

Oregon Department of Environmental Quality Aug. 17-18, 2016 Oregon Environmental Quality Commission meeting Rulemaking, Action item I

Water Quality Bacteria Standards 2016

This file contains the following documents:

- EQC staff report
- Attachment A: Draft rules redline/strikethrough
- Attachment B: Draft rules no markup
- Attachment C: Supporting documents

DEQ recommendation to the EQC

DEQ recommends that the Oregon Environmental Quality Commission adopt the proposed rule amendments in Attachment A to Chapter 340 of the Oregon Administrative Rules.

Overview

The proposed rule amendments will:

- Revise Oregon's water quality standards for bacteria in order to protect people who consume shellfish and recreate in coastal waters from illness due to fecal contamination of the water:
- Adopt the United States Environmental Protection Agency's 2012 Recommended Water Quality Criteria for coastal waters for enterococcus bacteria including:
 - o A 90-day geometric mean of 35 enterococcus organisms per 100 mL; and
 - o A limit of 130 enterococcus organisms per 100 mL that cannot be exceeded more than ten percent of the time in any 90-day period.
- Clearly identify that E. coli criteria protect contact recreation in freshwaters, enterococcus
 criteria protect contact recreation in coastal waters and fecal coliform criteria protect
 shellfish harvesting;
- Establish water quality standards designated use maps and modify designated use tables for coastal basins to show where shellfish harvesting is a designated use and the boundary between coastal contact recreation use and freshwater contact recreation use for purposes of applying the correct water quality criteria to protect those uses;

- Change the averaging period for the E. coli standard for freshwaters from 30 days to 90 days and change the averaging methodology from "log mean" to "geometric mean;"
- Require that wastewater effluent from fecal sources discharged to waters designated for coastal water contact recreation meet the applicable criteria on a monthly basis;
- Include an implementation provision that would require a minimum of five samples to calculate the geometric mean criteria for E. coli and enterococcus, as well as the 90th percentile value for enterococcus; and
- Incorporate plain language into the amended rules consistent with the Oregon Administrative Procedures Act.

Background

DEQ currently protects people recreating in coastal waters from illness due to fecal contamination of the water by implementing a federal water quality standard regulation for enterococcus bacteria in coastal waters. State-adopted water quality standards also limit the amount of E. coli bacteria in freshwater to protect contact recreation and the amount of fecal coliform bacteria in marine and estuarine waters to protect shellfish harvesting. In 2012, EPA published revised water quality criteria recommendations for contact recreation. The updated enterococcus criteria recommendations include a geometric mean value that is the same as the current federal criteria and a new 90th percentile value. In 2013, EPA required states that receive beach monitoring grant funds under the Beaches Environmental Assessment and Coastal Health Act to adopt the 2012 recommended water quality criteria before Oct. 1, 2016. Adopting the proposed bacteria standards rule amendments will fulfill this requirement for Oregon.

DEQ has never formally established where shellfish harvesting is a designated beneficial use, or the boundary between freshwater and coastal waters for purposes of applying the bacteria criteria. DEQ's proposed rule amendments clarify that each bacteria criterion applies to a specific designated use and includes designated use maps for coastal areas that show where these designated uses apply. In non-coastal areas, only the freshwater contact recreation use applies.

Affected parties

Affected parties include facilities that discharge to Oregon waterbodies and either have bacteria monitoring requirements or have permit limits for bacteria. These facilities include municipal wastewater discharge plants, industrial facilities and confined animal feeding operations. The Oregon Department of Agriculture implements DEQ's permit that regulates CAFOs. Other affected parties include agricultural operations, people who recreate in coastal waters and people who consume shellfish from Oregon's marine and estuarine waters and beaches.

Key policy and technical issues

- DEQ is proposing this rulemaking in order to adopt coastal recreation bacteria criteria, which are currently in federal rule, into Oregon's water quality standards and to update those criteria according to EPA's 2012 recommendations. In addition, adopting these criteria will allow the Oregon Health Authority to continue to receive grant money from EPA to administer the Oregon Beach Monitoring Program. This program posts beach advisories when bacteria levels in the water are potentially unsafe for swimming. Some of the grant money is in turn, provided to DEQ to collect and analyze water samples from Oregon beaches for bacteria. OHA is also revising the advisory level used to declare beach advisories, consistent with EPA's 2012 Recreational Water Quality Criteria.
- DEQ has prepared a series of designated use maps showing the locations where shellfish harvesting is designated as a beneficial use for purposes of applying water quality criteria to protect those uses, as the federal Clean Water Act requires. In addition, the maps identify the boundary between waters designated for coastal water contact recreation versus freshwater contact recreation in order to identify where each bacteria criteria apply. EPA has determined that enterococcus is a better indicator of the presence of fecal contamination and associated pathogens in coastal waters, whereas *E. coli*, Oregon's current criteria, remains a good indicator in fresh waters.
- The effect of the proposed revisions to the bacteria rule and creation of the designated use maps on regulated parties or DEQ programs should be minimal. DEQ already is operating under a 2004 federal bacteria standards rule that includes the geometric mean of 35 organisms of enterococcus bacteria per 100 mL, which is equivalent to DEQ's proposed rule. The proposed rule adds an additional 90th percentile metric for determining if bacteria levels are safe for those recreating in Oregon waters. DEQ expects that in most cases, sources able to meet the geometric mean criterion will also be able to meet the 90th percentile value.

Outreach efforts and public and stakeholder involvement

DEQ held four informational meetings in October jointly with the Oregon Health Authority in Coos Bay, Newport, Cannon Beach and Portland. In addition, DEQ held several meetings with individual stakeholders and Tribal staff to discuss the rulemaking.

Stakeholder and public involvement is discussed in more detail in that section, below.

Hearing testimony

DEQ held simultaneous public hearings on April 19, 2016, in Newport and Portland. No one testified at the hearings.

Summary of significant public comments and responses

DEQ received public comments from the U.S. Environmental Protection Agency, the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians, and a joint letter from the Oregon Farm Bureau, Oregon Dairy Farmers Association and Oregon Cattlemen's Association. Most of these comments either supported portions of the rulemaking or asked for clarification. DEQ made one revision to the proposed rule in response to an EPA comment related to the minimum sample size for bacteria criteria pertaining to freshwater. This comment will not change DEQ's implementation of the bacteria standard.

Public comments and responses are discussed in more detail below.

Effects of this rulemaking on any fees

This rulemaking would not impact any fees.

Brief summary of fiscal impact

DEQ expects the fiscal impact of rule revisions to be minor, at most. DEQ already requires most permitted facilities in coastal regions to monitor and meet effluent limits for enterococcus under the federal recreational criteria rule. The proposed geometric mean value for enterococcus is identical to the existing federal criterion and, as a result, will not result in changes to effluent limits. The proposed 90th percentile criterion will incorporate a new value that dischargers will need to meet. This value should be attainable for any facility already required to meet the geometric mean value and will not require additional monitoring beyond what is already required for these facilities. Clarifying where designated uses apply may change bacteria monitoring requirements for a few facilities in coastal areas. In some cases, a facility may need to monitor two indicator bacteria instead of one. For example, there will be situations where two designated uses now clearly apply. In some cases, use clarifications may provide regulatory relief for facilities that are monitoring two or three bacterial indicators and, under the proposed rule, it is clear that only one or two of the designated beneficial uses apply.

Statement of Need

Adoption of revised water quality criteria for bacteria

What need would the proposed rule address?

The proposed rule amendments will address the need to protect coastal waters from fecal contamination that could impact human health. The adoption will also fulfill EPA's requirement that Oregon adopt EPA's 2012 recommended water quality criteria for contact recreation in coastal waters in order to receive grant funds to monitor Oregon beaches.

How would the proposed rule address the need?

The proposed rule amendments address this need by adopting EPA's latest bacteria criteria recommendations into Oregon's water quality standards. The revised criteria will ensure that people who swim, wade, surf or are otherwise in contact with coastal waters are protected from illness due to exposure to fecal bacteria. After the EQC adopts and the EPA approves the revised criteria, the bacteria criteria become effective for Clean Water Act programs, including water quality permitting, assessment and total maximum daily load development.

How will DEQ know the rule addressed the need?

DEQ will know the proposed rules addressed the needs described above if the rules clearly identify and define Oregon's revised criteria for bacteria and EPA approves the rule revisions.

Clarification of where the bacteria criteria apply

What need would the proposed rule address?

The proposed rule amendments will clarify that each bacteria criterion applies to a specific designated use, as shown below:

| Bacterial indicator criterion: | Designated beneficial use: |
|--------------------------------|----------------------------------|
| e. coli | freshwater contact recreation |
| enterococcus | coastal water contact recreation |
| total fecal coliform | shellfish harvesting |

In addition, the rule amendments will identify where shellfish harvesting uses occur and where the boundary between freshwater and coastal water contact recreation occurs in Oregon estuaries. The rule also will clarify that all marine waters are designated for coastal water contact recreation and shellfish harvesting uses.

How would the proposed rule address the need?

The proposed rule amendments will clearly specify the designated use to which each fecal indicator bacteria criterion applies. In addition, proposed basin-specific criteria amendments and designated use maps will clearly identify where those uses apply. DEQ proposes to adopt maps showing designated coastal contact recreation and shellfish harvesting uses in coastal waters of the North, Mid and South Coast Basins, and the Columbia and Umpqua River Basins.

How will DEQ know the rule addressed the need?

DEQ will know the proposed rules addressed the needs described above if the rules clearly identify and define the uses to which bacteria criteria apply and the geographic extent of those uses in coastal basins. DEQ also will know that the rules addressed the need if EPA approves the bacteria rule revisions and if DEQ staff, regulated entities and the public can identify the applicable use and associated bacteria criterion or criteria in a given location.

Incorporation of effluent limitation provision for discharges to coastal waters

What need would the proposed rule address?

The proposed rule will clarify that entities that receive permits for discharging wastewater from fecal sources to coastal waters must meet enterococcus criteria on a monthly basis. This provision will provide applicable dischargers and DEQ a known target for planning and monitoring compliance on a monthly basis.

How would the proposed rule address the need?

The rule will address the need by adding a requirement to the effluent limitations provision noting that permit limits for discharges from fecal sources will be written to meet the enterococcus criteria on a monthly basis.

How will DEQ know the rule addressed the need?

DEQ will know the proposed rules addressed the needs described above if DEQ staff and the permittees find that the rules clearly identify this requirement and that it simplifies implementing the standard.

Minor changes

What needs would the proposed rule address?

The proposed rule amendments will provide a longer period for averaging E. coli data for use in Clean Water Act programs and ensure that the terminology and averaging period in the E. coli and enterococcus criteria are consistent with one another.

How would the proposed rule address the need?

The proposed revisions will address the above need by:

• Changing the averaging period for the E. coli criterion from 30 days to 90 days to be consistent with the recommended enterococcus criteria; and

• Changing the averaging method for the E. coli criteria to "geometric mean" from "log mean" to be consistent with the recommended criteria.

How will DEQ know the rule addressed the need?

DEQ will know the proposed rules addressed the needs described above if the rules clearly define the criteria statistics and the time period over which they are calculated. This provision will provide clarity to DEQ staff, regulated parties and the public regarding how DEQ determines if bacteria standards are being met.

Rules affected, authorities, supporting documents

Lead division Program or activity

Environmental Solutions Division Water Quality Standards and Assessment

Chapter 340 action

Amend:

OAR 340-041-0009, 340-041-0101, 340-041-0220, 340-041-0230, 340-041-0300, 340-041-0320

Statutory authority

ORS 468.020, 468B.030, 468B.035, 468B.048

Statute implemented

ORS 468B.030, 468B.035 & 468B.048

Documents relied on for rulemaking

| Document title | Document location | |
|--|--|--|
| Environmental Protection Agency. 2012 | EPA 2012 Recreational Water Quality Criteria | |
| Recreational Water Quality Criteria. Office of Water 820-F-12-058. Washington, DC. | EPA Headquarters | |
| Oregon Department of Environmental Quality. | DEQ Bacteria Criteria for Marine and Estuarine | |
| 2011. Oregon Bacteria Rule: Bacteria Criteria for Marine and Estuarine Water. DEQ 11-WQ- | Water | |
| 005. Portland, OR. | DEQ Headquarters | |
| | 811 SW 6th Ave. | |
| | Portland OR 97204 | |
| Environmental Protection Agency. 2004. Water | EPA Water Quality Standards for Coastal and | |
| Quality Standards for Coastal and Great Lakes | Great Lakes Recreational Waters | |
| Recreation Waters; Final Rule. 69 Fed. Reg. 220, pp. 67218-67243. November 16, 2004. | EPA Headquarters | |
| , 11 | 1 | |
| Oregon Department of Fish and Wildlife. 2015-6. "Where to Dig Bay Clams" maps. | ODFW Where to Dig Bay Clams Maps | |
| | ODFW Headquarters | |
| Other documents as identified in Issue Paper | DEQ Headquarters | |

Fee Analysis

This rulemaking does not involve fees.

Statement of fiscal and economic impact

Fiscal and Economic Impact

DEQ expects the impact of rule revisions to be at most minor. Many permitted facilities in coastal regions already are required to monitor and meet effluent limits for enterococcus under the federal recreational criteria rule. The proposed geometric mean value for enterococcus is identical to the existing federal criterion. The proposed 90th percentile criterion will incorporate a new value that dischargers will need to meet. This value should be attainable for any facility already required to meet the geometric mean value and will not require additional monitoring beyond what is already required for these facilities. Clarifying where designated uses apply may change bacteria monitoring requirements for a few facilities in coastal areas. In some cases, this may mean monitoring for two indicator bacteria instead of one, as certain areas where just one of E. coli, enterococcus or fecal coliform criteria applied may be designated for both coastal water and shellfish harvesting. In these cases, a facility would have to monitor for both enterococcus and fecal coliform. In some cases, use clarifications may provide regulatory relief for facilities that are monitoring for multiple bacterial indicators.

Statement of Cost of Compliance

State and federal agencies

State agencies

Revising the bacteria criteria will require DEQ to incorporate the revised criteria into Clean Water Act programs, such as permitting, assessing state waters and developing total maximum daily loads. This could initially take DEQ staff additional time to account for differences between the proposed criteria and the current criteria. Over time, however, establishing designated use maps in rule should save DEQ staff time by providing a clear geo-referenced database showing exactly where each bacterial indicator criteria applies. DEQ staff would not need to spend time looking at alternative sources of information to determine which uses and associated bacteria criteria apply.

DEQ National Pollutant Discharge Elimination System Permitting Program

Individual Permits

Direct Impacts

The proposed rules will require DEQ permitting staff:

- To review and revise permitting procedures to reflect changes to the criteria;
- To examine designated use maps in coastal basins to determine the applicable uses in waters to which regulated entities are discharging. This could be a time savings compared to current practices; and
- To spend additional time administering permit renewals to account for the addition of the 90th percentile value in the enterococcus criteria. Generally, this will be a one-time occurrence for each NPDES permit and should be a minor issue as the data set used to calculate the geometric mean is the same data set that will be used to calculate the 90th percentile value.

General Permits

Implementing the proposed water quality criteria would not have a direct or indirect effect on DEQ general permits because the criteria are not changing significantly from the 2004 criteria EPA adopted. The criteria therefore would not significantly affect any general permits that do have numeric bacteria limit requirements or would have them in the future.

Stormwater Permits

Implementing the proposed water quality criteria would not have a direct or indirect effect on DEQ general permits because the criteria are not changing significantly from the 2004 criteria EPA adopted. The criteria therefore would not significantly affect any stormwater permits that do have numeric bacteria limit requirements or would have them in the future.

401 Certification Program

It is possible that DEQ could use bacteria criteria as the basis for issuing Clean Water Act section 401 certifications if the federal project or permit could have an impact on bacteria levels. The proposed rule could impact projects in coastal waters. The impact would be minimal as it likely would not require additional sampling, only an additional calculation to ensure compliance with the 90th percentile value for enterococcus.

Other State Permitting Agencies

DEQ does not anticipate the proposed rules would have a direct or indirect effect on other state agencies or change their involvement or the general permits they administer. The CAFO permit DEQ and the Oregon Department of Agriculture developed jointly, and that ODA implements, has a zero discharge limit for bacteria. The proposed revisions would not change this limit and thus should not impact ODA staff.

DEQ Integrated Report Program

Direct Impacts

The proposed revised bacteria criteria may affect current 303(d) listings for bacteria, in which waterbodies are listed as impaired when data indicates bacteria levels are not attaining water quality standards. The changes could require time from DEQ staff members who develop the Integrated Report to incorporate the revisions. Based on the 2012 Proposed Integrated Report, 12 water bodies are listed as impaired and needing a TMDL due to enterococcus levels, 70 due to E. coli levels and 68 due to fecal coliform levels. As a result of the proposed clarifications of how the different criteria apply to uses and the geographic designation of those uses, it is likely that a number of waterbodies will be removed from the 303(d) list because DEQ has determined that the applicable uses do not apply to those waterbodies. At the same time, because the averaging period for the E. coli criteria and enterococcus criteria will be 90 days instead of 30 days, it is possible that DEQ will have sufficient data to assess more waterbodies than it otherwise would have. This may lead to the addition of some waterbodies to the 303(d) list.

DEQ's Integrated Report staff use the bacteria criteria to evaluate whether waterbodies are meeting state water quality standards. Revising state criteria for a pollutant requires additional staff time to incorporate those changes into the assessment. This should be a one-time occurrence to develop the listing methodology and should be fairly minor.

Indirect Impacts

Because most permitted sources are required to meet the bacteria criteria in their effluent prior to discharge (i.e. end of pipe), changes in the 303(d) listing status (i.e. impaired or high quality) of the receiving water body will not affect them.

DEQ Total Maximum Daily Load Program

Direct Impacts

DEQ does not expect the proposed numeric criteria revisions to significantly change the amount of staff time required to develop a bacteria TMDL. However, if the longer averaging period leads to an increase in the number of impairment listings the number of TMDLs needed would also increase. Additional staff time would be needed to develop those TMDLs. The proposed revisions also will not have any impact on TMDLs already developed for bacteria.

Indirect Impacts

Because most permitted sources are required to meet the bacteria criteria in their effluent prior to discharge (i.e. end of pipe), developing TMDLs will not likely affect those sources.

Local governments

DEQ anticipates adopting the proposed revised bacteria criteria for coastal contact recreation will have minor or no impacts to local governments. Clarifying use designation and developing use maps may have minor or no impacts. For a few dischargers, clarifying where uses apply may require monitoring for different or additional fecal indicator bacteria than existing rules and guidance require. For other dischargers, the proposed revisions may result in the need to monitor for fewer fecal indicator bacteria.

Direct Impacts

- The revised rules would require that municipalities discharging to coastal waters calculate both the geometric mean and 90th percentile value of enterococcus samples from their effluent. This requirement would not result in additional sampling, just an additional calculation that needs to be made on a monthly basis. If one or more weekly samples in a month exceeded the 90th percentile criterion of 130 enterococcus organisms per 100 mL, the municipality may wish to conduct additional sampling to show that the monthly 90th value was still less than the proposed criterion. It is likely that such additional sampling is not a change from current operations as the municipalities need to do so to ensure that enterococcus levels also meet the geometric mean effluent limit.
- Clarifying the uses to which bacteria criteria apply and the geographic designation of those uses may also have minor impacts. DEQ examined monitoring requirements for wastewater treatment plants operated by cities along the coast. In two cases, clarifying designated uses will likely reduce the number of bacteria effluent limits in the permit. In one or two cases a municipality may need to monitor for two indicators instead of one. This is because current DEQ guidance requires that only one E. coli or fecal coliform applies whereas under the proposed rule both fecal coliform and enterococcus will apply in many coastal areas. However, this may have happened irrespective of the rulemaking.

DEQ expects that the vast majority of municipalities in coastal areas already are, or should be, monitoring for the same indicators under existing bacteria standards as they will under the revised rules. They would therefore experience no significant impacts.

Indirect Impacts - None identified

Public

Direct Impacts

DEQ does not expect the public to incur direct or indirect fiscal or economic impacts from the proposed rules. DEQ does not directly regulate individuals and it is unlikely that affected parties would increase sewer rates or costs for goods or services based on these proposed rules.

Indirect Impacts - None identified

Large businesses - businesses with more than 50 employees

Direct Impacts

DEQ requires some businesses that discharge to coastal waters, including one pulp and paper manufacturer, to monitor and evaluate their effluent for enterococcus bacteria. The proposed revised rules would require that these businesses calculate both the geometric mean and 90th percentile value of enterococcus samples from their effluent. This would require only an additional calculation but no additional sampling. If one or more samples in a month exceeded the 90th percentile criterion of 130 enterococcus organisms per 100 mL the business may conduct additional sampling to show that the monthly 90th percentile value of enterococcus was still less than 130 organisms per 100 mL. It is likely that such additional sampling is not a change from current operations as the businesses would likely have done so to ensure that enterococcus levels also met the geometric mean effluent limit.

Indirect Impacts

Proposed revisions that would require NPDES permittees to meet enterococcus criteria in their effluent on a monthly basis could potentially affect one pulp and paper mill. That mill is currently required to meet the federal enterococcus criteria at the end of a mixing zone in the Pacific Ocean. Fecal-based bacteria in its discharge is likely incidental and would meet the enterococcus criteria if non-fecal bacteria were not counted. As a result, DEQ has clarified that the requirement to meet the enterococcus criteria on a monthly basis in the effluent pertains to enterococcus bacteria associated with fecal sources. The provision will allow flexibility for DEQ to continue to allow a mixing zone for enterococcus for this facility, as is currently in place under the existing permit, while still protecting public health from fecal contamination. This change will result in no impacts to the facility.

Small businesses – businesses with 50 or fewer employees

a. Estimated number of small businesses and types of businesses and industries with small businesses subject to proposed rule.

DEQ cross-referenced a list of current permit holders and a list of small businesses from the Oregon Secretary of State. The analysis indicates approximately two small businesses may be subject to the proposed rule changes.

b. Projected reporting, recordkeeping and other administrative activities, including costs of professional services, required for small businesses to comply with the proposed rule.

Small facilities could experience a small increase in monitoring requirements and associated analytical costs due to the addition of the 90th percentile value. Including the 90th percentile value would require small businesses to calculate the 90th percentile value for each month in addition to the geometric mean, which is already required. If one or more samples in a month exceeded the 90th percentile criterion of 130 enterococcus organisms per 100 mL, businesses may conduct additional sampling to show that the monthly 90th percentile value was less than 130 organisms per 100 mL. It is likely that such additional sampling is not a change of operations from current operations, as the businesses may have done so to ensure that enterococcus levels also met the geometric mean effluent limit.

c. Projected equipment, supplies, labor and increased administration required for small businesses to comply with the proposed rule.

For most facilities that currently monitor for bacteria, the proposed rules would not require additional equipment or supplies. Labor needed to comply would depend on monitoring requirements and the need for effluent limits and subsequent treatment, but are likely minor, if any.

d. Describe how DEQ involved small businesses in developing this proposed rule.

DEQ held public meetings in three coastal cities and in Portland, which were open to the general public, local governments and small businesses. DEQ did not target small businesses for additional involvement because DEQ does not expect the proposed rules will significantly affect small businesses.

Documents relied on for fiscal and economic impact

| Document title | Document location |
|--|--|
| DEQ Discharge Monitoring System data system ¹ | DEQ headquarters 811 SW 6 th Ave. Portland OR 97204 |
| Oregon Secretary of State Small Business List | Oregon Secretary of State 136 State Capitol Salem, OR 97310-0722 |

Advisory committee

DEQ did not appoint an advisory committee on the fiscal and economic impact of this proposal because DEQ does not expect the rule amendments to be significant or controversial. Instead, DEQ

¹ DMS is an SQL Server database system with an ASP.NET application interface that allows electronically entering, storing and retrieving self-reported Discharge Monitoring Reports that Permittees submit monthly on approved, certified paper forms. Data in DMS ranges from January 2004 – present.

held public meetings in three coastal cities and in Portland that were open to any person or business interested in this rulemaking.

Housing cost

To comply with ORS 183.534, DEQ determined the proposed rules would have no effect on the development cost of a 6,000-square-foot parcel and construction of a 1,200-square-foot detached, single-family dwelling on that parcel. The proposed rules would generally affect facilities that discharge to waters of the state and applicable Clean Water Act programs.

Federal relationship

Relationship to federal requirements

This section complies with the requirements in <u>OAR 340-011-0029</u> and <u>ORS 468A.327</u> to clearly identify the relationship between the proposed rules and applicable federal requirements.

The proposed rules would implement a federal requirement. The federal Clean Water Act requires states to adopt water quality standards to protect beneficial uses of the nation's waters. States must base standards on substantial evidence. DEQ must submit the proposed standards to EPA for approval after EQC adoption. DEQ determined the proposed bacteria standards revisions meet federal requirements as EPA recommended the standards. DEQ worked with EPA while developing the proposed rules and DEQ expects EPA will approve these proposed rules.

What alternatives did DEQ consider if any?

DEQ analyzed what would happen if it took no action to adopt EPA's 2012 recommended recreational water quality criteria. EPA is requiring states to adopt its 2012 criteria in order to receive grant funding under the BEACH Act. The BEACH Act grant funds Oregon's Beach Monitoring Program. With these funds, DEQ tests the bacteria levels at selected Oregon beaches and the Oregon Health Authority posts warnings to recreational users of Oregon's beaches if potential exposure to bacteria may cause gastrointestinal illness or other symptoms. Therefore, if DEQ does not adopt the proposed bacteria criteria revisions, it is possible that EPA would withhold future funding for the beach monitoring program. In addition, if DEQ takes no action, EPA may adopt the 2012 criteria recommendations on Oregon's behalf.

DEQ also analyzed what would happen if it did not clarify where each bacteria criterion applies based on the designated beneficial uses. Without this clarification, DEQ would continue to determine which criteria apply on a case-by-case basis. Such an outcome would continue regulatory uncertainty and would continue to require additional time for DEQ staff to determine the applicable criteria as it implements its rules in each instance.

Land Use

Land-use considerations

In adopting new or amended rules, ORS 197.180 and OAR 340-018-0070 require DEQ to determine whether the proposed rules significantly affect land use. If so, DEQ must explain how the proposed rules comply with state wide land-use planning goals and local acknowledged comprehensive plans.

Under OAR 660-030-0005 and OAR 340 Division 18, DEQ considers that rules affect land use if:

- The statewide land use planning goals specifically refer to the rule or program, or
- The rule or program is reasonably expected to have significant effects on:
 - o Resources, objectives or areas identified in the statewide planning goals, or
 - o Present or future land uses identified in acknowledged comprehensive plans

To determine whether the proposed rules involve programs or actions that affect land use, DEQ reviewed its Statewide Agency Coordination plan which describes the DEQ programs that have been determined to significantly affect land use. DEQ considers that its programs specifically relate to the following statewide goals:

| Goal | Title |
|------|---|
| 5 | Open Spaces, Scenic and Historic Areas, and Natural Resources |
| 6 | Air, Water and Land Resources Quality |
| 9 | Ocean Resources |
| 11 | Public Facilities and Services |
| 16 | Estuarial Resources |

Statewide goals also specifically reference the following DEQ programs:

- Nonpoint source discharge water quality program Goal 16
- Water quality and sewage disposal systems Goal 16
- Water quality permits and oil spill regulations Goal 19

Determination

The water quality standards program in general could affect land uses but the proposed rules do not. The proposed rules would revise Oregon's bacteria standards in coastal waters and clarify designated uses under the Clean Water Act. The water quality standards will continue to protect those uses.

DEQ's statewide goal compliance and local plan compatibility procedures adequately cover the proposed rules.

Stakeholder and public involvement

Advisory committee

DEQ did not convene an advisory committee because DEQ did not expect the proposed rule amendments would have a significant fiscal or economic impact, or be controversial, for the following reasons:

- The proposed geometric mean criterion for enterococcus is equivalent to the standards that EPA adopted for Oregon in 2004, which have been implemented since that time;
- The proposed 90th percentile value criterion for enterococcus should be achievable for all entities that already are required to meet the geometric mean criteria; and
- The proposed designated use clarifications affect few NPDES individual permits, and for at least two permittees, may provide regulatory relief.

EQC involvement

DEQ informed the commission about the bacteria standard rulemaking in the Director's Report at the Oct. 14-15, 2015, meeting.

Public Notice

DEQ provided notice of the Proposed Rulemaking with Hearing by:

- Filing notice with the Oregon Secretary of State for publication in the April 1, 2016, *Oregon Bulletin*
- Posting notice on the rulemaking web page: <u>DEQ Rulemaking for Water Quality Standards</u> for Bacteria
- Emailing 13,779 interested parties on the Agency Rulemaking, Water Quality Standards and Water Quality Assessment Rulemaking Lists through GovDelivery
- Emailing the following key legislators required under ORS 183.335:
 - o Chair Jessica Vega-Pederson, House Committee on Energy and Environment
 - o Chair Chris Edwards, Senate Committee on Environment and Natural Resources

Request for other options

During the public comment period, DEQ requested public comment on whether to consider other options for achieving the rules' substantive goals while reducing the rules' negative economic impact on business. This document includes a summary of comments and DEQ responses.

Public hearings and comment

DEQ held simultaneous public hearings in Portland and Newport. DEQ did not receive any oral testimony during the hearings. DEQ received three written public comments. Later sections of this document include a summary of comments received, DEQ's responses, and a list of the commenters. Original comments are on file with DEQ.

Presiding Officers' Record

Hearing 1

Meeting location: DEQ Headquarters, EQC-A, 811 SW 6th Ave., Portland, OR 97204.

Meeting date and time: April 19, 2016 Presiding Officer: Debra Sturdevant

Prior to the hearing, DEQ provided an informational webinar. When the webinar ended, the presiding officer convened the hearing noted that there were no persons from the public in attendance at the hearing and closed the hearing.

Hearing 2

Meeting location: Center for Health Education, 740 SW 9th Ave., Newport, OR 97365

Meeting date and time: April 19, 2016, 4 p.m.

Presiding Officer: Aron Borok

The presiding officer convened the hearing, summarized procedures for the hearing, and explained that DEQ was recording the hearing. The presiding officer asked people who wanted to present verbal comments to sign the registration list, or if attending by phone, to indicate their intent to present comments. The presiding officer advised all attending parties interested in receiving future information about the rulemaking to sign up for GovDelivery email notices.

No one provided testimony at this hearing.

Informational Meetings

DEQ held four meetings in October 2015 to provide information to interested parties and to answer questions related to the rulemaking. These meetings took place in Coos Bay, Newport, Cannon Beach and Portland. DEQ conducted the meetings jointly with the Oregon Health Authority, which provided information about their revised bacteria action value which is used to issue beach advisories. Approximately 40 people attended the meetings, not including DEQ and OHA staff. Meeting summaries are included in Appendix B of the Issue Paper attached to this document.

DEQ also held meetings and phone conversations with individual stakeholders to answer questions related to the rulemaking. The table below lists groups with whom DEQ met.

| Name | Representing | Date |
|------------------------------|--|---------------|
| Thomas Benke | A private oyster grower | Oct. 27, 2015 |
| Mary Ann Nash | Oregon Farm Bureau | Dec. 2, 2015 |
| Tracy Rutten | League of Oregon Cities | Dec. 2, 2015 |
| Kathryn Van Natta and others | Northwest Pulp and Paper Association | Dec. 15, 2015 |
| Steve Stratton | National Council for Air and Stream Improvement | Dec. 15, 2015 |
| Theresa Bousquet | National Council for Air and Stream Improvement | Dec. 15, 2015 |

In addition, DEQ sent an invitation to the federally-recognized Oregon Tribes offering the opportunity to discuss and provide input to DEQ on the proposed rulemaking. DEQ obtained input on shellfish distribution from a representative from the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians. DEQ also met with representatives of the Confederated Tribes of the Grand Ronde to provide information and receive input on the rulemaking.

