

GREEN/DUWAMISH AND CENTRAL PUGET SOUND (WRIA 9) IMPLEMENTATION TECHNICAL COMMITTEE



WRIA 9 Implementation Technical Committee Meeting

September 16, 2026 | 9:30 am – 11:30 am

[Join the meeting now](#) or call in (Teams audio only) **[+1 425-653-6586,,964865930#](#)**

Meeting ID: 231 836 952 578

Passcode: Us3c7LM3

9:30 Welcome & Introductions

9:45 The Effects of the Land Use Regulatory Framework on Stream Ecosystems in Unincorporated King County Watersheds

Presentation followed by Q&A

Jim will present a new report evaluating the effectiveness of the land use regulatory framework to protect stream ecosystems in rural, unincorporated King County. This analysis measured change in 12 aquatic environmental variables in nine study watersheds correlated with land cover change across 2008-2022. The full report is here:

<https://your.kingcounty.gov/dnrp/library/2025/kcr4180/kcr4180.pdf> and an

addendum analyzing riparian loss and permit compliance is here:

<https://your.kingcounty.gov/dnrp/library/2025/kcr4180/kcr4180-ADD.pdf>

Jim Bower,
King County
Water & Land
Resources
Division

10:30 Soos Creek Fine Sediment Total Maximum Daily Load

Presentation followed by Q&A

In April 2026, the EPA approved the Soos Creek Fine Sediment Total Maximum Daily Load (TMDL) water quality improvement plan. This TMDL addresses excess fine sediment in the Soos Creek watershed and provides a pathway for the restoration of the overall health of the watershed. Cleo and Teizeen will present the TMDL and watershed modeling. The TMDL webpage is here: <https://ecology.wa.gov/water-shorelines/water-quality/water-improvement/total-maximum-daily-load-process/directory-of-improvement-projects/soos-creek-watershed-fine-sediment-tmdl> and full report is here:

<https://apps.ecology.wa.gov/publications/SummaryPages/2510072.html>

Cleo Neculae &
Teizeen
Mohamedali,
Ecology

11:15 King County Recycled Water

Presentation followed by Q&A

Frank will present on the Regional Wastewater Service Plan update and opportunities to engage on the future of recycled water.

Frank Lyles,
King County
Wastewater
Treatment
Division

11:30 Adjourn

WRIA 9 ITC web page: <http://www.govlink.org/watersheds/9/committees/ImpleTechCmte.aspx>

Participant list:

Christina Neff, Cleo Neculae, Erik Rigaux, Erin Haley, Frank Lyles, Heidi Watters, Iris Kemp, Jackie Weber, Jim Bower, Jenn Stebbings, Jen Vanderhoof, Josh Kahan, Julian Douglas, Kathleen Hurley, Kollin Higgins, Marta Olson, Matt Goehring, Mike Mactutis, Mike Perfetti, Monica Walker, Nate Malmborg, Nik Novotny, Suzanna Smith, Sydney Kahn, Teizeen Mohamedali

The Effects of the Land Use Regulatory Framework on Stream Ecosystems in Unincorporated King County Watersheds

The goal of this study was to assess the bulk cumulative effect of all regulations occurring in unincorporated King County – critical area ordinance, stormwater runoff, clearing & grading, WDFW permits, ACOE permits, utility and road easements, etc. The study design was not intended to be diagnostic or to isolate effects from specific regulations, and results are limited by small sample sizes and relatively low levels of development across 2008 to 2022 in the studied watersheds. Regardless, this was a robust analysis that is driving current conversations about regulatory effectiveness.

The study used a Before-After-Control-Impact (BACI) design over six developed watersheds and three undeveloped watersheds in unincorporated King County. Researchers tried to select watersheds with similar geologies (glacial till, which is considered most sensitive to hydrologic changes), similar sizes, and similar elevations. They avoided watersheds with large lakes/waterbodies that might mask effects. Data were collected over two time periods: 2008-2012 and 2018-2022.

Twelve environmental response variables were assessed, including measures of stream hydrology, water quality, channel habitat complexity, and biotic communities. Hydrology, stream complexity, and habitat variables did not change across the two study periods, while temperature, biological (B-IBI), and wood count variables changed. Landcover changes across the study period were complex, with greatest effect in riparian areas. Wood recruitment was lower in developed watersheds but did not appear related to land cover change. Stream temperatures increased in developed watersheds but not in undeveloped watersheds. Average B-IBI decreased in developed watersheds and increased in undeveloped watersheds. Both temperature and B-IBI were related to land cover changes in regulated buffers including forest cover loss in developed watersheds.

