and PCBs in quillback rockfish; compared muscle tissue concentrations of these contaminants for three locations in Puget sound, assessed the importance of fish age, size, lipid content and location, and described these relationships using linear regression models. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>U.S. Fish and Wildlife Service, Best Management Practices to Minimize Adverse Effects to Pacific Lamprey (<i>Entosphenus tridentatus</i>) (2010);110</p> <p>https://www.blm.gov/sites/blm.gov/files/policies/1B-OR-2010-041_att.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The purpose of this document is to provide information on Best Management Practices for Pacific lamprey that can be incorporated into any stream disturbing activity on lands managed by the Forest Service and Bureau of Land Management within the Columbia River basin.</p>
<p>Ecology, Perfluorinated Compounds in Washington Rivers and Lakes (Aug. 2010)80</p> <p>https://apps.ecology.wa.gov/publications/documents/1003034.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The study represents an exploratory effort seeking information on 13 perfluorinated compounds (PFCs) statewide in surface waters, wastewater treatment plant effluents, and fish tissues. Generally speaking, total PFC concentrations in all matrices recorded as part of the study were within or below the range of values recorded at other United States locations.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p data-bbox="203 262 844 378">Puget Sound Ecosystem Monitoring Program, Indicators of Biological Exposure and Effects of Chemicals of Emerging Concern (Jan. 31, 2013)57</p> <p data-bbox="203 409 812 483">https://www.eopugetsound.org/articles/2013-puget-sound-marine-waters-overview</p>	<p data-bbox="906 262 1485 1050">Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This project notes that Contaminants of Emerging Concern (CECs) cover a wide range of man-made chemicals such as pharmaceuticals, personal care products, plasticizers, and automotive fluids. Regional monitoring has clearly indicated that many (perhaps thousands) of these compounds make their way into the Salish Sea and other regional waters, such as the Columbia River. As of yet, there has been no regional evaluation of which of those might be most important in terms of their potential to cause harm.</p>
<p data-bbox="203 1081 828 1239">NMFS, 5-Year Review: Summary & Evaluation of Lower Columbia River Chinook, Columbia River Chum, Lower Columbia River Coho, and Lower Columbia River Steelhead (2011);114</p> <p data-bbox="203 1270 876 1386">https://www.fisheries.noaa.gov/resource/document/2016-5-year-review-summary-evaluation-lower-columbia-river-chinook-salmon</p>	<p data-bbox="906 1081 1485 1869">Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data. This document describes the results of the agency's five year status review for ESA-listed lower Columbia River salmon and steelhead species. These include: Lower Columbia River Chinook salmon, Columbia River chum salmon, Lower Columbia River coho salmon, and Lower Columbia River steelhead.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>NMFS, 5-Year Review: Summary & Evaluation of Middle Columbia River Steelhead (2011);115</p> <p>https://www.fisheries.noaa.gov/resource/document/2016-5-year-review-summary-evaluation-middle-columbia-river-steelhead</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This document describes the results of the review of the ESA-listed Middle Columbia River (MCR) steelhead. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>EPA, Ecological Condition of the Columbia River Estuary EPA 910-R-07-004 (Dec. 2007);128</p> <p>https://archive.epa.gov/emap/archive-emap/web/pdf/columbia.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This project was designed to evaluate the overall condition of the Columbia River estuary. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Lyndal Johnson et al., (2013): Persistent Organic Pollutants in Juvenile Chinook Salmon in the Columbia River Basin: Implications for Stock Recovery, Transactions of the American Fisheries Society, 142:1, 21-40;131</p> <p>https://apps.ecology.wa.gov/publications/publications/1103024.pdf</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. In this study concentrations of persistent organic pollutants were measured in juvenile Chinook Salmon from various Columbia River stocks and life history types to evaluate the potential for adverse effects in these threatened and endangered fish. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>Lower Columbia Estuary Partnership, Lower Columbia River Ecosystem Monitoring Project Annual Report for Year 6 (September 2009 to November 2010) (2011);134</p> <p>https://www.estuarypartnership.org/resource/action-effectiveness-monitoring-columbia-river-estuary-habitat-restoration-program-annual-0</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This report describes Ecosystem Monitoring Project accomplishments for the reported period of this on-going project. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Lower Columbia Estuary Partnership, Lower Columbia River Ecosystem Monitoring Project Annual Report for Year 5 (September 2008 to November 2009) (2010);135</p> <p>https://www.estuarypartnership.org/resource/action-effectiveness-monitoring-columbia-river-estuary-habitat-restoration-program-annual-1</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This report describes Ecosystem Monitoring Project accomplishments for the reported period of this on-going project. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>Lower Columbia Estuary Partnership, Lower Columbia River Ecosystem Monitoring Project Annual Report for Year 4 (September 1, 2007 to August 31, 2008) (2009);136</p> <p>https://www.estuarypartnership.org/resource/lower-columbia-river-ecosystem-monitoring-project-annual-report-year-4-september-1-2007</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This report describes Ecosystem Monitoring Project accomplishments for the reported period of this on-going project. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Lower Columbia Estuary Partnership, Lower Columbia River Ecosystem Monitoring Project Annual Report for Year 3B (September 1, 2006 to August 31, 2007) (2008);137</p> <p>https://www.estuarypartnership.org/resource/lower-columbia-river-ecosystem-monitoring-project-annual-report-year-3b-september-1-2006</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This report describes Ecosystem Monitoring Project accomplishments for the reported period of this on-going project. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>Lower Columbia Estuary Partnership, Lower Columbia River Ecosystem Monitoring Project Annual Report for Year 7 (September 1, 2010 to December 31, 2011) (2012);141</p> <p>https://www.estuarypartnership.org/resource/action-effectiveness-monitoring-columbia-river-estuary-habitat-restoration-program-annual</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This report describes Ecosystem Monitoring Project accomplishments for the reported period of this on-going project. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Lower Columbia Estuary Partnership, Lower Columbia River Ecosystem Monitoring Project Annual Report for Year 8 (October 1, 2011 to September 30, 2012) (2013);142</p> <p>https://www.estuarypartnership.org/resource/lower-columbia-river-ecosystem-monitoring-program-annual-report-year-8-october-1-2011</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This report describes Ecosystem Monitoring Project accomplishments for the reported period of this on-going project. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>USGS, Foodweb transfer, sediment transport, and biological impacts of emerging and legacy organic contaminants in the lower Columbia River, Oregon and Washington, USA: USGS Contaminants and Habitat (ConHab) Project (2014)153</p> <p>https://pubs.er.usgs.gov/publication/70047331</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>USGS, Spatial and temporal trends in occurrence of emerging and legacy contaminants in the Lower Columbia River 2008–2010 (2014)154</p> <p>https://pubs.er.usgs.gov/publication/70103270</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. In this study an 86-mile stretch of the river was sampled over a 3 year period in order to determine the spatial and temporal trends in the occurrence and concentration of water-borne organic contaminants. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>USGS, Correlation of gene expression and contaminant concentrations in wild largescale suckers: A field-based study (2014)155</p> <p>https://pubs.er.usgs.gov/publication/70058854</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This project developed a custom microarray for largescale suckers (<i>Catostomus macrocheilus</i>) and used it to investigate the molecular effects of contaminant exposure on wild fish in the Columbia River. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>USGS, A survey of benthic sediment contaminants in reaches of the Columbia River Estuary based on channel sedimentation characteristics (2014)156 https://pubs.er.usgs.gov/publication/70101339</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. The study goal was to characterize sediment contaminant detections and concentrations in reaches of the Columbia River Estuary that were concurrently being sampled to assess contaminants in water, invertebrates, fish, and osprey (<i>Pandion haliaetus</i>) eggs. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>Henny et al., Wastewater dilution index partially explains observed polybrominated diphenyl ether flame retardant concentrations in osprey eggs from Columbia River Basin, 2008–2009 (2011)157 https://pubs.er.usgs.gov/publication/70004671</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington; study does not document that impairment of the existing or designated use is related to the environmental alteration on that same waterbody segment or grid. This study used the volume of Wastewater Treatment Plant (WWTP) discharge, a known source of PBDEs, as a measure of human activity at a location, and combined with river flow (both converted to millions of gallons/day) created a novel approach (an approximate Dilution Index) to relate waterborne contaminants to levels of these contaminants that reach avian eggs.</p>

Table 3: Modeled results are not appropriate to determine that standards in Washington are being met at specific waters.

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Mongillo T., E.E. Holmes, D.P. Noren, G.R. VanBlaricom, A.E. Punt, S.M. O'Neill, G.M. Ylitalo , M.B. Hanson, and P.S. Ross. 2012. Predicted polybrominated diphenyl ether (PBDE) and polychlorinated biphenyl (PCB) accumulation in Southern Resident killer whales. Mar. Ecol. Progress Ser. 453:263-277. http://www.int-res.com/abstracts/meps/v453/p263-277/</p>	<p>An individual-based modeling approach was used to predict the accumulation of sum PBDEs (ΣPBDEs) and sum PCBs (ΣPCBs) in specific individuals in the SRKW population. Modeled results are not appropriate to determine that standards in Washington are being met at specific waters.</p>
<p>Ecology, Estimating Loads of Nutrients, Bacteria, DO and TSS from 71 Watersheds Tributary to South Puget Sound (2001)44 https://apps.ecology.wa.gov/publications/documents/0203021.pdf</p>	<p>The primary goals of this study were to (1) assess the hydrodynamics and current water quality status of the South Puget Sound basin, and (2) develop computer models to simulate existing and future conditions in order to explore the links between loads and water quality at a finer resolution than is possible with the most extensive data collection programs. Modeled results are not appropriate to determine that standards in Washington are being met at specific waters.</p>
<p>Ecology, Control of Toxic Chemicals in Puget Sound Phase 2: Development of Simple Numerical Models, the long-term fate and bioaccumulation of polychlorinated biphenyls in Puget Sound (April 2009)24 https://apps.ecology.wa.gov/publications/publications/0903015.pdf</p>	<p>This study developed computer prediction tools to predict the concentration of PCBs in water, sediment, and biota of Puget Sound. Modeled results are not appropriate to determine that standards in Washington are being met at specific waters. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Spromberg, J. and N. Scholz. 2011. Estimating the Future Decline of Wild Coho Salmon Populations Resulting from Early Spawner Die-Offs in Urbanizing Watersheds of the Pacific Northwest, USA. Integrated Environmental Assessment and Management, 9999, 2011.</p> <p>http://wildfishconservancy.org/what-we-do/science/research-and-monitoring/ongoing-projects/SprombergScholzIEAM2011prespawnmortincoho.pdf</p>	<p>This study modeled the potential consequence of current and future urbanization on wild coho salmon in urban streams in Puget Sound. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Alava, J. et al. 2012. Habitat-Based PCB Environmental Quality Criteria for the Protection of Endangered Killer Whales (<i>Orcinus orca</i>). Environmental Science and Technology 2012, 46, 12655–12663.</p> <p>https://pubs.acs.org/doi/10.1021/es303062g</p>	<p>This study modeled PCB concentrations in killer whales and concludes that the uptake of PCBs by killer whales is through dietary consumption. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Hickie, B. et al. Killer Whales (<i>Orcinus orca</i>) Face Protracted Health Risks Associated with Lifetime Exposure to PCBs. Environ. Sci. Technol. 2007, 41, 6613-6619.</p> <p>https://pubmed.ncbi.nlm.nih.gov/17948816/</p>	<p>This study modeled the lifetime exposure of killer whales to PCBs. Modeled results are not appropriate to determine that standards in Washington are being met at specific waters. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>

Table 4: Submittals from third parties did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and/or study methods & data not documented or readily available.