To notify people about the informational meetings, DEQ:

- Sent GovDelivery bulletins, a free e-mail subscription service, on Oct. 8, 2015, to the following lists:
 - Water Quality Standards; 3797 subscribers
 - Water Quality Assessment; 3195 subscribers
- Added public meeting information to DEQ's calendar of public meetings at <u>DEQ</u> Calendar
- Announced public meetings on the following two DEQ web pages:
 - o DEO Bacteria Standards
 - o DEQ Bacteria Standards Rulemaking.

Summary of comments and DEQ responses

DEQ received comments from three parties, listed in the *Commenter* section below, by the close of the public comment period. This section organizes the comments into 10 categories with cross references to the commenter number. DEQ's response follows the summary of each comment. Original comments are on file with DEQ.

DEQ changed the proposed rules in response to comments described in the response section to Comment 2 below.

1 Comment

General Statements of Support

DEQ received comments in this category from commenters 1 and 3 listed in the *Commenter* section below.

The designated use maps for (the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians' area seem to be accurate for the most part.

EPA supports Oregon's intention to permit point source discharges based on a monthly duration.

Response

DEQ appreciates comments from CTCLUSI on the designated use maps.

DEQ appreciates EPA's support of rule language ensuring that point source discharges meet bacteria criteria on a monthly basis.

DEQ did not change the proposed rules in response to these comments of support.

2 Comment

Changes to Rule Language

DEQ received comment from EPA (commenter 3) recommending deleting the five sample minimum requirement from the rule.

Response

DEQ amended 340-041-0009(1) in the proposed rules and added section 340-041-0009(2) in response to these comments. DEQ removed the five sample minimum requirement in the standard as recommended and incorporated a new implementation provision requiring a minimum of five samples over a 90-day period in order to determine if a waterbody is impaired or meeting water quality criteria for *E. coli* or enterococcus. DEQ understands EPA's recommendation that sample sizes are not part of the water quality standard. However, because the proposed revisions, which are based on EPA's 2012 recommended Recreational Water Quality Criteria, are expressed as statistical values, a minimum sample size is necessary for these calculations to be statistically valid and meaningful due to the variability of bacteria in the environment. As a result, DEQ has amended the rules to include a new provision stating that at least five samples in a 90-day period are required to calculate statistically-expressed *E. coli* and enterococcus criteria (with the

exception of the single sample *E. coli* criterion) to ensure some level of statistical robustness. This provision does not impact permitting requirements, which are measured on a monthly basis. This provision will not be submitted to EPA as part of the water quality standards approval process, as it is an implementation provision.

3 Comment

Plain English revisions

Comments recommending revisions to implementation provisions of the bacteria standard. DEQ received comments in this category from commenter 2 listed in the *Commenter* section below.

The Oregon Farm Bureau, Oregon Dairy Farmers Association and Oregon Cattlemen's Association recommend that DEQ add language to 340-041-0009(5) and (10) that ensures that any regulated activity is the source of the water quality exceedances before DEQ regulates the activity or finds a violation and that DEQ will not regulate operators if the bacteria source is wildlife or other activities outside the operator's control. (OFB/ODFA/OCA)

The Oregon Farm Bureau, Oregon Dairy Farmers Association and Oregon Cattlemen's Association recommend adding language to 340-041-0009(10) that ensures that the Oregon Department of Agriculture will be responsible for addressing sources of contamination under the SB 1010 program.

Response

DEQ did not change the proposed rules in response to these comments. DEQ acknowledges that wildlife can be a source of bacterial contamination in Oregon waterways, and that such contamination can be difficult to differentiate from that which may be caused by agricultural activities.

DEQ develops general water quality permits for discharges that have the potential to affect water quality. Thus, while DEQ acknowledges that many agricultural operations do not discharge bacteria into waters of the state, DEQ has worked with ODA to develop the CAFO general permit to ensure that these operations meet water quality standards for bacteria and other contaminants. The current permit authorizes zero discharge from CAFOs into state waters. Nothing in the proposed bacteria criteria revisions would result in changes to the permit.

In addition, the SB 1010 program was developed to address water pollution from agricultural sources. Agricultural area management rules and plans developed under the SB 1010 program are practice-based. Nothing in the proposed revisions would result in changes to practices or rules developed under the SB 1010 program.

DEQ agrees that an operator should not be found in violation of water quality standards for bacteria if the source of the bacteria does not come from the operation. Nothing in the proposed revisions would affect appropriate rules surrounding burden of proof with respect to water quality standards enforcement actions.

The proposed revisions do not impact the primary role of ODA in addressing water pollution under the SB 1010 program. As such, DEQ will not propose revising the rule to state that ODA will be responsible for addressing sources of contamination under the SB 1010 program, because that would be redundant with existing rules and agreements between DEQ and ODA.

4 Comment

General Implementation Comments

DEQ received comments in this category from commenter 2 listed in the *Commenter* section below.

The Oregon Farm Bureau, Oregon Dairy Farmers Association and Oregon Cattlemen's Association commented that DEQ must use the most accurate data in implementation of the proposed rule.

The Oregon Farm Bureau, Oregon Dairy Farmers Association and Oregon Cattlemen's Association commented that DEQ should ensure adequate funding for implementation of the new standards.

Response

DEQ did not change the proposed rules in response to comments. DEQ appreciates comments that it should use the most accurate data technologies in implementation of the revised rules. DEQ regularly evaluates methods acceptable to EPA for analyzing water quality data for bacteria. Currently, for enterococcus analysis, DEQ utilizes Enterolert®. DEQ recently evaluated whether use of EPA Method 1611 (Enterococci in Water by TaqMan® Quantitative Polymerase Chain Reaction (qPCR) Assay) was appropriate for conducting TMDLs and regular monitoring for advisory purposes. Specifically, DEQ has concluded that such source tracking methods are appropriate for presence/absence types of analyses, but are not the most accurate methods to investigate bacteria sources that may be causing a problem. Even for presence/absence types of investigations, these methods require a detailed design. As analytical methods for bacteria become more advanced, DEQ may re-examine them to determine if they are appropriate for various Clean Water Act programs.

DEQ appreciates the desire to have adequate funding for implementing the new standards. In this case, promulgation of the new standards will not significantly impact DEQ's workload, since the rules do not present significant changes to the standard. As a result, DEQ's implementation in the permitting, assessment, and TMDL programs will experience little to no impact.

DEQ agrees with the commenters that the agency should properly communicate information on the new standards to communities where there are new impairment listings.

5 Comment

Comments regarding implementation of criteria in monitoring and assessment

DEQ received comments in this category from commenter 3 listed in the *Commenter* section below.

EPA suggested that Oregon should update its monitoring guidance to ensure that monitoring will be sufficient to assess Oregon waters consistent with revised recreational criteria.

Response

DEQ did not change the proposed rules in response to comments. DEQ acknowledges the need to have sufficient monitoring to assess Oregon waters consistent with revised recreational criteria. This need was one consideration in DEQ's decision to propose a 90-day averaging period in the *E. coli* and enterococcus criteria. With a longer period, DEQ is more likely to have a sufficient number of samples to calculate a geometric mean and assess it against criteria for both fecal indicators, as well as against the 90th percentile criterion for enterococcus and the single sample maximum for *E. coli*. While DEQ agrees with the principle stated by EPA to ensure adequate monitoring, this principle extends across all water quality standards. DEQ must prioritize and make the most efficient use of its resources to monitor the entire state and its 111,619 stream miles, 1,400 named lakes, as well as estuaries, wetlands and marine waters. EPA's anticipated approval of this rule and ongoing EPA funding to monitor beaches for enterococcus under the BEACH Act will provide partial funding for DEQ's monitoring for bacteria.

As a parallel process to these revisions to the water quality standards for bacteria, the Oregon Health Authority (OHA) is amending their enterococcus advisory level (Beach Action Value) to conform to EPA's 2012 Recreational Water Quality Criteria. The new advisory value of 70 MPN enterococcus per 100 mL is much more stringent than the current value of 158 that Oregon uses. This change will likely result in more frequent advisories and with that, a greater need to resample beaches that have advisories. As a result, the state will not be able to monitor as many beaches as we have in the past if the amount of funding stays the same. The data from these sampling efforts are also used for DEQ's water quality assessment. In short, as a result of the changes to the Beach Action Value requested by EPA, there likely will be fewer beaches where DEQ will have sufficient data for assessment purposes.

6 Comment

Comment regarding implementation of the criteria in permits

DEQ received comments in this category from commenter 3 listed in the *Commenter* section below.

DEQ should include a description of implementation methods for how DEQ would develop effluent limits for permittees that discharge bacteria from non-fecal sources.

Response

DEQ did not change the proposed rules in response to comments. DEQ is recommending the following implementation methods for developing effluent limits for permittees that discharge bacteria from non-fecal sources:

- 1) The permittee must verify that there is no cross-contamination between process wastewater and sewer lines containing human waste.
- 2) The permittee must submit a bacteria monitoring study that demonstrates what portions of the total enterococcus bacteria in its effluent are from fecal versus non-fecal (i.e. plant-based) sources, using methods such as EPA Method 1611 for qPCR analysis or another appropriate method acceptable to DEQ. The monitoring plan must include monitoring for total enterococcus levels as well as species identification in order to demonstrate what portion of total levels are coming from non-fecal sources.
- 3) The facility may also submit a study showing if there is non-human bacteria in the waste stream interfering in the enterococcus test results.

Based on the information collected in the analysis, DEQ will do the following:

- If source testing indicates that bacteria in the waste stream and effluent contains no fecal matter, DEQ will find that there is no reasonable potential for the source to exceed the criteria and will not require permit effluent limits for enterococcus.
- If the facility already has an effluent limit, antibacksliding provisions will determine whether the limit is retained or not.
- If tests indicate that there is a small amount of bacteria from nonhuman sources (for example, from birds or wildlife), DEQ will provide an effluent limit such that the standard is met at the edge of the mixing zone, taking into account ambient bacteria levels to ensure the standard is not exceeded.
- If testing indicates that the effluent contains bacteria that may be from a human source, DEQ will require the facility to meet the bacteria criteria according to proposed revisions in OAR 340-041-0009(5), requiring dischargers to meet enterococcus criteria at the end of pipe on a monthly basis.

7 Comment

Comments on DEQ's rationale for designated use maps

DEQ received comments in this category from commenter 3 listed in the *Commenter* section below.

EPA requested that DEQ:

Provide a discussion in the issue paper for each shellfish designation on why
the use correctly depict the attainable extent of shellfish distribution in each
estuary;

- Provide additional information on estuarine residence times for salinity and/or expand use maps to ensure that E. coli is not attenuated; and
- Provide information on why the 10 ppth was chosen and used as a line of
 evidence for shellfish harvesting and if estuarine circulating should allow for
 propagation of shellfish further upstream, that DEQ adjust shellfish
 harvesting maps, as needed.

EPA also recommended that DEQ include all available information on hydrology and estuarine circulation to the flushing time discussion time in the issue paper, to the extent that such information is available for each basin.

Response

DEQ did not change the proposed rules, but is providing a clarification in the Issue Paper in response to comments and summarized this clarification below.

Initially, DEQ examined salinity levels of 10 ppth as the basis for shellfish harvesting maps, as that level was the lowest salinity shown to support propagation of marine and estuarine shellfish, particularly oysters and softshell clams, as described in the issue paper. DEQ then examined information on shellfish presence and absence in Oregon estuaries from federal and state researchers and members of the public, as cited in the Issue Paper. DEQ opted to utilize this information as the basis for shellfish harvesting designation maps, as it was more accurate in describing potential shellfish harvesting areas than salinity information. For designating shellfish harvesting use, DEQ utilized federal and state reports from the early 1970s, and maps prepared by longtime recreational shellfish harvesters, as cited in the Issue Paper. After developing the maps based on these reports, DEQ verified the shellfish harvesting use maps with Oregon Department of Fish and Wildlife Shellfish Program staff, as well as DEQ's basin coordinators for coastal basins. In a few cases, such as the Columbia River, Yachats River and Umpqua River Estuaries, DEQ expanded shellfish harvesting use designations based on this input. DEQ included all areas downstream from the furthest upstream documented presence of shellfish as shellfish harvesting areas, even though many of these areas do not support shellfish propagation, to ensure that the use is protected.

DEQ also wishes to clarify the importance of residence time and flushing with respect to determining the boundary between fresh and coastal water recreation uses. As noted in the issue paper, *E. coli* can attenuate relatively quickly in water with high salinities. Some literature reports rapid die-off of *E. coli* at 10 parts per thousand (ppth) after a two day exposure. A key objective in delineating the boundary between fresh and coastal water contact recreation was to ensure that waters in the freshwater portion are not exposed to 10 ppth salinity for two days. At the locations where DEQ is proposing this boundary, the water is dominated by freshwater much of the time (with median salinities at or below 10 ppth), but can have higher salinities during high tide. Because the high tide lasts only a few hours, these waters will never be exposed to high salinity waters long enough to attenuate *E. coli* levels significantly.

8 Comment

Non-substantive corrections in the Issue Paper

DEQ received comments in this category from commenter 3 listed in the *Commenter* section below.

There appears to be a mislabeling of figures in the Issue Paper.

Response

DEQ has corrected labeling of figures and the Table of Figures accordingly in its final Staff Report to the Environmental Quality Commission.

9 Comment

Comment regarding definition and extent of coastal waters

DEQ received comments in this category from commenter 3 listed in the *Commenter* section below.

DEQ should clarify that its definition of coastal waters comports with the CWA definition of coastal waters.

Response

DEQ made a minor, non-substantive, revision to proposed rules at OAR 340-041-0101 in response to this comment. As noted in EPA's comments, DEQ's water quality standards do not define "coastal waters" in the definitions rule at OAR 340-041-0002. DEQ will continue to apply its bacteria criteria consistent with the definition of coastal water in the Clean Water Act §502(21), "marine coastal waters (including coastal estuaries) that are designated under section 303(c) by a State for use for swimming, bathing, surfing, or similar water contact activities." As there is no further definition of "coastal estuary" in the Clean Water Act or guidance and because all waters in Oregon are designated for contact recreation, DEQ has opted to utilize designated use maps and language in basin-specific criteria in coastal areas to indicate the extent of coastal waters. These waters include all marine waters and other estuarine waters designated for "coastal water contact recreation" in the use maps proposed in these revisions, consistent with the Clean Water Act definition.

In response to this comment, DEQ also notes that its definition of "marine water" in OAR 340-041-0002(34), which states "all oceanic, offshore waters outside of estuaries or bays and within the territorial limits of the State of Oregon" includes both intertidal marine water and water outside of the tidal zone.

DEQ has made a minor revision to proposed language in 340-041-0101(3) as a result of these comments. The proposed language previously read, "Coastal water contact recreation and shellfish harvesting use is to be protected in the main stem Columbia River designated in Figure 101A (August 2016)." DEQ is proposing to clarify this statement to "Coastal water contact recreation and shellfish harvesting use is to be protected in the portion of the main stem Columbia River designated for these uses in Figure 101A (August 2016)." DEQ seeks to provide additional clarity with this change. In addition, DEQ notes that marine waters outside the mouth of the Columbia are considered part of the North Coast Basin, rather than the Columbia River and, as such, are designated for coastal water contact recreation and shellfish harvesting uses, as noted in the proposed revisions at OAR 340-041-0230.

10 Comment

Clarifying comments

DEQ received a comment in this category from commenter 3 listed in the *Commenter* section below.

DEQ should identify the provisions and subparts that do not constitute new and revised water quality standards in the final package.

Response

DEQ did not change the proposed rules in response to this comment. DEQ has included several tables and figures in the proposed rule changes that already were adopted into water quality standards and approved by U.S. EPA. DEQ is not amending these tables and figures. DEQ has included these tables and figures so that they are available on the Secretary of State's administrative rule website, as they were previously only available on DEQ's website. DEQ will be clear when it submits the revised bacteria standard to EPA for approval that the content of the following tables and figures were not revised and they are not being submitted to EPA for action:

- Figure 1: Oregon Basin Index Map*
- Table 101B: Beneficial Use Designations, Fish Uses, Main Stem Columbia River
- Figure 220A: Fish Use Designations, Mid Coast Basin, Oregon
- Figure 220B: Salmon and Steelhead Spawning Use Designations, Mid Coast Basin, Oregon
- Figure 230A: Fish Use Designations, North Coast Basin, Oregon
- Figure 230B: Salmon and Steelhead Spawning Use Designations, North Coast Basin, Oregon
- Figure 300A: Fish Use Designations, South Coast Basin, Oregon
- Figure 300B: Salmon and Steelhead Spawning Use Designations, South Coast Basin, Oregon
- Figure 320A: Fish Use Designations, Umpqua Basin, Oregon
- Figure 300B: Salmon and Steelhead Spawning Use Designations, Umpqua Basin, Oregon

^{* -} Figure 1 is included several times, as it is referenced in all Basin-specific Criteria rules.

Comments received by close of public comment period

The table below lists people and organizations that submitted public comments about the proposed rules by the deadline on October 30, 2014 Original comments are on file with DEQ.

1 **Commenter** Ashlee Russell

Affiliation Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians

This commenter submitted comments under category 1 in the Summary

of comments and DEQ responses section above.

2 **Commenters** Mary Anne Nash, Tami Kerr and Jerome Rosa

Affiliation Oregon Farm Bureau, Oregon Dairy Farmers Association and Oregon

Cattlemen's Association, respectively

These commenters submitted joint comments under category 1 in the

Summary of comments and DEQ responses section above.

3 **Commenter** Angela Chung

Affiliation U. S. Environmental Protection Agency Region 10

This commenter submitted comments under categories 1, 2 and 3 in the

Summary of comments and DEQ responses section above.

Comments received after close of public comment period

DEQ received a letter of comment from the Confederated Tribes of the Grande Ronde on June 7, 2016, after the close of the public comment period.

Implementation

Notification

The proposed rules would become effective under the Clean Water Act upon EPA approval. DEQ anticipates approval by December 2016, if not earlier. DEQ will notify affected parties by GovDelivery and by updating DEQ's water quality standards website.

Compliance and enforcement

- Affected parties No changes to compliance and enforcement is anticipated.
- DEQ staff DEQ will continue to administer the program. Minor effort will be needed to incorporate the new 90th percentile criterion into permit templates and permit language and ensuring that this new criterion is reported. Minor effort will be needed to ensure that effluent limits are consistent with designated use maps. No change to enforcement is anticipated.

Measuring, sampling, monitoring and reporting

- Affected parties Minor effort will be needed from holders of individual NPDES permit holders discharging to coastal waters to report monthly 90th percentile bacteria levels complying with the new 90th percentile criterion. One or two facilities may need to monitor for two bacterial indicators, where they may have previously only monitored for one. One or two facilities will need to monitor for fewer indicators than previously required. The proposed changes will not affect frequency of sampling.
- DEQ staff No changes are anticipated in staff review of discharge monitoring reports and annual reports.

Systems

- Website No changes would be required to DEQ's website.
- Database Minor changes might be needed to DEQ's permit compliance database to incorporate the new 90th percentile criterion as a compliance metric.
- Invoicing No changes would be needed to invoicing.

Training

- Affected parties DEQ outreach and technical assistance would not be affected.
- DEQ staff Training would continue to be provided to program staff to ensure that the rules are properly implemented.

Requirement

Oregon law requires DEQ to review new rules within five years after EQC adopts them. The law also exempts some rules from review. DEQ determined whether the rules described in this report are subject to the five-year review. DEQ based its analysis on the law in effect when EQC adopted these rules.

Exemption from five-year rule review

The Administrative Procedures Act exempts all of the proposed rules from the five-year review because the proposed rules would:

• Amend or repeal an existing rule. ORS 183.405(4).

DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER POLLUTION

DIVISION 41

WATER QUALITY STANDARDS: BENEFICIAL USES, POLICIES, AND CRITERIA FOR OREGON

340-041-0009

Bacteria

- (1) Numeric Criteria: Organisms of the coliform group commonly associated with fecal sources (MPN or equivalent membrane filtration using a representative number of samples) may not exceed the criteria described in paragraphs (a) and (b) of this paragraph in subsections (a)-(c) of this section:
- (a) <u>Freshwater contact recreation</u> <u>Freshwaters and Estuarine Waters Other than Shellfish Growing Waters:</u>
- (A) A 3090-day log meangeometric mean of 126 E. coli organisms per 100 millilitermL.s, based on a minimum of five (5) samples;
- (B) No single sample may exceed 406 E. coli organisms per 100 milliliter L.s.
- (b) Coastal water contact recreation, as designated in OAR 340-041-0101, 340-041-220, 340-041-230, 340-041-300 and 340-041-0320:
- (A) A 90-day geometric mean of 35 enterococcus organisms per 100 mL;
- (B) Not more than ten percent of the samples may exceed 130 organisms per 100 mL.
- (cb) Marine Waters and Estuarine Shellfish Growing harvesting Waters, as designated in 340-041-0101, 340-041-220, 340-041-230, 340-041-300 and 340-041-0320:
- (A) A fecal coliform median concentration of 14 organisms per 100 milliliterm L.s.;
- (B) with notnNot more than ten percent of the samples may exceeding 43 organisms per 100 mL.ml.

- (112) A minimum of five samples in a 90-day period is required for calculating the criteria in sections (1)(a)(A) and (1)(b)(A) and (B) of this rule.
- (23) Raw Sewage Prohibition: No sewage may be discharged into or in any other manner be allowed to enter the waters of the State, unless such sewage has been treated in a manner the Department approved by the Department or otherwise allowed by these rules;
- (34) Animal Waste: Runoff contaminated with domesticated animal wastes must be minimized and treated to the maximum extent practicable before it is allowed to enter waters of the State.
- (45) Bacterial pollution or other conditions deleterious to waters used for domestic purposes, livestock watering, irrigation, bathing, or shellfish propagation, or otherwise injurious to public health may not be allowed.;
- (56) Effluent Limitations for Bacteria Implementation in NDPES Permits: Except as allowed in subsection (c) of this section, uUpon NPDES permit renewal or issuance, or upon request for a permit modification by the permittee at an earlier date, bacteria in effluent discharges to freshwaters, and estuarine waters other than shellfish growing waters associated with fecal sources may not exceed the following amounts:
- (a) In waters designated for coastal water contact recreation:
- (A) A monthly geometric mean of 35 enterococcus organisms per 100 mL, and
- (B) Not more than ten percent of samples in a month may exceed 130 enterococcus organisms per 100 mL.
- (b) In waters designated for freshwater contact recreation:
- (A) aA monthly log geometric mean of 126 E. coli organisms per 100 mlmL...; and
- (B) -No single sample may exceed 406 E. coli organisms per 100 mlmL. However,
- (C) nNo violation will be found, for an exceedance if the permittee takes at least five consecutive re-samples at four-hour intervals beginning as soon as practicable (preferably within 28 hours) after the original sample was taken and the log-geometric mean of the five re-samples is less than or equal to 126 organisms per 100 mL of E. coli. However, The following conditions applyapplies:
- (aA) Iif the Department finds that re-sampling within the timeframe outlined in this section would pose an undue hardship on a treatment facility, a more convenient schedule may be negotiated in the permit, provided that the permittee demonstrates that the sampling delay will result in no increase in the risk to water contact recreation in waters affected by the discharge;
- _(b) The aquatic life criteria for chlorine established in the water quality toxic substances rule under OAR 340-041-0033 must be met at all times outside the assigned mixing zone;

- (c) For sewage treatment plants that are authorized to use recycled water <u>under pursuant to OAR</u> 340, division 55, and that also use a storage pond as a means to dechlorinate their effluent prior to discharge to public waters, effluent limitations for bacteria may, upon <u>a permittee's</u> request by the permittee, be based upon appropriate total coliform limits as required by OAR 340-055-0012, division 55: requires:
- (iA) Class C limitations: No two consecutive samples may exceed 240 total coliform per 100 millilitermL.s.
- (iiB) Class A and Class B limitations: No single sample may exceed 23 total coliform per 100 millilitermL.s.
- (Ciii) No violation will be found for an exceedance under this paragraph if the permittee takes at least five consecutive re-samples at four hour intervals beginning as soon as practicable (preferably within 28 hours) after the original sample(s) were taken; and in the case of Class C recycled water, the log mean of the five re-samples is less than or equal to 23 total coliform per 100 millilitermL.s or, in the case of Class A and Class B recycled water, if the log mean of the five re-samples is less than or equal to 2.2 total coliform per 100 millilitermL.s.
- (67) Sewer Overflows in winter: Domestic waste collection and treatment facilities are prohibited from discharging raw sewage to waters of the State during the period of November 1 through May 21, except during a storm event greater than the one-in-five-year, 24-hour duration storm. However, the following exceptions apply:
- (a) The Commission may on a case-by-case basis approve a bacteria control management plan to be prepared by the permittee, for a basin or specified geographic area which describes hydrologic conditions under which the numeric bacteria criteria would be waived. These plans will identify the specific hydrologic conditions, and identify the public notification and education processes that will be followed to inform the public about an event and the plan, describe the water quality assessment conducted to determine bacteria sources and loads associated with the specified hydrologic conditions, and describe the bacteria control program that is being implemented in the basin or specified geographic area for the identified sources.;
- (b) Facilities with separate sanitary and storm sewers existing on January 10, 1996, and that which currently experience sanitary sewer overflows due to inflow and infiltration problems, must submit an acceptable plan to the Department at the first permit renewal, which describes actions the facility will take that will be taken to assure compliance with the discharge prohibition by January 1, 2010. Where discharges occur to a receiving stream with sensitive beneficial uses, the Department may negotiate a more aggressive schedule for discharge elimination.;
- (c) On a case-by-case basis, the <u>Department may define the</u> beginning of winter <u>may be defined</u> as October 15, if the permittee so requests and demonstrates to the Department's satisfaction that the risk to beneficial uses, including water contact recreation, will not be increased due to the date change.

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- (78) Sewer Overflows in summer: Domestic waste collection and treatment facilities are prohibited from discharging raw sewage to waters of the State during the period of May 22 through October 31, except during a storm event greater than the one-in-ten-year, 24-hour duration storm. The following exceptions apply:
- (a) For facilities with combined sanitary and storm sewers, the Commission may on a case-by-case basis approve a bacteria control management plan such as that described in subsection (6)(a) of this rule.
- (b) On a case-by-case basis, the <u>Department may define the</u> beginning of summer may be defined as June 1 if the permittee so requests and demonstrates to the Department's satisfaction that the risk to beneficial uses, including water contact recreation, will not be increased due to the date change.;
- (c) For discharge sources whose permit identifies the beginning of summer as any date from May 22 through May 31: If the permittee demonstrates to the Department's satisfaction that an exceedance occurred between May 21 and June 1 because of a sewer overflow, and that no increase in risk to beneficial uses, including water contact recreation, occurred because of the exceedance, no violation may be triggered, if the storm associated with the overflow was greater than the one-in-five-year, 24-hour duration storm.
- (89) Storm Sewers Systems Subject to Municipal NPDES Stormwater Permits: Best management practices must be implemented for permitted storm sewers to control bacteria to the maximum extent practicable. In addition, a collection-system evaluation must be performed prior to permit issuance or renewal so that illicit and cross connections are identified. Such connections must be removed upon identification. A collection system evaluation is not required where the Department determines that illicit and cross connections are unlikely to exist.
- (910) Storm Sewers Systems Not Subject to Municipal NPDES Stormwater Permits: A collection system evaluation must be performed of non-permitted storm sewers by January 1, 2005, unless the Department determines that an evaluation is not necessary because illicit and cross connections are unlikely to exist. Illicit and cross-connections must be removed upon identification.
- _(10) Water Quality Limited for Bacteria: In those water bodies, or segments of water bodies identified by the Department as exceeding the relevant numeric criteria for bacteria in the basin standards and designated as water-quality limited under section 303(d) of the Clean Water Act, the requirements specified in section 11 of this rule and in OAR 340-041-0061(11) must apply.
- (11) In water bodies designated the Department identifies designated by the Department as water-quality limited for bacteria, and in accordance with priorities the Department establishes by the Department, the Department may require those sources that the Department determines to be contributing to the problem to development and implementation of a bacteria management plan may be required of those sources that the Department determines to be contributing to the problem. The Department may determine that a plan is not necessary for a particular stream segment or segments within a water-quality limited basin based on the contribution of the

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segment(s) to the problem. The bacteria management plans will identify the technologies, best management practices and/or measures and approaches to be implemented by point and nonpoint sources to limit bacterial contamination. For point sources, their National Pollutant Discharge Elimination System permit is their bacteria management plan. For nonpoint sources, designated management agencies will develop the bacteria management plan will be developed by designated management agencies (DMAs) which that will identify the appropriate best management practices or measures and approaches.

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048 Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048

Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 6-2008, f. & cert. ef. 5-5-08; DEQ 10-2011, f.

& cert. ef. 7-13-11; DEQ 16-2013, f. & cert. ef. 12-23-13

Basin-Specific Criteria (Main Stem Columbia River)

340-041-0101

Beneficial Uses to Be Protected in the Main Stem Columbia River

- (1) Water quality in the main stem Columbia River (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 101A (November 2003).
- (2) Designated fish uses to be protected in the main stem Columbia River are shown in Table 101B (November 2003).
- (3) Coastal water contact recreation and shellfish harvesting use is to be protected in the portion of the main stem Columbia River, as designated for these uses in Figure 101A (August 2016).

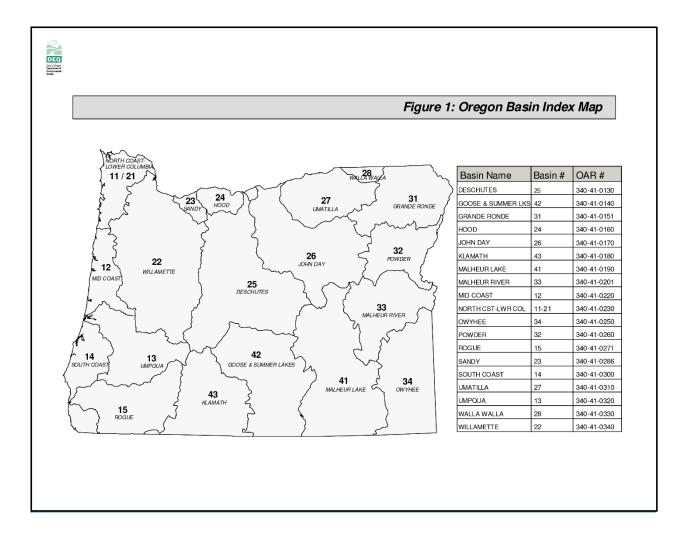




Table 101A

Designated Beneficial Uses Main stem Columbia River (OAR 340-041-0101) (November 2003)

| Columbia River Mouth to RM 86 | Columbia River RM 86 to 309 | |
|----------------------------------|---------------------------------------|--|
| X | X | |
| X | X | |
| X | X | |
| X | X | |
| X | X | |
| X | X | |
| X | X | |
| X | X | |
| X | X | |
| X | X | |
| X | X | |
| | X | |
| X | X | |
| | X X X X X X X X X X X X X X X X X X X | |

¹ With adequate pretreatment and natural quality to meet drinking water standards.

² See also Table 101B for fish use designations for this river.

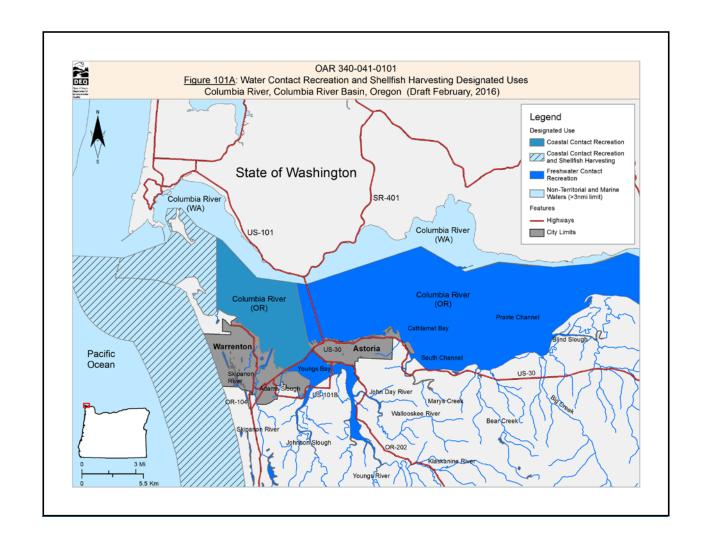
³ See also Figure 101A for coastal water contact use and shellfish harvesting designations.



