1.4.10: Revetments

Current Condition

Figure 26. Sinnema Quaale Project Overview, 2015[1]

The Snoqualmie River runs for 27 miles within the Snoqualmie Valley Agriculture Production District (SVAPD), creating 54 miles of riverbank. King County flood protection facilities[2], in the form of revetments and levees, cover 21 of 64 miles of Snoqualmie riverbank. See Map 15.

These 131 levees and revetments in the King County River Facility Inventory are inspected every other year or after a big flood in order to observe the physical condition of facilities.

There are also an unknown number of private revetments along the river in the SVAPD. Many landowners struggle to know how to maintain or create a revetment because it is not mentioned in permitting information or in code.

Flood protection facilities protect infrastructure such as roads, bridges, homes, and businesses. However, they are not put in to protect only farmland. While many revetments do protect farmland as a secondary purpose to protecting infrastructure, 300 agriculture acres were impacted by flooding in Cherry Creek, and because there's no infrastructure present, there's no way to get a revetment to reduce flooding.

Concerns continue to exist about sediment deposits that affect farmlands from Capital Improvement Projects (CIP). Removal of revetments causes banks to erode and can affect the way sediment and water move through downstream farmlands. As a result, King County addresses this risk with an adaptive management approach to remedy any unintended consequences.

Flood protection facilities along roadways in the SVAPD can have significant benefits for farmland or farm transportation corridors such as in the case of the Sinnema Quaale Upper Revetment Repair Project[3] completed in 2016 (see Figure 26) and the Dutchman Road Revetment Repair Project[4] with planned construction in 2024 (see Map 14).

Desired Condition by 2046

Revetments in the APD are repaired and improved to minimize erosion of farmland, prevent loss of road or bridge access or farmland productivity. Farm properties without revetments are able to implement flexible bank stabilization programs with harvestable or income generating buffers that do not create net loss of ag land.

Timeline

2023

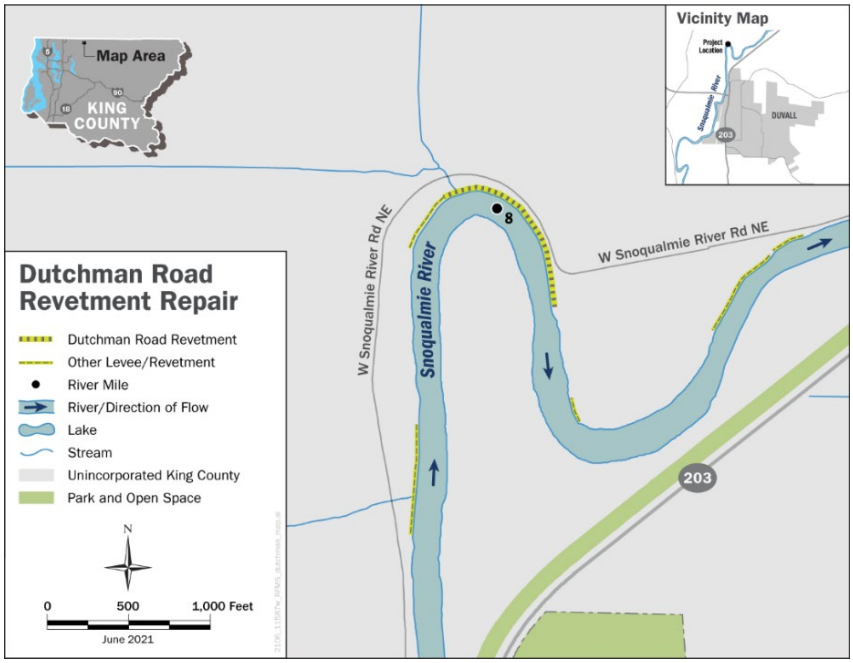
- Correct disparity that includes urban but not rural streams in the flood hazard management plan, and add rural streams, so that "agricultural bank stabilization and berms" are permitted, rather than having to qualify as a "habitat berm".
- In the Flood Hazard Management Plan, protect the farm sector by prioritizing maintenance projects that will protect agriculture or have an agriculture benefit.
- In the Flood Hazard Management Plan, within agricultural land protections, prioritize Farmland Preservation Program properties, farmable agriculture lands, and food production.

2024

- Pursue multi-benefit projects for sediment removal in the Snoqualmie River for levee repair and levee setbacks that also reduce flooding on farms and may free comprehensive storage for farm pads.
- Conduct and Complete Channel Migration Zone study and map.
- Conduct outreach to farmers and landowners to identify additional areas in need of revetments or buffer planting.
- Coordinate with RFMS to elevate priority of vulnerable revetments in the APD for maintenance and repair.
- Protect the farm sector by changing King County Code to include farmable agricultural land as business "infrastructure" so that it can be protected by revetments and allowed for emergency repair.
- Post monitoring reports of revetment work to be public facing.

