

Focus on: Chelan River Use Attainability Analysis



Figure 1. A newly restored channel near the mouth of the Chelan River now supports spawning salmon (Photo: Chelan PUD)

Ecology is undergoing a rulemaking process to consider updates to Chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington. This focus sheet summarizes key information for this rulemaking.

What is a Use Attainability Analysis?

A Use Attainability Analysis (UAA) is a study of the factors that can affect whether a waterbody can meet the water quality goals established for it, also known as designated uses. Designated uses set goals to protect fish, shellfish, and wildlife, recreation, drinking water, agriculture and industrial uses, and navigation.

Federal regulations allow a state to change or remove a designated use only [under specific circumstances](#)¹, or factors. A UAA is an examination of how one or more of those factors might prevent a waterbody from attaining a designated use. A state cannot change or remove a designated use which is already an existing use. If a waterbody is meeting the designated use, a state cannot change or remove the use.

Why is Ecology considering a UAA for the Chelan River?

In December, 2019, Public Utility District No. 1 of Chelan County (Chelan PUD) requested Ecology consider a UAA for the Chelan River. The Chelan PUD operates the Lake Chelan Hydroelectric Project and must ensure the river is meeting water quality standards. However, the Chelan River has historically been too warm and had too low of dissolved oxygen to meet state standards.

State water quality standards have a [compliance schedule for dams](#)² that require dam owners to identify “all reasonable and feasible improvements that could be used to meet standards” (WAC 173-201A-510(5)(ii)). Then, “if an applicable water quality standard is not met by the end of the time provided in the attainment plan, or after completion of all reasonable and feasible improvements, the owner must take the following steps:

¹ <https://www.epa.gov/wqs-tech/use-attainability-analysis-uaa#factors>

² <https://apps.leg.wa.gov/WAC/default.aspx?cite=173-201A-510>

- Evaluate any new reasonable and feasible technologies that have been developed (such as new operational or structural modifications) to achieve compliance with the standards, and develop a new compliance schedule to evaluate and incorporate the new technology;
- If the water quality standards are still not met after the end of the compliance schedule or after completion of all reasonable improvements, the dam owner must “propose an alternative to achieve compliance with the standards, such as site specific criteria, conducting a UAA, or water quality offset.”³

As part of the request for a UAA, Chelan PUD has submitted a report to Ecology that demonstrates through studies over the last ten years that the natural conditions of the Chelan River prevent the river from meeting the water quality standards, and that the designated use established for the river cannot be attained based on the natural conditions. The next sections describe how Chelan PUD came to this conclusion.

Federal relicensing required Chelan PUD to make water quality improvements

In 2006, the dam was relicensed by the Federal Energy Regulatory Commission (FERC) and Ecology issued a Clean Water Act Section 401 Water Quality Certification as part of the relicensing. As required by the relicensing, Chelan PUD had to provide flow to the Chelan River, which had been diverted for hydropower for over 80 years. Chelan PUD was also required to research and implement improvements to the river, and conduct a 10-year monitoring and adaptive management program to evaluate how those improvements helped the river meet objectives for salmon spawning, survival, and habitat use. Specifically, the dam relicensing required:

- Setting biological objectives for salmon spawning, survival, and habitat use
- Restoring riparian habitat in the lower channel of the river, and rewatering the river where flows were previously diverted for hydropower use
- Monitoring and adaptive management for 10 years to determine what biological objectives were met, and why some objectives were not met

Based on the outcome of this work, Ecology would consider the need to modify the water quality standards for the Chelan River that aligned with the highest attainable designated use.

Chelan PUD UAA report conclusions

The [UAA report](#)⁴ from the Chelan PUD includes an assessment of the potential for the Chelan River to meet the current designated use for aquatic life and the associated water quality standards. The current designated use on the Chelan River was set without an evaluation of whether the use was existing or attainable in the river. The report is a culmination of the work the Chelan PUD conducted to improve water quality and habitat conditions and understand what is limiting the river from meeting the current goals.

The report includes recommendations for designated uses in the Chelan River that reflect the highest attainable designated uses for aquatic life.

Ecology considered the following conclusions from the UAA report for this rulemaking:

- Chinook salmon and steelhead are now spawning in the lower reach of the river after restoring river flows and surrounding habitat.