Table 101B

Beneficial Use Designations – Fish Uses Main stem Columbia River (OAR 340-041-0101) (November 2003)

| Geographic Extent of Use | Salmon and Steelhead Migration Corridors (20°C) | Salmon and Steelhead Spawning through Fry Emergence | Shad and Sturgeon Spawning and Rearing |
|---|---|---|--|
| Mainstem Columbia River | | | |
| Beacon Rock to Upstream of Ives Island (RM 141,5 to RM 143.5) | | October 15 – March 31 | |
| Columbia River, mouth to WA border (RM 309) | X | | |
| Columbia River (RM 146 to RM 203) | | | X |



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[ED. NOTE: Tables and figures referenced are not included in rule text. Click here for PDF copy of table(s) and figures.]

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048 Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048

Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03

Basin-Specific Criteria (Mid Coast Basin)

340-041-0220

Beneficial Uses to Be Protected in the Mid Coast Basin

- (1) Water quality in the Mid Coast Basin (see Figure 1) may be managed to protect the designated beneficial uses shown in Table 220A (November 2003).
- (2) Designated fish uses to be protected in the Mid Coast Basin are shown in Figures 220A and 220B (November 2003).
- (3) Coastal water contact recreation use is to be protected in all Mid Coast Basin marine waters and in coastal waters designated in Figures 220C through 220H (August 2016).
- (4) Shellfish harvesting use is to be protected in all Mid Coast Basin marine waters and in coastal waters designated in Figures 220C through 220H (August 2016).

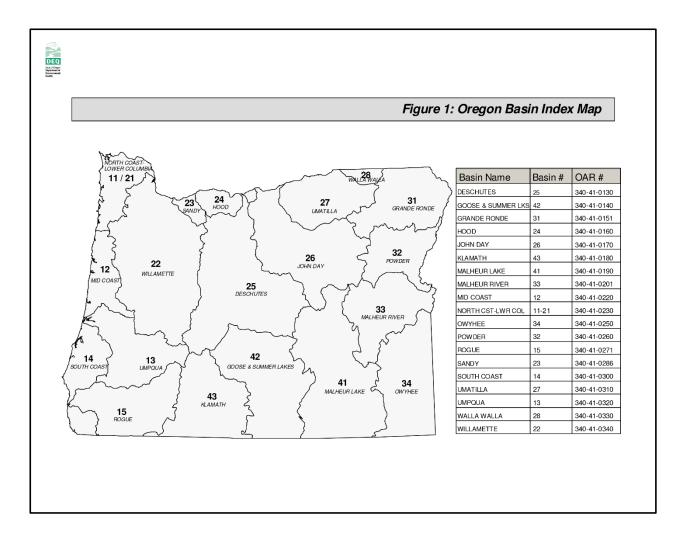




Table 220A

Designated Beneficial Uses

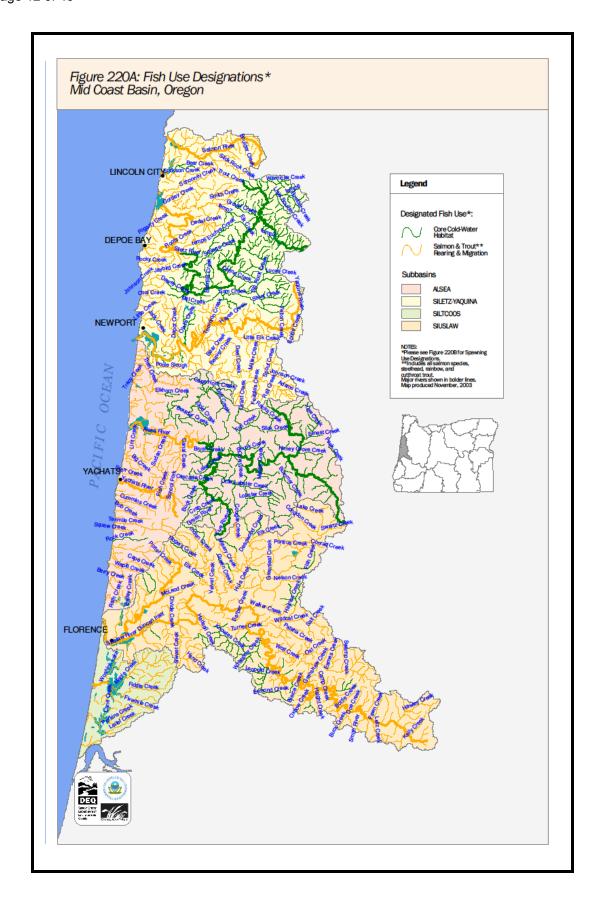
Mid Coast Basin
(OAR 340-041-0220)
(November 2003)

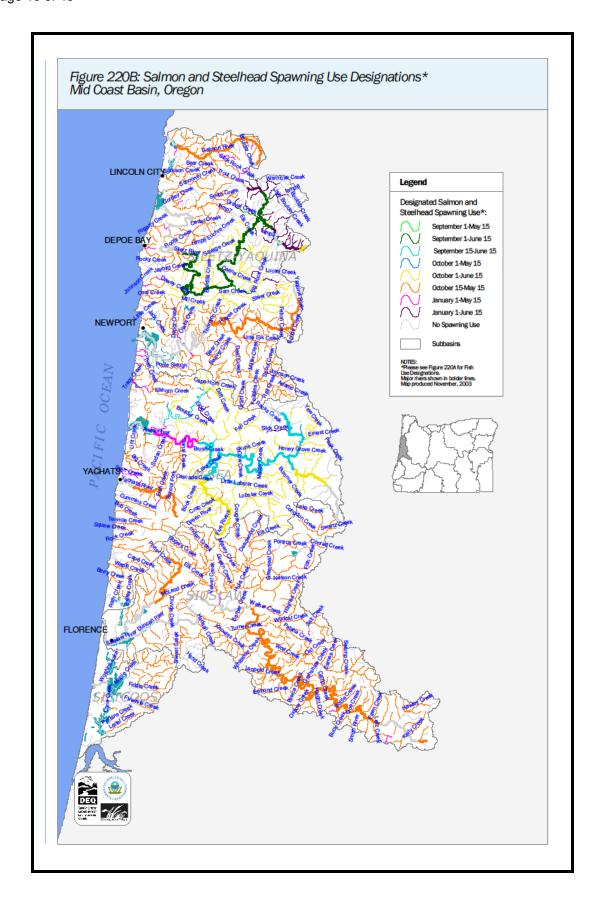
| Beneficial Uses | <u>Estuaries &</u> <u>Adjacent Marine</u> <u>Waters</u> | All Steams & Tributaries Thereto |
|--|---|----------------------------------|
| Public Domestic Water Supply ¹ | | X |
| Private Domestic Water Supply ¹ | | X |
| Industrial Water Supply | X | X |
| Irrigation | | X |
| Livestock Watering | | X |
| Fish & Aquatic Life ² | X | X |
| Wildlife & Hunting | X | X |
| Fishing ³ | X | X |
| Boating | X | X |
| Water Contact Recreation ³ | <u>X</u> | X |
| Aesthetic Quality | X | X |
| Hydro Power | | X |
| Commercial Navigation & Transportation | X | |

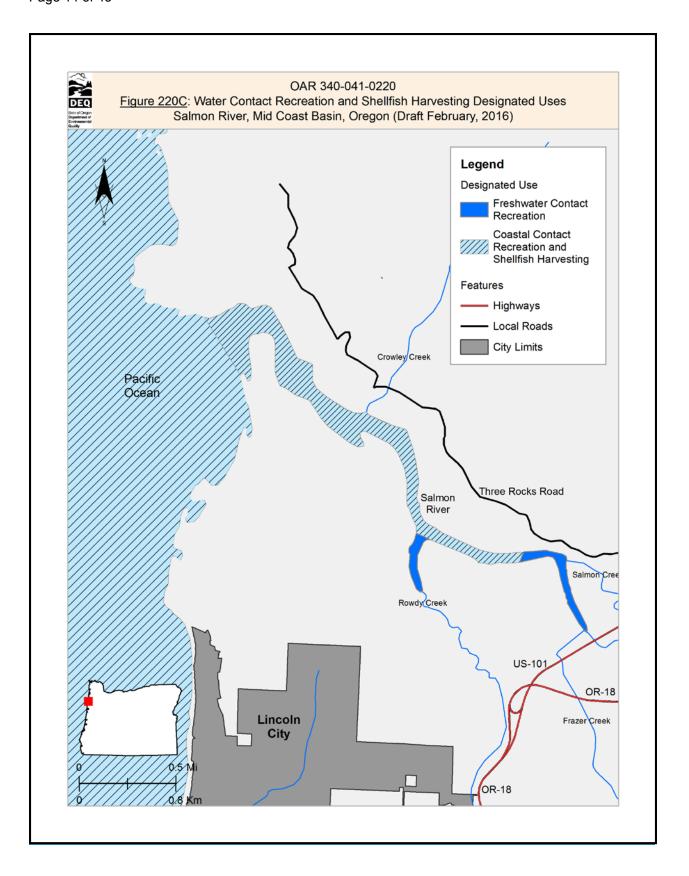
¹ With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.

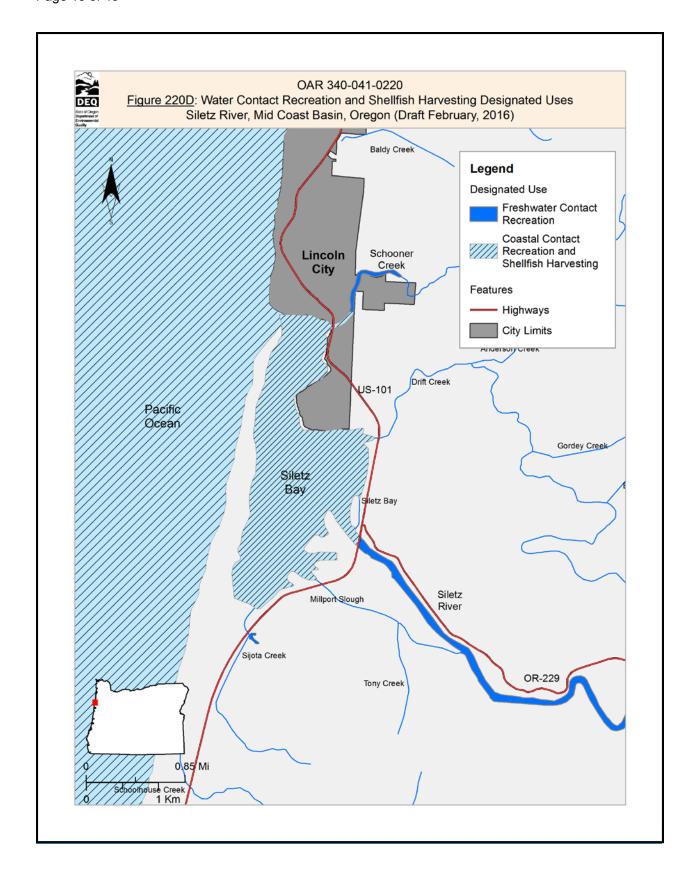
² See also Figures 230A and 230B for fish use designations for this basin.

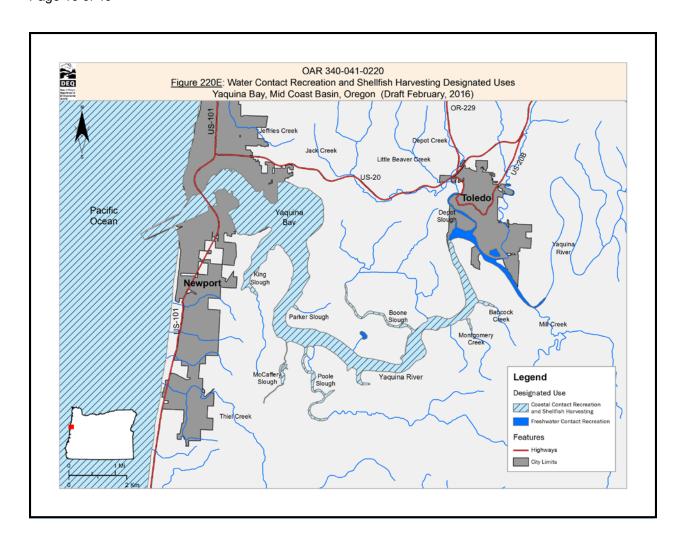
³ For coastal water contact recreation and shellfish harvesting uses, see also Figures 220C (Salmon River Estuary), 220D (Siletz Bay), 220E (Yaquina Bay), 220F (Alsea River Estuary), 220G (Yachats River Estuary), and 220H (Siuslaw River Estuary)

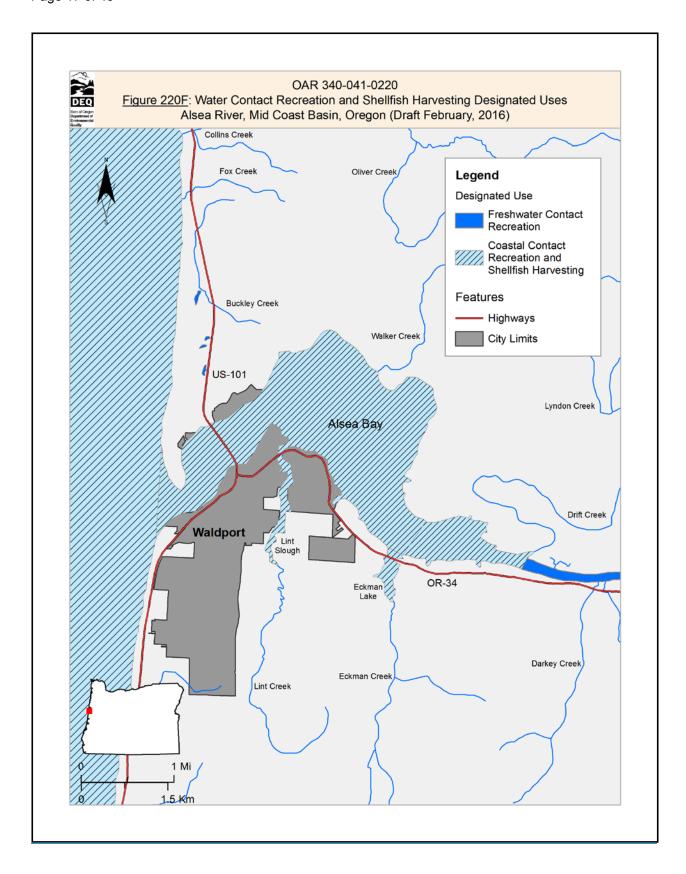


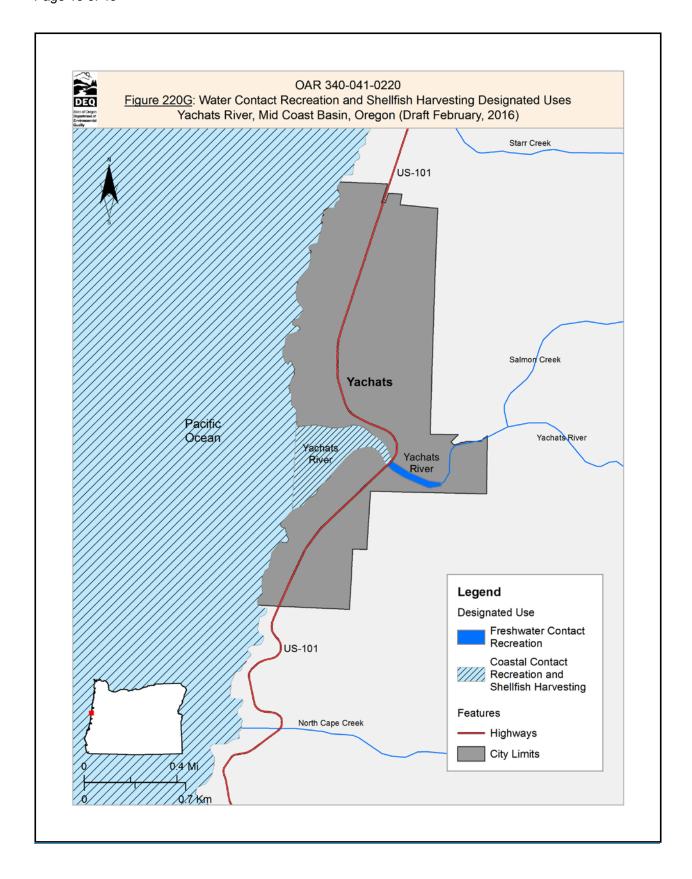


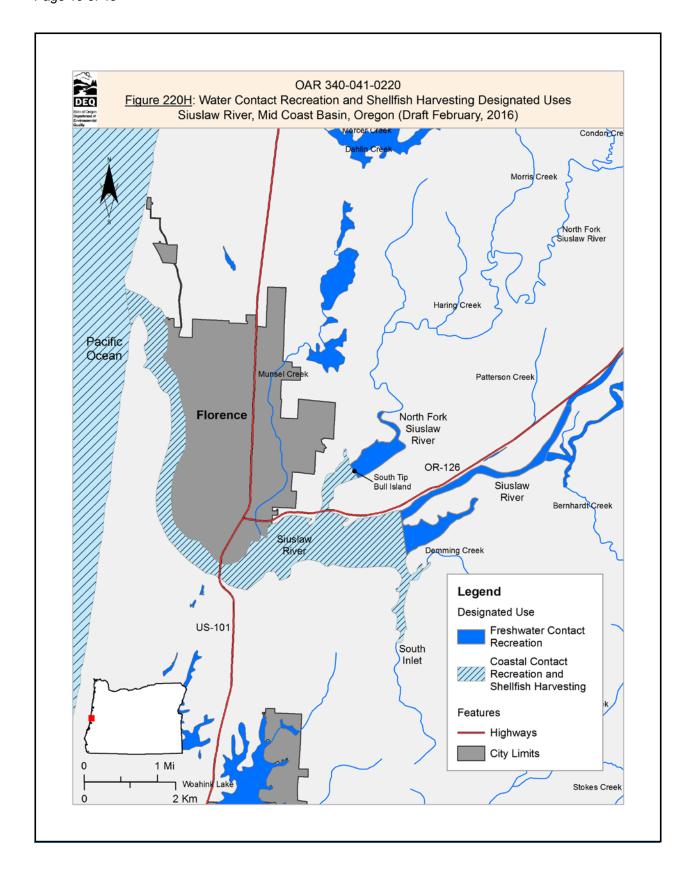












Attachment A Aug. 17-18, 2016, EQC meeting Page 20 of 43

[ED. NOTE: Tables and figures referenced are not included in rule text. Click here for PDF copy of tables and figures.]

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048 Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048

Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03

Basin-Specific Criteria (North Coast)

340-041-0230

Beneficial Uses to Be Protected in the North Coast Basin

- (1) Water quality in the North Coast Basin (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 230A (November 2003).
- (2) Designated fish uses to be protected in the North Coast Basin are shown in Figures 230A and 230B (November 2003).
- (3) Coastal water contact recreation use is to be protected in all North Coast Basin marine waters and in coastal waters designated in Figures 230C through 230H (August 2016).
- (4) Shellfish harvesting use is to be protected in all North Coast Basin marine waters and in coastal waters as designated in Figures 230Cthrough 230H (August 2016).

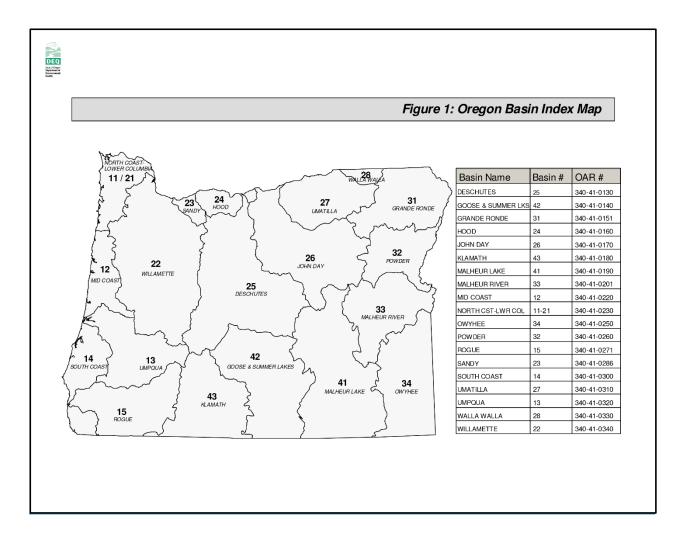




Table 230A

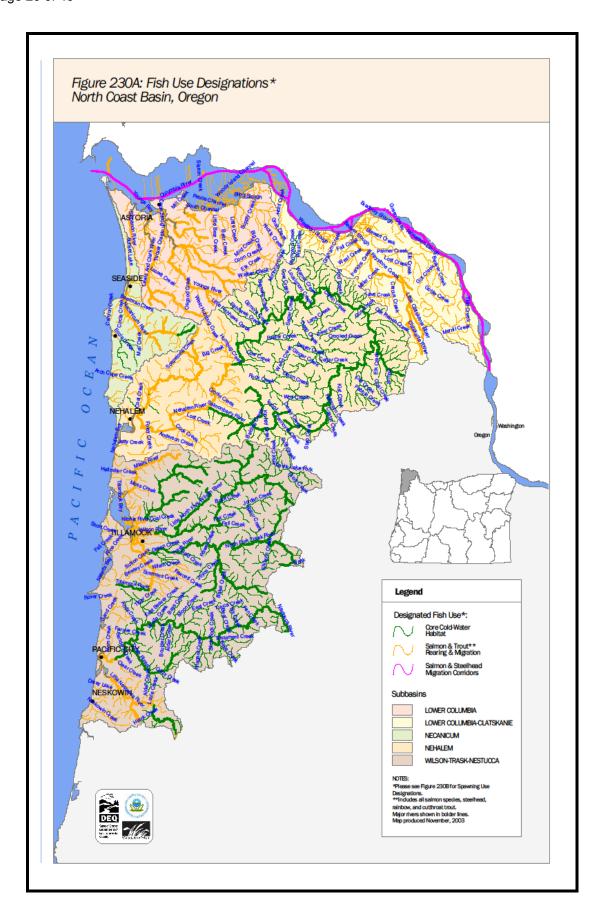
Designated Beneficial Uses
North Coast Basin
(OAR 340-041-0230)
(November 2003)

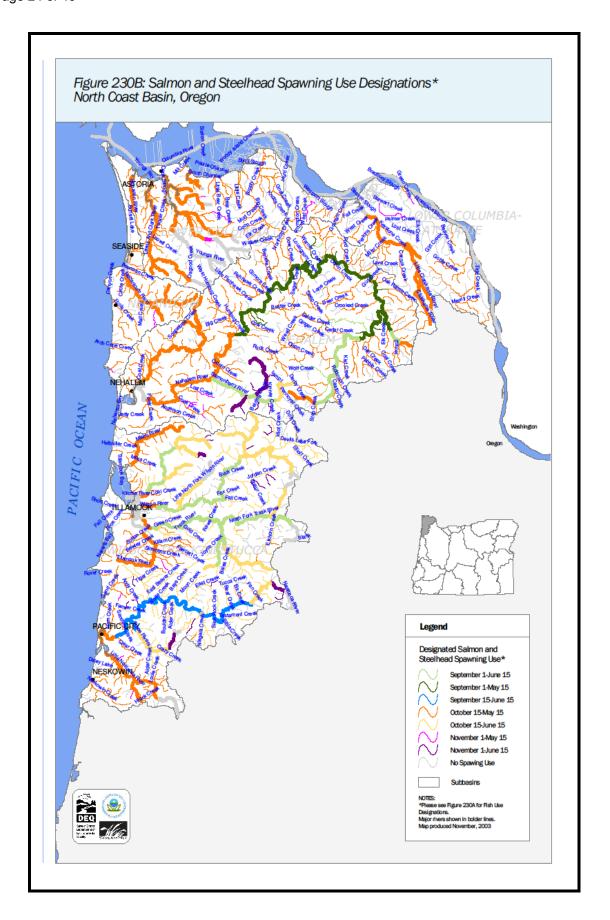
| Beneficial Uses | <u>Estuaries &</u> <u>Adjacent Marine</u> <u>Waters</u> | All Steams & Tributaries Thereto |
|--|---|----------------------------------|
| Public Domestic Water Supply ¹ | | X |
| Private Domestic Water Supply ¹ | | X |
| Industrial Water Supply | X | X |
| Irrigation | | X |
| Livestock Watering | | X |
| Fish & Aquatic Life ² | X | X |
| Wildlife & Hunting | X | X |
| Fishing ³ | X | X |
| Boating | X | X |
| Water Contact Recreation ³ | X | X |
| Aesthetic Quality | X | X |
| <u>Hydro Power</u> | | |
| Commercial Navigation & Transportation | X | |

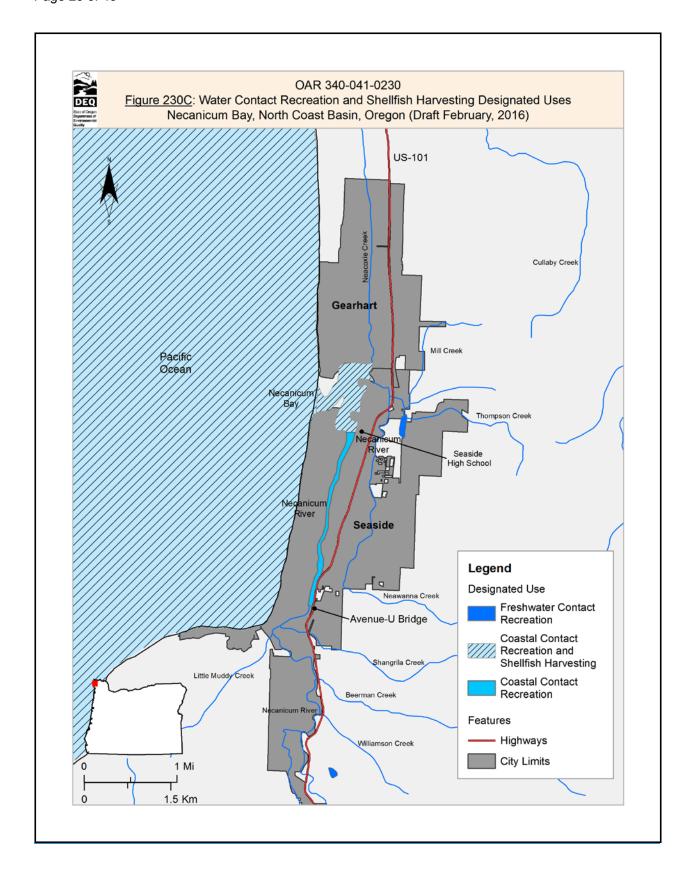
¹ With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.

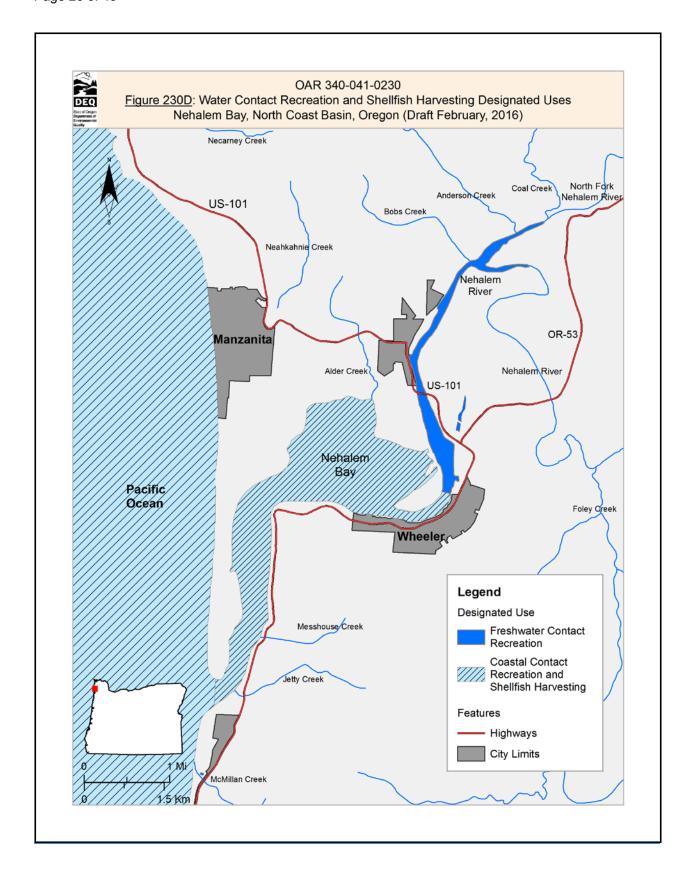
² See also Figures 230A and 230B for fish use designations for this basin.