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>NOAA Fisheries Northwest Fisheries Science Center, Habitat Quality, Toxics, and Salmon in the Lower Columbia Estuary: Multi-Year Coordinated Fish, Fish Prey, Habitat and Water Quality Data Collection under the Ecosystem Monitoring Project (Oct. 23, 2012);129 https://www.estuarypartnership.org/sites/default/files/resource_files/JohnsonEMPSWG_2012_Oct28.pdf</p>	<p>This is a PowerPoint presentation given at the Lower Columbia Estuary Partnership Science Workgroup meeting. Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available.</p>
<p>Curtis Roegner, NOAA Fisheries, Oxygen-depleted water in the Columbia River estuary; Observations and consequences (April 23, 2013);130 https://www.estuarypartnership.org/sites/default/files/resource_files/Roegner_LCREP_2013_DO.pdf</p>	<p>This is a PowerPoint presentation given at a NOAA Fisheries Estuary Partnership Science Work shop. Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available.</p>
<p>U.S. Fish and Wildlife Service, Environmental Conservation Online System, Listing and Occurrences for Washington;145 https://www.fws.gov/southeast/conservation-tools/environmental-conservation-online-system/</p>	<p>This submittal is an online link to the Environmental Conservation online System (ECOS) which is a gateway web site that provides access to data systems in the U.S. Fish and Wildlife Service (Service) and other government data sources. Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available. It is important to note that any water quality data associated with the submittal that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Fish and Wildlife Service, Environmental Conservation Online System, Species ad hoc Search [Species proposed for listing];146 https://ecos.fws.gov/ecp0/reports/ad-hoc-species-report?status=P&header=Species+Proposed+for+Listing&fleadreg=on&fstatus=on&finvpop=on</p>	<p>This submittal is an online link to the Environmental Conservation online System (ECOS) which is a gateway web site that provides access to data systems in the U.S. Fish and Wildlife Service (Service) and other government data sources. Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available. It is important to note that any water quality data associated with the submittal that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>U.S. Fish and Wildlife Service, Environmental Conservation Online System, Candidate Species Report147 https://ecos.fws.gov/ecp/species-reports</p>	<p>This submittal is an online link to the Environmental Conservation online System (ECOS) which is a gateway web site that provides access to data systems in the U.S. Fish and Wildlife Service (Service) and other government data sources. Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available. It is important to note that any water quality data associated with the submittal that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>U.S. Fish and Wildlife Service, Environmental Conservation Online System, Species Profile, Oregon spotted frog;148 https://www.fws.gov/oregonfwo/articles.cfm?id=149489458</p>	<p>This submittal is an online link to the Environmental Conservation online System (ECOS) which is a gateway web site that provides access to data systems in the U.S. Fish and Wildlife Service (Service) and other government data sources. Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available. It is important to note that any</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
	water quality data associated with the submittal that is in EIM or the federal Water Quality Portal would be used in the assessment of data.
<p>USFWS, Trace Elements and Oil-Related Contaminants in Sediment, Bivalves, and Eelgrass from Padilla and Fidalgo Bays, Skagit County, Washington⁶⁶</p> <p><i>Unable to locate this study on USFWS website or Google.</i></p>	Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available.
<p>USFWS, Environmental Contaminants Program On-Refuge Clean-up Investigations Sub-Activity WA-Preliminary Assessment to Determine Superfund Site Impacts on the Ridgefield National Wildlife Refuge (June 27, 2000)⁶¹ https://www.fws.gov/wafwo/contaminants_new.html</p>	The link to this study goes to a USFWS website. The actual study could not be found on USFWS website. Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available.
<p>O'Neill, S.M., J.E. West, G.M. Ylitalo, C.A. Sloan, M.M. Krahn, and T.K. Collier. 2004. Concentrations of polybrominated diphenyl ethers (PBDEs) in fish from Puget Sound, WA, USA. Poster presentation: SETAC World Congress and 25th Annual Meeting in North America Society of Environmental Toxicology and Chemistry. Portland, Oregon. Washington Department of Fish and Wildlife. Olympia, Washington. https://wdfw.wa.gov/publications/01033</p>	Submittal was a poster and did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available.
<p>Arkoosh, M., J. Dietrich, G.M. Ylitalo, L.J. Johnson, and S.M. O'Neill. 2013. Polybrominated diphenyl ethers (PBDEs) and Chinook salmon health. U.S. Department of Commerce. National Oceanic and Atmospheric Association, National Marine Fisheries Service, Northwest Fisheries Science Center, Newport, Oregon. 49 pp. plus Appendices.</p> <p><i>Submittal not on WDFW website.</i></p>	Unable to locate study. From title, this appears to paper look at PBDEs in comparison to Chinook salmon health. Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available.

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>O'Neill S.M., C.F. Bravo and T.K. Collier. (2008) Environmental Indicators for the Puget Sound Partnership: A Regional Effort to Select Provisional Indicators (Phase 1) Summary Report. Northwest Fisheries Science Center, Seattle Washington. 64 pp.</p> <p>https://www.academia.edu/1272967/Environmental_indicators_for_the_puget_sound_partnership_a_regional_effort_to_select_provisional_indicators_Phase_1</p>	<p>Unable to locate this study on WDFW website. From title, this summary report is intended to select provisional indicators for Puget Sound. It is not an ambient monitoring study. Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available.</p>

Table 5: The study submitted falls outside of the WQA cycle window of 2006 – 2017.

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Gregory J. Fuhrer, Dwight Q. Tanner, Jennifer L. Morace, Stuart W. McKenzie, and Kenneth A. Skach, USGS Water-Resources Investigations Report 95-4294: Water Quality of the Lower Columbia River Basin: Analysis of Current and Historical Water-Quality Data through 1994 (1996);100 https://pubs.usgs.gov/wri/1995/4294/report.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017.</p>
<p>U.S.G.S. NASQAN National Stream Quality Accounting Network, Monitoring the Water Quality of the Nation's Large Rivers, Columbia River NASQAN Program, Fact Sheet FS-004-98 (regarding contamination in tissues of mink and river otter, and eggs of the bald eagle);101 https://pubs.usgs.gov/fs/1998/0004/report.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017.</p>
<p>Dungeness Crab Species Monitored: Toxic Contaminants in Puget Sound Fish and Shellfish _Washington Department of Fish & Wildlife.pdf https://wdfw.wa.gov/species-habitats/science/marine-toxics</p>	<p>Study submitted falls outside of the WQA cycle window of 2006 – 2017. In a 2001 focus study, the Fish Component monitored for the presence and severity of toxic contaminants in this species at a limited number of sites in Puget Sound.</p>
<p>Lower Columbia River Bi-State Program, Reconnaissance Survey of the Lower Columbia River, Laboratory Data Report, Vol. 2: Sediment Inorganic Data, Sediment Conventional Data (Jan. 1992);120 https://www.estuarypartnership.org/sites/default/files/resource_files/TC8526_06_reconsurvey2_1d_vol_2.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017.</p>
<p>Lower Columbia River Bi-State Program, Reconnaissance Survey of the Lower Columbia River, Laboratory Data Report, Vol. 4: Tissue Data, Excluding Dioxins and Furans (1992);121 https://www.estuarypartnership.org/sites/default/files/resource_files/TC8526_06_reconsurvey2_1d_vol_4.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Lower Columbia River Bi-State Program, Reconnaissance Survey of the Lower Columbia River, Section 2.1 Reconnaissance Survey. Task 6 Vol. 3 (1992);122</p> <p>https://www.estuarypartnership.org/sites/default/files/resource_files/TC8526_06_reconsurvey2_1e_vol_3.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017.</p>
<p>Lower Columbia River Bi-State Program, Reconnaissance Survey of the Lower Columbia River, Section 2.1 Reconnaissance Survey. Lab Data Report Vol. 3;123</p> <p>https://www.estuarypartnership.org/sites/default/files/resource_files/TC8526_06_reconsurvey2_1d_vol_3.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017.</p>
<p>Lower Columbia River Bi-State Program, Reconnaissance Survey of the Lower Columbia River, Section 2.1 Reconnaissance Survey. Lab Data Report Vol. 6;124</p> <p>https://www.estuarypartnership.org/sites/default/files/resource_files/TC8526_06_reconsurvey2_1d_vol_6.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. I</p>
<p>Lower Columbia River Bi-State Program, Reconnaissance Survey of the Lower Columbia River, Section 2.1 Reconnaissance Survey. Lab Data Report Vol. 5;125</p> <p>https://www.estuarypartnership.org/sites/default/files/resource_files/TC8526_06_reconsurvey2_1d_vol_5.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017.</p>
<p>Lower Columbia River Bi-State Program, Reconnaissance Survey of the Lower Columbia River, Section 2.1 Reconnaissance Survey. Lab Data Report Vol. 7;126</p> <p>https://www.estuarypartnership.org/sites/default/files/resource_files/TC8526_06_reconsurvey2_1d_vol_7.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>USFWS, Environmental Contaminants in Great Blue Herons (<i>Ardea Herodias</i>) from the Lower Columbia River and Willamette Rivers, Oregon and Washington, USA (1999)62 https://setac.onlinelibrary.wiley.com/doi/full/10.1002/etc.5620181222</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. This study does not focus on ambient water quality conditions of Washington waters. The project collected great blue heron (<i>Ardea herodias</i>) eggs and prey from six colonies in Oregon and Washington, USA, during 1994 to 1995.</p>
<p>USFWS, Organochlorine Contaminants in Double-Crested Cormorants from Lewis and Clark national Wildlife Refuge in the Columbia River Estuary (Oct. 18, 1999)63 https://pubs.er.usgs.gov/publication/70188686</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. This study does not focus on ambient water quality conditions in Washington.</p>
<p>Charles Henny, Robert Grove, Olaf R Hedstrom, National Biological Service, Forest and Rangeland Ecosystem Science Center, Northwest Research Station, A Field Evaluation of Mink and River Otter on the Lower Columbia River and the Influence of Environmental Contaminants (Feb. 12, 1996);119 https://www.estuarypartnership.org/sites/default/files/resource_files/Sec_3_3_3a.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington.</p>
<p>Ecology, Hood Canal Marine Sediments Data Summaries, Findings, Publications81 https://apps.ecology.wa.gov/publications/publications/1003006.pdf</p>	<p>Summary fact sheet submitted falls outside of the WQA cycle window of 2006 – 2017. All available sediment data from related Ecology studies was considered for listing.</p>
<p>Ecology, South Puget Sound Water Quality Study Phase 1 (Oct. 2002)42 https://apps.ecology.wa.gov/publications/publications/0203021.pdf</p>	<p>Data from South Puget Sound Water Quality Study Phase 1 falls outside of the WQA cycle window of 2006 – 2017. More recent data from this long term study was used in the current assessment.</p>