In summary, at the watershed scale, regulations appear to ameliorate negative stream impacts. However, in regulated buffers, the regulations and/or enforcement of regulations are insufficient to mitigate impacts. These findings support the new 2025 Best Available Science recommendations to increase stream riparian buffer widths in fish-bearing and non-fish-bearing streams.

As an addendum to this study, a separate permit analysis was conducted. Researchers extracted all potential permits for parcels in the nine watersheds. They found that of 43 total acres of forest cover loss across 342 parcels, 77% occurred without permits. Most changes were small changes across many parcels, although seven parcels accounted for 21% forest loss (large

changes by a few landowners). Almost all (92%) changes were land conversion from forest to another pervious surface (e.g., trees to grass).

Q&A:

- What are implications of change/no change in B-IBI?
 - All the watersheds changed overtime, even the three control watersheds – it's impossible in our region to have a true reference – but those three control watersheds had only very minor changes over the past 80 years though they'd been logged prior to that. As forest stands transition to a later seral stage, would expect to see improved B-IBI scores.
- Beavers were a confounding variable in this study. Emerging research about beaver impacts on temperature, depending on geographical location and location in the watershed. In some cases, beaver dams have a moderating effect on temperature, in some cases they decrease stream temperatures. The assumption of ponding leading to more sun exposure leading to hotter water is not necessarily true – hyporheic increase produced by beaver dams and ponding can moderate or even cool water temperatures.

Further questions? Contact Jim at James.Bower@kingcounty.gov.

Soos Creek Fine Sediment Total Maximum Daily Load

Soos Creek is the largest tributary to the Green River. The TMDL was completed end of 2025 and approved by EPA April 2026. It split Soos Creek into subbasins and documented 10 Category 5 or 303(d) listings in all subbasins.

B-IBI scores for streams in Soos Cr are lower than reference streams (Puget Lowland ecoregion). The 10th percentile of reference stream distribution is a B-IBI score of 65. All Soos Cr subbasins are below that threshold. There are a few sites with Good & Excellent B-IBI scores that highlight potential for thriving under certain conditions.

Stressor identification pointed to three stressors:

- High pulse counts / stream flashiness
- Fine sediment from upland sources and instream erosion (clay, silt, sand smaller than 2mm diameter)
- Habitat degradation

Only one of those stressors (sediment) qualifies as a pollutant, but they are interrelated and all must be addressed. The TMDL implementation plan is intended to address all three.

The team developed and calibrated a watershed model to simulate hydrology and sediment processes which estimated total suspended solids (TSS) loads under forested conditions as a baseline and statistical analyses to understand relationships between B-IBI and land cover, flow

alteration, fine sediment, and TSS; these tools were used to establish sediment loading capacity/targets.

Progress will be tracked via implemented BMPs and the number of acres where flow is controlled and basic treatment of fines is provided. The TMDL does not include TSS monitoring at outfalls, which would be prohibitively onerous. The TMDL is 40 years with full implementation by 2066. Realistically, it is likely that water quality improvements will materialize more as runoff is progressively managed – improvements are unlikely to be linear.

Ecology intends to conduct periodic monitoring during implementation phase. It is possible that some places will experience restored water quality before TMDL allocations are fully achieved. If future monitoring shows B-IBI scores are consistently above threshold, the TMDL could potentially be considered satisfied and would shift focus to maintenance of BMPs over implementation.

Q&A:

- What distinguished Soos Cr from other tributaries as needing this action, given that lots of waterbodies have impaired water quality?
 - The project started in 2012. This is the first TMDL in Washington state based on B-IBI; the east coast had developed lots of TMDLs like this, and EPA Region 10 was interested in piloting a stormwater TMDL. EPA, Ecology, and King County agreed that Soos Cr was a good place to start as it had documented impairments, lots of B-IBI data, a calibrated model, simulated hydrology, and TSS data collected by the Muckleshoot Tribe.
- Given that B-IBI is based on cold, clear water and glacially fed systems are naturally much higher in fine sediment, is this transferable to other watersheds with more natural variability in sediment loads?
 - The stressors identified in this analysis are unique to Soos Cr. If something like this were done elsewhere, you could not assume the same stressors and would need to start from the beginning. This analysis modeled existing and reference conditions specific to Soos Cr and set targets relative to Soos Cr conditions. Targets would not be applicable to other watersheds.
- Jurisdictions have concerns over implementation costs and feasibility. Large-scale acquisition would be required to meet targets. Field data on sediment loads are only from the downstream portion of watershed – model extrapolates the rest.