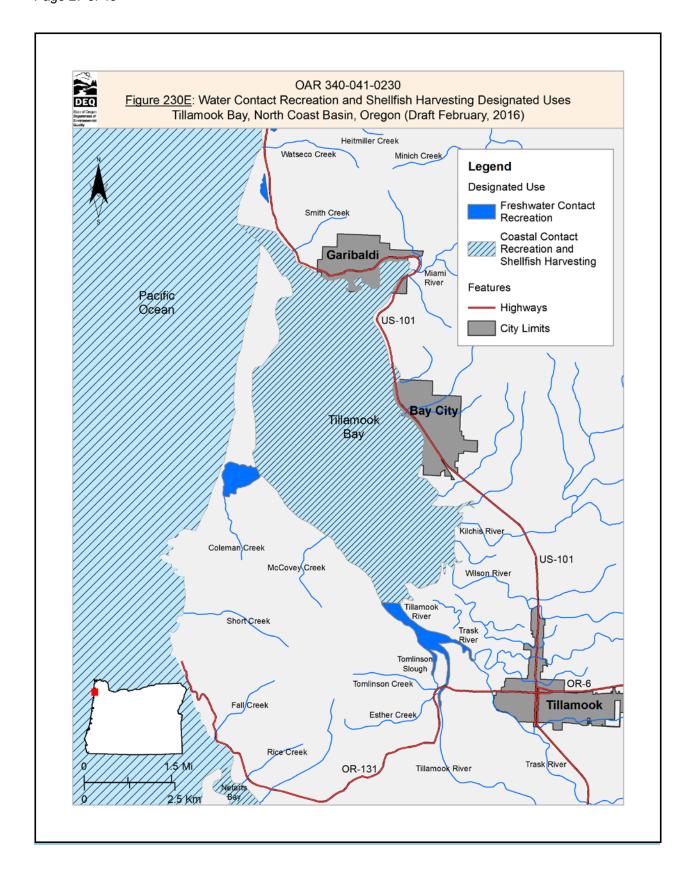
³ For coastal water contact recreation and shellfish harvesting uses, see also Figures 230C (Necanicum River Estuary), 230D (Nehalem Bay), 230E (Tillamook Bay), 230F (Netarts Bay), 230G (Sand Lake), and 230H (Nestucca Bay)

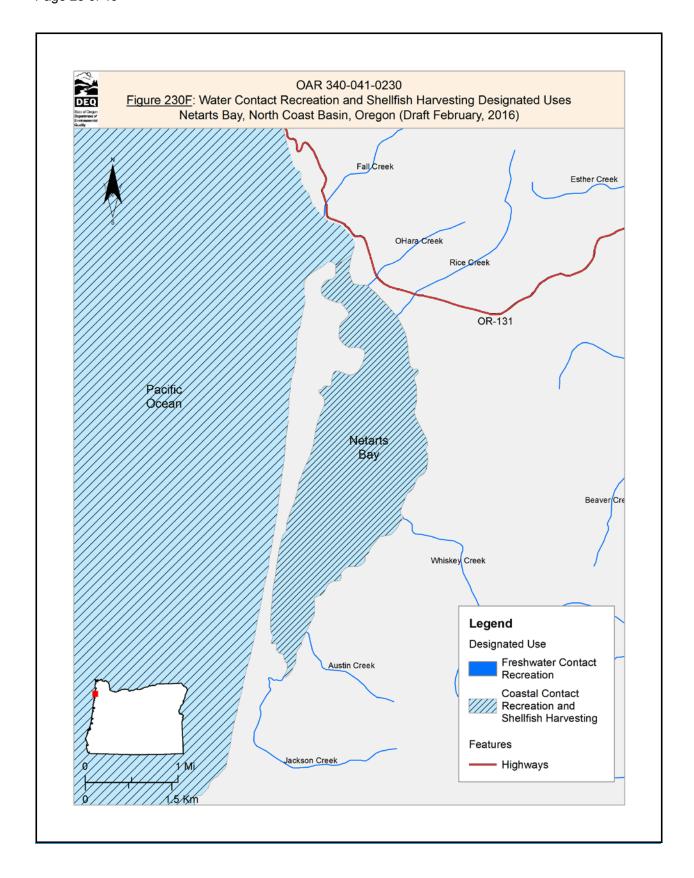


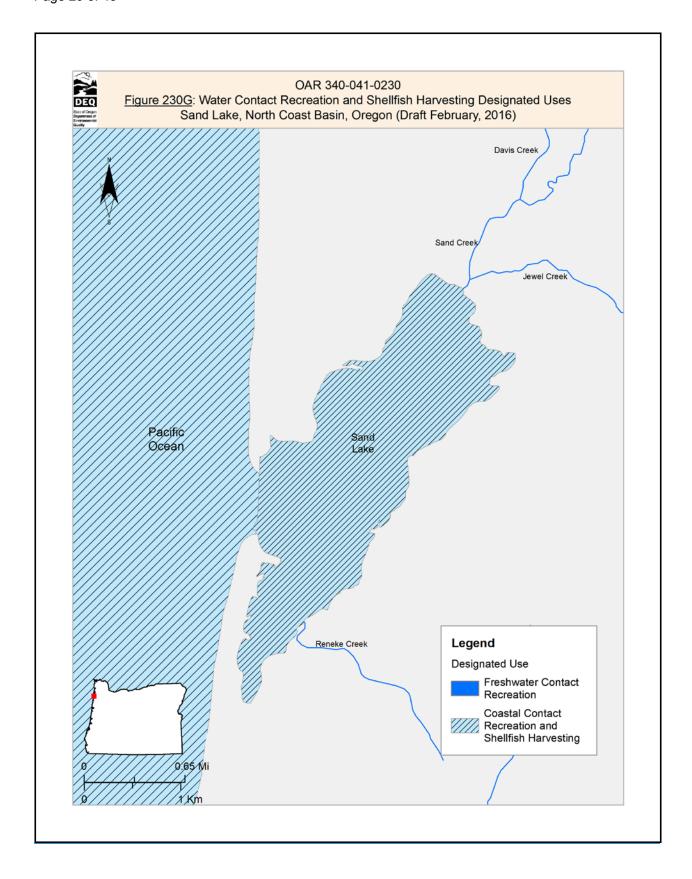


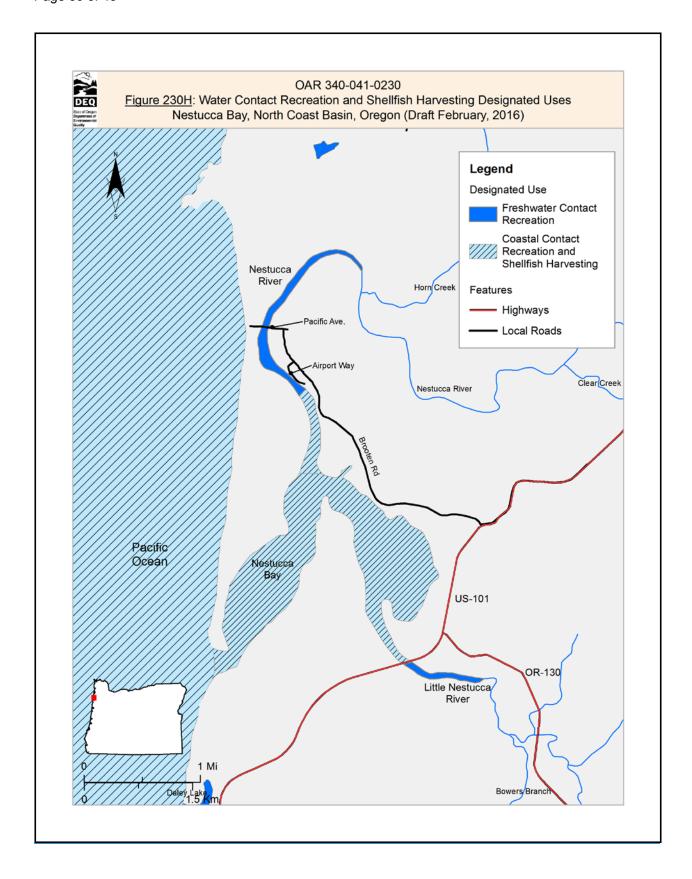












Attachment A Aug. 17-18, 2016, EQC meeting Page 31 of 43

[ED. NOTE: Tables and figures referenced are not included in rule text. Click here for PDF copy of tables and figures.]

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048 Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048

Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03

Basin-Specific Criteria (South Coast)

340-041-0300

Beneficial Uses to Be Protected in the South Coast Basin

- (1) Water quality in the South Coast Basin (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 300A (November 2003).
- (2) Designated fish uses to be protected in the South Coast Basin are shown in Figures 300A (August 2005) and 300B (November 2003).
- (3) Coastal water contact recreation use is to be protected in all South Coast Basin marine waters and in coastal waters designated in Figures 300C and 300D (August 2016).
- (4) Shellfish harvesting use is to be protected in all South Coast Basin marine waters and in coastal waters as designated in Figures 300C and 300D (August 2016)

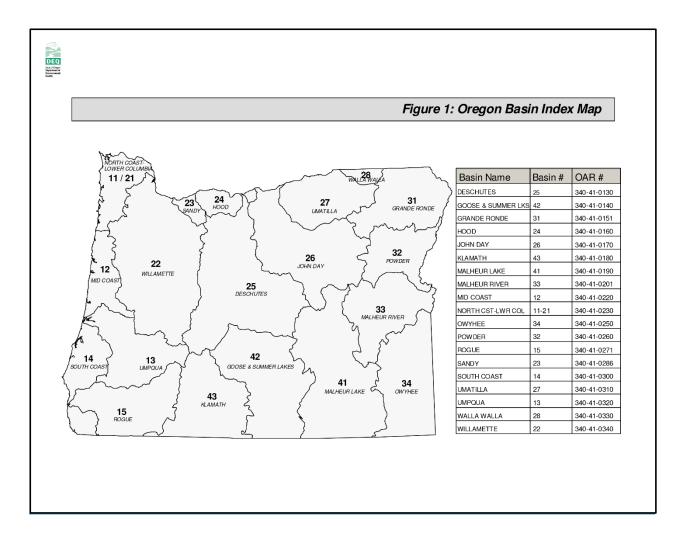




Table 300A

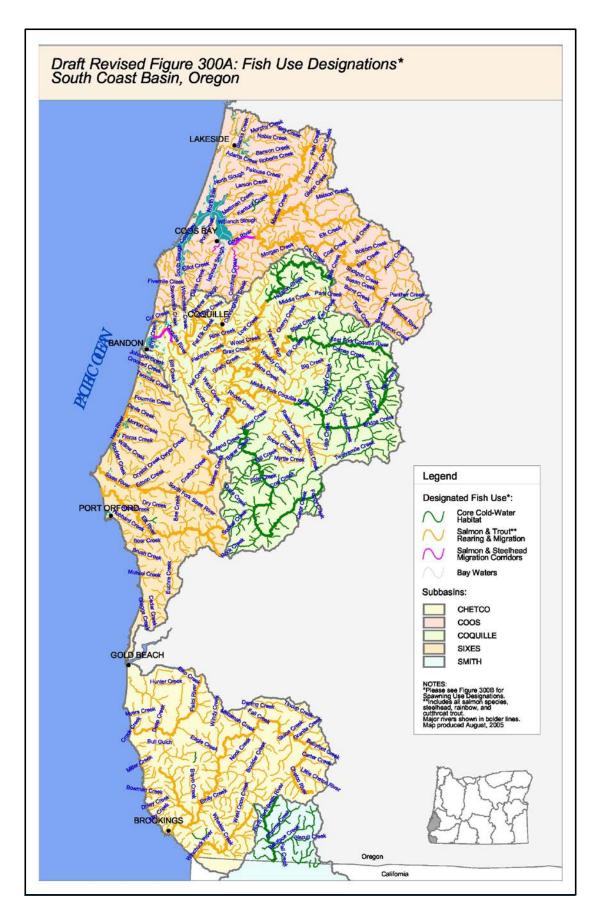
Designated Beneficial Uses
South Coast Basin
(OAR 340-041-0300)
(November 2003)

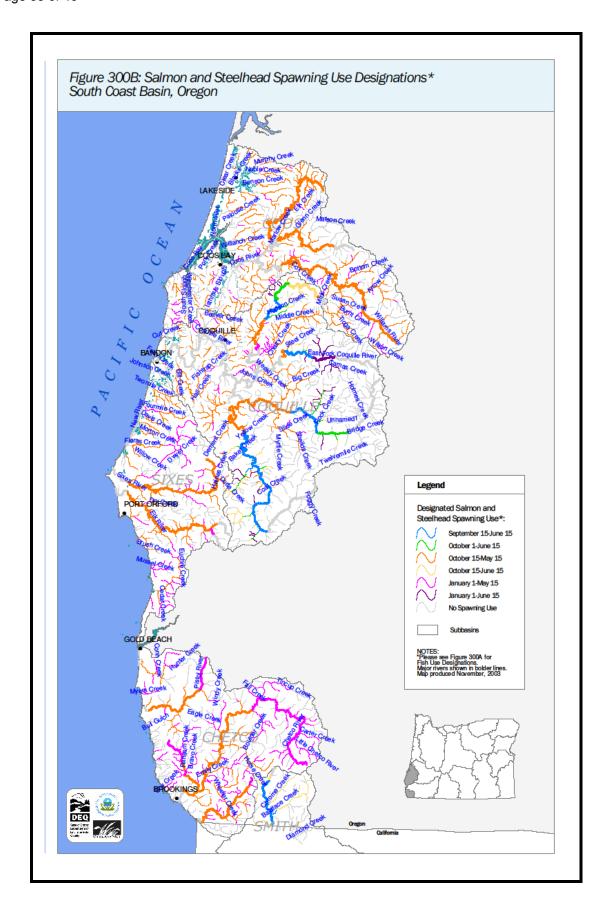
| <u>Beneficial Uses</u> | Estuaries & Adjacent Marine Waters | All Steams & Tributaries Thereto |
|--|------------------------------------|----------------------------------|
| Public Domestic Water Supply ¹ | | X |
| Private Domestic Water Supply ¹ | | X |
| Industrial Water Supply | X | X |
| <u>Irrigation</u> | | X |
| Livestock Watering | | X |
| Fish & Aquatic Life ² | X | X |
| Wildlife & Hunting | X | X |
| Fishing ³ | X | X |
| Boating | X | X |
| Water Contact Recreation ³ | X | X |
| Aesthetic Quality | X | X |
| Hydro Power | | X |
| Commercial Navigation & Transportation | X | |

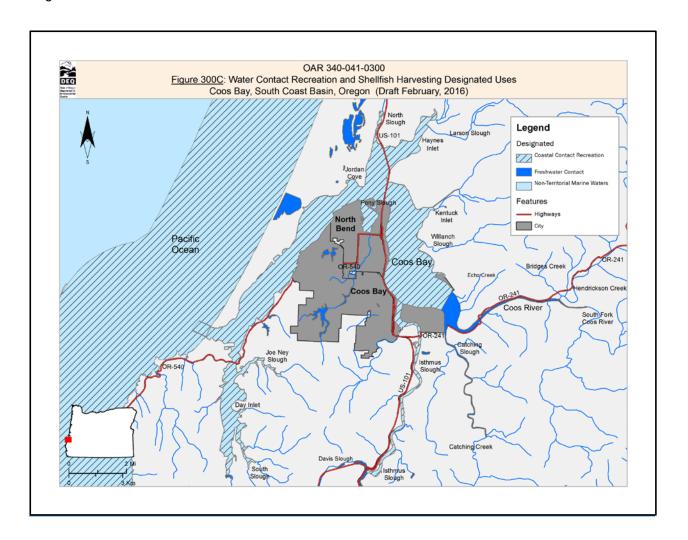
¹ With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.

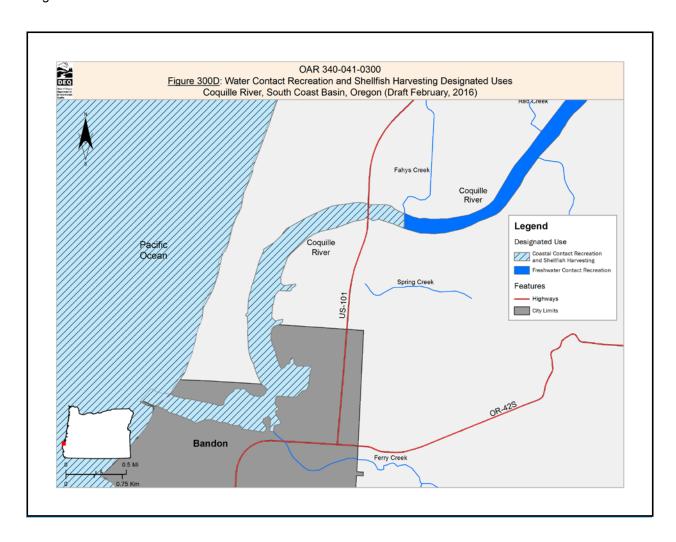
² See also Figures 300A and 300B for fish use designations for this basin.

³ For coastal water contact recreation and shellfish harvesting uses, see also Figures 300C (Coos Bay) and 300D (Coquille River Estuary).









[ED. NOTE: Tables and figures referenced are not included in rule text. Click here for PDF copy of tables and figures.][ED. NOTE: Tables referenced are available from the agency.]

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048 Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048

Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 2-2007, f. & cert. ef. 3-15-07

Basin-Specific Criteria (Umpqua Basin)

340-041-0320

Beneficial Uses to Be Protected in the Umpqua Basin

(1) Water quality in the Umpqua Basin (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 320A (November 2003).

- (2) Designated fish uses to be protected in the Umpqua Basin are shown in Figures 320A (November 2003) and 320B (August 2005).
- (3) Coastal water contact recreation use is to be protected in all marine waters adjacent to the Umpqua River and in coastal waters designated in Figure 320C (August 2016).
- (4) Shellfish harvesting use is to be protected in all marine waters adjacent to the Umpqua River and in coastal waters as designated in Figure 320C (August 2016).

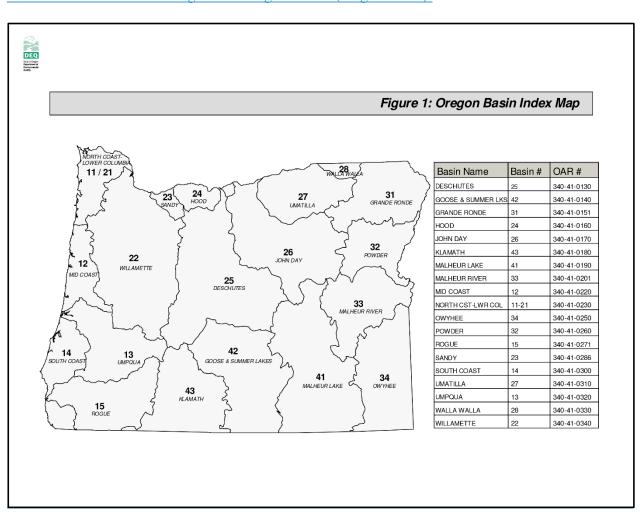




Table 320A

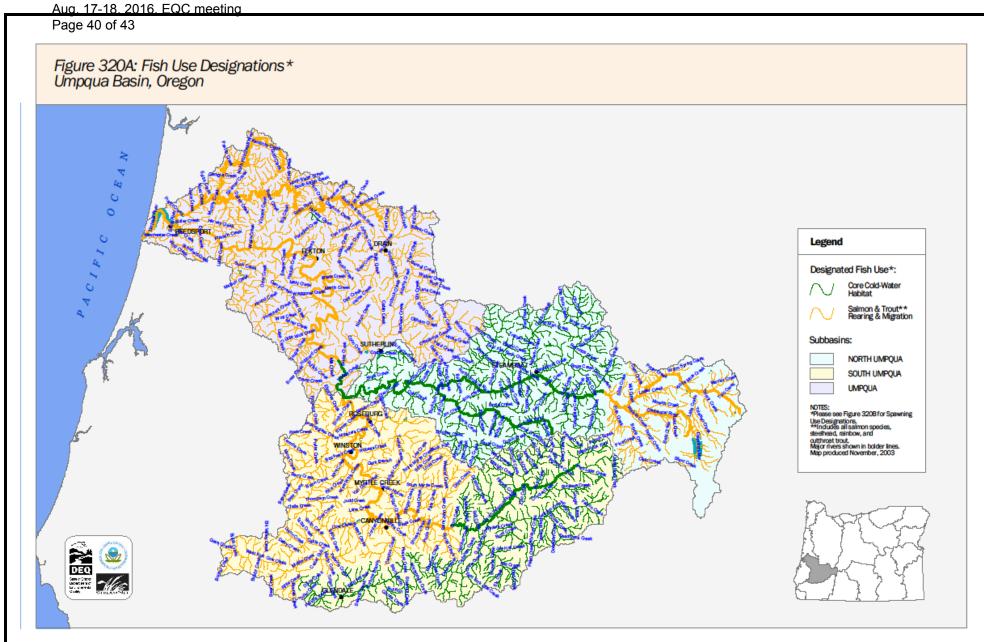
Designated Beneficial Uses
Rogue Umpqua Basin
(OAR 340-041-0320)
(November 2003)

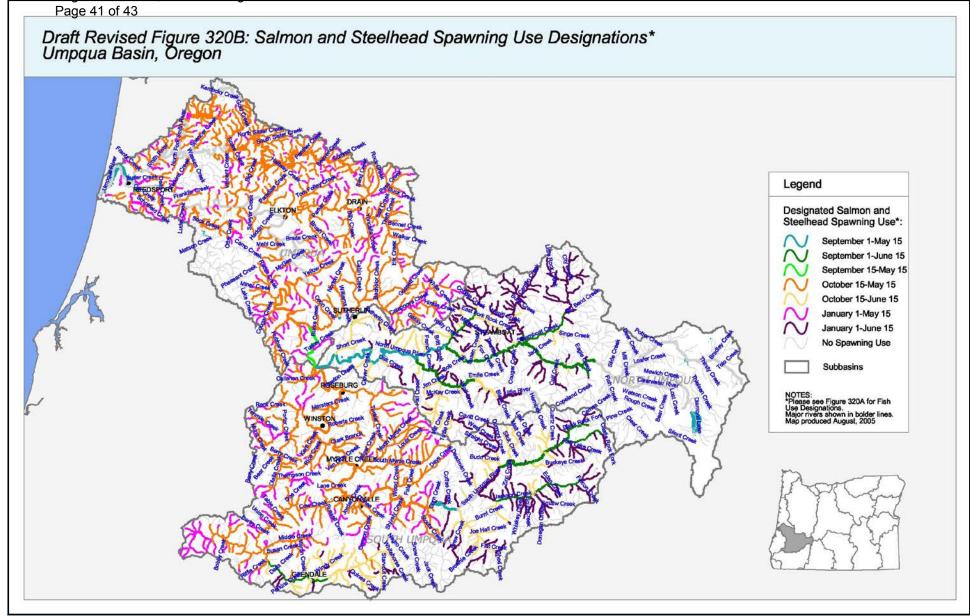
| Beneficial Uses | Umpqua R. Estuary to Head of Tidewater & Adjacent Marine Waters | Umpqua R. Main from Head of Tidewater to Confluence of N. & S. Umpqua Rivers | North Umpqua <u>River Main</u> <u>Stem</u> | South Umpqua River Main Stem | All Other Tributaries to Umpqua, North & South Umpqua Rivers |
|--|---|--|--|---------------------------------------|--|
| Public Domestic Water Supply¹ | | <u>X</u> | <u>X</u> | <u>X</u> | <u>X</u> |
| Private Domestic Water Supply 1 | | X | X | X | X |
| Industrial Water Supply | X | X | X | X | X |
| <u>Irrigation</u> | | <u>X</u> | <u>X</u> | <u>X</u> | <u>X</u> |
| Livestock Watering | | X | X | X | X |
| Fish & Aquatic Life ² | X | X | X | X | X |
| Wildlife & Hunting | X | X | X | X | X |
| <u>Fishing</u> | <u>X</u> ³ | <u>X</u> | <u>X</u> | <u>X</u> | <u>X</u> |
| Boating | <u>X</u> | <u>X</u> | <u>X</u> | <u>X</u> | <u>X</u> |
| Water Contact Recreation | <u>X</u> ³ | X | X | <u>X</u> | X |
| Aesthetic Quality | X | X | X | X | X |
| <u>Hydro Power</u> | | | <u>X</u> | <u>X</u> | <u>X</u> |
| Commercial Navigation & Transportation | X | | | | |

¹ With adequate pretreatment (filtration and disinfection) and natural quality to meet drinking water standards.

² See also Figures 320A and 320B for fish use designations for this basin.

³ For coastal water contact recreation and shellfish harvesting uses in the Umpqua River Estuary and Adjacent Marine Waters, see also Figure 320C.





Aug. 17-18, 2016, EQC meeting Page 42 of 43 OAR 340-041-0320 Figure 320C: Water Contact Recreation and Shellfish Harvesting Designated Uses Winchester Bay, Umpqua Basin, Oregon (Draft February, 2016) Tankenitch Creek ivemile Creek Tahkenitch Lake Creek Holden Leitel Creek West Fork Mallard Joyce Creek Creek Joyce US-101 Creek Hudson Slough Threemile Creek Frantz Lower Smith Creek River Rd. Brainarc Creek Pacific Smith Øcean River Otter Butler Creek Umpqua Reedsport River Scholfield Koepke Winchester Slough Dean Creek **OR-38** Bay Creek US-101 Legend Winchester Creek Designated Use Scholfield Freshwater Contact Creek Recreation Coastal Contact Recreation and Shellfish Harvesting Winter Parker Non-Territorial and Marine Waters (>3nmi limit) **Features** Blacks Wilkins Murphy Highways Creek Local Roads City Limits

Attachment A Aug. 17-18, 2016, EQC meeting Page 43 of 43

[ED. NOTE: Tables and Figures referenced are not included in rule text. Click here for PDF copy of tables and figures.]

[ED. NOTE: Tables referenced are available from the agency.] Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048

Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048

Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 2-2007, f. & cert. ef. 3-15-07

DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER POLLUTION

DIVISION 41

WATER QUALITY STANDARDS: BENEFICIAL USES, POLICIES, AND CRITERIA FOR OREGON

340-041-0009

Bacteria

- (1) Numeric Criteria: Organisms commonly associated with fecal sources may not exceed the criteria in subsections (a)-(c) of this section:
- (a) Freshwater contact recreation:
- (A) A 90-day geometric mean of 126 E. coli organisms per 100 mL,
- (B) No single sample may exceed 406 E. coli organisms per 100 mL.
- (b) Coastal water contact recreation, as designated in OAR 340-041-0101, 340-041-220, 340-041-230, 340-041-300 and 340-041-0320:
- (A) A 90-day geometric mean of 35 enterococcus organisms per 100 mL;
- (B) Not more than ten percent of the samples may exceed 130 organisms per 100 mL.
- (c) Shellfish harvesting, as designated in 340-041-0101, 340-041-220, 340-041-230, 340-041-300 and 340-041-0320:
- (A) A fecal coliform median concentration of 14 organisms per 100 mL;
- (B) Not more than ten percent of the samples may exceed 43 organisms per 100 mL.
- (2) A minimum of five samples in a 90-day period is required for calculating the criteria in sections (1)(a)(A) and (1)(b)(A) and (B) of this rule.
- (3) Raw Sewage Prohibition: No sewage may be discharged into or in any other manner be allowed to enter the waters of the State, unless such sewage has been treated in a manner the Department approved or otherwise allowed by these rules.

- (4) Animal Waste: Runoff contaminated with domesticated animal wastes must be minimized and treated to the maximum extent practicable before it is allowed to enter waters of the State.
- (5) Bacterial pollution or other conditions deleterious to waters used for domestic purposes, livestock watering, irrigation, bathing, or shellfish propagation, or otherwise injurious to public health may not be allowed.
- (6) Implementation in NDPES Permits: Upon NPDES permit renewal or issuance, or upon request for a permit modification by the permittee at an earlier date, bacteria in effluent discharges associated with fecal sources may not exceed the following amounts:
- (a) In waters designated for coastal water contact recreation:
- (A) A monthly geometric mean of 35 enterococcus organisms per 100 mL, and
- (B) Not more than ten percent of samples in a month may exceed 130 enterococcus organisms per 100 mL.
- (b) In waters designated for freshwater contact recreation:
- (A) A monthly geometric mean of 126 E. coli organisms per 100 mL; and
- (B) No single sample may exceed 406 E. coli organisms per 100 mL. However,
- (C) No violation will be found for an exceedance if the permittee takes at least five consecutive re-samples at four-hour intervals beginning as soon as practicable (preferably within 28 hours) after the original sample was taken and the geometric mean of the five re-samples is less than or equal to 126 organisms per 100 mL of E. coli. However, if the Department finds that re-sampling within the timeframe outlined in this section would pose an undue hardship on a treatment facility, a more convenient schedule may be negotiated in the permit, provided that the permittee demonstrates that the sampling delay will result in no increase in the risk to water contact recreation in waters affected by the discharge;
- (c) For sewage treatment plants that are authorized to use recycled water under OAR 340, division 55, and that also use a storage pond as a means to dechlorinate their effluent prior to discharge to public waters, effluent limitations for bacteria may, upon a permittee's request, be based upon appropriate total coliform limits as OAR 340-055-0012-requires:
- (A) Class C limitations: No two consecutive samples may exceed 240 total coliform per 100 mL.
- (B) Class A and Class B limitations: No single sample may exceed 23 total coliform per 100 mL.
- (C) No violation will be found for an exceedance under this paragraph if the permittee takes at least five consecutive re-samples at four hour intervals beginning as soon as practicable (preferably within 28 hours) after the original sample(s) were taken; and in the case of Class C recycled water, the log mean of the five re-samples is less than or equal to 23 total coliform per

100 mL, or, in the case of Class A and Class B recycled water, if the log mean of the five resamples is less than or equal to 2.2 total coliform per 100 mL.

- (7) Sewer Overflows in winter: Domestic waste collection and treatment facilities are prohibited from discharging raw sewage to waters of the State during the period of November 1 through May 21, except during a storm event greater than the one-in-five-year, 24-hour duration storm. However, the following exceptions apply:
- (a) The Commission may on a case-by-case basis approve a bacteria control management plan to be prepared by the permittee, for a basin or specified geographic area which describes hydrologic conditions under which the numeric bacteria criteria would be waived. These plans will identify the specific hydrologic conditions and the public notification and education processes that will be followed to inform the public about an event and the plan, describe the water quality assessment conducted to determine bacteria sources and loads associated with the specified hydrologic conditions, and describe the bacteria control program that is being implemented in the basin or specified geographic area for the identified sources.
- (b) Facilities with separate sanitary and storm sewers existing on January 10, 1996, and that currently experience sanitary sewer overflows due to inflow and infiltration problems, must submit an acceptable plan to the Department at the first permit renewal, which describes actions the facility will take to assure compliance with the discharge prohibition by January 1, 2010. Where discharges occur to a receiving stream with sensitive beneficial uses, the Department may negotiate a more aggressive schedule for discharge elimination.
- (c) On a case-by-case basis, the Department may define the beginning of winter as October 15, if the permittee so requests and demonstrates to the Department's satisfaction that the risk to beneficial uses, including water contact recreation, will not be increased due to the date change.
- (8) Sewer Overflows in summer: Domestic waste collection and treatment facilities are prohibited from discharging raw sewage to waters of the State during the period of May 22 through October 31, except during a storm event greater than the one-in-ten-year, 24-hour duration storm. The following exceptions apply:
- (a) For facilities with combined sanitary and storm sewers, the Commission may on a case-by-case basis approve a bacteria control management plan such as that described in subsection (6)(a) of this rule.
- (b) On a case-by-case basis, the Department may define the beginning of summer as June 1 if the permittee so requests and demonstrates to the Department's satisfaction that the risk to beneficial uses, including water contact recreation, will not be increased due to the date change.
- (c) For discharge sources whose permit identifies the beginning of summer as any date from May 22 through May 31: If the permittee demonstrates to the Department's satisfaction that an exceedance occurred between May 21 and June 1 because of a sewer overflow, and that no increase in risk to beneficial uses, including water contact recreation, occurred because of the

Attachment B Aug. 17-18, 2016, EQC meeting Page 4 of 42

exceedance, no violation may be triggered, if the storm associated with the overflow was greater than the one-in-five-year, 24-hour duration storm.

- (9) Storm Sewers Systems Subject to Municipal NPDES Stormwater Permits: Best management practices must be implemented for permitted storm sewers to control bacteria to the maximum extent practicable. In addition, a collection-system evaluation must be performed prior to permit issuance or renewal so that illicit and cross connections are identified. Such connections must be removed upon identification. A collection system evaluation is not required where the Department determines that illicit and cross connections are unlikely to exist.
- (10) Storm Sewers Systems Not Subject to Municipal NPDES Stormwater Permits: A collection system evaluation must be performed of non-permitted storm sewers by January 1, 2005, unless the Department determines that an evaluation is not necessary because illicit and cross connections are unlikely to exist. Illicit and cross-connections must be removed upon identification.
- (11) In water bodies the Department identifies as water-quality limited for bacteria, and in accordance with priorities the Department establishes, the Department may require those sources that the Department determines to be contributing to the problem to develop and implement a bacteria management plan. The Department may determine that a plan is not necessary for a particular stream segment or segments within a water-quality limited basin based on the contribution of the segment(s) to the problem. The bacteria management plans will identify the technologies, best management practices and measures and approaches to be implemented by point and nonpoint sources to limit bacterial contamination. For point sources, their National Pollutant Discharge Elimination System permit is their bacteria management plan. For nonpoint sources, designated management agencies will develop the bacteria management plan that will identify the appropriate best management practices or measures and approaches.

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048 Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048

Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 6-2008, f. & cert. ef. 5-5-08; DEQ 10-2011, f.

& cert. ef. 7-13-11; DEQ 16-2013, f. & cert. ef. 12-23-13

Basin-Specific Criteria (Main Stem Columbia River)

340-041-0101

Beneficial Uses to Be Protected in the Main Stem Columbia River

- (1) Water quality in the main stem Columbia River (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 101A (November 2003).
- (2) Designated fish uses to be protected in the main stem Columbia River are shown in Table 101B (November 2003).

(3) Coastal water contact recreation and shellfish harvesting use is to be protected in the portion of the main stem Columbia River designated for these uses in Figure 101A (August 2016).