<p>O'Neill, S.M., and J.E. West. 2009. Marine distribution, life history traits and the accumulation of polychlorinated biphenyls (PCBs) in Chinook salmon (<i>Oncorhynchus tshawytscha</i>) from Puget Sound, Washington. Transactions of the American Fisheries Society 138:616-632. https://wdfw.wa.gov/publications/01030</p>	<p>This paper was based on data that were collected 1992-1996, clearly outside the data window for the 2018 WQ Assessment.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>O'Neill, S.M., J.E. West, and J.C. Hoeman. 1998. Spatial trends in the concentration of polychlorinated biphenyls (PCBs) in chinook (<i>Oncorhynchus tshawytscha</i>) and coho salmon (<i>O. kisutch</i>) in Puget Sound and factors affecting PCB accumulation: results from the Puget Sound Ambient Monitoring Program. Pages 312-328 in R. Strickland, editor. Puget Sound Research 1998 Conference Proceedings. Puget Sound Water Quality Action Team. Washington Department of Fish and Wildlife. Olympia, Washington. 17pp. https://wdfw.wa.gov/publications/01031</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for WQA. This study does not focus on ambient water quality conditions of Washington waters.</p>
<p>West, J.E., and S.M. O'Neill. 1998. Persistent pollutants and factors affecting their accumulation in rockfishes (<i>Sebastes</i> spp.) from Puget Sound, Washington. Pages 336-345 in R. Strickland, editor. Puget Sound Research 1998 Conference Proceedings. Puget Sound Water Quality Action Team. Washington Department of Fish and Wildlife. Olympia, Washington. 11pp. https://wdfw.wa.gov/publications/01037</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. This study does not focus on ambient water quality conditions of Washington waters.</p>
<p>O'Neill, S.M., and J.E. West. 2001. Exposure of Pacific herring (<i>Clupea pallasii</i>) to persistent organic pollutants in Puget Sound and the Georgia Basin. Puget Sound Research 2001 Conference Proceedings. Puget Sound Water Quality Action Team. Washington Department of Fish and Wildlife. Olympia, Washington. 6pp. https://wdfw.wa.gov/publications/01028</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>West J.E., S.M. O'Neill, G.R. Lippert and S.R. Quinnell. 2002. Toxic contaminants in marine and anadromous fish from Puget Sound, Washington: Results from the Puget Sound Ambient Monitoring Program Fish Component, 1989-1999. pp. 56 + appendices, Washington Department of Fish and Wildlife, Olympia, WA. https://wdfw.wa.gov/publications/01026</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>O'Neill, S.M., G.M. Ylitalo, M. Krahn, J.E. West, J. Bolton, and D. Brown. 2005. Elevated levels of persistent organic pollutants in Puget Sound versus other freeranging populations of Pacific salmon: the importance of residency in Puget Sound. Abstract of presentation at 2005 Puget Sound Georgia Basin Research Conference. Seattle, Washington.</p> <p><i>Submittal not on WDFW Website.</i></p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>O'Neill, S.M., and J.E. West. 2002. Contaminants in Fish. Pages 66-77 in Puget Sound Water Quality Action Team, editors. 2002 Puget Sound Update: Eighth Report of the Puget Sound Ambient Monitoring Program. Olympia, Washington. 156pp. https://wdfw.wa.gov/publications/01029</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>West, J.E., S.M. O'Neill, G.R. Lippert, and S.R. Quinnell. 2001. Toxic contaminants in marine and anadromous fishes from Puget Sound, Washington: Results of the Puget Sound Ambient Monitoring Program Fish Component, 1989-1999. Washington Department of Fish and Wildlife. Olympia, Washington. 311pp. http://wdfw.wa.gov/publications/01026</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>West, J.E., S.M. O'Neill, D. Lomax, and L. Johnson. 2001. Implications for reproductive health in quillback rockfish (<i>Sebastes maliger</i>) from Puget Sound exposed to polychlorinated biphenyls. Puget Sound Research 2001 Conference Proceedings. Puget Sound Water Quality Action Team. Washington Department of Fish and Wildlife. Olympia, Washington. https://wdfw.wa.gov/publications/01041</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>O'Neill, S.M., and J.E. West. 2000. Toxic Contaminants in Fish. Pages 56-64 in Puget Sound Water Quality Action Team, editors. 2000 Puget Sound Update: Seventh Report of the Puget Sound Ambient Monitoring Program. Washington Department of Fish and Wildlife. Olympia, Washington. 133pp. https://wdfw.wa.gov/publications/01027</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>West, J. E. 1997. Protection and restoration of marine life in the inland waters of Washington State. Puget Sound/Georgia Basin Environmental Report Series: Number 6. Puget Sound Water Quality Action Team. Washington Department of Fish and Wildlife. Olympia, Washington. 154pp. http://wdfw.wa.gov/publications/01035</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>O'Neill, S.M., J.E. West, and S.R. Quinnell. 1995. Contaminant monitoring in fish: overview of the Puget Sound Ambient Monitoring Program Fish Task. Pages 35-50 in E. Robichaud, editor. Puget Sound Research 1995 Conference Proceedings. Puget Sound Water Quality Authority. Washington Department of Fish and Wildlife. Olympia, Washington. 18pp. https://wdfw.wa.gov/publications/01032</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Olson, O.P., L. Johnson, G. Ylitalo, C. Rice, J. Cordell, T.K. Collier, and J. Steger. 2008. Fish habitat use and chemical contaminant exposure at restoration sites in Commencement Bay, Washington. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-88, 117 p. https://www.webapps.nwfsc.noaa.gov/assets/25/607_04162008_152110_CommencementBayTM88Final.pdf</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Ross, p. et al. 2000. High PCB Concentrations in Free Ranging Pacific Killer Whales, <i>Orcinus orca</i>: Effects of Age, Sex and Dietary Preference. Marine Pollution Bulletin Vol. 40, No. 6, pp. 504±515, 2000. https://www.sciencedirect.com/science/article/abs/pii/S0025326X99002337</p>	<p>The data from this study was over 20 years old and fall outside of the data window for this WQA. Blubber biopsies were collected in British Columbia for the purpose of comparing different whale populations. Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington.</p>
<p>USFWS, Environmental Contaminants in Bald Eagles Nesting in Hood Canal, Washington, 1992-1997 (July 29, 2000)65 https://ecos.fws.gov/ServCat/DownloadFile/21677?Reference=23158</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Ecology, The Influence of Sediment Quality and Dissolved Oxygen on Benthic Invertebrate Communities in Hood Canal (2008)84 https://apps.ecology.wa.gov/publications/publications/0703047.pdf</p>	<p>The data from these studies fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies. Any D.O. and sediment data in EIM was considered and used for the assessment.</p>
<p>Ecology, Sediment Quality In Hood Canal (2005)89 https://apps.ecology.wa.gov/publications/documents/1003006.pdf</p>	<p>The data from these studies fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies. Any D.O. and sediment data in EIM was considered and used for the assessment.</p>
<p>Ecology, Benthic Infaunal Community Structure in Hood Canal in Relation to Sediment and Water Quality Variables (2005)91 https://apps.ecology.wa.gov/publications/documents/0703047.pdf</p>	<p>The data from these studies fall outside of the data window for this WQA. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Lower Columbia River Bi-State Program, Contaminant Ecology of Fish and Wildlife of the Lower Columbia River, Summary and Integration (April 1996);102 https://www.estuarypartnership.org/sites/default/files/resource_files/Sec_3_3_1b.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Columbia Basin Fish and Wildlife Authority, Contamination Ecology of Selected Fish and Wildlife of the Lower Columbia River, A Report to the Bi-State Water Quality Program (April 23, 1996);103 https://www.estuarypartnership.org/sites/default/files/resource_files/LCRBiStateFWS3.3.1a_CBFWA_WILD_ContamEcolSelectedFish%26WildinLCR96.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Columbia River Estuary Study Taskforce, Historic Habitats of the Lower Columbia River (Oct. 1995); 104 https://www.estuarypartnership.org/sites/default/files/resource_files/LCRBiStateFWS3.5.5b_Graves_HistoricHabitatsofTheLCR95.PDF</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Lower Columbia River Bi-State Program, Reconnaissance Survey of the Lower Columbia River; Task 2 Summary Report: Inventory and Characterization of Pollutants (June 26, 1992);105 https://www.estuarypartnership.org/sites/default/files/resource_files/TC8526_02_reconsurvey1_2_task2b.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Washington State Department of Health, Health Analysis of Chemical Contaminants in Lower Columbia River Fish (May 1996);106 https://www.estuarypartnership.org/sites/default/files/resource_files/Additions_A_health_analysis.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Lower Columbia River Bi-State Program, Reconnaissance Survey of the Lower Columbia River, Task 6: Reconnaissance Report (May 17, 1992);107 https://www.estuarypartnership.org/sites/default/files/resource_files/TC8526_06_reconsurvey2_1e_vol_1.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Lower Columbia River Bi-State Program, Assessing Human Risks from Chemically Contaminated Fish in the Lower Columbia River: Risk Assessment (May 1, 1996);108 https://www.estuarypartnership.org/sites/default/files/resource_files/TC9968_05_sec4_1d.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Lower Columbia River Bi-State Program, Assessing Health of Fish Species and Fish Communities in the Lower Columbia River (Jan. 29, 1996);109 https://www.estuarypartnership.org/sites/default/files/resource_files/Sec_3_3_2b.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Lower Columbia River Bi-State Program, Reconnaissance Survey of the Lower Columbia River, Task 1: Final Summary Report (April 29, 1992);118 https://www.estuarypartnership.org/sites/default/files/resource_files/TC8526_01_reconsurvey1_1_task1d.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>U.S. Fish and Wildlife Service, Interim report: Environmental contaminants in bald eagles nesting along the lower Columbia River (Feb. 9, 1996);127 https://www.estuarypartnership.org/sites/default/files/resource_files/Sec_3_3_4a.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Lower Columbia River Bi-State Program, The Health of the River 1990-1996, Integrated Technical Report (May 20, 1996);143 https://www.estuarypartnership.org/sites/default/files/resource_files/Additions_D_1996_health_of_the_river_integrated_report.pdf</p>	<p>Study submitted is more than 20 years old and falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Lower Columbia Estuary Partnership, Lower Columbia River Ecosystem Monitoring Project Annual Report for Year 2 (September 1, 2004 to August 31, 2005) (2006);139 https://www.estuarypartnership.org/resource/lower-columbia-river-ecosystem-monitoring-project-annual-report-year-2-september-1-2004</p>	<p>Study submitted falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Lower Columbia Estuary Partnership, Lower Columbia River Ecosystem Monitoring Project Annual Report for Year 3 (September 1, 2005 to August 31, 2006) (2007);138 https://www.estuarypartnership.org/sites/default/files/resource_files/Year_3_Ecosystem_Monitoring_Project_Annual_Report.pdf</p>	<p>Study submitted falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>Tom Rosetta and David Borys, Oregon DEQ, Identification of Sources of Pollutants to the Lower Columbia River Basin (June 1996);117 https://www.estuarypartnership.org/sites/default/files/resource_files/Additions_C_id_of_pollutant_sources.pdf</p>	<p>Study submitted falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>
<p>USF&WS, Changes in Productivity and Environmental Contaminants in Bald Eagles nesting Along the Lower Columbia River (Aug. 12, 1999)59 https://www.fws.gov/oregonfwo/Contaminants/FieldStudies/BaldEagle/LCR-BaldEagleFinalReport.pdf</p>	<p>Study submitted falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>USFWS, Effects of Nutrient Enrichment on Wetlands at Conboy Lake National Wildlife Refuge (2002)64 https://www.fws.gov/oregonfwo/documents/ScientificReports/ConboyLakeNutrient.pdf</p>	<p>Study submitted falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington.</p>