2025

Map 14. Dutchman Road Revetment Repair Project[5]



- Utilize Channel Migration Zone study to identify banks at risk of erosion.
- Revetments on private land have process guidance, clear permitting, and funding support to accomplish projects.
- Conduct cost/benefit analysis of bank stabilization techniques.
- Stabilize banks with working buffers, USDA Conservation Reserve Enhancement Program (CREP), or flexible, multi-tiered incentivized riparian buffers to reduce erosion.
- Secure multi-benefit partnerships and long-term funding from King County Stormwater Management (SWM), the King County Flood Control District, special district assessments, and multi-benefit project grants such as Floodplains by Design and the Family Forest Fish Passage Program (FFF2P), etc. to increase capacity for revetment maintenance in tandem with fish habitat and flood improvement projects.
- Study and inventory private revetments within SVAPD, amount of ag land at risk from private revetment failure, and when possible, determine how long have they been there, and ownership.

2026

- Create agricultural bank protection plan to prioritize protection of farmable land by protecting with or removing revetments, adding buffers, and ensuring little or no impact to agricultural farmable acreage.
- Reduce cost to landowners through creating or increasing cost-share programs to further help with farmer/landowner buffer planting, maintenance, and monitoring costs.
- On agricultural farmable properties, add private revetments to property title as critical agriculture infrastructure.

Background	Service Providers	Priority
King County Flood Control District (FCD) provides policy and oversight for flood hazard reduction projects and programs. FCD develops 6-year capital improvement program project list[6], including projects to repair and improve levees and revetments. Projects are sequenced based on policies and flood risk criteria contained in Flood Hazard Management Plan. • Proposed based on risk to public safety, public infrastructure, impacts on economy.	Lead: • KC WLRD: Rivers and Floodplain Management Partners: • SVWID • KC Flood Control District • KC Stormwater Services	*MEDIUM*

- Prioritized based on readiness, partnerships, external funding, and legal responsibility.

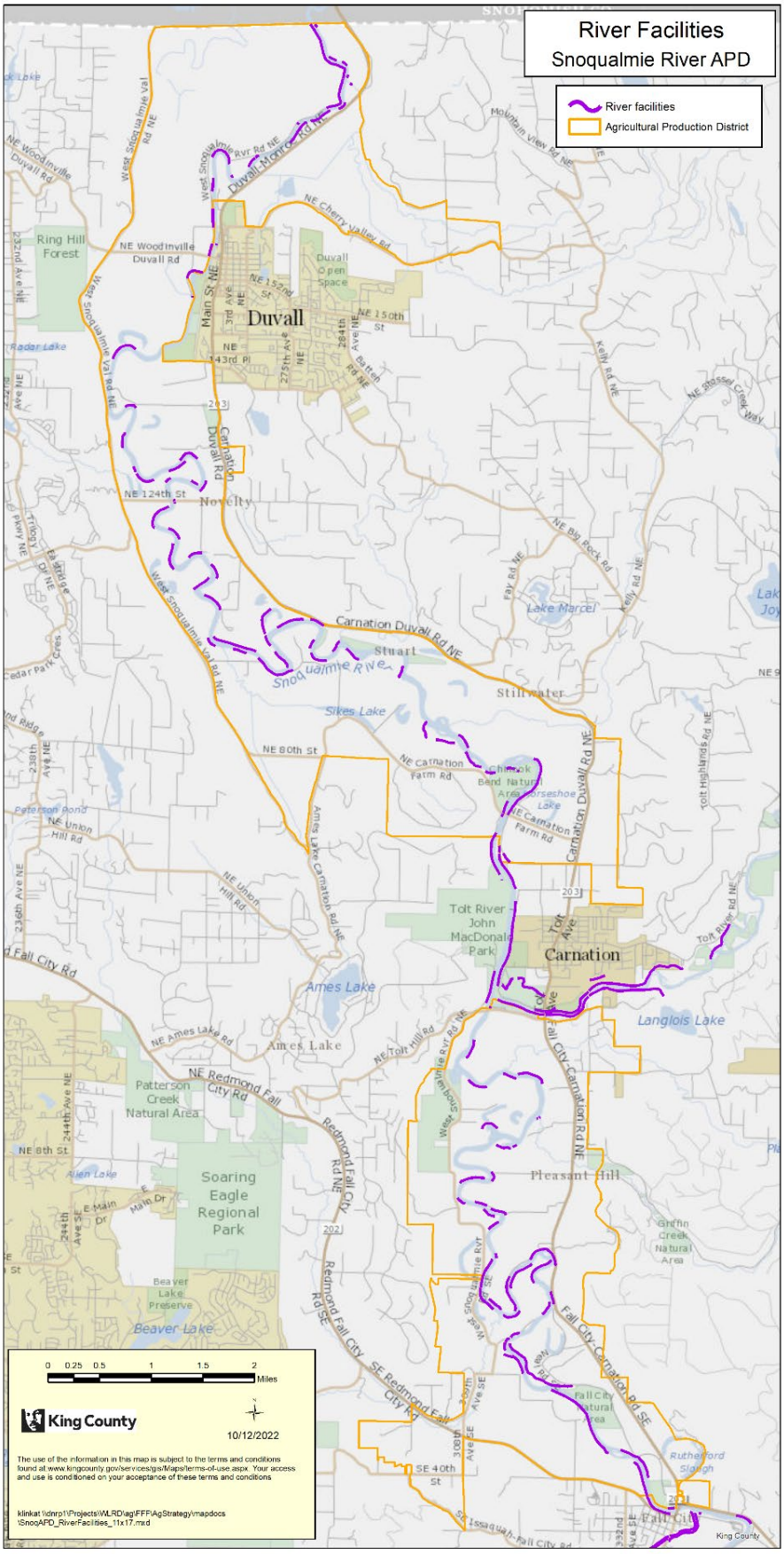
New facilities are regulated under King County Code K.C.C. 21A.25.170[7] and are only allowed under limited circumstances, i.e., public roadways, sole access routes, residual structures at imminent risk.