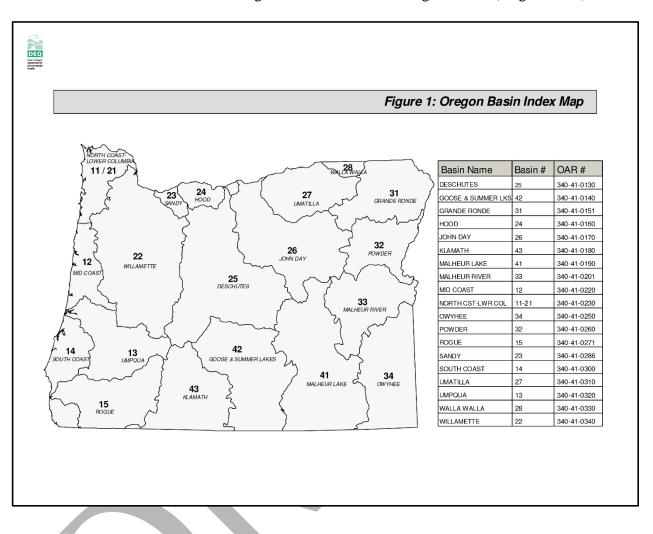




Table 101A

Designated Beneficial Uses Main stem Columbia River (OAR 340-041-0101) (November 2003)

| Beneficial Uses | Columbia River Mouth to RM 86 | Columbia River RM 86 to 309 |
|--|----------------------------------|--------------------------------|
| Public Domestic Water Supply ¹ | X | X |
| Private Domestic Water Supply ¹ | X | X |
| Industrial Water Supply | X | X |
| Irrigation | X | X |
| Livestock Watering | X | X |
| Fish & Aquatic Life ² | X | X |
| Wildlife & Hunting | X | X |
| Fishing ³ | X | X |
| Boating | X | X |
| Water Contact Recreation ³ | X | X |
| Aesthetic Quality | X | X |
| Hydro Power | | X |
| Commercial Navigation & Transportation | X | X |

¹ With adequate pretreatment and natural quality to meet drinking water standards.

² See also Table 101B for fish use designations for this river.

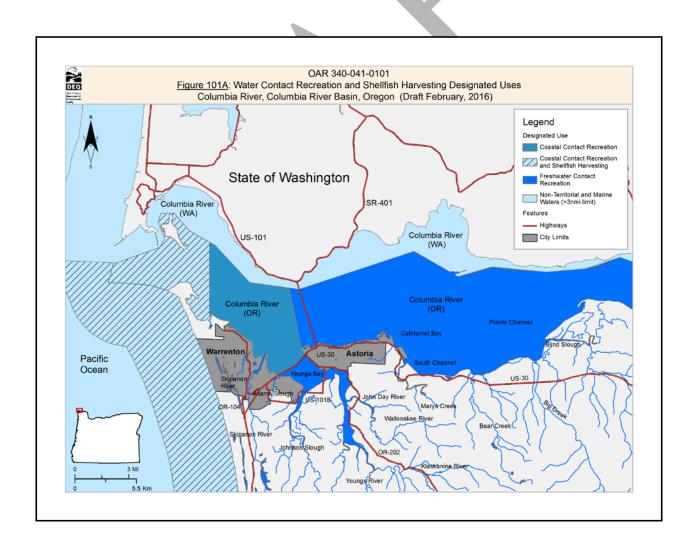
³ See also Figure 101A for coastal water contact use and shellfish harvesting designations.



Table 101B

Beneficial Use Designations – Fish Uses Main stem Columbia River (OAR 340-041-0101) (November 2003)

| Geographic Extent of Use | Salmon and Steelhead Migration Corridors (20°C) | Salmon and Steelhead Spawning through Fry Emergence | Shad and Sturgeon Spawning and Rearing |
|---|---|---|--|
| Mainstem Columbia River | | | |
| Beacon Rock to Upstream of Ives Island (RM 141,5 to RM 143.5) | | October 15 – March 31 | |
| Columbia River, mouth to WA border (RM 309) | X | | |
| Columbia River (RM 146 to RM 203) | | | X |



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Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048 Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048

Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03

Basin-Specific Criteria (Mid Coast Basin)

340-041-0220

Beneficial Uses to Be Protected in the Mid Coast Basin

- (1) Water quality in the Mid Coast Basin (see Figure 1) may be managed to protect the designated beneficial uses shown in Table 220A (November 2003).
- (2) Designated fish uses to be protected in the Mid Coast Basin are shown in Figures 220A and 220B (November 2003).
- (3) Coastal water contact recreation use is to be protected in all Mid Coast Basin marine waters and in coastal waters designated in Figures 220C through 220H (August 2016).
- (4) Shellfish harvesting use is to be protected in all Mid Coast Basin marine waters and in coastal waters designated in Figures 220C through 220H (August 2016).

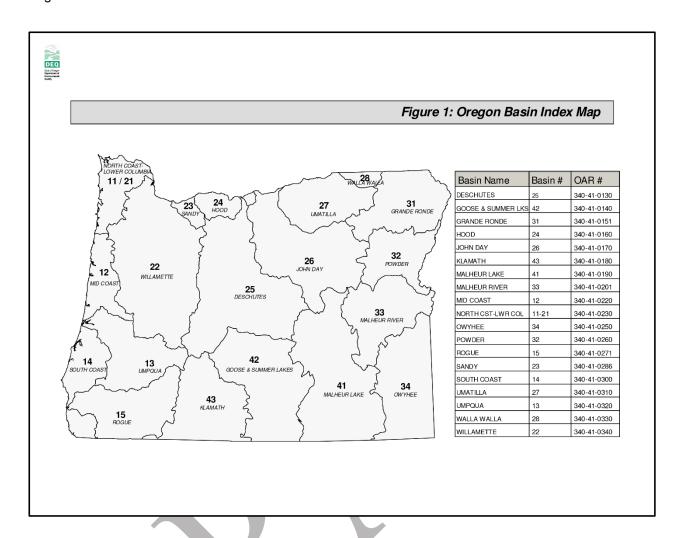




Table 220A

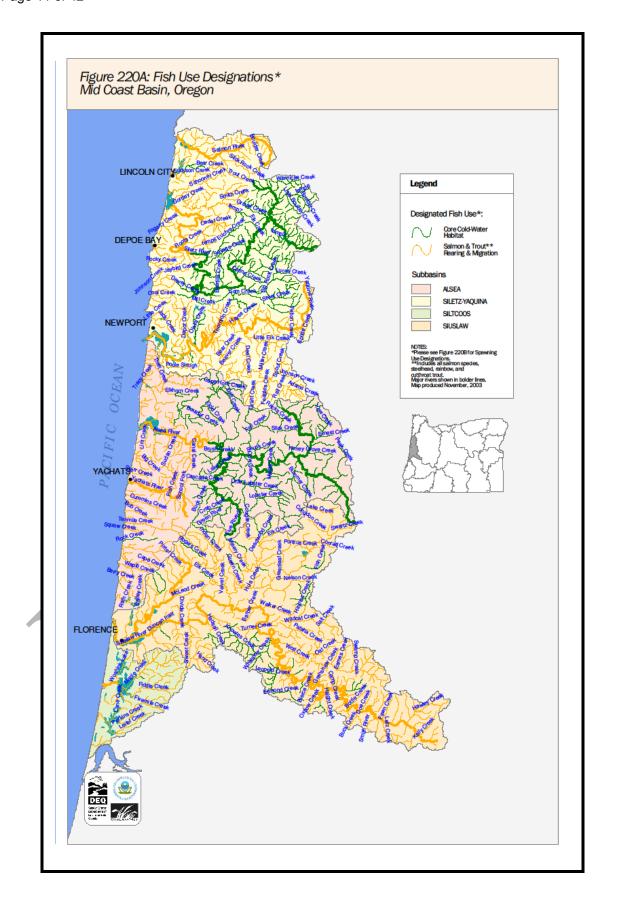
Designated Beneficial Uses Mid Coast Basin (OAR 340-041-0220) (November 2003)

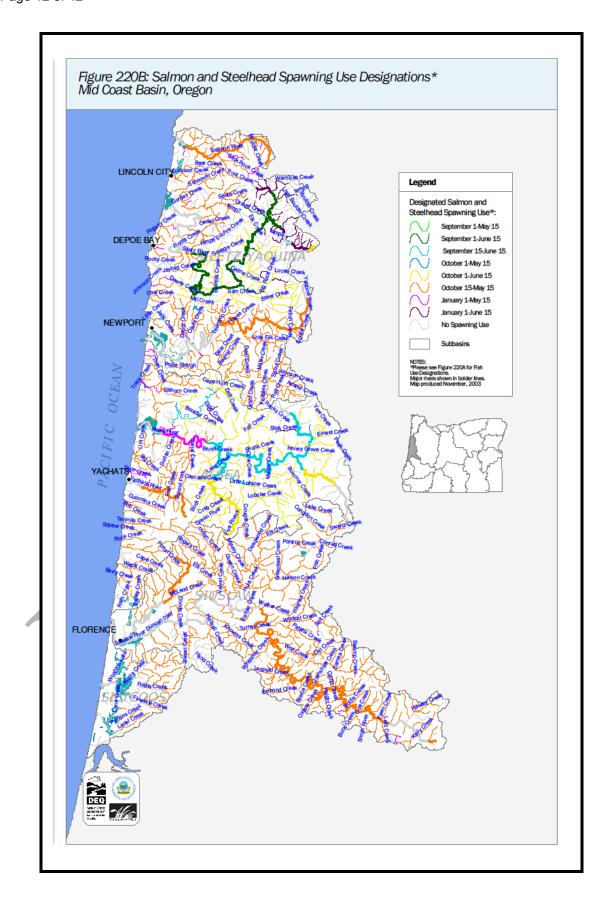
| Beneficial Uses | Estuaries & Adjacent Marine Waters | All Steams & Tributaries Thereto |
|--|--|-------------------------------------|
| Public Domestic Water Supply ¹ | | Х |
| Private Domestic Water Supply ¹ | | Х |
| Industrial Water Supply | X | X |
| Irrigation | | X |
| Livestock Watering | | Х |
| Fish & Aquatic Life ² | Х | Х |
| Wildlife & Hunting | X | X |
| Fishing ³ | X | X |
| Boating | X | X |
| Water Contact Recreation ³ | X | X |
| Aesthetic Quality | X | X |
| Hydro Power | | Х |
| Commercial Navigation & Transportation | Х | |

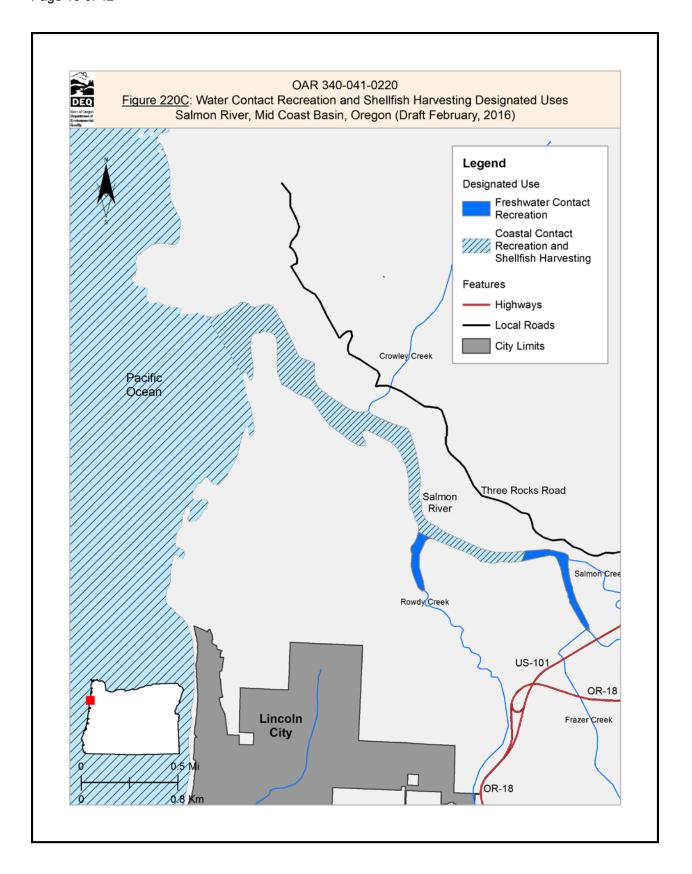
¹ With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.

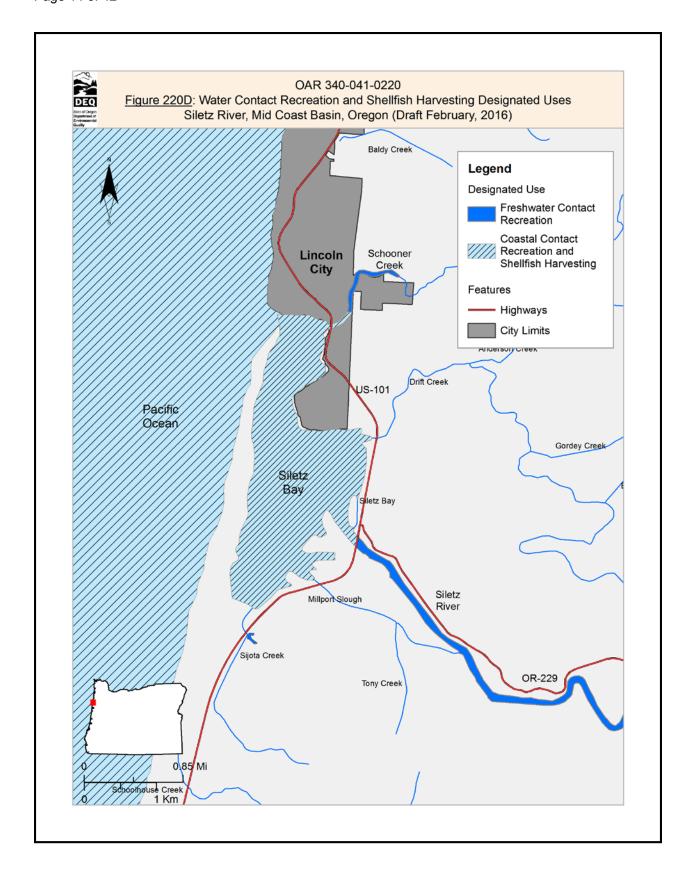
² See also Figures 230A and 230B for fish use designations for this basin.

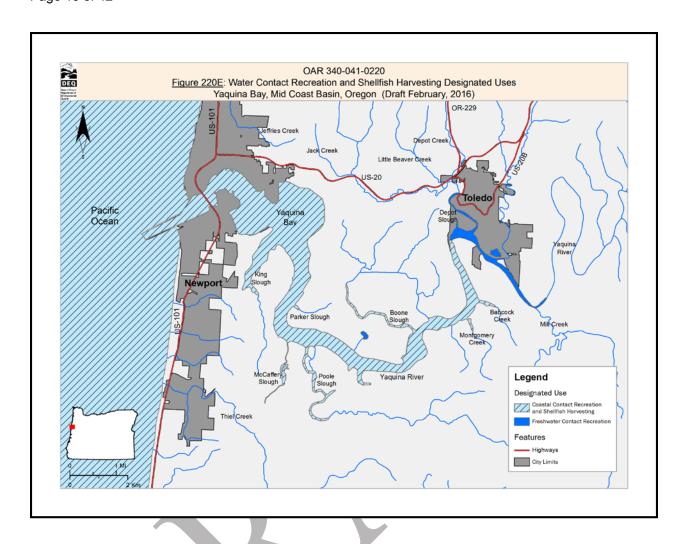
³ For coastal water contact recreation and shellfish harvesting uses, see also Figures 220C (Salmon River Estuary), 220D (Siletz Bay), 220E (Yaquina Bay), 220F (Alsea River Estuary), 220G (Yachats River Estuary), and 220H (Siuslaw River Estuary)

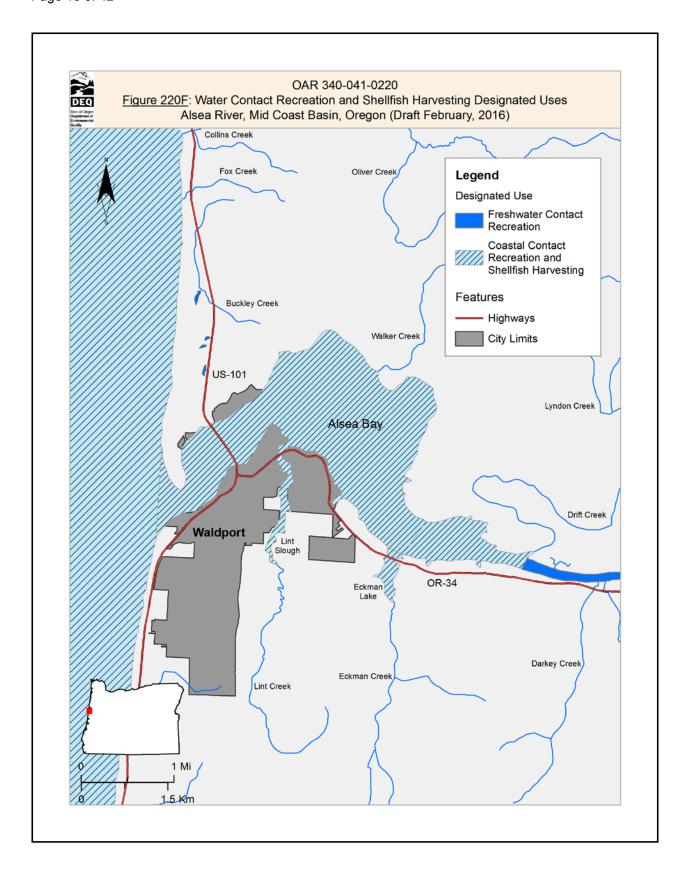


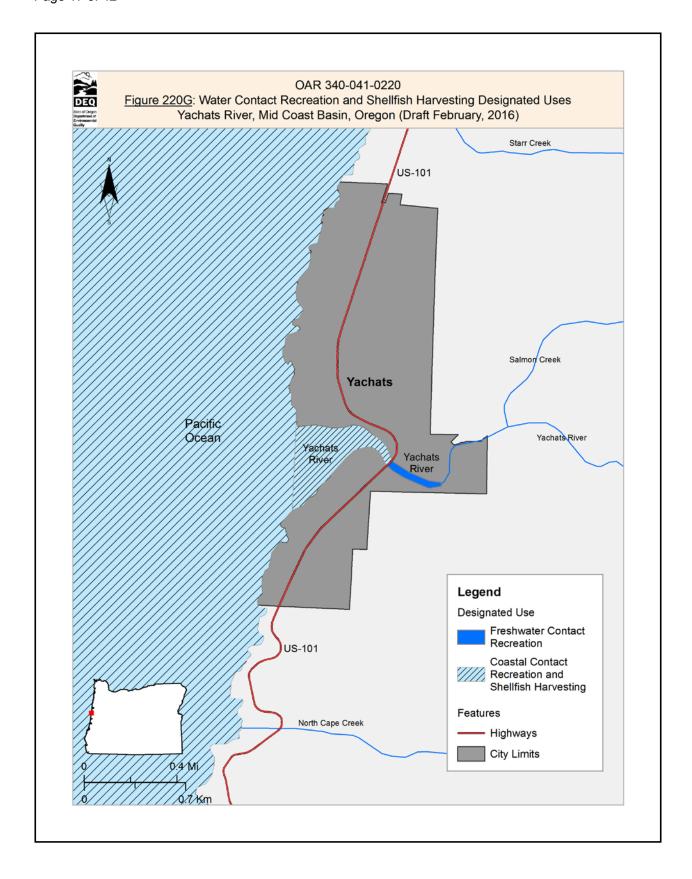


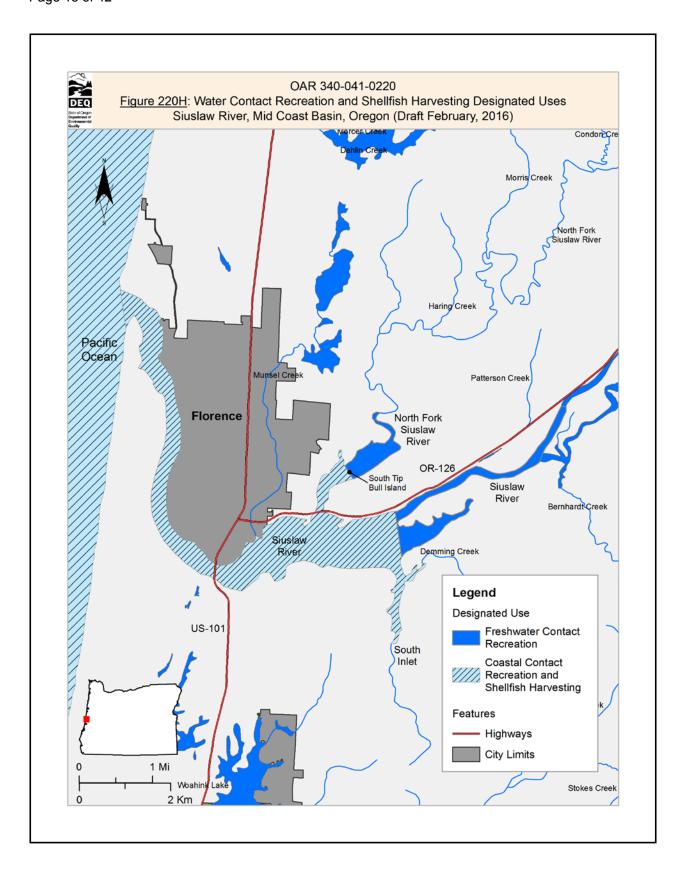












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Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03

Basin-Specific Criteria (North Coast)

340-041-0230

Beneficial Uses to Be Protected in the North Coast Basin

- (1) Water quality in the North Coast Basin (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 230A (November 2003).
- (2) Designated fish uses to be protected in the North Coast Basin are shown in Figures 230A and 230B (November 2003).
- (3) Coastal water contact recreation use is to be protected in all North Coast Basin marine waters and in coastal waters designated in Figures 230C through 230H (August 2016).
- (4) Shellfish harvesting use is to be protected in all North Coast Basin marine waters and in coastal waters as designated in Figures 230Cthrough 230H (August 2016).

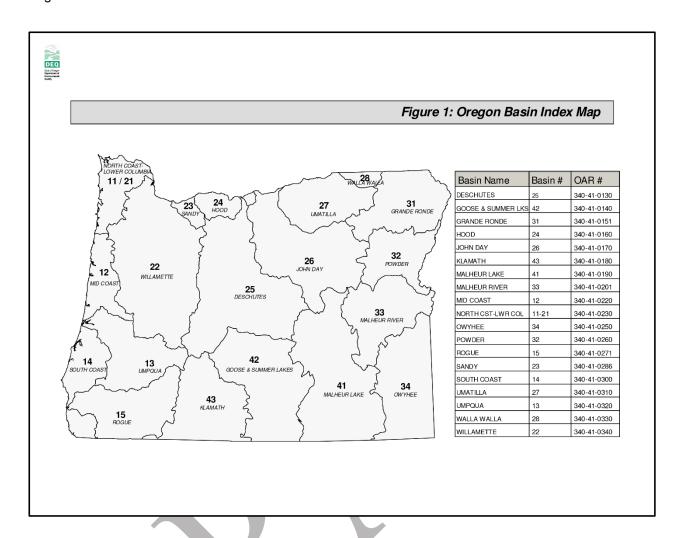




Table 230A

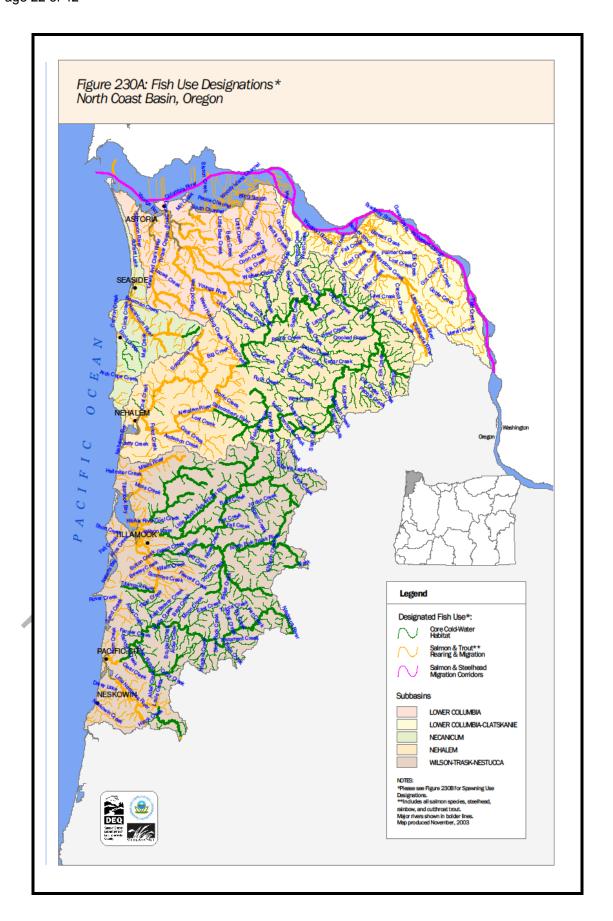
Designated Beneficial Uses North Coast Basin (OAR 340-041-0230) (November 2003)

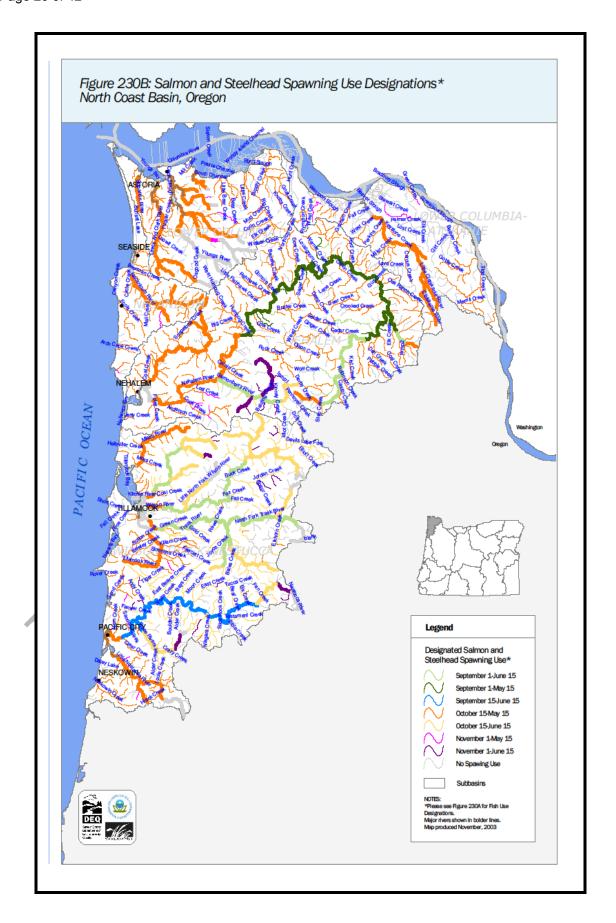
| Beneficial Uses | Estuaries & Adjacent Marine Waters | All Steams & Tributaries Thereto |
|--|--|-------------------------------------|
| Public Domestic Water Supply ¹ | | Х |
| Private Domestic Water Supply ¹ | | Х |
| Industrial Water Supply | Х | X |
| Irrigation | | X |
| Livestock Watering | | X |
| Fish & Aquatic Life ² | Х | X |
| Wildlife & Hunting | Х | X |
| Fishing ³ | X | X |
| Boating | Х | X |
| Water Contact Recreation ³ | X | X |
| Aesthetic Quality | Х | X |
| Hydro Power | | |
| Commercial Navigation & Transportation | X | |

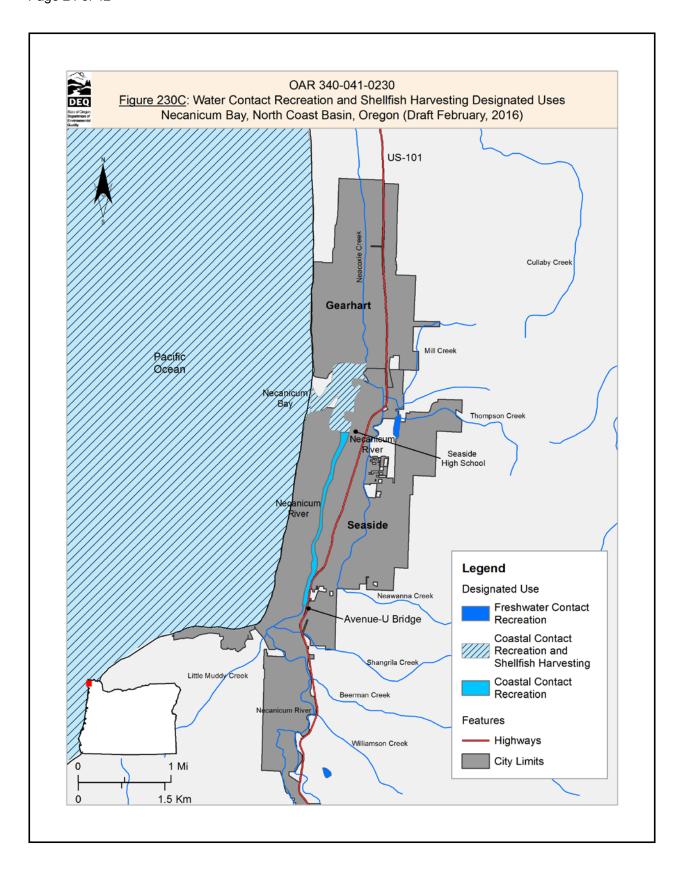
¹ With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.

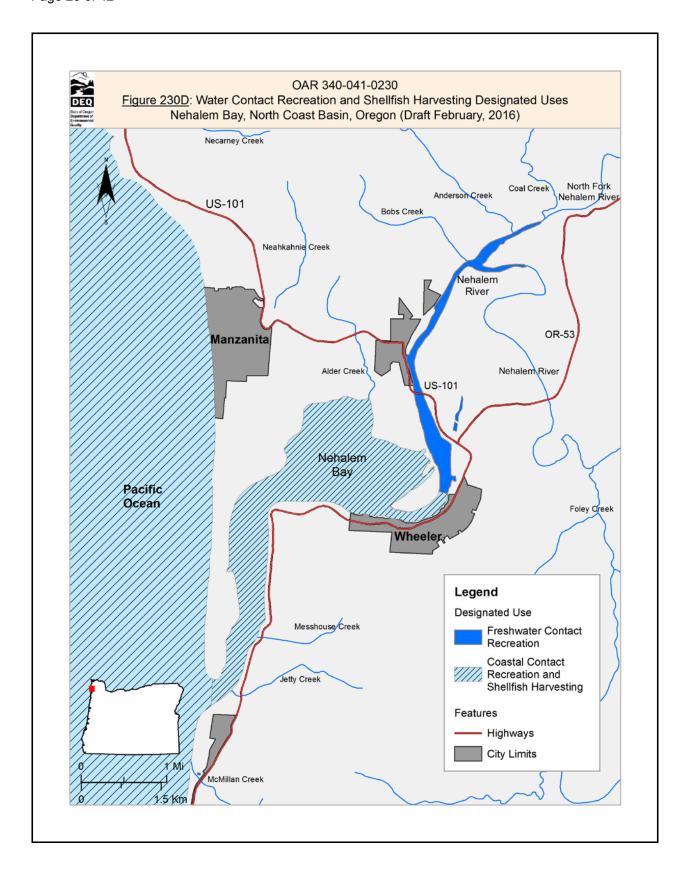
² See also Figures 230A and 230B for fish use designations for this basin.