<p>West, J.E., and S.M. O'Neill. 1995. Accumulation of mercury and polychlorinated biphenyls in quillback rockfish (<i>Sebastes maliger</i>) from Puget Sound Washington. Pages 666-677 in E. Robichaud, editor. Puget Sound Research 1995 Conference Proceedings. Puget Sound Water Quality Authority. Washington Department of Fish and Wildlife. Olympia, Washington. 14pp. https://wdfw.wa.gov/publications/01036</p>	<p>Data submitted falls outside of the WQA cycle window of 2006 – 2017. Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington. Modeled results are not appropriate to determine that standards in Washington are being met at specific waters.</p>
<p>West, J.E., R.M. Buckley, and D.C. Doty. 1994. Ecology and habitat use of juvenile rockfishes (<i>Sebastes</i> spp.) associated with artificial reefs in Puget Sound, Washington. Bulletin of Marine Science 55(2-3):344-350. https://www.ingentaconnect.com/content/umrsmas/bullmar/1994/00000055/f0020002/art00008</p>	<p>Study submitted falls outside of the WQA cycle window of 2006 – 2017. Modeled results are not appropriate to determine that standards in Washington are being met at specific waters. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Ralph Elston, Ph.D. AquaTechnics, Pathways and Management of Marine Nonindigenous Species in the Shared Waters of British Columbia and Washington (January 1997)19 https://www.amazon.co.uk/Pathways-management-nonindigenous-Washington-environmental/dp/B0006FANVK</p>	<p>The data from these studies are well over 20 years old and fall outside of the data window for this WQA.Submittal did not include documentation addressing the accuracy and completeness of the information submitted to Ecology, and study methods & data not documented or readily available.</p>
<p>Bigg, M., I. MacAskie, and G. Ellis. 1976. Abundance and movements of killer whales off eastern and southern Vancouver Island with comments on management. Ecological Reserves Collection, Government of British Columbia, Ref. No. 336. <i>Unable to locate study.</i></p>	<p>This study was 45 years old and falls outside of the data window for this WQA. This study was not specific to Washington waters. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Grant, S.C.H. and P.S. Ross. 2002. Southern resident killer whales at risk: Toxic chemicals in the British Columbia and Washington environment. Can. Tech. Rep. Fish. Aquat. Sci. 2412: xii + 111 p. https://www.researchgate.net/publication/237636125_Southern_Resident_Killer_Whales_at_Risk_To_toxic_Chemicals_in_the_British_Columbia_and_Washington_Environment</p>	<p>This submittal falls outside of the data window for this WQA. Intent of the study was not to demonstrate ambient water conditions at specific locations in Washington.</p>
<p>Stehr, C. et al. 2000. Exposure of juvenile chinook and chum salmon to chemical contaminants in the Hylebos Waterway of Commencement Bay, Tacoma, Washington. Journal of Aquatic Ecosystem Stress and Recovery 7: 215–227, 2000. https://link.springer.com/article/10.1023/A:1009905322386</p>	<p>The data from the study fall outside of the data window for this WQA. Further, data from these studies would not have been considered in the 2018 WQ Assessment because the tissue samples would not have met Policy 1-11 requirements.</p>
<p>Johnson, L. et al. 2006. Contaminant exposure in outmigrant juvenile salmon from Pacific Northwest estuaries of the United States. Environ Monit Assess DOI 10.1007/s10661-006-9216-7. https://pubmed.ncbi.nlm.nih.gov/16957861/</p>	<p>The data from these studies (collected 1996-2001) fall outside of the data window for this WQA. Further, data from these studies would not have been considered in the 2018 WQ Assessment because the tissue samples would not have met Policy 1-11 requirements.</p>
<p>Lower Columbia Estuary Partnership, Lower Columbia River and Estuary Ecosystem Monitoring; Water Quality and Salmon Sampling Report (2007);132 https://www.estuarypartnership.org/resource/lower-columbia-river-and-estuary-ecosystem-monitoring-water-quality-and-salmon-sampling</p>	<p>The data from these studies (collected 1996-2001) fall outside of the data window for this WQA. Further, data from these studies would not have been considered in the 2018 WQ Assessment because the tissue samples would not have met Policy 1-11 requirements.</p>

Table 6: Data associated with a submittal was considered for listing, but did not show exceedances of the standards, or did not meet data or quality assurance requirements in accordance with credible data statutes and policies.

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Pacific Herring Species Monitored: Toxic Contaminants in Puget Sound Fish and Shellfish _Washington Department of Fish & Wildlife.pdf https://wdfw.wa.gov/species-habitats/science/marine-toxics/species-monitored</p>	<p>This submittal is a website that provides information on their pacific herring monitoring program. Focus of website is on WDFW’s monitoring program, and not on determining water quality or ambient conditions of specific waterbodies. Associated data was considered not used in the 2018 WQ Assessment because fish were analyzed as whole body, which is not considered edible fin-fish tissue for the assessment in accordance with Policy 1-11.</p>
<p>Ecology, Persistent Bioaccumulative and Toxic Contaminants in Pelagic Marine Fish Species from Puget Sound (March 2011)33 https://apps.ecology.wa.gov/publications/publications/1110003.pdf</p>	<p>Data associated with this summary submittal was considered but not used in the 2018 WQ Assessment because the tissue data did not meet Policy 1-11 requirements. Fish were analyzed as whole body, including stomach contents and bile, which are not considered edible tissue types.</p>
<p>West, J.E., J.A. Lanksbury, S.M. O'Neill, and A. Marshall. 2011. Control of Toxic Chemicals in Puget Sound Phase 3: Persistent Bioaccumulative and Toxic Contaminants in Pelagic Marine Fish Species from Puget Sound. Washington Department of Fish and Wildlife. Olympia, Washington. 70pp. https://wdfw.wa.gov/publications/01362</p>	<p>Data from this study, associated with Phase 3 Puget Sound Toxics Loading Assessment, was considered but not used in the 2018 WQ Assessment because the tissue data did not meet Policy 1-11 requirements. Fish tissue type was whole body and whole body tissue is not considered an edible tissue type per Assessment Policy 1-11.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Lower Columbia Estuary Partnership, Juvenile Salmon Ecology in Tidal Freshwater Wetlands of the Lower Columbia River Estuary: Synthesis of the Ecosystem Monitoring Program, 2005–2010 (2013);133 https://www.estuarypartnership.org/resource/juvenile-salmon-ecology-tidal-freshwater-wetlands-lower-columbia-river-estuary-synthesis</p>	<p>Intent of the study was not to demonstrate ambient water conditions at specific locations. It is important to note that any water quality data associated with the study that is in EIM or the federal Water Quality Portal would be used in the assessment of data.</p>
<p>Lanksbury, J.A., L.A. Niewolny, A.J. Carey, and J.E. West. 2014. Toxic Contaminants in Puget Sound's Nearshore Biota: A Large-Scale Synoptic Survey Using Transplanted Mussels (<i>Mytilus trossulus</i>). Washington Department of Fish and Wildlife; WDFW Report Number FPT 14-08. Olympia, Washington. 177pp. https://wdfw.wa.gov/publications/01643</p>	<p>This study focused on toxic contaminants generated primarily from terrestrial sources, and conveyed to Puget Sound nearshore habitats via stormwater and other hydraulic watershed processes. Intent of the study was not to demonstrate ambient water conditions at specific locations. Tissue data associated with the study were considered but could not be used because data were reported in dry weight and thus are not useable for the assessment because other ancillary data (percent moisture) is needed to calculate a wet weight for comparison to the TEC thresholds.</p>
<p>Lanksbury, J.A. and J.E. West. 2012. 2011/2012 Mussel Watch Phase 1: Sampling Summary and Progress Report. Washington Department of Fish and Wildlife. Olympia, Washington. 75pp. http://wdfw.wa.gov/publications/01381/</p>	<p>Tissue data associated with the study could not be used because it appears that data were reported in dry weight and thus are not useable for the assessment because other ancillary data (percent moisture) is needed to calculate a wet weight for comparison to the TEC thresholds. Listings from previous cycles based on Mussel Watch data were still carried forward.</p>
<p>Lanksbury, J.A., J.E. West, K. Herrmann, A. Hennings, K. Litle, and A. Johnson. 2010. Washington State 2009/10 Mussel Watch Pilot Project: A Collaboration between National, State and Local Partners. Olympia, WA. Puget Sound Partnership, 283pp. https://wdfw.wa.gov/publications/01127</p>	<p>Tissue data associated with the study could not be used because it appears that data were reported in dry weight and thus are not useable for the assessment because other ancillary data (percent moisture) is needed to calculate a wet weight for comparison to the TEC thresholds. Listings from previous cycles based on Mussel Watch data were still carried forward.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>West, J.E., S.M. O'Neill, and G.M. Ylitalo. 2008. Spatial extent, magnitude, and patterns of persistent organochlorine pollutants in Pacific herring (<i>Clupea pallasii</i>) populations in the Puget Sound (USA) and the Georgia Basin (Canada). <i>Science of the Total Environment</i> 394:369-378. https://www.sciencedirect.com/science/article/abs/pii/S004896970701340X</p>	<p>Tissue data associated with the study could not be used because fish were analyzed as whole body, which is not considered edible fin-fish tissue in accordance with Policy 1-11.</p>
<p>Ecology, Toxic Contaminants in Harbor Seal (<i>Phoca vitulina</i>) Pups from Puget Sound (March 2011) https://apps.ecology.wa.gov/publications/publications/1110001.pdf</p>	<p>Data from the harbor seal pups was considered but not used in the 2018 Assessment in accordance with Policy 1-11 because harbor seals are not considered an edible species in Washington waterbodies.</p>
<p>Washington Department of Fish and Wildlife. 2011. Toxic Contaminants in Harbor Seal (<i>Phoca vitulina</i>) Pups from Puget Sound. Ecology Publication Number 11-10-001. https://apps.ecology.wa.gov/publications/documents/1110001.pdf</p>	<p>Data from the harbor seal pups was considered but not used in the 2018 Assessment in accordance with Policy 1-11 because harbor seals are not considered an edible species in Washington waterbodies.</p>