³ WAC 173-201A-510(g)

⁴ <https://fortress.wa.gov/ecy/ezshare/wq/standards/ChelanUAA.pdf>

- A large canyon with steep waterfalls through the middle part of the river prevents salmonids from swimming to upstream parts of the river to spawn. Spawning was only observed in the lower part of the river.
- Despite Chelan PUD increasing the flow of water from Lake Chelan to the river channel, the temperature of the river often exceeds 17.5 °C (63.5 °F) from mid-spring through mid-fall. The high temperature of the water is likely because very warm water from Lake Chelan feeds the headwaters of the Chelan River, and a lack of riparian habitat and large woody debris in the upper reaches of the river allows the river to continue to get warmer from exposure to the sun.
- The habitat conditions in the middle and upper sections of Chelan River do not support salmonids. This part of the river is characterized by gravel on the riverbed that is too large for spawning, limited prey availability, limited algae production, and overall stream structure that is not favorable for spawning.

What changes are Ecology proposing?

Ecology proposes revising the aquatic life designated use for the Chelan River, and updating criteria for temperature and dissolved oxygen to support the new designated uses. These new “site-specific criteria” would only apply to the Chelan River. We are also proposing a provision that prohibits any heat inputs to the river caused by human activity.

The current aquatic life designated use for the Chelan River is **salmonid spawning, rearing, and migration** for the entire four-mile stretch of the river. Ecology proposes dividing the river into two designated uses, based on the different conditions in the upper and middle sections (Reaches 1-3) and lower section (Reach 4) of the river:

- **Reaches 1-3:** migration for naturally limited waters
- **Reach 4:** salmonid spawning, rearing, and migration for naturally limited waters

“Naturally limited” means naturally occurring pollutants limit the river from fully supporting the biological needs of salmon. In the case of the Chelan River, naturally high water temperature is the naturally occurring pollutant.

Ecology is proposing changes to the designated use of the Chelan River because of the following two factors as described in the [federal regulations](#)⁵:

- Naturally occurring pollutant concentrations prevent the attainment of the use (40 CFR 131.10(g)(1))
- Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses (40 CFR 131.10(g)(5))

How did Ecology come up with the site-specific criteria for temperature?

In the UAA report, Chelan PUD calculated temperature criteria that would be protective of the proposed designated uses in Reaches 1-3 and Reach 4. To do this, they first had to understand the natural warming of the river as water flows from Lake Chelan to the Columbia River, using data collected between 2010 and 2019.

For Reaches 1-3 of the river, Chelan PUD used the temperature of the water that flows out of the dam into the river as the baseline, or background temperature. Then, they subtracted the temperature of the water at the

⁵ <https://www.law.cornell.edu/cfr/text/40/131.10>

end of Reach 3 to determine how warm the river gets in this section. Chelan PUD repeated the same process for Reach 4, calculating the solar heating from the end of the Reach 3 to the end of the restored habitat channel near the mouth of the river.

Chelan PUD based the maximum allowable heating on the difference in temperature between each of the two parts of the river. Ecology considered the information submitted by Chelan PUD, future potential changes in climate, and how often the statewide temperature criteria allows an exceedance. This information led to the following proposal:

- **Reaches 1-3:** No more than 3.75 °C increase from solar heating over the water body segment
- **Reach 4:** No more than 1.25 °C increase from solar heating over the water body segment

How did Ecology come up with the site-specific criteria for dissolved oxygen?

Ecology based the proposed dissolved oxygen criteria on monitoring data collected by Chelan PUD between June and August of 2015. This data suggests that water entering the Chelan River from Lake Chelan is slightly low in dissolved oxygen and that dissolved oxygen in lower sections of the river are higher than upper sections. Based on this information, Ecology proposes the following dissolved oxygen criteria:

- **Reaches 1-3:** Not to exceed 8.0 mg/L or 90% oxygen saturation
- **Reach 4:** Not to exceed 8.0 mg/L or 95% oxygen saturation

Oxygen saturation is the percentage of the maximum dissolved oxygen level a waterbody can hold at a given temperature. Ecology proposes a higher saturation level of oxygen in the lower section of the river to support the oxygen needs of spawning salmon.

Next steps

Ecology is taking public comment on the proposed changes until May 21, 2021. We will then review and respond to comments received. Our anticipated rule adoption date is August 4, 2021.

Related Information

- [Rulemaking webpage](#)
- [Press release](#)



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To request an ADA accommodation, contact Ecology by phone at 360-407-6600 or email at marla.koberstein@ecy.wa.gov, or visit <https://ecology.wa.gov/accessibility>. For Relay Service or TTY call 711 or 877-833-6341.