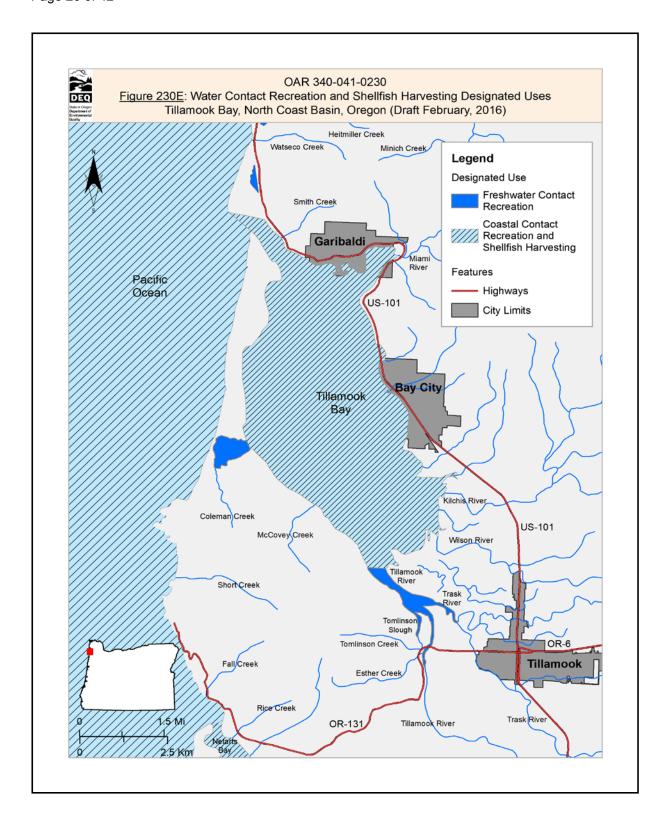
³ For coastal water contact recreation and shellfish harvesting uses, see also Figures 230C (Necanicum River Estuary), 230D (Nehalem Bay), 230E (Tillamook Bay), 230F (Netarts Bay), 230G (Sand Lake), and 230H (Nestucca Bay)

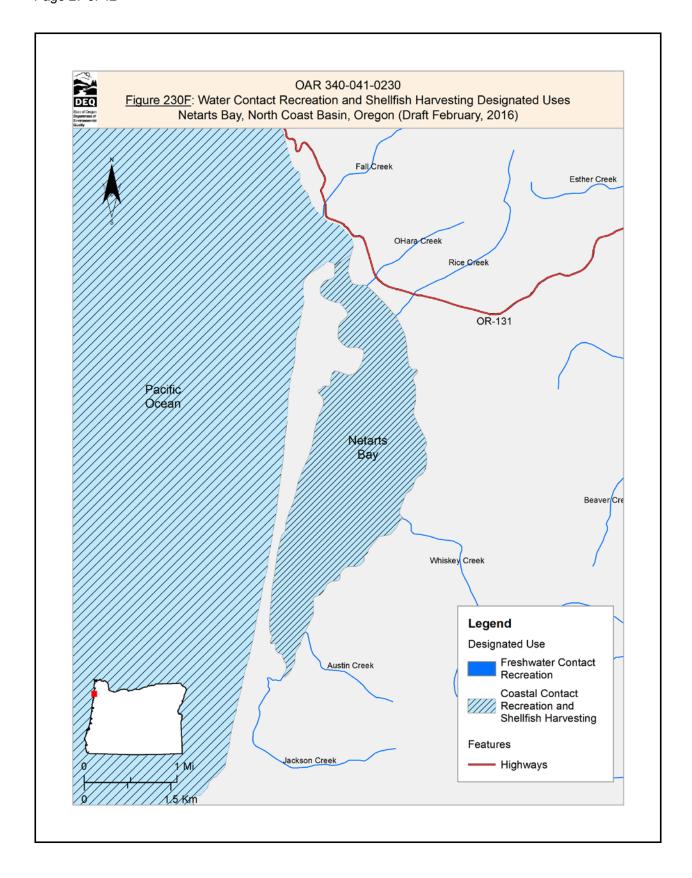


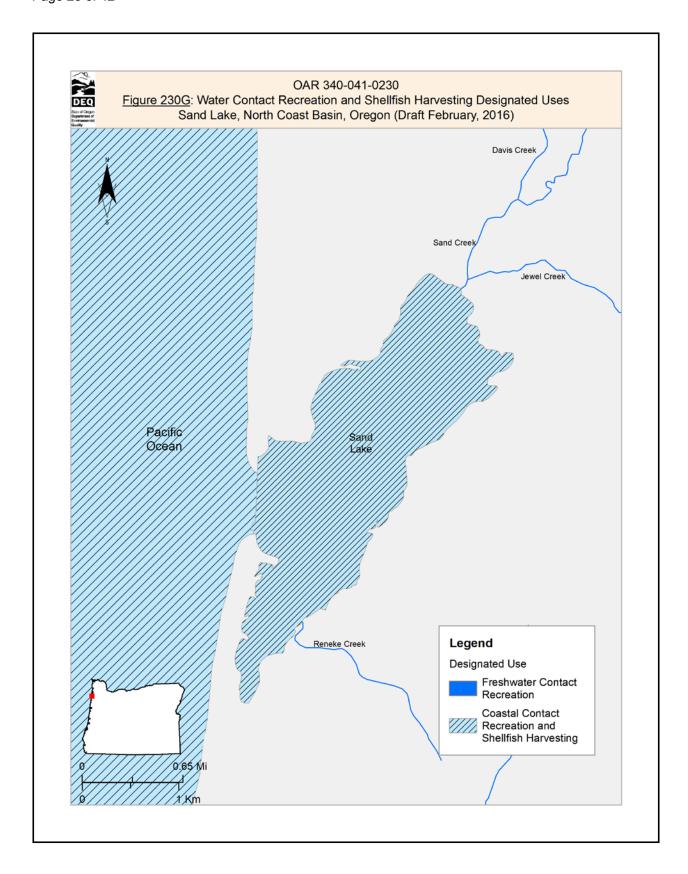


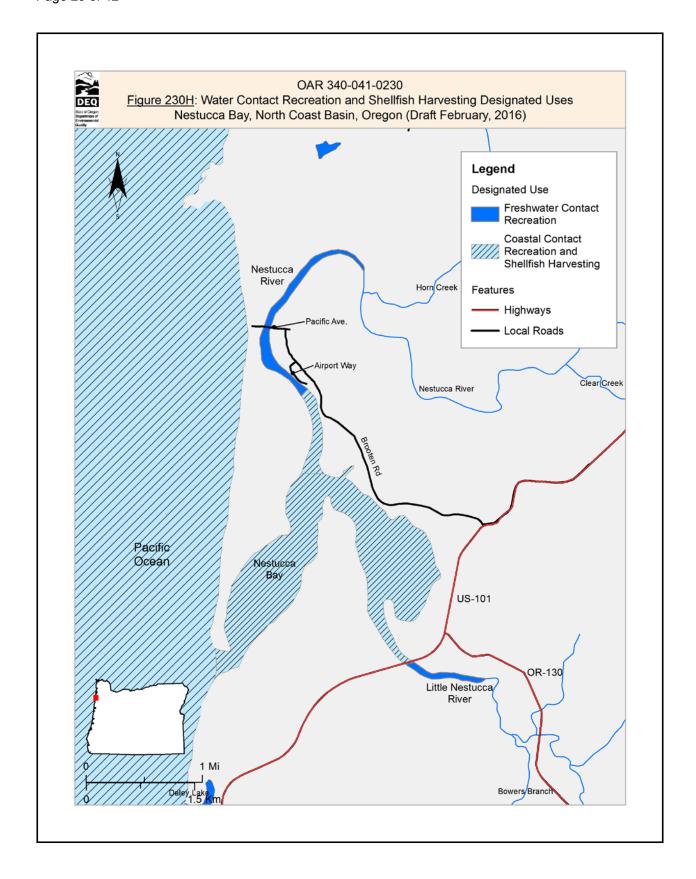












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Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03

Basin-Specific Criteria (South Coast)

340-041-0300

Beneficial Uses to Be Protected in the South Coast Basin

- (1) Water quality in the South Coast Basin (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 300A (November 2003).
- (2) Designated fish uses to be protected in the South Coast Basin are shown in Figures 300A (August 2005) and 300B (November 2003).
- (3) Coastal water contact recreation use is to be protected in all South Coast Basin marine waters and in coastal waters designated in Figures 300C and 300D (August 2016).
- (4) Shellfish harvesting use is to be protected in all South Coast Basin marine waters and in coastal waters as designated in Figures 300C and 300D (August 2016)

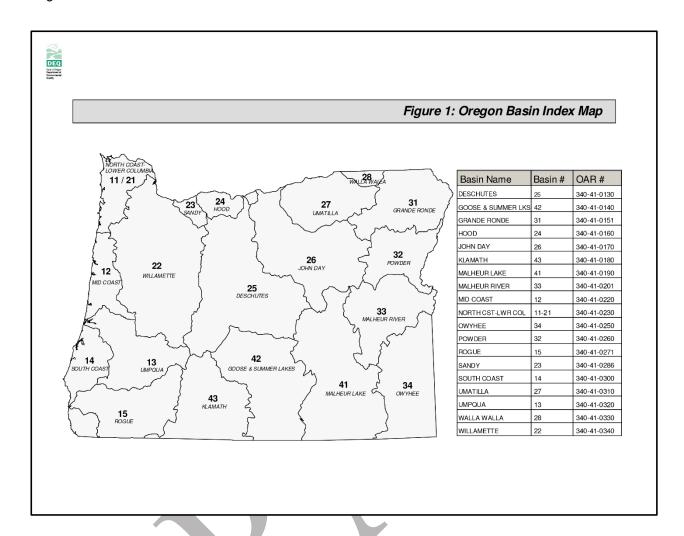




Table 300A

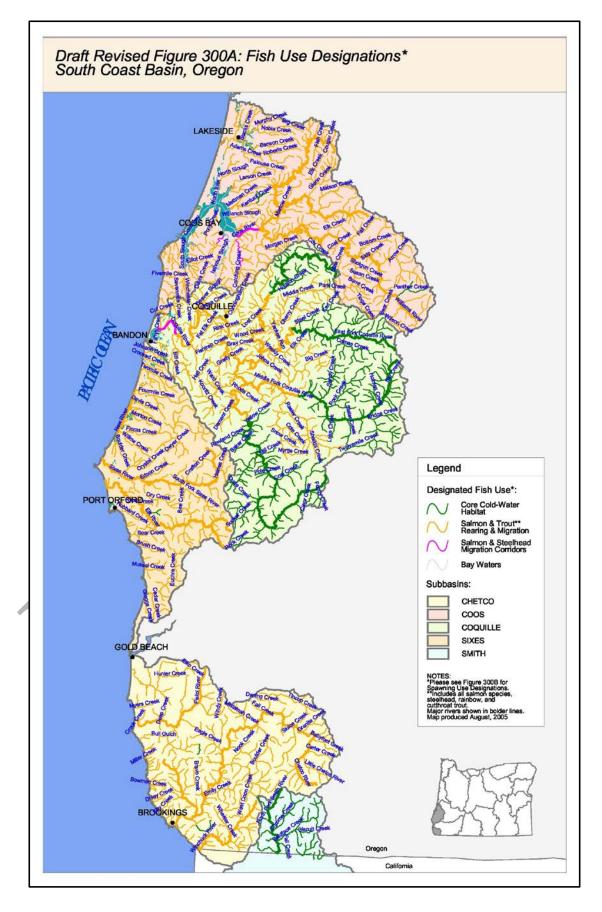
Designated Beneficial Uses South Coast Basin (OAR 340-041-0300) (November 2003)

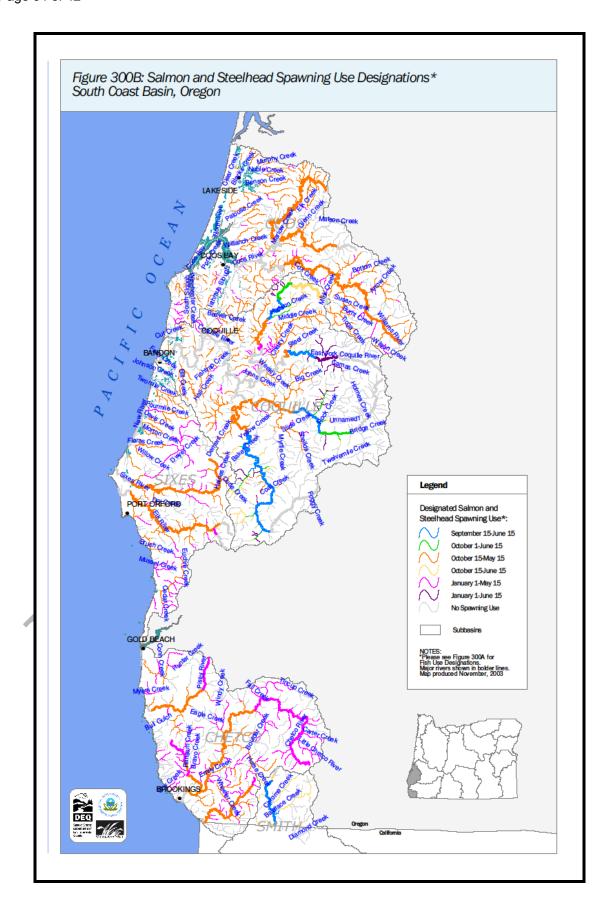
| Beneficial Uses | Estuaries & Adjacent Marine Waters | All Steams & Tributaries Thereto |
|--|--|-------------------------------------|
| Public Domestic Water Supply ¹ | | X |
| Private Domestic Water Supply ¹ | | X |
| Industrial Water Supply | Х | X |
| Irrigation | | X |
| Livestock Watering | | X |
| Fish & Aquatic Life ² | Х | X |
| Wildlife & Hunting | Х | X |
| Fishing ³ | Х | X |
| Boating | Х | X |
| Water Contact Recreation ³ | x | X |
| Aesthetic Quality | x | X |
| Hydro Power | | X |
| Commercial Navigation & Transportation | x | |

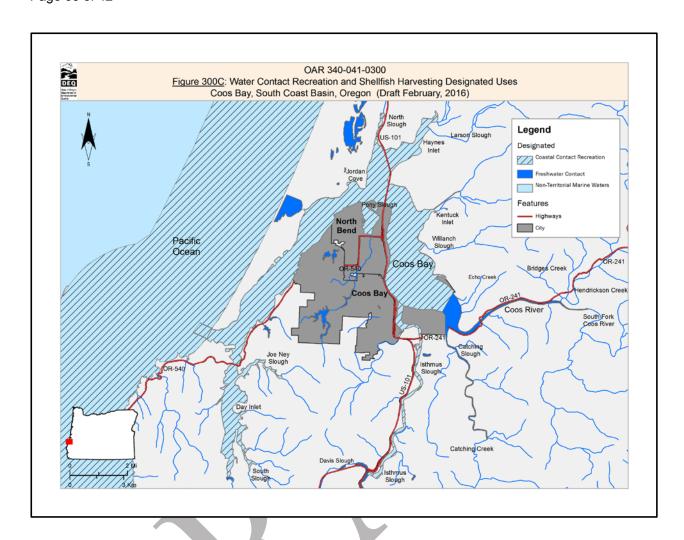
¹ With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.

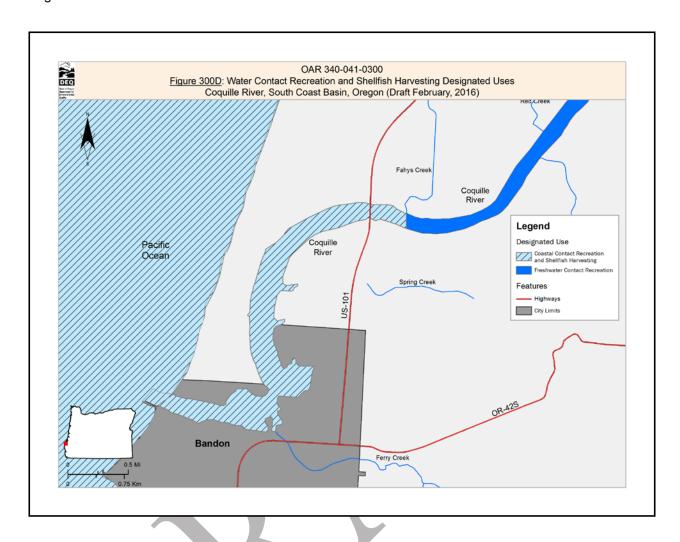
² See also Figures 300A and 300B for fish use designations for this basin.

³ For coastal water contact recreation and shellfish harvesting uses, see also Figures 300C (Coos Bay) and 300D (Coquille River Estuary).









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Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 2-2007, f. & cert. ef. 3-15-07

Basin-Specific Criteria (Umpqua Basin)

340-041-0320

Beneficial Uses to Be Protected in the Umpqua Basin

(1) Water quality in the Umpqua Basin (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 320A (November 2003).

- (2) Designated fish uses to be protected in the Umpqua Basin are shown in Figures 320A (November 2003) and 320B (August 2005).
- (3) Coastal water contact recreation use is to be protected in all marine waters adjacent to the Umpqua River and in coastal waters designated in Figure 320C (August 2016).
- (4) Shellfish harvesting use is to be protected in all marine waters adjacent to the Umpqua River and in coastal waters as designated in Figure 320C (August 2016).

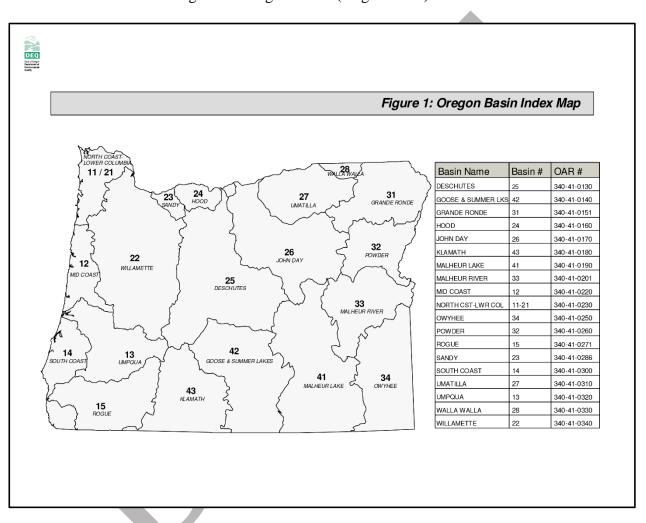




Table 320A

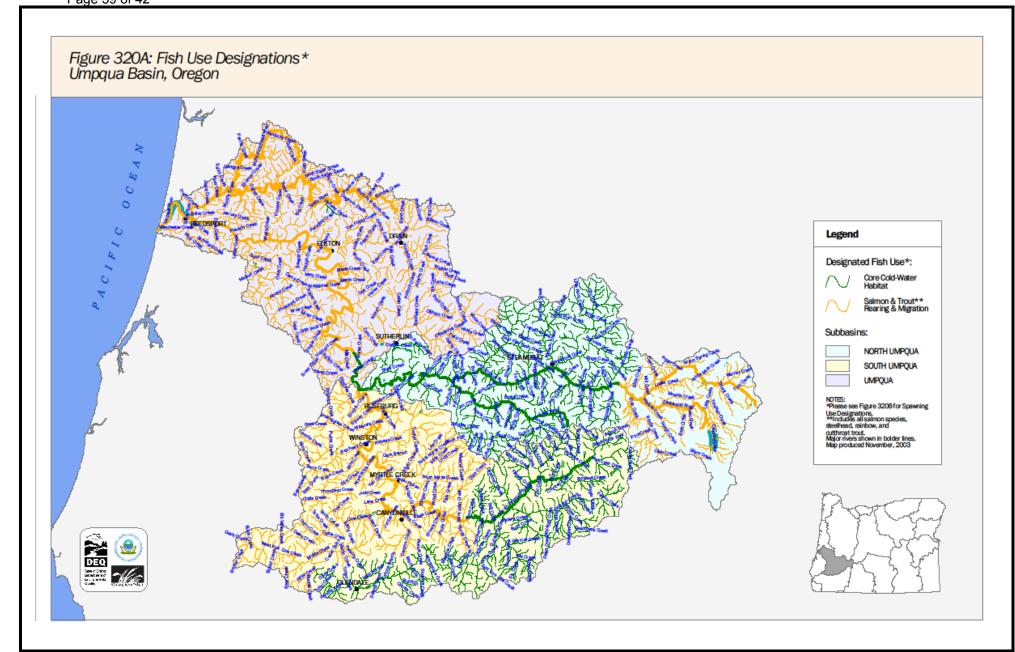
Designated Beneficial Uses Umpqua Basin (OAR 340-041-0320) (November 2003)

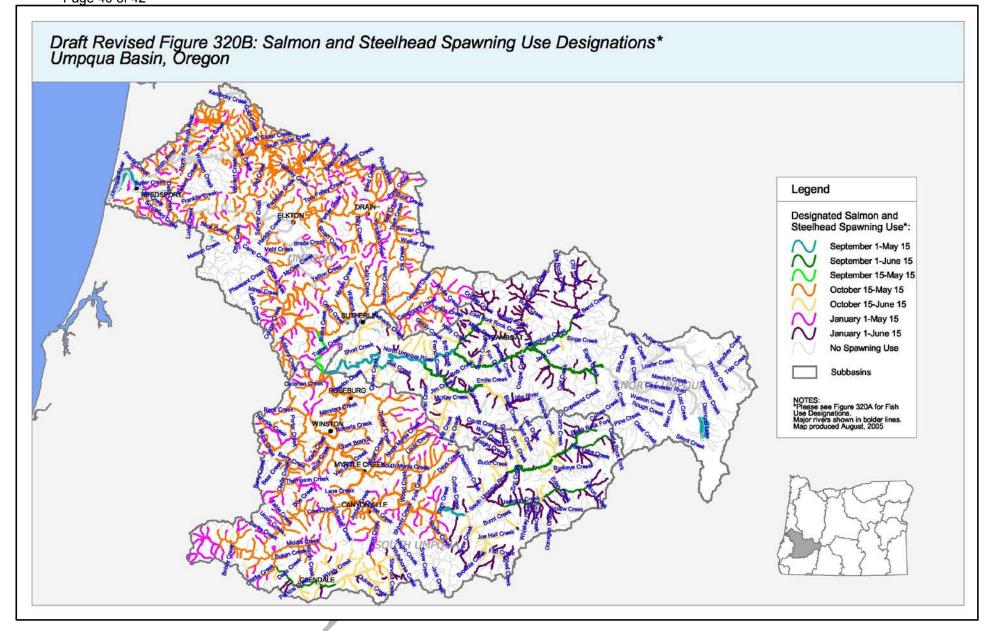
| Beneficial Uses | Umpqua R. Estuary to Head of Tidewater & Adjacent Marine Waters | Umpqua R. Main from Head of Tidewater to Confluence of N. & S. Umpqua Rivers | North Umpqua River Main Stem | South Umpqua River Main Stem | All Other Tributaries to Umpqua, North & South Umpqua Rivers |
|--|---|--|------------------------------------|---------------------------------------|--|
| Public Domestic Water Supply ¹ | | X | X | X | X |
| Private Domestic Water Supply | | X | X | X | X |
| Industrial Water Supply | X | X | X | X | X |
| Irrigation | | X | X | X | X |
| Livestock Watering | | X | X | X | X |
| Fish & Aquatic Life ² | X | X | X | X | X |
| Wildlife & Hunting | X | X | X | X | X |
| Fishing | X^3 | X | X | X | X |
| Boating | X | X | X | X | X |
| Water Contact Recreation | X ³ | X | X | X | X |
| Aesthetic Quality | X | X | X | X | X |
| Hydro Power | | | X | X | X |
| Commercial Navigation & Transportation | X | | | | |

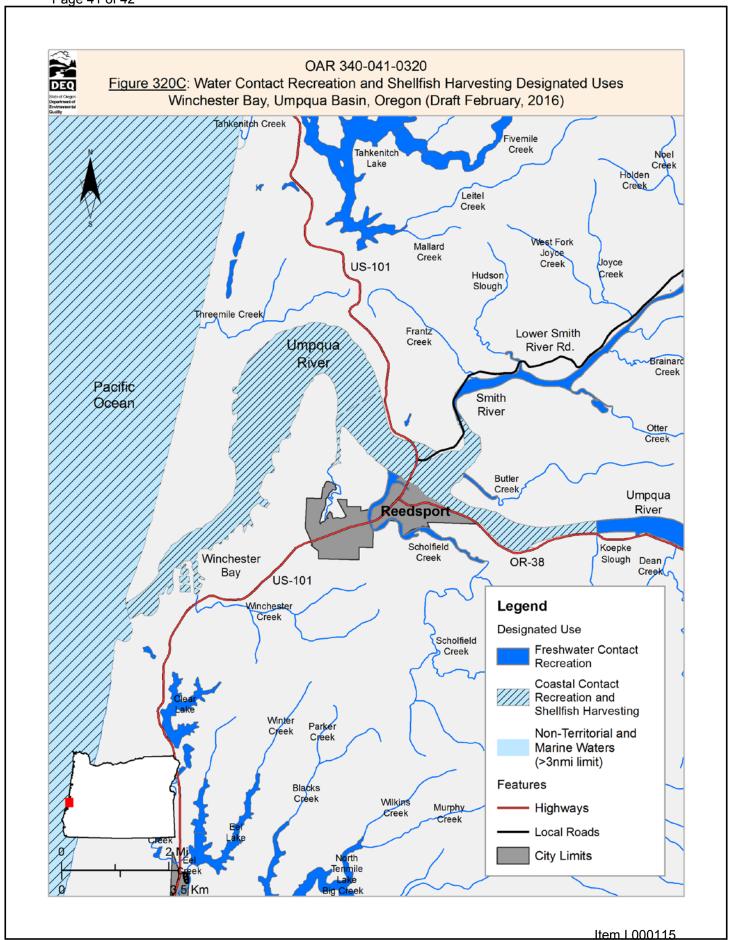
¹ With adequate pretreatment (filtration and disinfection) and natural quality to meet drinking water standards.

² See also Figures 320A and 320B for fish use designations for this basin.

³ For coastal water contact recreation and shellfish harvesting uses in the Umpqua River Estuary and Adjacent Marine Waters, see also Figure 320C.







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Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 2-2007, f. & cert. ef. 3-15-07



Issue Paper: Revisions to the Water Quality Standard for Bacteria

By: Aron Borok

February 2016



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Last updated: 3/14/16 By: Aron Borok Attachment C Aug. 17-18, 2016, EQC meeting Page 2 of 36

This report prepared by:

Oregon Department of Environmental Quality 811 SW 6th Avenue Portland, OR 97204 1-800-452-4011 www.oregon.gov/deq

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I would like to acknowledge Debra Sturdevant for providing many excellent comments for this report and the project in general. I also would like to thank James McConnaghie for preparing draft designated use maps, as well as initial maps detailing shellfishing areas and salinity data. I also would like to acknowledge staff from the Oregon Department of Fish and Wildlife and Oregon Department of Agriculture Shellfish Programs and the Environmental Protection Agency Western Ecology Division for providing information and support related to shellfish distribution in Oregon.



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Objectives of the Rulemaking and Project Background

Objectives of the Rulemaking

DEQ is proposing to revise Oregon's water quality standards for bacteria to adopt the U. S. Environmental Protection Agency's 2012 recommended water quality criteria for enterococci for coastal contact recreation. DEQ also is proposing to better define the boundary between where coastal and freshwater water contact recreation use occurs, as well as to clarify the waters that are designated for "shellfish harvesting" use and therefore remain subject to the current fecal coliform criteria. The use clarifications include the following:

- Adding beneficial use maps showing where "shellfish harvesting," "coastal contact recreation" and "marine contact recreation" uses are designated; and
- Identifying "shellfish harvesting" as a subcategory of fishing use in the coastal basin use tables.

In addition, DEQ recommends several minor revisions to the current bacteria standard rule language at 340-041-0028 for clarification, consistency and readability.

DEQ has coordinated its efforts with the Oregon Health Authority, including public outreach, in their promulgation of the Beach Action Value for the Beaches Environmental Assessment and Coastal Health Act of 2000.

Background

In 2004, EPA adopted Oregon's currently effective Clean Water Act criteria to protect people who engage in coastal water contact recreation as part of a federal rulemaking. The current criteria include a single sample maximum (158 colony forming units (CFU)/100 mL) and a geometric mean (GM) value (35 CFU/100 mL based on at least five samples in a 30-day period) of enterococcus as an indicator of fecal contamination and associated pathogens. OHA's Oregon Beach Monitoring Program utilizes the single sample maximum as the advisory level to warn swimmers that the beach may not be safe for swimming. DEQ utilizes the geometric mean to determine if a water body is impaired and as the basis for any needed limits in water quality permits. Unlike other Oregon water quality standards, which are contained in the Oregon Administrative Rules, these EPA-promulgated criteria are contained in the Code of Federal Regulations.

In 2012, EPA published new recommended Clean Water Act criteria for primary contact recreation in coastal waters. These recommended criteria are based on epidemiological studies conducted in the United States that examined the correlation between beachgoers' direct contact exposure to and ingestion of water and subsequent gastrointestinal illness.

EPA recommended two different sets of criteria based on different rates of illness; 36 illnesses per 1000 users or 32 illnesses per 1000 users. DEQ is proposing to adopt the criteria based on the

illness rate of 36 illnesses per 1000 users which includes the same geometric mean value (35 CFU/100 mL) as the currently effective criteria EPA adopted in 2004. In addition, the proposed criteria include a "Statistical Threshold Value," (130 CFU/100 mL) which is a value that may not be exceeded more than 10% of the time.

In 2014, EPA required states that receive federal grant funding for beach monitoring to develop and submit schedules for adopting EPA's new recommended CWA criteria into state water quality standards and a beach advisory value. In November 2014, DEQ and OHA submitted schedules to adopt the criteria and BAV, respectively, by EPA's deadline of September 2016. DEQ then initiated the rulemaking process to adopt the CWA criteria. Concurrently, OHA is adopting the new BAV as an advisory level to use for the OBMP. The BAV is not a water quality standard under the Clean Water Act and thus will not be used for permitting, assessment or other DEQ regulatory programs. DEQ and OHA coordinated their public outreach process to describe these relationships and distinctions between the two state programs and related requirements.

As part of this project, DEQ is also clarifying which beneficial uses are associated with each of the three different bacterial indicators in the state's water quality standards. Currently, there is a criterion for fecal coliform that has existed in Oregon's water quality standards since 1979¹ and is based on EPA's 1976 recommended criteria to protect people who consume filter-feeding shellfish from fecal contamination. This criterion currently applies to all marine waters and estuarine shellfish growing waters although the rule does not explicitly indicate where it applies. In addition, Oregon's standards contain a criterion for *E. coli* adopted in 1996 that applies to freshwaters and estuarine non-shellfish growing waters. With this rulemaking, DEQ proposes that these criteria and the newly adopted enterococcus criteria will apply as follows:

- Enterococcus criteria will apply to coastal water contact recreation use. DEQ defines coastal waters as all marine beaches and waters along the western Oregon border, as well as "coastal estuaries," consistent with the BEACH Act.
- *E. coli* criteria will apply to freshwater contact recreation use which is designated in all waters of the state not otherwise designated for coastal water contact recreation use.
- Fecal coliform criteria will apply to shellfish harvesting areas².

To further clarify where the bacteria criteria and associated uses apply, DEQ has also developed designated use maps for all coastal estuaries, which show the upstream extent of shellfish harvesting use and the boundary between where coastal water contact recreation and freshwater contact recreation uses apply. These maps will be incorporated into basin-specific rules that identify the criteria for coastal basins, including the Columbia River, the Umpqua River, and the North, Mid, and South Coast Basins. DEQ's objective in developing these maps is to clarify the application of the bacteria criteria so that the standards are implemented consistently and predictably. In addition, the bacteria standard and the basin-specific criteria rules will clarify that all marine waters are designated for shellfish harvesting and coastal contact recreation use.