<p>Sound Experience Microplastic Citizen Science Program (SEMCSPP) data and results, collected using methods summarized in an undergraduate research thesis at the University of Washington, Tacoma (Reetz, 2014). Submittal by Center for Biological Diversity via 6/30/2016 correspondence to Ecology.</p> <p>Reetz, L. R. (2014). Characterizing microplastics of surface waters in the Puget Sound, WA. Unpublished Undergraduate Research.</p>	<p>The submitter requests listing South Puget Sound, East of Anderson Island for microplastics based on the undergraduate research report (Reetz, 2014) and the accompanying data from SEMCSPP. The study states that no quality assurance or quality control methods were in place for sample collection or lab processing. Additionally, the data records from SEMCSPP did not correspond with the data presented in the study results section. For these reasons, this information would not meet Washington's Credible Data Act requirements (RCW 90.48.580) and was not further considered.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Gilman, N. E. (2013). Examining spatial concentrations of marine micro-plastics on shorelines in south Puget Sound, Washington. <i>Unpublished Thesis</i>. Submittal by Center for Biological Diversity via 6/30/2016 correspondence to Ecology.</p>	<p>The submitter requests listing Budd Inlet as impaired for microplastics based on results and supporting data from this graduate student research thesis. The study and the accompanying data quantified mean microplastic concentrations on twelve beach sites spanning Budd, Eld, and Totten Inlets in 2013. The study found the presence of micro plastics on the shores of all three inlets, with Budd Inlet containing microplastic concentrations two orders of magnitude larger than Eld and Totten Inlets. However, it is currently unclear how reported concentrations of microplastics along these beaches may “adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health”, as defined in WAC 173-201A-260(2)(a). Additionally the visible presence of microplastics on beaches does not suggest an impairment to aesthetic uses as defined in WA 173-201A-260(2)(b). This submittal did not meet listing requirements in Policy 1-11 for assessment of waters under Washington’s narrative water quality criteria. The study would need to provide information that clearly documents the connection between sources, causes, and effects on designated uses in order to meet credible data requirements in Washington.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p data-bbox="203 258 883 485">Davis, W., & Murphy, A. G. (2015). Plastic in surface waters of the Inside Passage and beaches of the Salish Sea in Washington State. <i>Marine Pollution Bulletin</i>, 97(1-2), 169–177. Submittal by Center for Biological Diversity via 6/30/2016 correspondence to Ecology.</p> <p data-bbox="203 489 846 520">http://doi.org/10.1016/j.marpolbul.2015.06.019</p>	<p data-bbox="906 258 1487 1646">The submitter requests listing marine waters off of Fort Worden, Fort Flagler State Park, and Discovery Park as impaired for microplastics. The study summarized results of anthropogenic debris on 37 beaches in Washington State collected 2008 to 2011 and surface water debris collected from Salish Sea to Skagway, Alaska in 2011. The study asserts that considerably higher concentrations of anthropogenic marine debris were on beaches in Washington than those reported on beaches outside of Washington State. The authors also suggested that plastic on Washington’s beaches is largely sourced from surface water. While the presence of microplastics in Puget Sound’s urbanized areas and Washington beaches have been documented, we currently do not have enough information to determine how current levels of microplastics may “adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health”, as defined in WAC 173-201A-260(2)(a), or impact Washington’s aquatic organisms. This submittal did not meet listing requirements in Policy 1-11 for assessment of waters under Washington’s narrative water quality criteria. The study would need to provide information that clearly documents the connection between sources, causes, and effects on designated uses in order to meet credible data requirements in Washington.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p data-bbox="204 258 878 562">Adventurers and Scientists for Conservation (ASC) Global Microplastics Initiative data. Submittal by Center for Biological Diversity via 6/30/2016 correspondence to Ecology. Data submitters cited a study by Lonnstedt and Eklov (2016) which found impacts to development, growth, and behaviors of European Perch exposed to varying levels of microplastics.</p> <p data-bbox="204 604 854 793">Lonnstedt, O. M., & Eklov, P. (2016). Environmentally relevant concentrations of microplastic particles influence larval fish ecology. <i>Science</i>, 352(6290), 1213 – 1216. http://doi.org/10.1126/science.aad8828</p>	<p data-bbox="907 258 1487 1493">The submitters request listing Commencement Bay, Puyallup River, Steilecoom Harbor, and Juan de Fuca Straight for microplastics based on ASC studies and impairments to European Perch (Lonnstedt & Eklove 2016). Data collected in Washington’s waters from 2014-2015 ranged from 0 to 32 microplastics/L. Based on current research, it’s unclear whether the levels reported can impact local aquatic life. Data submitters cited a study by Lonnstedt and Eklov (2016) which found impacts to development, growth, and behaviors of European Perch exposed to varying levels of microplastics. However, European Perch are not resident species in Washington’s marine waters. Also, the difference in impacts to fish between the control group and the average microplastic concentration group (10 microplastics/L) were statistically negligible for nearly all factors analyzed. Most impacts were noted in the high exposure group (80 microplastics/L). No waterbodies in Washington provided in the ASC dataset had levels above the 80 microplastics/L threshold. Due to lack of established criteria and lack of information supporting impacts to organisms in Washington’s marine waters, there is not sufficient evidence to list this waterbody under Ecology’s narrative criteria.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>National Ocean and Atmosphere Administration’s Pacific Marine Laboratory (NOAA/PMEL) West Coast Ocean Acidification monitoring surface seawater CO₂ data sets from which pH can be calculated, links to download data submitted via 6/30/2016 correspondence to Ecology.</p>	<p>After reviewing the <i>p</i>CO₂ data sets, Ecology determined that these data are not appropriate for use in the WQA. Ecology does not have approved numeric criteria for determining impairment to aquatic life utilizing surface water <i>p</i>CO₂ measurements. Additionally, Ecology does not have an established method for the conversion of salinity measurements to total alkalinity or conversion of <i>p</i>CO₂ to infer pH for purposes of the WQA. For assessment of waters under Washington’s narrative water quality criteria, Ecology must have information that clearly documents the connection between sources, causes, and effects on designated uses. This ensures we are meeting our credible data requirements in Washington (RCW 90.48.570-590). Due to lack of established criteria, appropriate methodology, and lack of information supporting impacts under Ecology’s narrative criteria, it was determined that these <i>p</i>CO₂ data are not appropriate for use in the WQA.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>National Ocean and Atmosphere Administration’s Pacific Marine Laboratory (NOAA/PMEL) West Coast Ocean Acidification (WCOA) cruise, information on biological impacts on pteropods on the WOAC and NANOOS cruises, 2014, submitted via 6/30/2016 correspondence to Ecology. Data consists of pteropod shell damage characterization and calculated aragonite saturation based on samples collected from a 2014 WOAC and NANOOS cruise of Puget Sound. Ecology reviewed the pteropod data.</p>	<p>Ecology currently does not have numeric criteria for aragonite saturation or an approved standard methodology for analyzing marine biological organism data for purposes of the WQA. While data demonstrate a range of severity in pteropod shell damage, there are no reference conditions or sites with which to compare these data. Without reference conditions, it is unclear whether these data represent the natural conditions of aquatic life in Washington’s waters. Additionally, the few samples collected are not likely to capture the potential variability in pteropod shell development. Ecology recognizes the relationships between pH, aragonite saturation, and pteropod shell dissolution as documented by Bednarsek and others (2012, 2014). However, there is not sufficient data collected in Washington’s waters for purposes of listing under our narrative criteria at this time.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Center for Biological Diversity, data and information submittal to list Dabob OA mooring (47.97°N, -124.95°W) as impaired for ocean acidification, submitted via 6/24/2016 correspondence to Ecology.</p>	<p>The request to list this buoy site for ocean acidification is based on pCO_2 data from this station, which can reach levels well above 500 ppm. The submitter asserts that these levels would correlate with relatively low pH. Ecology determined that using pCO_2 data trends alone are not appropriate for the WQA. Ecology does not have approved numeric criteria for determining impairment to aquatic life utilizing surface water pCO_2 measurements. For assessment of waters under Washington’s narrative water quality criteria, Ecology must have information that clearly documents the connection between sources, causes, and effects on designated uses in order to meet credible data requirements in Washington. Due to lack of established criteria and lack of information supporting impacts under Ecology’s narrative criteria, it was determined that these pCO_2 data are not appropriate for use in the WQA.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Center for Biological Diversity, data and information submittal to list Twanoh (NANOOS ORCA buoy at Twanoh (47.37°N, 123.01°W) as impaired for ocean acidification, submitted via 6/24/2016 correspondence to Ecology.</p>	<p>The request to list this buoy site for ocean acidification is based on $p\text{CO}_2$ data from this station, which can reach levels well above 500 ppm. The submitter asserts that these levels would correlate with relatively low pH. Ecology determined that using $p\text{CO}_2$ data trends alone are not appropriate for the WQA. Ecology does not have approved numeric criteria for determining impairment to aquatic life utilizing surface water $p\text{CO}_2$ measurements. For assessment of waters under Washington’s narrative water quality criteria, Ecology must have information that clearly documents the connection between sources, causes, and effects on designated uses in order to meet credible data requirements in Washington. Due to lack of established criteria and lack of information supporting impacts under Ecology’s narrative criteria, it was determined that these $p\text{CO}_2$ data are not appropriate for use in the WQA.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Center for Biological Diversity, pH data and information submittal to list Taylor Shellfish Farm (Dabob Bay, 47.8199°N, -122.8215°W) as impaired for ocean acidification, submitted via 6/24/2016 correspondence to Ecology.</p>	<p>Upon review of this third party submittal, there is not sufficient information provided with the data to demonstrate that quality assurance practices appropriate for the WQA were used. Per Policy 1-11, data submittals must include “documentation addressing the accuracy and completeness of the information submitted” and “documentation from the original data submitter indicating that the required QA objectives were met”. However, even if data were deemed appropriate for the WQA, Ecology does not agree with the assertion that there was nonattainment of Washington’s aquatic life standard. It appears from our review that all pH monitoring data were within the acceptable range of 7.0 to 8.5 units based on application of Policy 1-11, and there was no accompanying analysis demonstrating that there was a human-caused variation within the range of less than 0.2 units. There is no presentation of biological data collected at this location that supports the statements that a pH of less than 7.8 represents harm to oyster larvae and pteropods in Dabob Bay. Due to lack of quality assurance documentation and lack of information supporting impacts under Ecology’s narrative criteria requirements, it was determined that these pH data are not appropriate for use in the WQA.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Center for Biological Diversity, data and information submittal to list Dockton Park Station (Outer Quartermaster Harbor, 47.371618° N, - 122.454097°W) as impaired for ocean acidification, submitted via 6/24/2016 correspondence to Ecology. The outer Quartermaster Harbor mooring system is located in Dockton Park and it is part of the King County four active water quality stations.