King County Rivers and Flood Management implements the work of the FCD.

Strategies

- Policy Support
  - Secure multi-benefit partnerships and long-term funding from King County Stormwater Management (SWM), the King County Flood Control District, special district assessments, and multi-benefit project grants such as Floodplains by Design and the Family Forest Fish Passage Program (FFF2P), etc. to increase capacity for revetment maintenance in tandem with fish habitat and flood improvement projects.
  - Pursue multi-benefit projects for sediment removal in the Snoqualmie River for levee repair and levee setbacks that also reduce flooding on farms and may free comprehensive storage for farm pads.
  - Protect the farm sector by changing King County Code to include farmable agricultural land as business "infrastructure" so that it can be protected by revetments and allowed for emergency repair.
  - In the Flood Hazard Management Plan, protect the farm sector by prioritizing maintenance projects that will protect agriculture or have an agriculture benefit.
  - In the Flood Hazard Management Plan, within agricultural land protections, prioritize Farmland Preservation Program properties, farmable agriculture lands, and food production.
  - Conduct and Complete Channel Migration Zone study and map; Utilize Channel Migration Zone study to identify banks at risk of erosion.
  - Coordinate with RFMS to elevate priority of vulnerable revetments in the APD for maintenance and repair.
  - Allow "agricultural bank stabilization and berms" as a permitted activity, rather than having to qualify as a "habitat berm".
  - Revetments on private land have process guidance, clear permitting, and funding support to accomplish projects.
  - Conduct cost/benefit analysis of bank stabilization techniques (FFF 1.0).
  - Study and inventory private revetments within SVAPD, amount of ag land at risk from private revetment failure, and when possible, determine how long have they been there, and ownership.
  - Create agricultural bank protection plan to prioritize protection of farmable land by protecting with or removing revetments, adding buffers, and ensuring little or no impact to agricultural farmable acreage.
  - On agricultural farmable properties, add private revetments to property title as critical agriculture infrastructure.
  - Expand agricultural input into updates on the Surface Water Design Manual to ensure it matches situations on farms and does not create undo financial burden especially when making farm infrastructure improvements.
- Outreach and Education
  - Conduct outreach to farmers and landowners to identify additional areas in need of revetments or buffer planting.
  - Continue to ensure adjacent landowners are protected from any negative impacts from King County maintaining, re/moving, or constructing revetments and that funding is provided for monitoring and repairs (FFF 1.0).
  - When feasible, post monitoring reports of revetment work to be public facing.
  - Stabilize banks with working buffers, USDA Conservation Reserve Enhancement Program (CREP), or flexible, multi-tiered incentivized riparian buffers to reduce erosion.
  - Reduce cost to landowners through creating or increasing cost-share programs to further help with farmer/landowner buffer planting, maintenance, and monitoring costs.

Map 15. King County levees and revetments in the SVAPD[8]



[1] King County Department of Natural Resources and Parks, "Sinnema Quaale Upper Revetment Analysis and Repair Project" [LINK]. Last updated March 15, 2021. Accessed 9/19/2022.
[2] King County Code 21A.06.492, "Flood Protection Facility definition". [LINK]. Accessed 9/19/22.
[3] King County Department of Natural Resources and Parks, "Sinnema Quaale Upper Revetment Analysis and Repair Project" [LINK]. Last updated March 15, 2021. Accessed 9/19/2022.
[4] King County Department of Natural Resources and Parks, "Dutchman Road Revetment Repair Project" [LINK]. Last updated December 8, 2021. Accessed 9/19/2022.
[5] King County Department of Natural Resources and Parks, "Dutchman Road Revetment Repair Project" [LINK]. Last updated December 8, 2021. Accessed 9/19/2022.
[6] King County Flood Control District, "2022 Six-Year Capital Improvement Program: Final Adopted". [LINK]. Accessed 9/19/22.
[7] King County Code 21A.25.170, "Shoreline Stabilization". [LINK]. Accessed 9/19/22.
[8] King County Department of Natural Resources and Parks, "Levees and Revetments: King County, Washington" [LINK]. Last updated June 29, 2015. Accessed 9/19/2022.