¹ The criteria initially were divided into basin-specific rules, then centralized in the statewide rule in 2003.

² Shellfish harvesting use is defined as areas that may support propagation and growth of filter-feeding marine and estuarine bivalves, such as clams and oysters, as the underlying fecal coliform criteria are based on consumption of filter feeders (EPA 1976).

It is important to note that all Oregon waters, including marine beach and offshore marine waters, are designated for "contact recreation." Due to the adoption of EPA's 2012 recreational criteria DEQ is designating the boundary between "freshwater contact recreation" and "coastal water contact recreation" to provide clarity to DEQ staff and interested parties where the uses and associated bacteria criteria apply. Any waterbody not designated as coastal water contact recreation on the maps or in the basin-specific criteria is designated as freshwater contact recreation use.

Relationship to OHA Adoption of Beach Action Value

In Oregon, DEQ and OHA both have roles in protecting people from illness due to direct exposure to bacteria and other pathogens in coastal waters. DEQ is responsible for developing permit limits for bacteria and assessing waters to ensure they are meeting the bacteria standards. OHA administers the Oregon Beach Monitoring Program under which they post health advisories on the state's beaches when levels of enterococci bacteria indicate a risk of illness from swimming or other full immersion contact with the water. Through an interagency agreement, DEQ laboratory staff sample and analyze beach water for bacteria. Both agencies use the results from these samples. OHA is engaging in a parallel process to adopt EPA's recommended BAV to use for advisory purposes. OHA plans to adopt the BAV in September 2016 and to begin utilizing the BAV during the 2017 sampling season. DEQ and the OBMP have coordinated their processes, including holding four joint public meetings in October 2015 to inform the public about the changes to their program.

Proposed Bacteria Criteria for Coastal Water Contact Recreation

History of DEQ Bacteria Criteria and EPA Recommended Criteria

DEQ first adopted bacteria criteria in the 1970s. These criteria were based on 1976 EPA recommendations and were initially based on studies linking fecal contamination in shellfish harvesting waters with contamination found on filter-feeding marine and estuarine mollusks (EPA 1976).

In 1986, EPA published recommended water quality criteria to protect those engaging in full-body contact recreation, such as swimming and surfing, in both fresh and coastal waters. These criteria were based on epidemiological studies conducted in the Great Lakes and northeastern United States that linked various bacterial indicators with incidences of gastrointestinal illness.

Analysis of the studies showed that the bacterial indicators *E. coli* and enterococcus were the best indicators of illness in freshwater and that enterococcus was the best indicator in coastal waters. The Environmental Quality Commission (EQC) adopted the enterococcus criteria for freshwaters and non-shellfish growing estuarine waters to replace the fecal coliform criteria as of July 1, 1995. Fecal coliform criteria for marine waters and estuarine shellfish growing waters remained in the standards and are identical to the fecal coliform standards currently in effect.

Then, in 1996, the EQC replaced the enterococci criteria with *E. coli* criteria for "freshwaters and non-shellfish harvesting estuaries" for the following reasons:

- *E. coli* test results could be achieved in a faster time frame than enterococcus results (1 day vs. 2 days).
- E. coli criteria were as protective as the enterococcus criteria.
- *E. coli* test results are more specific and may avoid detection of bacteria groups from pulp and paper mills that may mimic enterococcus and show false positive results, even though such groups were not known to be correlated with fecal contamination or human health risk.

On Oct. 10, 2000, the BEACH Act was signed into law.³ As part of the BEACH Act, EPA required all states with coastal recreation waters to adopt revised water quality standards for bacterial indicators of pathogens. In 2004, EPA adopted bacteria standards rules for coastal contact recreation in Oregon and other coastal states (69 Fed. Reg. 220, 67218-67243 (11/16/2004)). These criteria had two components: a "steady-state geometric mean indicator density" and a range of single sample maximum criteria. For marine waters, the enterococcus criterion was 35 colony forming units (CFU)/100 mL not to be exceeded in any 30-day period based on a minimum of five samples. DEQ currently uses this criterion to develop permit limits in coastal waters and to assess coastal waters as part of its Clean Water Action Section 303(d) assessment. The "single sample maximum" criteria were based on different levels of beach use, ranging from 104 to 501 CFU/100 mL. OBMP and DEQ opted to use the single sample maximum criterion of 158 CFU/100 mL based on "moderate level" beach use. OBMP uses this criterion for to issue beach advisories.

Description of changes from 2004 Federal Criteria

In 2012, EPA published revised recommended recreational water quality criteria under Section 304(a) of the Clean Water Act. EPA developed the criteria based on the same studies used to develop the 2004 criteria as well as more recent scientific information including the National Epidemiological and Environmental Assessment of Recreational Water data. The recommended recreational water quality criteria include two components: 1) a geometric mean; and 2) a "statistical threshold value," which may not be exceeded in more than ten percent of samples in the averaging period.

The 2012 recommendations include two sets of criteria values for both the geometric mean and STV. These values are based on different illness rates (32 or 36 illnesses per 1000 recreational users of coastal waters). EPA is allowing states the option to adopt criteria for either illness rate.

³ Beaches Environmental Assessment and Coastal Health Act, Pub. L. No. 106-284 (2000).

DEQ is choosing to adopt criteria based on the higher illness rate. DEQ has concluded that this higher rate will be sufficiently protective because exposure to coastal waters in Oregon, especially rates of swimming or full immersion contact recreation, are generally much less than at those beaches upon which the criteria are based. Moreover, Oregon beaches generally are not impacted by wastewater treatment plants, whereas the beaches selected for EPA's studies were selected based on the proximity to wastewater treatment plant discharges. The proposed criteria are 35 CFU/100 mL for the geometric mean, which is identical to the current EPA-adopted criterion, and 130 CFU/100 mL as the STV.

Summary of scientific basis of 2012 EPA Recommended Criteria

The following section is a brief summary of EPA's rationale for the recommended enterococci criteria for coastal recreation waters. More detailed information is available on EPA's website.⁴

Clean Water Act section 502(23) defines a "pathogen indicator" as "a substance that indicates the potential for human infectious disease." Fecal indicators such as enterococcus and *E. coli* indicate the potential presence of fecal pathogens that may cause gastrointestinal (GI) illness while the indicators may not always cause GI illness themselves.

In a variety of studies EPA considered in the late 1970s and early 1980s, *E. coli* and enterococcus were the best indicators of GI illness in freshwater. Enterococcus was the best indicator in marine and coastal estuarine waters.

EPA also used the recent National Epidemiological and Environmental Assessment of Recreational Water studies which looked at the relationship between indicator bacteria and GI illness using epidemiological studies at U.S. beaches impacted by wastewater treatment plants between 2003 and 2009 (U.S. EPA 2010)⁵. In the NEEAR studies, the definition of GI illness was more inclusive than that of the studies used in EPA's 1986 recommended criteria. The more recent studies did not require a fever to be counted as an illness whereas the previous studies did.

EPA compared the NEEAR studies to the studies used in developing the 1986 criteria and found that illness rates were similar. In addition, EPA found that "water quality in the range of 30 to 35 enterococci CFU per 100 mL are the lowest water quality values reported to show statistically significant differences in swimming-associated illness rates." As a result, the recommended geometric mean criteria are effectively the same as in the 1986 criteria.⁶

EPA is recommending that states adopt the STV to constrain the number of samples with high levels of bacteria that could potentially occur even though the mean value is met. Levels of fecal indicator bacteria can be quite variable. EPA recommended the STV based on the 90th percentile value of the log₁₀ normal distribution of fecal indicator bacteria from the studies that EPA used in developing the

⁴ http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/

⁵ Beaches studied included three beaches on Lake Michigan, one on Lake Erie, and one marine beach each in Rhode Island, Mississippi and Alabama. Additional studies were carried out at a non-WWTP-impacted site in South Carolina and at a beach in Puerto Rico to examine illnesses in a tropical setting.

⁶ For further information, see the discussion of the criteria beginning on page 21 of EPA's criteria document.

recommendations. For the chosen illness rate of 36 illnesses per 1000 users, the STV is 130 CFU enterococcus per 100 mL⁷.

Rationale for 90-day duration period for both enterococcus and *E. coli*

The duration component of the criterion represents a critical exposure period during which the distribution of fecal indicator bacteria values should provide adequate protection for a population of recreational water users. During this critical exposure period there should not be numerous events or lengthy periods of time where very high levels of fecal indicator bacteria occur as this could lead to unacceptably high risk of illnesses. A very long critical exposure period could allow an excessive number of high exposure events over a shorter term to be "averaged out" over the long-term. EPA's recommended criteria document suggests that states use a 30-day duration period as the optimal period during which the geometric mean of all samples from a given location not exceed the criteria and no more than ten percent of samples exceed the STV.

Since release of the 2012 recommended criteria, EPA has stated that it would be acceptable for states to adopt a duration period of up to 90 days as the critical exposure period to protect recreational uses. (U.S. EPA 2015). DEQ is proposing to use a 90-day duration for the enterococcus criteria. In addition, DEQ is proposing to change the duration period for the *E. coli* criterion at 340-041-0009(a)(A) from 30 days to 90 days for consistency. The following paragraphs explain EPA's rationale for allowing up to a 90 day period.

EPA noted that the epidemiological studies used to develop the 2012 criteria recommendations were conducted over exposure periods of up to 90 days. This makes durations up to 90 days scientifically defensible. In addition, analysis of data from waters that experience short-term variability, or "transient fluctuations," from periodic high concentration releases exhibit very similar criteria attainment assessment outcomes using a 30-day or 90-day assessment period when both the GM and STV criteria components are evaluated.

For example, EPA analyzed monitoring data from locations in New Jersey impacted by combined sewer overflow (CSO) discharges. This is an example of a "transient fluctuation." EPA reviewed 17,538 records from 703 monitoring stations collected from 1996-2011. EPA combined the data into 2,890 monitoring station and year sets and assessed those combinations for attainment of the GM and STV over fixed 30 day periods and fixed 90 day periods. The STV criterion component appears to be a significant factor in preventing significant levels of fecal indicator bacteria to be "averaged out" over a 90 day assessment period. There is an overall 98% rate of agreement between results using 30 day and 90 day assessment periods and most cases of disagreement are the result of a single measurement exceeding a 30-day GM but not exceeding a 30-day STV. The small percentage of outcomes where only a 30 day assessment period indicate non-attainment are predominantly a result of a single monthly measurement that lie between the GM and STV over the period of record and may thus have a low probability of reflecting excessive risk of illness. On a station level, considering multiple years of data, 75% are in non-

⁷ For further information, see the discussion beginning on page 39 of EPA's criteria document.

attainment using a 90-day assessment period and 76% are in non-attainment using a 30-day assessment period. This represents a 99% rate of agreement.

DEQ also is proposing changing the duration for the *E. coli* criteria from 30 days to 90 days. EPA considers the magnitude of DEQ's current *E. coli* criteria to be as protective as the proposed enterococcus criteria. As a result, changing the duration of the criteria to 90 days should provide the same level of protection as doing so for the enterococcus criteria for the reasons that EPA provided above.

A benefit of utilizing a longer averaging period for calculation of the geometric mean values for enterococcus and *E. coli* data and the 90th percentile value for enterococcus data is that there is a greater likelihood of having a sufficient number of samples at a given location in a 90 day period than a 30-day period. As a result, DEQ would more likely be able to calculate a valid geometric mean and a 90th percentile value to compare to the criteria for assessment and other Clean Water Act purposes.

Rationale for incorporating a monthly duration period for NPDES permitted facilities

DEQ proposes to use a monthly duration period for effluent limitations for NPDES facilities which must monitor for *E. coli* bacteria. OAR 340-041-0009(5). Under that provision, effluent discharges from NPDES-permitted facilities are required to meet the *E. coli* criteria, including the monthly log-mean and single sample maximum, in the discharge (at the end of pipe). DEQ proposes to continue using a 30-day time frame for permit limits, even though the standard allows a 90-day duration, for the following reasons:

- Facilities already are required to meet this criterion on a monthly basis so that treatment technology and processes are generally in place and available to attain the standard on a shorter duration.
- DEQ would likely be unable to allow for a greater duration for attaining effluent limits than is currently used due to anti-backsliding requirements.
- A longer averaging period would make it difficult for a facility to know if it was out of compliance until well after the fact and would therefore impact its ability to resample or manage its treatment accordingly.
- Permittees are required to monitor and report compliance with their permit limits on a monthly basis.

For the same reasons, DEQ proposes to expand this provision to include a monthly duration for those facilities that discharge to coastal waters and thus must monitor for enterococcus. DEQ guidance requires such facilities to meet current EPA-promulgated criteria (geometric mean of 35 CFU enterococcus per 100 mL) in their effluent on a monthly basis. (ODEQ 2011). DEQ proposes to maintain these duration requirements with the addition of any limits needed to ensure achieving the STV of 130 CFU per 100 mL on a monthly basis.

⁸ The provision allows facilities that exceed the single sample to resample in the first 28 hours to determine if they can achieve compliance with the log-mean.

DEQ is clarifying that these requirements apply to bacteria in effluent discharges associated with fecal sources, which is consistent with the existing language in the bacteria standard:

"Numeric criteria: Organisms of the coliform group commonly associated with *fecal sources* (MPN or equivalent membrane filtration using a representative number of samples) may not exceed the criteria described in paragraphs (a) and (b) of this paragraph." OAR 340-041-0009(1)(emphasis added).

This change acknowledges that certain non-fecal discharges, such as pulp and paper effluent, may contain bacteria that are detected as *E. coli* or enterococcus, but are not pathogenic and do not indicate the presence of fecal contamination. (Gauthier and Archibald 2001; Degnan 2007; Croteau, et al. 2007). Due to the potential interference of plant-based bacteria in enterococcus tests, it may be difficult for pulp and paper mills to achieve compliance with enterococcus criteria even if the discharge poses little risk to public health due to the lack of pathogenic bacteria in the discharge. The proposed provision will allow flexibility to entities that can demonstrate to DEQ that their discharge does not come from fecal sources. DEQ would require such entities to demonstrate through biochemical species identification techniques that the effluent contains non-fecal based bacteria species. Once the demonstration is made, DEQ would include appropriate effluent limits in the permit to ensure that public health is protected.

Minor changes to the water quality standard for bacteria

Removal of reference to "MPN or equivalent membrane filtration using a representative number of samples"

The current bacteria standard specifies that criteria are to be measured using the "most probable number procedure or an equivalent membrane filtration process." DEQ's current procedure for analyzing marine samples for enterococcus uses the MPN procedure. EPA's 2012 recommended criteria require using colony forming units using EPA standard method 1600 for enterococcus and EPA Standard Method 1603 for *E. coli* or "equivalent methods that measure the appropriate culturable bacteria." (U.S. EPA 2012). The MPN method, while differing from those EPA methods measuring CFU, is an equivalent method that EPA approved. As either of those procedures is appropriate and they are generally well correlated, DEQ has concluded that it is unnecessary to specify the method of measurement within the standard. The current use of the term "organism" in the numeric criteria (e.g., "No single sample may exceed 406 *organisms* per 100 mL") will allow using the CFU, MPN or other EPA-approved methods.

Language specifying minimum sample size for calculating geometric mean and 90th percentile values

The current E. coli criteria specify that the log mean must not exceed 126 organisms per 100 milliliters "based on a minimum of five (5) samples." Because the bacteria criteria (both existing and proposed) are based on a statistical measurement (geometric mean and 90th percentile), some minimum data set is still necessary to measure compliance and attainment with the standards.

⁹ 40 CFR 136.3(a)

However, EPA's 2012 recreational water quality criteria (RWQC) do not specify a minimum sample size for calculating either *E. coli* or enterococcus criteria. As a result of past legal decisions, minimum sample sizes are not an approvable part of water quality criteria. As a result, DEQ is removing the minimum sample size from the water quality standards. Instead, DEQ is adding an implementation provision at OAR 340-041-0009(2) requiring at least 5 samples to calculate the geometric mean and 90th percentile values. This provision will not affect permitting requirements, which are addressed separately in the implementation provision addressing "effluent limitations for bacteria.

Change of averaging method for *E. coli* from "log mean" to "geometric mean"

DEQ is proposing to change the averaging methodology under the *E. coli* criterion from "log mean" to "geometric mean." These terms are mathematically identical. However, using the term "geometric mean" is consistent with EPA's 2012 criteria recommendations, as well as previous iterations of *E. coli* criteria for freshwater contact recreation.

Removal of provision related to aquatic life criteria for chlorine in effluent

OAR 340-041-0009(5)(b) is a provision in the bacteria rule that requires that aquatic life criteria for chlorine established in DEQ's toxic substances rule, OAR 340-041-0033, must be met at all times outside the assigned mixing zone. This provision is redundant with the toxic substances rule to which it refers and is therefore unnecessary. As a result, DEQ is proposing to remove this provision.

Minor revisions and plain language revisions.

Other revisions to the rule implement the plain language review required under Oregon's Administrative Procedures Act or remove references to other rules that no longer exist. These minor revisions do not result in substantive changes to the rule or its implementation.

Applicability of Bacteria Criteria and Designated Use Maps

Background

Under the current bacteria criteria, *E.* coli criteria currently apply in freshwater and "non-shellfish harvesting" estuarine waters. OAR 340-041-0009(a). Fecal coliform criteria apply to all marine and shellfish harvesting estuarine waters. OAR 340-041-0009(b). Federal enterococcus criteria apply in coastal waters. However, DEQ has never designated precise locations of these uses. An objective of the rulemaking is to clarify the designated uses and the geographic extent of those uses to which the three different bacteria criteria apply. These uses include:

- Water contact recreation in coastal waters
- Water contact recreation in freshwater
- Shellfish harvesting, which is a subcategory of "fishing," a fish consumption use

DEQ recommends designating all marine waters within Oregon's territory, to a distance of three miles from Oregon's shoreline, for shellfish harvesting and coastal contact recreation uses. For major Oregon estuaries, DEQ developed designated use maps that will be adopted into the basin-specific use rules for the Columbia River mainstem, the North, Mid, and South Coasts, and Umpqua River Basin. OAR 340-041-0101, 340-041-230, 340-041-220, 340-041-300 and 340-041-320. Each use map focuses on one major Oregon estuary. These maps show the furthest upstream extent of shellfish harvesting and the boundary between coastal and freshwater contact recreation uses. All waters of the state not otherwise designated for coastal contact recreation use are considered freshwater contact recreation whether or not they are included in the use maps in this rule.

Proposed use maps are included in Appendix C of this document. In addition, Appendix C includes a map showing designations along the coastline (Figure 36). ¹⁰ The following section describes to the methodology by which DEQ developed the proposed designated use maps.

Data used for use designation

DEQ evaluated two types of information in order to identify the location of shellfish harvesting and the boundary between marine contact recreation and freshwater contact recreation:

- 1. Salinity data collected by DEQ and the Columbia River Estuarine Operational Forecast System operated by the National Oceanic and Atmospheric Administration to determine the demarcation between fresh and saline waters. ¹¹ Salinity is particularly important for applying bacteria criteria as *E. coli* bacteria dies quickly in salt water. As a result, *E. coli* is not a useful indicator of fecal contamination in marine waters whereas enterococci are appropriate in either freshwater or saltwater, as EPA's 2012 recommended criteria describe. Salinity data from the Center for Coastal Margin Observation and Prediction also was used as a secondary tool to ground truth whether shellfish presence was consistent with salinity levels in the Columbia River Estuary.
- 2. Documented evidence of shellfish distribution through review of agency reports, reports provided by shellfish harvesters and confirmation with state and tribal biologists to ensure that the shellfish harvesting use designations align with shellfish habitat.

Data evaluation

Salinity Data

Salinity data are critical to demarcate the boundary between marine and freshwater uses. *E. coli* dies quickly in salt water whereas enterococcus survives longer. Anderson, et al. (1979), examined survival of a type of *E. coli* at different salinities (10, 15, 25, 30 parts per thousand) and exposure durations (2, 5, and 8 days). At 10 ppth salinity, survival of *E. coli a* was 100.6,

¹⁰ This map will not be included in the rulemaking and is here for reference only.

¹¹ All Oregon waters are designated for contact recreation use. The purpose of the analysis was to determine the boundary between freshwater and coastal water contact recreation use and, as a result, where *E. coli* and enterococcus criteria apply.

87.6 and 53.5 percent at two, five, eight days respectively. At 15 ppth, survival was 27.9, 11.7 and 7.1 percent. Survival was even lower at 25 and 30 ppth. A second type of *E. coli* was tested at 10 and 30 ppth and a temperature of 44.5°C. Survival of *E. coli* b was higher at 10 ppth than at 30 ppth.

Based on the literature, DEQ focused on a median salinity level of 10 ppth to demarcate the boundary between freshwater and coastal water contact recreation in Oregon estuaries. As a result, a key objective in delineating the boundary between fresh and coastal water contact recreation was to ensure that waters in the freshwater portion are not exposed to 10 ppth salinity for two days. At the locations where DEQ is proposing this boundary, as described in the "Recommended Delineation of Use Designations" section that follows, the water is dominated by freshwater much of the time (with annual median salinities at or below 10 ppth), but can have higher salinities during high tide. Because the high tide lasts only a few hours, these waters will never be exposed to high salinity waters long enough to attenuate E. coli levels significantly. For example, DEQ analyzed EPA salinity data from the Alsea River near the proposed location of the boundary between fresh and coastal water recreation uses. As a conservative measure, DEQ evaluated dry season data, when salinity is generally higher due to lower freshwater flow from upstream. Percentage of occurrence in less than 10 ppth, between 10 and 20 ppth, and greater than 20 ppth are shown below. These data indicate that at all levels salinity is less than 10 ppth frequently and most of the time at mid-depth and the surface. As a result, E. coli would not be exposed to high salinity long enough to be sufficiently attenuated.

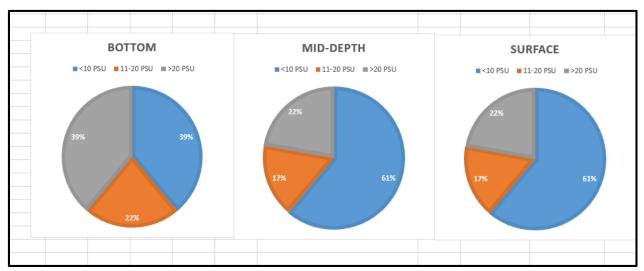


Figure 1. Salinity ranges for samples from the Alsea River near the mouth of Drift Creek. Data provided by EPA Western Ecology Division, Newport, OR.

In order to determine the boundary between freshwater and coastal water contact recreation in all coastal estuaries, DEQ analyzed estuarine salinity data available from its Laboratory Analytical Storage and Retrieval database to identify the approximate location where median annual salinity

equals approximately 10 ppth. In order to ensure that there was sufficient data to evaluate where salinity in estuaries was approximately 10 ppth, DEQ used the following methodology:

- DEQ only examined data from 1985 to the present. Data from LASAR earlier than this date are more sporadically collected and also had questionable quality control due to anomalies (for example, apparent errors in the time or location samples were taken).
- In general, more salinity data was available during the late spring, summer and early fall than for the late fall, winter and spring. In addition, if there were multiple samples from a given month and year, this data was averaged. DEQ grouped data by month and calculated the median for each month to minimize sampling bias.
- Once DEQ calculated median salinity for each month, it calculated the median salinity for the entire year.
- DEQ only used locations where salinity data were taken in at least 50 months from 1985 to the present.

Once median salinity was calculated, data was plotted on maps using ArcGIS. Maps indicating the location of salinity levels at 10 ppth are shown in Appendix A.

DEQ used salinity models developed by the National Oceanic and Atmospheric Administration to evaluate salinity in the Columbia River Estuary. More information on this analysis is included under "Columbia River Estuary" in the "Rationale for Designating Uses in Each Estuary" section that follows.

Shellfish Data

In order to protect consumers of marine and estuarine shellfish from illness due to exposure to fecal bacteria, DEQ is proposing to broadly designate shellfish harvesting use in all waters from an estuary's mouth to the furthest point upstream point in each estuary where shellfish are found. DEQ examined the following lines of evidence:

- Oregon Department of Fish and Wildlife's (ODFW) "Where to Dig" maps, available on its website, which show easily accessible clamming areas in the state. (ODFW 2015). 12
- Oregon Department of Agriculture's (ODA) Commercial Harvesting Areas, which indicate where the agency allows commercial shellfish to be grown within the Coos, Netarts, Tillamook, Umpqua and Yaquina Estuaries.¹³
- A 1979 cooperative report between the Oregon State University Sea Grant Program and the Oregon Department of Fish and Wildlife detailing subtidal clam distribution in many Oregon estuaries (Hancock, et al. 1979), as well as a number of 1970s "Resource Use" studies published by the Oregon Department of Fish and Wildlife, as cited in this document.
- Online maps showing clam harvesting areas from two websites: www.clamdigging.info and www.razorclamming.com.
- Personal communications with tribal governments and the Oregon Department of Fish and Wildlife's Shellfish and Estuarine Assessment of Coastal Oregon program.¹⁴

¹² ODFW provided DEQ with GIS layers corresponding with its maps to assist in developing maps.

¹³ Commercial shellfish growing in other estuaries is prohibited. ODA provided DEQ with maps of shellfish harvesting areas which DEQ converted to a GIS layer.

¹⁴ http://www.dfw.state.or.us/mrp/shellfish/seacor/

Based on the data collected, DEQ developed maps with proposed shellfish harvesting use designations in the following estuaries: Necanicum, Nehalem, Tillamook, Netarts, Nestucca, Salmon River, Siletz, Yaquina, Alsea, Yachats, Siuslaw, Umpqua, Coos Bay, and Coquille River. For each estuary, DEQ noted the uppermost distribution of shellfish in coastal and estuarine areas. Once these areas were delineated, DEQ received peer review from ODFW shellfish biologists, who confirmed the uppermost distribution or reported areas further upstream where shellfish have been found. Based on these reports, DEQ adjusted the use maps accordingly. In addition, DEQ is proposing to designate a small portion of the Columbia River Estuary for shellfish harvesting use based on information from ODFW.

DEQ also used salinity data as a secondary "fact check" in examining shellfish harvesting designations. Estuarine and marine shellfish species have a preferred salinity range for survival. Species found in the upper ends of estuaries including Pacific oysters (*Crassostrea gigas*) and softshell clams (*Mya arenaria*) tolerate salinity as low as 10 ppth (Abraham and Dillon 1986; Emmett, et al. 1991). These shellfish must be almost continuously exposed to these salinities to survive (*pers. comm., Liz Perotti, 1/27/2016*). In several cases, shellfish presence was documented upstream of where salinity was 10 ppth; this is likely due to the fact that DEQ salinity data is taken in surficial waters, whereas salinity at depth, where shellfish occur, is often higher than at the surface. In particular, salinity data was used to examine if there was a need to expand shellfish harvesting designation in the Columbia River Estuary, as DEQ was unable to find any surveys there. This information is included in the section discussing use designations in the Columbia that follows.

In rivers, such as the Sixes, Rogue, and Chetco, the degree of freshwater influence precludes propagation of bay clams. Resource surveys in these areas do not note any populations of bay clams and specifically note that the Rogue does not support populations of bay clams. Moreover, there is not sufficient salinity in these rivers to support shellfish. (*pers. comm...*, Liz Perotti, manager, SEACOR program, ODFW, 2/11/16). Other small streams and creeks that enter the Pacific do not have sufficient salinity intrusion to support bay clam propagation and ODFW is not aware of any harvest occurring in these waters. (*pers. comm..*, Liz Perotti, 2/11/16).

Recommended delineation of use designations

Shellfish Harvesting Use

Based on the analysis in the "Data Evaluation" section above, DEQ is proposing to designate all estuarine waters from the upper end of shellfish distribution downstream to the mouth of the estuary as having shellfish harvesting use. In addition, DEQ proposes to clarify that all territorial marine waters are designated for shellfish harvesting use.

Contact Recreation Uses

In all but two estuaries, DEQ proposes to delineate the boundary between coastal and freshwater contact recreation uses in the same location as the upper boundary of shellfish harvesting areas. In all estuaries except the Columbia and Necanicum estuaries, shellfish are documented slightly upstream, but no more than a few miles, of the area where median salinity was calculated as 10 ppth. As noted, enterococci criteria are equally protective in low salinity freshwater and marine water. As a result, applying enterococci criteria further upstream provides the same level of

protection in these waters. Furthermore, designating these uses in the same location provides administrative efficiency for implementing bacteria criteria for the vast majority of state waters. For example, designating coastal contact recreation in the same location as shellfish harvesting will simplify how DEQ identifies waterbody segments for assessing waters against bacteria criteria in Integrated Reports.

In two estuaries, the Columbia River Estuary and the Necanicum Estuary, shellfish are not found as far upstream as the area where median salinity is 10 ppth, likely due to inappropriate substrate. As a result, DEQ proposes to designate the boundary between coastal water and freshwater contact recreation uses based on the location where median salinity is approximately 10 ppth. Specific information about these two exceptions is included in the corresponding sections below.

Under the federal BEACH Act, rivers that flow freely to ocean waters are not coastal waters for purposes of applying contact recreation criteria. In Oregon, the Sixes, Chetco, and Rogue rivers, as well as the many smaller rivers and creeks not named in this section, flow freely to the ocean and, therefore do not have sufficient saltwater intrusion to be considered coastal waters. DEQ's proposed rules clarify that freshwater contact recreation use is designated for the entire rivers to their mouth. The marine waters adjacent to the mouths of these rivers and creeks are designated as coastal contact recreation in the proposed rule language as shown on the reference map in Figure 36.

Rationale for Mapping Designating Uses in Each Estuary

This section describes in more detail the information DEQ used to map the shellfish harvesting use and the boundary between coastal water and freshwater contact use within each estuary. Figures referred to in the discussion showing ODFW and ODA shellfish harvesting areas, median salinity from DEQ monitoring stations and available shellfish distribution, are referred to in the text and included in Appendix A. Proposed designated use maps are included in Appendix C.

Columbia River Estuary

Shellfish harvesting designation

DEQ proposes to clarify that the area to the west of Trestle Bay is designated for shellfish harvesting. In general, the Columbia River estuary does not have bay clams, likely due the high freshwater discharge and resulting low salinities present in the Columbia (CREST 1978). However, there are reports of softshell clams within Trestle Bay and small, unharvestable razor clams on the upstream side of the south Jetty. (*pers. comm.*, Matt Hunter, shellfish biologist, ODFW, 2/18/16). While it is uncertain if these clams are utilized for anything more than fish bait, DEQ is including a designation of shellfish harvesting for this area to ensure any consumers are protected. (*pers. comm.*, Liz Perotti, ODFW, 2/11/16).

In response to feedback received from stakeholders suggesting that salinity intrusion as far upstream in the Columbia River as Bonneville Dam, DEQ examined salinity data from the Columbia River to determine if there was a need to expand the designation beyond Trestle

Bay. As noted earlier in the Issue Paper, a minimum salinity of 10 ppth is required to support shellfish propagation.

DEQ examined salinity data from two locations reported by the Center for Coastal Margin Observation and Prediction website. ¹⁵ 2002 is the only full year of data available. Continuous salinity data (taken every minute) was collected in deep waters at the Fort Stevens wharf, approximately one mile upstream of Trestle Bay. Data from some dates were unavailable but the data was sufficient to examine minimum salinity data. DEQ summarized monthly minimum, maximum and median data for each month.