</p>	<p>Upon review of this third party submittal, there is not sufficient information provided with the data to demonstrate that quality assurance practices appropriate for the WQA were used. Per Policy 1-11, data submittals must include “documentation addressing the accuracy and completeness of the information submitted” and “documentation from the original data submitter indicating that the required QA objectives were met”. For example, King County’s Marine Monitoring website indicates that all pH data records should be paired with a quality control descriptor, which was missing from this submittal. Upon review of the data, we note that pH values ranged from 3.59 to 8.76, which is a highly unrealistic range for pH in a heavily studied marine environment. This calls into question quality assurance concerns that are not adequately addressed by the third party submittal. Additionally, there is no presentation of biological data collected at this location that supports the statements that the presented aragonite saturation levels at this locations are impacting oysters or pteropods in Quartermaster Harbor. It was determined that these data are not appropriate for use in the WQA due to: lack of quality assurance documentation, discrepancies between data provided and data represented in figures, lack of established aragonite criteria, and lack of information supporting impacts under Ecology’s narrative criteria.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Center for Biological Diversity, data and information submittal to list Quarter Master Yacht Club as impaired for ocean acidification, submitted via 6/24/2016 correspondence to Ecology. The inner Quartermaster Harbor mooring system is located at the Quartermaster Yacht Club.</p>	<p>Upon review of this third party submittal, there is not sufficient information provided with the data to demonstrate that quality assurance practices appropriate for the WQA were used. Per Policy 1-11, data submittals must include “documentation addressing the accuracy and completeness of the information submitted” and “documentation from the original data submitter indicating that the required QA objectives were met”. For example, King County’s Marine Monitoring website indicates that all pH data records should be paired with a quality control descriptor, which was missing from this submittal. Additionally, the data provided were the exact same data as those provided from the Quartermaster Harbor monitoring station listed directly above, which calls into question whether the data provided are actually the data presented in Figure 17 of the submittal. Nonetheless, pH values in data provided ranged from 3.59 to 8.76, which is a highly unrealistic range for pH in a heavily studied marine environment. This calls into question quality assurance concerns that are not adequately addressed by the third party submittal. Additionally, there is no presentation of biological data collected at this location that supports the statements that the presented aragonite saturation levels at this locations are impacting oysters or pteropods in Quartermaster Harbor. It was determined that these data are not appropriate for use in the WQA due to: lack of a quality assurance documentation, discrepancies between data provided and data represented in figures, lack of established aragonite criteria, and lack of information supporting impacts under Ecology’s narrative criteria.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Center for Biological Diversity, data and information submittal to list Point Williams as impaired for ocean acidification, submitted via 6/24/2016 correspondence to Ecology. The mooring system located in Central Puget Sound off of Point Williams is deployed from an oceanic buoy.</p>	<p>Upon review of this third party submittal, there is not sufficient information provided with the data to demonstrate that quality assurance practices appropriate for the WQA were used. Per Policy 1-11, data submittals must include “documentation addressing the accuracy and completeness of the information submitted” and “documentation from the original data submitter indicating that the required QA objectives were met”. For example, King County’s Marine Monitoring website indicates that all pH data records should be paired with a quality control descriptor, which was missing from this submittal. Additionally, the data provided were the exact same data as those provided from the Quartermaster Harbor monitoring station listed above, which calls into question whether the data provided are actually the data presented in Figure 16. Nonetheless, pH values in data provided ranged from 3.59 to 8.76, which is a highly unrealistic range for pH in a heavily studied marine environment. This calls into question quality assurance concerns that are not adequately addressed by the third party submittal. Additionally, there is no presentation of biological data collected at this location that supports the statements that the presented aragonite saturation levels at this locations are impacting oysters or pteropods in Point Williams. In summary, it was determined that these data are not appropriate for use in the WQA due to: lack of quality assurance documentation, discrepancies between data provided and data represented in figures, lack of established aragonite criteria, and lack of information supporting impacts under Ecology’s narrative criteria.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Center for Biological Diversity, data and information submittal to list Seattle Aquarium as impaired for ocean acidification, submitted via 6/24/2016 correspondence to Ecology. The Elliott Bay mooring system is located at, and is a joint project with, the Seattle Aquarium.</p>	<p>Upon review of this third party submittal, there is not sufficient information provided with the data to demonstrate that quality assurance practices appropriate for the WQA were used. Per Policy 1-11, data submittals must include “documentation addressing the accuracy and completeness of the information submitted” and “documentation from the original data submitter indicating that the required QA objectives were met”. For example, King County’s Marine Monitoring website indicates that all pH data records should be paired with a quality control descriptor, which was missing from this submittal. Additionally, the data provided were the exact same data as those provided from the Quartermaster Harbor monitoring station listed above, which calls into question whether the data provided are actually the data presented in Figure 16. Nonetheless, pH values in data provided ranged from 3.59 to 8.76, which is a highly unrealistic range for pH in a heavily studied marine environment. This calls into question quality assurance concerns that are not adequately addressed by the third party submittal. Additionally, there is no presentation of biological data collected at this location that supports the statements that the presented aragonite saturation levels at this locations are impacting oysters or pteropods in Elliott Bay. In summary, it was determined that these data are not appropriate for use in the WQA due to: lack of quality assurance documentation, discrepancies between data provided and data represented in figures, lack of established aragonite criteria, and lack of information supporting impacts under Ecology’s narrative criteria.</p>

Table 7: Submittal is not a water quality study, and not related to determining ambient water conditions.

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Hood, E. 2005. Are EDCs Blurring Issues of Gender? Environmental Health Perspectives. VOLUME 113 NUMBER 10 October 2005: 671 – 677.</p> <p><i>Unable to locate study online.</i></p>	<p>This article on adverse human health effects of exposure to endocrine-disrupting chemicals is unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>Lower Columbia Estuary Partnership, Historical Habitat Change in the Lower Columbia River, 1870 - 2010 (2012);140 https://www.estuarypartnership.org/sites/default/files/resource_files/Lower Columbia Estuary Historical Landcover Change final 2013_small.pdf</p>	<p>This spatial analysis of long term land cover change for the lower Columbia River estuary and its floodplain by comparing GIS representations of late 1800’s maps is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>U.S. Fish and Wildlife Service, Species Assessment and Listing Priority Assignment Form: Rana pretiosa (May 9, 2011).149 https://www.fs.fed.us/r6/sfpnw/issssp/documents/planning-docs/cp-fws-candidate-ha-rana-pretiosa-2011-05.pdf</p>	<p>This online page provides a species assessment and listing priority assignment for the Oregon spotted frog. Submittal is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>NMFS, Endangered and Threatened Wildlife and Plants: Threatened Status for Southern Distinct Population Segment of North American Green Sturgeon (April 7, 2006)150 https://www.fisheries.noaa.gov/action/critical-habitat-designation-southern-distinct-population-segment-north-american-green</p>	<p>This is an online page describing NOAA Fisheries action to conserve the threatened Southern Distinct Population Segment of North American green sturgeon. Submittal is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>NMFS, Endangered and Threatened Wildlife and Plants; Adding Four Marine Taxa to the List of Endangered and Threatened Wildlife, Final Rule (April 4, 2007)151 https://www.federalregister.gov/documents/2007/04/04/E7-6188/endangered-and-threatened-wildlife-and-plants-adding-four-marine-taxa-to-the-list-of-endangered-and</p>	<p>This is a federal register notice for a final rule where the U.S. Fish and Wildlife Service (Service), are adding four marine taxa to the List of Endangered and Threatened Wildlife Submittal is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>NMFS, Endangered and Threatened Wildlife and Plants; Marine and Anadromous Taxa: Additions, Removal, Updates, and Corrections to the List of Endangered and Threatened Wildlife (July 24, 2014)152 https://www.federalregister.gov/documents/2014/07/23/2014-16756/endangered-and-threatened-wildlife-and-plants-marine-and-anadromous-taxa-additions-removal-updates</p>	<p>This is a federal register notice for a final rule where the U.S. Fish and Wildlife Service (Service), are adding several marine taxa, removing one species, and revising the entries of many more in accordance with the Endangered Species Act of 1973, as amended (Act). ubmittal is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>O'Neill, S. M., G.M. Ylitalo, and J.E. West. 2014. Energy content of Pacific salmon as prey of northern and southern resident killer whales. <i>Endangered Species Research</i> 25(2): 265-281. http://www.int-res.com/abstracts/esr/v25/n3/p265-281/</p>	<p>This study analyzed proximate composition and calculated caloric content of Pacific salmon to evaluate the importance of salmon species, population, body size, and lipid levels in determining their energy content as prey for killer whales. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>West J.E., T.E. Helser, and S.M. O'Neill. 2014. Variation in quillback rockfish (<i>Sebastes maliger</i>) growth patterns from oceanic to inland waters of the Salish Sea. <i>Bulletin of Marine Science</i>. 90 (2): 747-761. https://www.ingentaconnect.com/content/umrsm/as/bullmar/2014/00000090/00000003/art00001</p>	<p>This study compared patterns of growth variation in quillback rockfish from four regions across the Salish sea. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>da Silva, D.A.M., J. Buzitis, W.L. Reichert, J.E. West, S.M. O'Neill, L.L. Johnson, T.K. Collier, and G.M. Ylitalo. 2013. Endocrine disrupting chemicals in fish bile: A rapid method of analysis and field validation using English sole (<i>Parophrys ventulus</i>) from Puget Sound, WA, USA. <i>Chemosphere</i> 92(11): 1550-1556. https://www.sciencedirect.com/science/article/abs/pii/S0045653513006255?via%3Dihub</p>	<p>This study describes a recently developed and rapid method to measure bisphenol A (BPA), 17β-estradiol (E2) and 17α-ethynylestradiol (EE2) in bile of fish using enzymatic hydrolysis. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>James, C.A., J. Kershner, J. Samhour, S.M. O'Neill, and P.S. Levin. 2012. A methodology for evaluating and ranking water quantity indicators in support of ecosystem-based management. <i>Environmental Management</i> 49:703-19. https://link.springer.com/article/10.1007/s00267-012-9808-7</p>	<p>This paper describes an indicator evaluation and selection process designed to support the Ecosystem-based Management approach in Puget Sound. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Lanksbury, J.A. and J.E. West. 2011. Blue Mussels as Indicators of Stormwater Pollution in Nearshore Marine Habitats in Puget Sound: Proposed Revised Statement of Hypothesis. Washington Department of Fish and Wildlife. Olympia, Washington. 