Further questions? Contact Cleo at CNEC461@ECY.WA.GOV.

King County Recycled Water

There was no regional water quality treatment 60 years ago and water bodies were not swimmable or good habitat. King County adopted a comprehensive plan for wastewater (Regional Wastewater Services Plan, RWSP) in 1999 that provides policies that govern the regional wastewater system through 2030. The RWSP included a third treatment plant, CSO

control by 2030, conveyance system improvements, reducing inflow and infiltration, and continuing to recycle water and biosolids.

The Wastewater Treatment Division is working on updating the RWSP for the next 30 years (to 2060). The update is in early stages and intends to cover lots of subject areas including recycled water.

Recycled water (RW) = reclaimed water = reuse water. It is a safe water source that uses advanced treatment of wastewater to meet strict water quality standards. Irrigation and wetlands are the two primary current uses of RW, but it could also be used for commercial, groundwater recharge, and streamflow augmentation.

RW reduces reliance on Puget Sound for effluent discharge, provides drought-proof water supply, and supports conservation and recycling values. It's safe for food crops and plants love it. It reduces the need to pull water from the river or groundwater stores.

King County distributed 87M gallons of recycled water in 2025. South Plant (Renton) has a 1M gallon per day production capacity. It currently distributes 3M gallons per year which is about 0.1% of effluent recycled and distributed with the remaining discharged to Puget Sound.

The near-term focus for RW is on non-potable uses near existing RW infrastructure. Future possibilities could include environmental uses like wetland enhancement and groundwater recharge or serving agricultural users, such as farmers lacking water supply. The RWSP update will determine the scope of what is possible through 2060.

Opportunities for WRIA 9 to engage:

- Comment letter on the range of recycled water policy options fall/winter 2026
- Comment during the SEPA Scoping public comment period in early/mid 2027
- Stay engaged on recycled water policy discussions going forward 2027-2028

Q&A:

- Tukwila previously pursued RW for irrigation near Starfire. One thing that would have to be addressed is cost. Consider feasibility study in Tukwila.
 - WTD remains interested and excited in this option to reduce Green River water withdrawals. There is an existing pipeline to Foster Golf Course, which received RW in 2022 when their river pumps broke. There is a perception that Green River water is free whereas RW has a cost. But there are costs associated with using river water as well.
- What is the timeline for the comment process through SEPA?
 - Outreach team will provide info. All sewer agency members will be notified and get community engagement. Expect first half of 2027.
- Is there existing infrastructure that could move water all the way to Green River APD? How much would that cost?

- No feasibility done yet – targeting next year for conversation. Right now the choice is business-as-usual or do-more, and WTD is in brainstorming phase.
- Is there a difference between recycled water and reclaimed water?
 - The legal term in WAC is reclaimed water. WTD has found in community engagement efforts since late 1990s that community better understands and prefers the term recycled water. Other states also sometimes call it reuse water. They are all the same thing, just different terms.
- How is RW used for wetland enhancement?
 - WTD has a current example near Carnation. 100% of Carnation treatment plant is treated to RW standards and then released into Chinook Bend Natural Area. The site used to be a dairy farm and very degraded area. Releasing water and other site improvements were done in an effort to restore wetland function. It's case-by-case specific. Ecology requirements that must be met for water quality to discharge to wetland depends on characteristics of wetland.
 - Jen V. (King County Science) has done a lot of monitoring at that wetland, which is about 3 times bigger than historically and has lots of beavers.
- What about pharmaceutical residue concerns?
 - WTD did a study that showed pharmaceuticals and CECs are present in low levels in RW. But, you would need to eat incredible amounts to be exposed to a single dose – for example, 22k lbs of kale to get one dose of ibuprofen.
 - Impact at these levels to aquatic organisms unknown, but likely lower impact than other sources of CECs in watersheds.
- Most reclaimed water endeavors use class B – does WTD use class A?
 - WTD produces class A at all three treatment plants – South, Brightwater, Carnation – and majority of permit holders in WA state are producing class A. There is a current pilot study with partners in Olympia looking at going beyond class A to potable water – the first study in WA state.

Further questions? Contact Frank at flyles@kingcounty.gov.