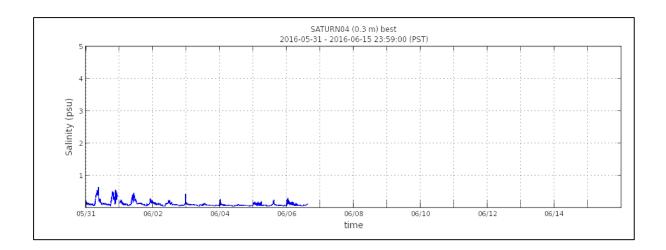
| Date | Min. Salinity (psu/ppth) | Max. salinity (psu/ppth) | Median salinity (psu/ppth) | Notes (Dates indicate times when data was available). |
|--------|-----------------------------|-----------------------------|----------------------------------|--|
| Jan-02 | 0.26 | 26.43 | 14.92 | |
| Feb-02 | 0.26 | 30.25 | 13.38 | |
| Mar-02 | no data | no data | no data | |
| Apr-02 | 0.32 | 27.72 | 12.4 | April 20-30 |
| May-02 | 0.23 | 26.65 | 13.39 | |
| Jun-02 | 0.25 | 31.67 | 14.57 | June 15-30 |
| Jul-02 | 1.62 | 32.07 | 22.01 | |
| Aug-02 | 2.63 | 32.81 | 14.99 | |
| Sep-02 | 6.48 | 32.68 | 23.69 | |
| Oct-02 | 3.32 | 32.02 | 22.25 | |
| Nov-02 | 5.53 | 31.64 | 24.98 | |
| Dec-02 | 4.28 | 29.7 | 23.33 | Dec. 1-Dec. 19 |

Table 1. Salinity data from Fort Stevens Wharf (CCMOP website)

The data indicates that salinity falls below 10 ppth on many days at this location and often has salinity approaching that of freshwater during periods of high flow. As a result, DEQ has concluded that it is unlikely that estuarine shellfish would be able to survive downstream of Trestle Bay.

DEQ also examined CCMOP salinity data from depth at the "Saturn 4" station located east of Tongue Point on the eastern side of Astoria to determine the upstream extent of salinity intrusion. Available data from May 31-June 6, 2016 is shown below:

¹⁵ http://www.stccmop.org/. Accessed June 15, 2016.



Although data is incomplete this was the only available data. The data indicates that salinity is approximately that of freshwater. Thus, while DEQ agrees that tidal influences can affect water levels as far upstream as Bonneville Dam, salinity intrusion sufficient to support shellfish propagation does not occur this far upstream, nor even as far as just upstream of Trestle Bay. As a result, DEQ is not recommending changing the proposed shellfish harvesting designation from what was proposed during the comment period of this rulemaking.

All marine waters in the North Coast Basin adjacent to the mouth of the Columbia River are designated for shellfish harvesting.

Contact Recreation Designation

DEQ analyzed salinity data obtained from the NOAA Columbia River Estuary Operational Forecast System (CRE-OFS) to determine the boundary between coastal and freshwater contact recreation. CRE-OFS provides users with present and near future forecasts of various water quality data, including salinity, four times per day in various locations along the Columbia River, its estuary and offshore from its mount into the Pacific Ocean. ¹⁶ Figure 1 shows an example model projection.

DEQ examined salinity projections from July 22 to July 29 from stations nearest the mouth of the Columbia River to the Astoria-Megler Bridge Station that crosses the Columbia from Astoria to Washington. The dates chosen were characteristic of low flow conditions during which upstream salinity intrusions may be higher. Evaluating data during these conditions is important to ensure the analysis captures high salinity conditions as higher salinity levels cause *E. coli* die-off. Hourly salinity was estimated by visually examining the graphs and median salinity was calculated for each 24 hour period beginning and ending at 8 a.m. each day. Figure 2 shows daily median salinities. DEQ proposes to designate coastal contact recreation use as far upstream as the eastern edge of Young's Bay. In this area, salinity sometimes exceeds 10 ppth, but daily median salinity is less than 6 ppth.

¹⁶ CREOFS website, accessed 7/29/2015

Based on the information in Figure 2, median salinity is approximately 10 ppth near Jetty A, on the Washington side of the Columbia, near Fort Canby. Salinity appears to maintain higher levels on the southern side of the Columbia, with a median salinity of 10 ppth at Tansy Point in Warrenton. Salinity is much lower than 10 ppth near the Astoria Megler Bridge and in Young's Bay, west of the Astoria-Warrenton Highway. DEQ proposes that the portion of the river from the mouth to the western edge of Astoria and north of the Young's Bay Bridge (Highway 101) be designated as coastal contact recreation, as shown in Figure 20. Upstream of these areas, median salinity is consistently lower than 10 ppth. Thus, the freshwater contact recreation use and an *E. coli* criterion are appropriate.

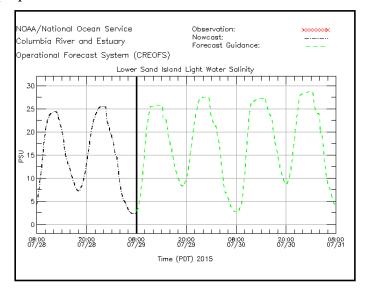


Figure 2. CRE-OFS Modeled Salinity for July 28-31, 2015 at Lower Sand Island Lighthouse. (from <u>CRE-OFS</u> website, accessed 7/29/2015).

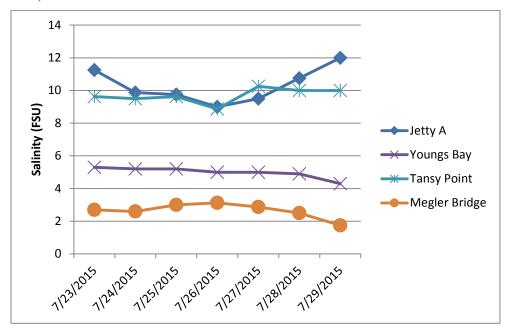


Figure 3. Median Daily Salinity at Columbia River Estuary

Necanicum River Estuary – Summary of Data and Conclusions

- *ODFW*. While ODFW identifies the Necanicum Bay as an accessible area for shellfish harvesting, the agency has not developed maps indicating where shellfish reside. However, ODFW has confirmed that shellfish harvesting only occurs in the lower estuary. (*pers. comm.*, Liz Perotti, ODFW, 1/28/16). Further upstream of this point, although salinity may be sufficient, the river most likely has insufficient substrate or other conditions for shellfish.
- *ODA*. Commercial shellfish harvest is not allowed in Necanicum Bay.
- Other available information. Limited data exist to determine where shellfish harvesting
 areas and the boundary between fresh and coastal water recreation are located in the
 Necanicum River. Two websites indicate that clamming is available in the lower estuary,
 as ODFW confirms.¹⁷
- Salinity. DEQ salinity data are limited in the Necanicum. The only sufficient data set that DEQ has is from a station at the 12th Avenue Bridge in Seaside. The data indicate that median salinity of the Necanicum River at 12th Ave. is approximately 18 ppth. Limited data taken near the Avenue U bridge indicates that water there also has salinity greater than 10 ppth at times. Thus, while salinity south of the lower estuary may be sufficient for clam propagation, another limiting factor such as substrate, may not be appropriate for bivalves. However, salinity at the Avenue U bridge may be sufficiently high to limit E. coli survival. Thus, DEQ proposes to designate this area for coastal contact recreation to ensure that appropriate criteria are applied in this area based on the water's salinity.

Based on current information, DEQ proposes to designate the Necanicum estuary as shown in Figure 21.

Nehalem River Estuary – Summary of Data and Conclusions

- *ODFW*. According to the current ODFW maps, accessible shellfish areas in Nehalem Bay include areas north of and across the estuary from Brighton, as well as the flats northwest of Wheeler. (Figure 3).
- *ODA*. Commercial shellfish harvest is not allowed in Nehalem Bay.
- Other information sources. ODFW staff indicate that shellfish harvesting occurs somewhat further upstream than their maps indicate, approximately to the northern end of Wheeler. (pers. comm., Liz Perotti, ODFW, 1/27/16).
- Salinity data. DEQ salinity data indicate that median salinity is approximately 8 ppth at Paradise Cove (west end of Wheeler), 14 ppth at the Nehalem Bay State Park boat ramp and 5 ppth near the Wheeler Marina. (Figure 3).

Based on available information, DEQ is proposing to designate the Nehalem River Estuary as shown in Figure 22.

Tillamook Bay – Summary of Data and Conclusions

¹⁷ http://www.razorclamming.com/locations/oregon-clam-bays/necanicum-river-estuary map/. Accessed December 1, 2015; http://www.clamdigging.info/Necanicum%20River.html. Accessed December 1, 2015.

- *ODFW*. Accessible recreational harvesting areas ODFW identified occur in the northern half of Tillamook Bay (Figure 4).
- *ODA*. ODA has approved commercial shellfish growing in the northern half of Tillamook Bay, overlapping with accessible ODFW areas. (Figure 4).
- Other information sources. Other documentation indicates that softshell clams are distributed much more broadly: as far south as Dick's Point on the western side of the bay and the mouth of the Kilchis River on the eastern side of the bay. (Hancock, et al. 1979; Figure 5).
- *Salinity*. DEQ's salinity data collected throughout Tillamook Bay suggests that salinity in the southern portion of the bay is sufficient for propagation of softshell clams and oysters. (Figure 4).

Based on available information, DEQ recommends designating the Tillamook Bay as shown in Figure 23.

Netarts Bay – Summary of Data and Conclusions

- *ODFW*. ODFW maps indicate that there are shellfish harvesting areas throughout the northern portion of the bay. Native littleneck clams are found throughout the harvestable area of the bay which extends as far south as the mouth of Whiskey Creek. (ODFW 2014). South of this point, ODFW has established a shellfish preserve that extends as far south as the mouth of Austin Creek, which supports a wide array of clam populations. South of this area, DEQ has no information suggesting that clams reside in this area, potentially due to lack of appropriate substrate. (Hancock, et al. 1979).
- *ODA*. Commercial harvesting is approved in the entire bay as far south as Whiskey Creek.
- *Other information sources*. DEQ did not consult other information sources for Netarts Bay, as information ODFW provided was comprehensive.
- Salinity data. As the bay is primarily fed by marine water without a sizeable freshwater input, DEQ data indicate the salinity is well above minimum levels needed to support bay clams.

DEQ recommends designating the entire Netarts Bay for shellfish harvesting and coastal contact recreation use as shown in Figure 24. Although the southern portion of the bay does not include shellfish populations based on available information, there is a risk that any fecal contamination in this area would reach shellfish beds. Therefore, DEQ recommends this portion be included as part of the designation.

Sand Lake – Summary of Data and Conclusions

- *ODFW*. Sand Lake is not included within accessible shellfishing areas on ODFW maps.
- ODA. Commercial shellfish harvest is not allowed in Sand Lake.
- Other information sources. One report notes that there is one clamming area within the "bay system" of Sand Lake. (Kreag 1979). Online information indicates that there is a

¹⁸ http://www.dfw.state.or.us/mrp/shellfish/seacor/findings_netarts_bay.asp. Accessed December 2, 2015.

small clamming area on the north side of Whalen Island. ¹⁹ DEQ staff confirm that there is clamming in the Sand Lake Estuary. (*pers. comm...*, York Johnson, DEQ, 12/16/15).

• Salinity data. DEQ has little salinity data within Sand Lake.

While information on shellfish harvesting is scarce, DEQ recommends erring on the side of inclusiveness in the Sand Lake Estuary and designating the entire estuary for shellfish harvesting and coastal contact recreation use as shown in Figure 25.

Nestucca and Little Nestucca Estuaries – Summary of Data and Conclusions

- *ODFW*. According to the current ODFW maps, the primary accessible area for clamming in Nestucca Bay is in most of the eastern lobe of the bay. (Figure 6). ODFW confirmed that clamming occurs in the tidal flats near the boat ramp near the intersection of Brooten Road and Nestucca Manor Drive. (*pers. comm.*, Liz Perotti, ODFW, 1/28/16).
- *ODA*. Commercial shellfish harvest is not allowed in Nestucca Bay.
- *Other information sources*. Studies are generally consistent with ODFW-identified shellfishing areas. (Hancock, et al. 1979; Figure 7).
- Salinity data. DEQ has very little salinity data within the Nestucca Estuary. The EPA Western Ecology Division provided DEQ with data that it has collected for research. The data indicate that, on average, salinity is approximately 11 ppth at the mouth of the Nestucca River into the bay. In the Little Necanicum portion of the bay, median salinity is approximately 13.5 near the Highway 101 bridge.

Based on available information, DEQ recommends designating Nestucca Bay as shown in Figure 26.

Salmon River Estuary – Summary of Data and Conclusions

- *ODFW*. ODFW does not have information related to shellfish harvesting areas in the Salmon River.
- *ODA*. Commercial shellfish harvest is not allowed in the Salmon River Estuary.
- Other sources of information. A study by the Fish Commission of Oregon indicates that there are shellfish beds in mud flats across the river from the mouth of Crowley Creek and in a narrow area that runs from the mouth of Crowley Creek upstream to approximately the mouth of Mink Creek. (Gaumer, et al. 1973; Figure 8). Hancock, et al. (1979) shows similar distribution for softshell and Baltic clams. Other online information indicates that clam beds do not exist as far south as the 1973 study.²⁰
- Salinity data. DEQ does not have sufficient data at any location within the Salmon River Estuary to assist in determining where shellfish may reside. EPA Western Ecology Division data, although limited, indicates that salinity during the wet season in the estuary near Mink Creek may not be high enough to support softshell clam populations.

Based on available information, DEQ is recommending designating the Salmon River Estuary as shown in Figure 27.

Siletz Bay - Summary of Data and Conclusions

¹⁹ http://www.clamdigging.info/Sand%20Lake.html. Accessed December 23, 2015.

²⁰ http://www.clamdigging.info/Salmon%20River%20Estuary.html. Accessed December 3, 2015.

- *ODFW*. ODFW maps indicate that accessible shellfish harvesting areas in the northern area of the bay near Highway 101, reaching approximately as far south as the intersection of Highway 101 and SW Jetty Avenue. (Figure 9). In addition, ODFW has communicated that shellfish are found in Schooner Creek, at least 300 meters upstream of the bay.
- *ODA*. Commercial shellfish harvest is not allowed in Siletz Bay.
- Other sources of information. Distributional sampling in the 1970s indicated that softshell clams and Baltic clams extend almost to the southern edge of the estuary. (Figure 10).
- Salinity data. DEQ has some salinity data in Siletz Bay, but primarily located in the northern half of the bay. Even in this area, available data are almost exclusively taken from the May-September period, with samples taken during other months during one or two years. As a result, DEQ does not consider that available data provide sufficient basis for delineating shellfish harvesting areas.

Based on this information and paucity of data for some locations in Siletz Bay, DEQ recommends erring on the side of inclusiveness and designating the all of Siletz Bay west of Highway 101 for shellfish harvesting and coastal contact recreation use, as shown in Figure 28.

Yaquina Bay – Summary of Data and Conclusions

- *ODFW*. ODFW shellfish harvesting maps indicate that there are accessible shellfish areas as far upstream as Babcock Creek, south of Toledo. Several other areas are accessible around Newport. (Figure 11). ODFW also confirms that shellfish are harvested in Poole and McCaffery Sloughs. (*pers. comm.*, Liz Perotti, ODFW, 1/27/16).
- *ODA*. ODA has approved commercial shellfish growing in Yaquina Bay as far east as Green Point. (Figure 11).
- Other available information. Softshell clam distribution may occur as much as one mile further upstream of Babcock Creek than ODFW "where to clam" maps indicate.
 (Hancock, et al. 1979; Figure 12). More recent online information is consistent with this report.²¹
- Salinity information. DEQ salinity data on Yaquina indicate that median salinity in the uppermost areas of clam distribution is 5 ppth, somewhat lower than that typically found to support shellfish propagation. (Figure 11). Such data suggest that salinity is about 9 ppth at the uppermost accessible area based on ODFW "where to fish" maps. It may be that DEQ's data, which are taken from near the surface, do not represent salinity in the bottom substrate, which may be higher.

Based on the available information, DEQ recommends designating Yaquina Bay as shown in Figure 29.

Alsea River Estuary – Summary of Data and Conclusions

• *ODFW*. ODFW shellfish harvesting maps show that there are accessible shellfishing areas as far upstream as Eckman Creek. (Figure 13). ODFW staff suggest there also is clamming east of Eckman Lake and maybe as far upstream as Drift Creek. (*pers. comm.*, Liz Perotti, ODFW, 1/27/16).

²¹ http://www.razorclamming.com/locations/oregon-clam-bays/yaquina-bay-newport/, accessed December 3, 2015.

- *ODA*. ODA has not approved commercial shellfish growing in the Alsea River Estuary.
- Other available information. Hancock, et al. (1979), indicates that softshell clams and California softshells occur primarily in the flats in the area near Bayview. (Figure 14). It does not appear that the survey conducted in that report included areas further upstream than this area. Other online information indicates that clamming is accessible near Eckman Creek, consistent with ODFW maps.²²
- Salinity information. DEQ has collected sufficient salinity data from three stations to calculate median salinity. Median salinity at the station furthest upstream (50 yards downstream of mid-channel island) is 12.9 ppth. Limited EPA data indicate that median salinity slightly upstream of Eckman Creek is 10 ppth.

Based on the available information, DEQ recommends designating the Alsea River as shown in Figure 30.

Yachats River Estuary – Summary of Data and Conclusions

- ODFW. Personal communications from ODFW indicate that there are some razor clams in the Yachats River Estuary, but not as far upstream as the Highway 101 bridge. (pers. comm., Steve Rumrill, ODFW, 12/16/15).
- ODA. ODA has not approved commercial shellfish growing in the Yachats River Estuary.
- Other available information. DEQ has not found other information about clams found in the Yachats River Estuary.
- Salinity information. Limited conductivity information indicates that the Yachats River is estuarine up to Highway 101.

Based on this information and paucity of data for some locations in the Yachats River Estuary, DEQ recommends erring on the side of inclusiveness and designating the all of the Yachats River Estuary west of Highway 101 for shellfish harvesting and coastal contact recreation use, as shown in Figure 31.

Siuslaw River Estuary – Summary of Data and Conclusions

- ODFW. ODFW shellfish harvesting maps include a few areas as far upstream as the east bank mouth of the North Fork Siuslaw River. (Figure 15). ODFW confirms that shellfish are found further east of these areas. (pers. comm., Liz Perotti, ODFW, 1/27/16).
- *ODA*. ODA has not approved commercial shellfish growing in the Siuslaw River Estuary.
- Other available information. Hancock, et al. (1979), shows that shellfish beds exist in similar areas as the ODFW maps, as well as in a few areas in the lower extent of the North Fork Siuslaw River, up to about 500 meters downstream of Bull Island. (Figure 16). Other online information indicates that there is some clamming in the Siuslaw slightly upstream of ODFW-identified areas as far as the upstream end of Cox Island. ²³
- Salinity Data. DEQ has little salinity information in the Siuslaw River Estuary.

Based on available information, DEQ recommends designating the Siuslaw River Estuary as shown in Figure 32.

http://www.clamdigging.info/Alsea%20Bay.html. Accessed December 8, 2015.
 http://www.clamdigging.info/Siuslaw%20River%20Estuary%201.html. Accessed December 8, 2015.

Umpqua River Estuary/Winchester Bay – Summary of Data and Conclusions

- *ODFW*. ODFW maps indicate that in some years, clams can be found as far upstream as Bolon Island, slightly downstream of the mouth of Smith River. (Figure 17). In addition, ODFW staff note that shellfish harvesting may occur further upstream along the Smith River and on the Umpqua somewhat east of Smith River. (*pers. comm.*, Liz Perotti, ODFW, 1/27/16).
- *ODA*. Commercial shellfish harvesting is allowed in the lower portion of the Umpqua as far upstream as Henderson Cove. (Figure 17).
- Other available information. Online information indicates that there may be clamming in the area of Blacks Island, just upstream of Bolon Island at the mouth of the Smith River.²⁴ ODFW has confirmed that shellfish are found on Blacks Island. (*pers. comm.*, S. Rumrill, ODFW, 12/14/15)
- Salinity Data. DEQ analyzed salinity data from several stations in the Umpqua River. The data indicate that median salinity is 10 ppth a few miles upstream above. (Figure 17). ODFW and online sources note that clams inhabit areas approximately several miles further upstream of this point. An ODFW report noted that the Umpqua has a significant saline wedge on the bottom when river flow is high and which can extend up to six miles upstream from the mouth. (Ratti 1979). This wedge may result in the presence of softshell clams further upstream than DEQ's salinity data indicate would allow clams to survive.

Based on the available information, DEQ recommends designating the Umpqua River as shown in Figure 33.

Coos Bay – Summary of Data and Conclusions

- *ODFW*. According to ODFW, there are several clamming areas in Coos Bay. These include several areas in South Slough as far south as Day Inlet and in Coos Bay as far east as Kentuck Slough and as far north as Haynes Inlet. (Figure 18). In addition, native oysters are found in Isthmus Slough as far south as Millington and clams have been found under the Davis Slough bridge. (*pers. comm.*, Liz Perotti, ODFW, 1/27/16).
- *ODA*. Commercial shellfish harvesting is allowed in much of Coos Bay including from the mouth to Sitka Dock; in South Slough as far south as Elliot Creek; in portions of Haynes Inlet and in the bay offshore of North Bend. (Figure 18).
- Other available information. Online information indicates that there is clamming for softshell clams south of Kentuck Slough into Cooston Channel almost all the way to the mouth of the Coos River. DEQ also has reports of softshell clams at the mouth of Catching Slough and just above the Coos River Bridge and native oysters at and above the Newport Lane Bridge across Isthmus Slough. (Pers. comm., John Schaefer, Biologist, Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians, November 16, 2015).

²⁴ http://www.clamdigging.info/Winchester-Bay%201.html, accessed December 8, 2015.

²⁵ http://www.razorclamming.com/locations/oregon-clam-bays/coos-bay-map/, accessed December 9, 2015.

• Salinity Data. Median salinity at DEQ LASAR stations indicates that salinity levels are well above 10 ppth throughout Coos Bay and the connecting sloughs and inlets, as far upstream as the mouth of the Coos River. (Figure 18).

Based on the available information, DEQ recommends designating Coos Bay as shown in Figure 34.

Coquille River Estuary – Summary of Data and Conclusions

- *ODFW*. ODFW indicates that clamming beds are accessible in the Bandon Marsh area of the estuary. (Figure 19).
- *ODA*. Commercial shellfish growing is not approved in the Coquille River.
- *Other available information*. Online information indicates that softshell clams may be found upstream of the 101 bridge. ²⁶ ODF reports corroborate this. (Kreag, 1979b).
- Salinity Data. DEQ has collected sufficient salinity data from one station in the Coquille River, near the 101 bridge. At that station, the median salinity is just above 10 ppth, consistent with where softshell clams are found.

Based on available information, DEQ recommends designating the Coquille River as shown in Figure 35.

Implementation of Proposed Revisions

Implementation of Enterococcus Criteria for Permitting Individual NPDES Facilities

Implementation of the proposed standard for developing effluent limits for individually permitted facilities discharging to waters designated for coastal contact recreation will be much the same as implementation of the current suite of bacteria standards. As noted in the previous section, DEQ is proposing a monthly duration for facilities to show that they are meeting the geometric mean criterion of 35 CFU enterococcus per 100 mL²⁷. This requirement is identical to current requirements for such facilities. (DEQ 2011). Additionally, permits for these facilities will include requirements as necessary to ensure that the enterococcus levels in their effluent are

²⁶ http://www.clamdigging.info/Coquille%20Bay.html. Accessed December 9, 2015.

²⁷ Monthly geometric means are calculated by multiplying all samples from a location in a given month, then taking the "nth" root of the samples, where n equals the number of samples. For example, if you have five samples, the results of all five samples are multiplied together, then the 5th root is taken of the result. The purpose of the geometric mean is to ensure that one very high sample is not heavily weighted.

less than 130 CFU per 100 mL (the statistical threshold value) 90 percent of the time on a monthly basis. ²⁸ The following examples indicate how the calculation would work:

Example #1. Facility meets geometric mean but exceeds 90^{th} percentile value. A facility takes five bacteria samples of their effluent in a month. The bacteria level from one sample is 145 CFU enterococcus per 100 mL but the levels in the remaining four samples are 10 CFU per 100 mL. In this case, the facility would be meeting its geometric mean limit: $(145*10*10*10*10)^{1/5}$ = approximately 17 CFU enterococcus/100 mL. However, 20% of the samples exceeds the STV of 130 CFU/100 mL. This facility exceeds the STV-based limit.

Example #2. Facility meets both geometric mean and 90th percentile value. The same facility as in example #1 takes ten samples within the month. One sample is at 145 CFU of enterococcus per 100 mL and the remaining samples measure 10 CFU of enterococcus per 100 mL. As only ten percent of samples exceeds 130 CFU per 100 mL, the facility is meeting the STV-based limit and the geometric mean (approximately 13 CFU per 100 mL).

Example #3. Facility exceeds geometric mean but meets 90th percentile value. The same facility takes 10 samples. Samples equal 10, 15, 30, 30, 40, 60, 65, 90, 120, and 140 CFU per 100 mL. The geometric mean of the samples is approximately 45 CFU enterococcus per 100 mL, which exceeds the limit of 35 CFU per 100 mL. However, only one out of ten samples exceeds 130 CFU per 100 mL, so the facility is meeting the 90th percentile value.

Implementation of *E. coli* Criteria for Permitting Individual NPDES Facilities

DEQ's current procedures for effluent limitations for *E. coli* will not change. These procedures are outlined in the <u>Oregon Bacteria Criteria Internal Management Directive</u> (DEQ 2011). These procedures state: "*E. coli* criteria...must be met at end-of-pipe whenever the existing or designated use is water contact recreation (WCR); no [mixing zones] are allowed in this situation." The IMD will be modified slightly to reflect that the designated use associated with the *E. coli* criteria is "freshwater contact recreation," to be consistent with use designations in this rulemaking. The requirement that the criteria must be met at end-of-pipe will not change.

Implementation of Recreational Criteria in Water Quality Assessments

Every two years, DEQ is required to prepare an Integrated Report that includes an assessment of whether each water body is meeting water quality standards, where data are available. If DEQ determines that the water body is not meeting water quality standards, the water body is placed

²⁸ The 90th percentile is calculated by taking the results of all samples collected within a month and sorting them from lowest to highest. For the enterococcus criteria, if more than ten percent of samples is greater than 130 CFU enterococcus per 100 mL or the appropriate limit, it would be in violation of permit requirements. In many cases, a facility collects less than ten samples in a month, so only one sample in excess of 130 CFU per 100 mL would result in a violation. However, if more than 10 and less than 20 samples were collected, one sample could be in excess of 130 CFU per 100 mL without a violation.

on Oregon's 303(d) list of impaired waters. DEQ then develops a total maximum daily load that outlines what steps need to be taken to reduce pollutant loads to meet standards.

As part of the Integrated Report, DEQ prepares a methodology that it uses to determine whether the water body meets each water quality standard (Category 2), is not attaining the standard (Category 5) or if there are insufficient data to make a determination (Category 3).

The following describes DEQ's preliminary concepts about how DEQ would assess waters under the proposed amendments. As part of the Integrated Reporting process, DEQ develops an Assessment Methodology that documents how water bodies are assessed under each standard.²⁹ The Assessment Methodology will describe DEQ's methodology more specifically and will be made available for public comment prior to development of the next Integrated Report.

Coastal Contact Recreation Criteria

The following shows DEQ's initial concept regarding the listing methodology under the proposed enterococcus criteria to protect contact recreation designated use in coastal waters. This is similar to how DEQ has assessed coastal waters previously but includes a 90-day duration consistent with the proposed standard.²⁸ Note that, because samples may be taken over a period that is greater than 90 days, DEQ anticipates calculating a rolling 90-day mean during the period during which samples are available.³⁰ If any calculated 90-day geometric mean was greater than 35 Enterococci per 100 mL or if more than 10 percent of samples in one 90-day period was greater than 130 Enterococci per 100 mL, the waterbody or beach would be listed as water quality limited if a statistically valid minimum number of samples are available during the 90-day period.

Category 5: Water Quality Limited, TMDL Needed (303(d) List). A geometric mean for samples collected over 90 days is greater than 35 Enterococci per 100 ml or greater than ten percent of samples collected over 90 days is greater than 130 Enterococci per 100 mL, based on a sample set of 5 or more samples.

Category 4: Water Quality Limited, TMDL Not Needed. This category incorporates any waterbodies that were listed as impaired and for which TMDLs already have been approved or where other pollution controls would result in attainment of water quality standards. The proposed revisions aren't expected to affect DEQ's evaluation of data in this category.

Category 3: Insufficient Data. Less than 5 samples are available for evaluation for a 90 day period.

Category 3B: Insufficient Data – Potential Concern. Less than 5 samples are available for a seasonal sampling period, and one or more samples exceeds 130 Enterococci per 100 ml, or the Oregon Beach Monitoring Program has issued one or more advisories based on monitoring results for Enterococci in a seasonal sampling period, not including precautionary advisories.

²⁹ DEQ's assessment methodology for the 2012 Integrated Report is available here: http://www.oregon.gov/deq/WQ/Documents/Assessment/AssessmentMethodologyRep.pdf.

³⁰ In general, DEQ assesses based on enterococcus data collected from beaches as part of the Oregon Beach Monitoring Program. The OBMP currently collects data between late May and early September. Assuming that this remains the case, DEQ could only assess for attainment of the enterococcus standard during this time. If additional data outside this time period become available, DEQ would assess on all available data.

Category 2: Attaining. The geometric mean for samples collected over all 90 day periods for which there is at least 5 samples is equal to or less than 35 Enterococci per 100 ml and no more than ten percent of samples in any 90 day period is equal to or more than 130 Enterococci per 100 mL.

Freshwater Contact Recreation

As DEQ is changing the duration of the geometric mean *E. coli* criterion from 30 days to 90 days, DEQ will consider all data collected from a particular site over a 90-day period in assessing whether the water body is meeting the criterion with a minimum of 5 samples. As with the enterococcus criteria, if data collected from a site are taken over a greater than 90 days, a rolling geometric mean would be calculated for each 90 day period.

Category 5: Water Quality Limited, TMDL Needed (303(d) List) A 90-day geometric mean greater than 126 *E. coli* organisms per 100 ml based on a minimum of five samples, or more than 10% of the samples exceed 406 *E. coli* organisms per 100 ml, with a minimum of at least two exceedances.

Category 4: Water Quality Limited, TMDL Not Needed This category incorporates any waterbodies that were listed as impaired and for which TMDLs already have been approved or where other pollution controls would result in attainment of water quality standards. The proposed revisions are not expected to affect DEQ's evaluation of data in this category.

Category 3: Insufficient Data Less than five samples are available to evaluate for all 90 day periods, or five to nine samples are available for the season of interest with one sample exceeding 406 *E. coli* organisms per 100 milliliters. Category 3B: Insufficient Data – Potential Concern Less than five samples are available to evaluate for the season of interest, with two or more samples exceeding 406 *E. coli* organisms per 100 milliliters.

Category 2: Attaining The 90-day geometric mean is equal to or less than 126 *E. coli* organisms per 100 ml based on a minimum of five samples, and, if data from 10 or more samples are available, 90% of the samples are below 406 *E. coli* organisms per 100 ml. If data from five to nine samples are available, no exceedances of 406 *E. coli* organisms per 100 ml.

Public Involvement for this Rulemaking

DEQ held a series of meetings in Oct. 2015 to provide information to interested parties and to answer questions related to the rulemaking. These meetings took place in Coos Bay, Newport, Cannon Beach and Portland. The meetings were conducted jointly with OHA, which provided information related to adoption of the BAV for purposes of issuing advisories. Approximately 40 people attended the meetings, not including DEQ and OHA staff. Summaries of these meetings and meeting materials pertinent to the rulemaking are included in Appendix B.

DEQ also held meetings and phone conversations with individual stakeholders to answer questions relevant to their interests. Meetings included those with Oregon Farm Bureau, League of Oregon Cities, Oregon Department of Agriculture, Northwest Pulp and Paper Association and a representative of a commercial oyster grower.

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