28pp. https://wdfw.wa.gov/publications/01366</p>	<p>This report summarizes the feasibility of applying a probabilistic random sampling design for monitoring the status and trends of toxic contaminants in blue mussels. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Johnson, L., C. Bravo, S.M. O'Neill, J.E. West, M.S. Myers, G. Ylitalo, N. Scholz, and T. Collier. 2010. A Toxics-Focused Biological Observing System for Puget Sound (Developed by the Washington Department of Fish and Wildlife and NOAA Fisheries for the Puget Sound Partnership). Washington Department of Ecology Publication #10-10-04. 30pp. https://wdfw.wa.gov/publications/01129</p>	<p>This concept paper provides a general description of the Toxics-Focused Biological Observing System. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Moser, M.L., M.S. Myers, B.J. Burke, and S.M. O'Neill. 2005. Effects of surgically-implanted transmitters on survival and feeding behavior of adult English sole. Pages 269-274 in M. T. Lembo and G. Marmulla, editors. Aquatic telemetry: advances and applications. Proceedings of the Fifth Conference on Telemetry held in Europe. FAO/COISPA, Ustica, Italy https://wdfw.wa.gov/publications/01043</p>	<p>A laboratory study was conducted to assess the feasibility of surgically implanting Acoustic telemetry transmitters for long-term monitoring of adult English sole. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Judd, N., S.M. O'Neill and D.A. Kalman. 2003. Are seafood PCB data sufficient to assess health risk for high seafood consumption groups? Human and Ecological Risk Assessment. 9:691-707. https://www.tandfonline.com/doi/abs/10.1080/713609962</p>	<p>This study looked at possible health risks from seafood PCB exposure for the Tulalip and Squaxin Island tribes. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>West, J.E., S.M. O'Neill, and D.C. Doty. 2002. Polycyclic Aromatic Hydrocarbons in Dungeness crabs. Page 62 in Puget Sound Water Quality Action Team, editors. 2002 Puget Sound Update: Eighth Report of the Puget Sound Ambient Monitoring Program. Washington Department of Fish and Wildlife. Olympia, Washington. 156pp. https://wdfw.wa.gov/publications/01029</p>	<p>The goals of this pilot project were to determine whether crabs are sufficiently exposed to toxics (as measured by tissue burdens) to warrant their use as a monitoring species, especially for natural resource damage assessments in the event of an oil spill. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>Rockfish Species Monitored_ Toxic Contaminants in Puget Sound Fish and Shellfish_ Washington Department of Fish & Wildlife.pdf https://wdfw.wa.gov/species-habitats/science/marine-toxics</p>	<p>This submittal is a website that provides an identification guide for rockfish. Focus of website is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Staghorn Sculpin Species Monitored: Toxic Contaminants in Puget Sound Fish and Shellfish_ Washington Department of Fish & Wildlife.pdf https://wdfw.wa.gov/species-habitats/science/marine-toxics</p>	<p>This submittal is a website that provides an identification guide for staghorn sculpin. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Pullin, A. & Knight, T. 2009. "Doing more good than harm – Building an evidence-base for conservation and environmental management". Biological Conservation 142 (2009) 931-934. https://www.sciencedirect.com/science/article/abs/pii/S0006320709000421</p>	<p>Paper on Building an evidence-base for conservation and environmental management. This paper provides tips on conducting a literature search. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Liberati, A. et.al. 2009. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. Journal of Clinical Epidemiology 62 (2009) e1ee34. https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1000100</p>	<p>Journal article on reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Dehart, M. Fish Passage Center. 2016. Memorandum on “The effect of water temperature on steelhead upstream passage”. October 31, 2016.</p> <p><i>Memorandum is not available online.</i></p>	<p>This memo focuses on observing the timing of salmonids in the Columbia River passing over Bonneville Dam when temperatures are above 18°C, and summarized observed effects. The study summarizes affects at a temperature not comparable to Columbia river water quality standards of 20°C. The study was not focused on the ambient condition of the Columbia River meeting standards. Any relevant data showing excursions of temperature criteria found in EIM or the federal Water Quality Portal were included in the WQA.</p>
<p>Pullin, A. and Stewart, G. 2006. “Guidelines for Systematic Review in Conservation and Environmental Management”. Conservation Biology Volume 20, No. 6, 1647–1656.</p> <p>https://www.researchgate.net/publication/6618138_Guidelines_for_Systematic_Review_in_Environmental_Management</p>	<p>Paper on Guidelines for Systematic Review in Conservation and Environmental Management. Focus of study was unrelated to determining water quality or ambient condition of specific waterbodies.</p>
<p>Center for Reviews and Dissemination, University of York. 2009. CRD’s guidance for undertaking reviews in health care. ISBN 978-1-900640-47-3. January 2009.</p> <p>https://www.york.ac.uk/media/crd/Systematic_Reviews.pdf</p>	<p>Guidance for undertaking reviews in health care. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Matkin, C. O, M. J. Moore, and F.M.D. Gulland. 2017. Review of Recent Research on Southern Resident Killer Whales (SRKW) to Detect Evidence of Poor Body Condition in the Population. Independent Science Panel Report to the SeaDoc Society. 3 pp. + Appendices. DOI 10.1575/1912/8803</p> <p>https://georgiastrait.org/wp-content/uploads/2018/02/review-of-recent-research-on.pdf</p>	<p>This review found that poor body condition is associated with loss of fetuses, calves and adults. The causes of this are complex, and analysis is further compounded by stochastic events such as vessel strike. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>James, C. et. al. 2015. Contaminants of Emerging Concern: A Prioritization Framework for Monitoring in Puget Sound. Puget Sound Ecosystem Monitoring Program Toxics Workgroup. January 2015. https://www.eopugetsound.org/sites/default/files/features/resources/CEC_Prioritization_White_Paper_2015-02-28.pdf</p>	<p>The purpose of this document is to define a process to identify a priority group of Contaminants of Emerging Concern (CEC) for marine and freshwater monitoring programs in the Pacific Northwest. Focus of paper is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>O’Neill, S., G. Ylitalo, and J. West. 2014. Energy content of Pacific salmon as prey of northern and southern resident killer whales. Endangered Species Research. Vol. 25: 265–281, 2014. https://www.int-res.com/abstracts/esr/v25/n3/p265-281/</p>	<p>Study of relationship of salmon to killer whales. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies. No data was provided to show causal relationship with waterbody.</p>
<p>Mongillo, T. M., G. M. Ylitalo, L. D. Rhodes, S. M. O’Neill, D. P. Noren, and M. B. Hanson. 2016. Exposure to a mixture of toxic chemicals: Implications for the health of endangered Southern Resident killer whales. U.S. Dept. Commer., NOAA Tech. Memo. NMFSNWFS-135, 107 p. doi:10.7289/V5/TM-NWFS-135. https://www.webapps.nwfsc.noaa.gov/assets/25/8314_11302016_111957_TechMemo135.pdf?utm_source=Copy+of+August+Orca+News+-+8.29.2016&utm_campaign=2017.1.17+-+SRKW+Petition&utm_medium=email</p>	<p>The primary objectives of this study was to review the contaminants that may pose a risk to the Southern Resident killer whales and to discuss the health implications of exposure to these contaminants. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Puget Sound Institute. 2018. New Puget Sound Herring Research. February 5, 2018. https://www.pugetsoundinstitute.org/2018/02/new-puget-sound-herring-research/</p>	<p>This write-up focuses on the many hypothesized causes of herring declines, to try to pinpoint the primary cause or, therefore, the best management or policy actions for recovery. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Lundin, J. et al. 2016. Modulation in Persistent Organic Pollutant Concentration and Profile by Prey Availability and Reproductive Status in Southern Resident Killer Whale Scat Samples. Environmental Science and Technology. May 2016, 50, 12, 6506 – 6516.</p> <p>https://pubs.acs.org/doi/full/10.1021/acs.est.6b00825</p>	<p>This study broadens the understanding of persistent organic pollutants in the endangered Southern Resident killer whale population by addressing modulation by prey availability and reproductive status, along with endocrine disrupting effects. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Spromberg, J. et al. 2016. Coho salmon spawner mortality in western US urban watersheds: bioinfiltration prevents lethal storm water impacts. Journal of Applied Ecology 2016, 53, 398–407. doi: 10.1111/1365-2664.12534.</p> <p>https://waterquality.fisheries.org/wp-content/uploads/2016/07/Spromberg_et_al-2016-Journal_of_Applied_Ecology.pdf</p>	<p>Study on spawning mortality from urban stormwater found that mixtures of metals and petroleum hydrocarbons – conventional toxic constituents in urban storm water – are not sufficient to cause the spawner mortality syndrome. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Peck, K. et al. 2010. DEVELOPMENT OF AN ENZYME-LINKED IMMUNOSORBENT ASSAY FOR QUANTIFYING VITELLOGENIN IN PACIFIC SALMON AND ASSESSMENT OF FIELD EXPOSURE TO ENVIRONMENTAL ESTROGENS. Environmental Toxicology and Chemistry, Vol. 30, No. 2, pp. 477–486, 2011.</p> <p>https://setac.onlinelibrary.wiley.com/toc/15528618/2011/30/2</p>	<p>A competitive enzyme-linked immunosorbent assay was developed to quantitate vitellogenin (VTG) in plasma and serum of coho (<i>Oncorhynchus kisutch</i>) and chinook (<i>O. tshawytscha</i>) salmon. Identification of proper techniques for preserving VTG integrity in plasma and serum samples showed that VTG from both species was robust. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Fisheries and Oceans Canada. 2008. Recovery Strategy for the Northern and Southern Resident Killer Whales (<i>Orcinus orca</i>) in Canada. Species at Risk Act Recovery Strategy Series, Fisheries & Oceans Canada, Ottawa, ix + 81 pp.</p> <p>https://www.cbc.ca/bc/news/bc-081009-killer-whale-recovery-strategy.pdf</p>	<p>This paper outlines recovery strategies for the Northern and Southern resident killer whales in Canada. This recovery strategy focuses on numerous performance measures to reach objectives. It is focused on the overall improvement of recovering the species. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Aquatic Bioinvasion Research & Policy Institute, Portland State University, An assessment of marine biofouling introductions to the Puget Sound region of Washington State (May 2014)18 https://wdfw.wa.gov/sites/default/files/publications/01654/wdfw01654.pdf</p>	<p>This study focuses on biofouling that may be introduced by vessel traffic in various areas of Puget Sound, and looks at laws and regulations to protect from biofouling. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>U.S.G.S., NAS - Nonindigenous Aquatic Species, Species Lists by State, Washington Query;20 https://nas.er.usgs.gov/queries/StateSearch.aspx</p>	<p>USGS provides a list of nonindigenous aquatic species by state. A website disclaimer states that “the data represented on this site vary in accuracy, scale, completeness, extent of coverage and origin. It is the user's responsibility to use these data consistent with their intended purpose and within stated limitations.” Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>Ecology, Control of Toxic Chemicals in Puget Sound, Phase 3: Study of Atmospheric Deposition of Air Toxics to the Surface of Puget Sound (Sept. 2003)28 https://apps.ecology.wa.gov/publications/summary/pages/1002012.html</p>	<p>This study provided revisions to prior estimates or first reported atmospheric deposition fluxes of polycyclic aromatic hydrocarbons (PAHs), polybrominated diphenyl ethers (PBDEs), and select trace elements for Puget Sound. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Ecology, Summary Technical Report Control of Toxic Chemicals in Puget Sound Phase 3: Loadings from POTW Discharge of Treated Wastewater (Dec. 2010)30 https://apps.ecology.wa.gov/publications/summary/pages/1010057.html</p>	<p>The project team’s purpose was to improve the estimates of toxic chemical loadings to Puget Sound by targeted assessment of National Pollutant Discharge Elimination System (NPDES) permitted publicly owned treatment works (POTWs). Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>Ecology, Control of Toxic Chemicals in Puget Sound Phase 3: Primary Sources of Selected Toxic Chemicals and Quantities Released in the Puget Sound Basin(Nov. 2011)31 https://apps.ecology.wa.gov/publications/documents/1103024.pdf</p>	<p>The overall goal of the project (Primary Sources) is to balance the chemical loading data generated from the Puget Sound Toxics Loading Analysis (PSTLA) with information on chemical releases in order for the Washington State Department of Ecology, the Puget Sound Partnership, and others to develop and implement a toxics reduction and control strategy. Focus of study was unrelated to determining ambient conditions of specific waterbodies.</p>
<p>Ecology, Estuarine Flow in the South Basin of Puget Sound and its Effects on Near-Bottom Dissolved Oxygen (Oct. 2007)38 https://apps.ecology.wa.gov/publications/publications/0703033.pdf</p>	<p>The south basin of Puget Sound is a complex and interconnected system of straits, open reaches, and fjord-like bays. South-basin waters exchange with main-basin Puget Sound waters over a sill (shallow area) and through the Tacoma Narrows. The study concluded that the estuarine flow pattern is controlled by variations in the wind. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Puget Sound Partnership, Aquatic Invasive Species Guidebook (July 2009)39 https://www.psp.wa.gov/downloads/ANS/NewANSGuide.pdf</p>	<p>This guide was developed to help people identify and report nonnative aquatic species that are considered invasive. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Puget Sound Partnership, Marine Invasive Species Identification Guide (June 2009)40 https://www.psp.wa.gov/downloads/ANS/MISMOnline.pdf</p>	<p>This Guide identifies invasive marine plants with specific details on identifying them. Focus of the guide is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>NMFS, Endangered and Threatened Species; Designation of Critical Habitat for Southern Resident Killer Whale, Final Rule (Nov. 29, 2006)51 https://www.fisheries.noaa.gov/action/critical-habitat-southern-resident-killer-whale#:~:text=In%20November%202006%20we%20issued%20a%20final%20rule,habitat%20for%20the%20Southern%20Resident%20killer%20whale%20DPS</p>	<p>In November 2006 NMFS issued a final rule designating approximately 2,560 square miles (6,630 square km) of inland waters of Washington State as critical habitat for the Southern Resident killer whale. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>NMFS, Southern Resident Killer Whale Critical Habitat52 https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/critical-habitat-southern-resident-killer-whales</p>	<p>Southern Resident killer whale critical habitat data (2006) can be downloaded as a shapefile, viewed interactively in the Protected Resources App, or accessed through a map service (REST URL). Focus of map is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>NMFS, Southern Resident Killer Whales (Orcinus orca) 5-Year Review: Summary and Evaluation (Jan. 2011)53 https://www.fisheries.noaa.gov/resource/document/southern-resident-killer-whales-orcinus-orca-5-year-review-summary-and-evaluation</p>	<p>The Endangered Species Act of 1973 (ESA) requires completion of periodic reviews of species that are listed as threatened or endangered to ensure that the listing of these species remains accurate. Focus of this review is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>NMFS, Endangered and Threatened Wildlife and Plants: Endangered Status for Southern Resident Killer Whales, Final Rule (Nov. 18, 2005)54 https://www.federalregister.gov/documents/2019/04/15/2019-06917/endangered-and-threatened-wildlife-and-plants-endangered-status-of-the-gulf-of-mexico-brydes-whale</p>	<p>The Southern Resident Population was listed as endangered in 2005 under the Endangered Species Act and are considered depleted under the Marine Mammal Protection Act. Focus of the Final Rule is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>NMFS, Recovery Plan for Southern Resident Killer Whales (Orcinus orca) Jan. 18, 2008)55 https://www.fisheries.noaa.gov/resource/document/recovery-plan-southern-resident-killer-whales-orcinus-orca</p>	<p>This plan identifies a range of actions that will contribute to recovery of Southern Resident killer whales. Many of these actions will have a direct effect on killer whale habitat, but they will also help restore and improve a range of habitats, species. Focus of the plan is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>USFWS, Draft Hazardous Materials and Environmental Assessment Report, Destruction Island, Washington (Jan. 2000)67 https://www.fws.gov/pacific/planning/draft/docs/WA/waislands/waislandsupdate2.pdf</p>	<p>The planning team and Service staff used input from the public, various organizations, other agencies, and affected Tribes to formulate the following issues that are the most significant to the Refuges. These issues will provide the basis for drafting management objectives and strategies for public review. Focus of the report is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>USFWS, News Release: Oregon Spotted Frog to be Protected under the Endangered Species Act Oregon and Washington populations will be listed as threatened (Aug. 28, 2014)68 https://www.fws.gov/wafwo/species/osf/NR_reopen2_CHcom_final_8_sept_2014.pdf</p>	<p>The U.S. Fish and Wildlife Service announced its decision to extend protection to the Oregon spotted frog (Rana pretiosa) as a threatened species under the Endangered Species Act. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>USFWS, Environmental Contaminants Program Off-Refuge Investigations Trumpeter Swan Lead Shot Poisoning Investigation in Northwest Washington and Southwest British Columbia (June 2009)72 https://www.fws.gov/wafwo/pdf/EC_TRUSLeadShotPoisoningFinalReport.pdf</p>	<p>Trumpeter (Cygnus buccinator) and tundra swan (Cygnus columbianus) populations wintering in northwest Washington State and on the Sumas Prairie, British Columbia, from 1999-2008, lost over 2,574 members, the majority (62%, 1,586) were confirmed as lead poisoned caused by the ingestion of lead pellets. In 2001, an international effort was initiated to locate the source(s) of the lead. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

Narrative Data Submittal	Reasons(s) for not using Submittal
<p>USFWS, Sea Otter (<i>Enhydra lutris kenyoni</i>) Washington Stock (Aug. 2008)75 https://www.fws.gov/wafwo/pdf/WA_NSQ_SAR_Aug2008_final.pdf</p>	<p>The WDFW finalized their sea otter recovery plan in 2004. This stock is not classified as strategic because the population is growing and is not listed as “depleted” under the MMPA or “threatened” or “endangered” under the Endangered Species Act of 1973. Focus of paper is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>NMFS, Behavioral impairment and increased predation mortality in cutthroat trout exposed to carbaryl (Jan. 11, 2011)78 https://www.fws.gov/wafwo/documents/PR_Behavioralimpairment_Increasedpredationcutthroattroutexposedcarbaryl.pdf</p>	<p>This study showed that the olfactory system of trout is unresponsive to carbaryl, and that trout do not avoid seawater containing the pesticide at environmentally representative concentrations. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>
<p>USGS, Chemical contaminants in fish feeds used in federal salmonid hatcheries in the USA (Jan. 12, 2007)79 https://www.fws.gov/wafwo/pdf/maule_et_al_2007_contam_in_fish_food_final.pdf</p>	<p>Recent studies have demonstrated that fish feeds contain significant concentrations of contaminants, many of which can bioaccumulate and bioconcentrate in fish. Organochlorine (OC) contaminants are present in the fish oils and fish meals used in feed manufacture, and some researchers speculate that all fish feeds contain measurable levels of some contaminants. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies in Washington .</p>
<p>Washington Herp Atlas, Pacific Giant Salamander92 https://wdfw.wa.gov/publications/02135</p>	<p>The Washington Herp Atlas link to each species account and to photos of each species, photos showing the key features for species identification and dot distribution maps. Focus of document is unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

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<p>Washington Herp Atlas, Cope’s Giant Salamander93 https://wdfw.wa.gov/publications/02135</p>	<p>The Washington Herp Atlas link to each species account and to photos of each species, photos showing the key features for species identification and dot distribution maps. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Washington Herp Atlas, Cascade Torrent Salamander94 https://wdfw.wa.gov/publications/02135</p>	<p>The Washington Herp Atlas link to each species account and to photos of each species, photos showing the key features for species identification and dot distribution maps. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Washington Herp Atlas, Columbia Torrent Salamander95 https://wdfw.wa.gov/publications/02135</p>	<p>The Washington Herp Atlas link to each species account and to photos of each species, photos showing the key features for species identification and dot distribution maps. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>
<p>Washington Herp Atlas, Olympic Torrent Salamander96 https://wdfw.wa.gov/publications/02135</p>	<p>The Washington Herp Atlas link to each species account and to photos of each species, photos showing the key features for species identification and dot distribution maps. Focus of study was unrelated to determining water quality or ambient conditions of specific waterbodies.</p>

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<p>The following links were submitted from the Washington Invasive Species Council (WISC) website to consider as narrative listings for the WQA: https://invasivespecies.wa.gov/</p> <p>Washington Invasive Species Council, Stop the Invasion: Viral Hemorrhagic Septicemia Washington Invasive Species Council, Stop the Invasion: Brazilian elodea⁶ Washington Invasive Species Council, Stop the Invasion: Bullfrog⁷ Washington Invasive Species Council, Stop the Invasion: Common Reed⁸ Washington Invasive Species Council, Stop the Invasion: Cordgrass⁹ Washington Invasive Species Council, Stop the Invasion: Eurasian Watermilfoil¹⁰ Washington Invasive Species Council, Stop the Invasion: European Green Crab¹¹ Washington Invasive Species Council, Stop the Invasion: Hydrilla¹² Washington Invasive Species Council, Stop the Invasion: Nonnative crayfish¹³ Washington Invasive Species Council, Stop the Invasion: New Zealand Mudsnaill¹⁴ Washington Invasive Species Council, Stop the Invasion: Parrotfeather¹⁵ Washington Invasive Species Council, Tunicates, non-native¹⁶ Washington Invasive Species Council, Stop the Invasion: Variable Leaf Milfoil¹⁷</p>	<p>The Washington Invasive Species Council (WISC) is comprised of state and local environmental agencies, local governments and industry, and was developed to protect Washington’s environment and economy from harmful invasive species. The WISC provides valuable information on invasive animals, insects, noxious weeds and other wildlife diseases that may occur in Washington. It provides assessment tools to help different agencies prioritize management of invasive species in their area. Focus of submittals are unrelated to determining water quality or ambient conditions of specific waterbodies in Washington.</p>