SNOQUALMIE VALLEY AGRICULTURAL STRATEGIC PLAN

Public Review Draft, May 2023

SVAPD Agriculture Task Force

Abstract

The SVAPD Agriculture Task Force, made up of farmers and industry professionals in the commercial farm sector drafted the plan over four years to elevate the land resource needs for farmers in the SVAPD, policy makers and service providers alike, to understand the agriculture needs based on facts, implement the solutions, and gain the results needed in the next 25 years. From drainage to climate change to farmland preservation, this plan has 17 short issue papers and 283 strategies to achieve the desired condition for each issue.

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SVAPD Agriculture Land Resource Strategic Plan

Executive Summary

This plan's scope of work was created by **Fish, Farm, Flood (FFF)**,[1] but it is also **a stand-alone agricultural plan** to guide support for agricultural needs[2] in the Snoqualmie Valley Agriculture Production District (SVAPD) over the next 25 years. In March 2019, the Agriculture Task Force was formed and convened by King County Agriculture Staff. The task force worked on the problems facing the commercial farming sector in the SVAPD in managing the agriculture land resource for farming productivity. The task force brings experience from farmers and industry professionals in the commercial farm sector:

- farmer organizations: SnoValley Tilth and Snoqualmie Valley Preservation Alliance,
- agency agriculture policy advisors: King County Agriculture Commission,
- special purpose districts: Snoqualmie Valley Watershed Improvement District and King Conservation District,
- educational institutions: Washington State University Center for Sustainable Agriculture and Natural Resources,
- and the FFF Implementation Oversight Committee (IOC).

The Task Force Scope of Work[3] laid out two main goals for the plan:

1) *Improve the long-term productivity of farmland, bring more acres into production, especially food production, and increase opportunities for farmers to develop the necessary infrastructure to support or increase their farm businesses*

2) *Propose acreage to permanently protect for farming* (also called out in Recommendation 32 and Farm 4 of the FFF agreement[4]).

The **vision of this plan** is to elevate the land resource needs for infrastructure, policy, and regulatory improvements for commercial farmers in the SVAPD and King County so that farmers in the APD, policy makers and service providers can understand the agricultural needs based on facts, implement the solutions, and gain the results needed in the next 25 years.

The result is the Agriculture Task Force's recommendations that tackle the two goals of **Improved Farmland Productivity** and **Increased Farmland Protections** through 9 sub-goals and 17 short issue papers. The issue papers break out:

- the *current condition* of the issue through available data or original research,
- *background* information on the issue,
- the *desired condition* to achieve by 2048,
- as well as *strategies* to achieve that condition and
- a *timeline* to do so, and list the
- *service providers* to accomplish the work, and

- a designated *priority* to accomplish the work.

The Task Force has compiled **new and existing data** to highlight the composition of the SVAPD Agriculture Sector in order to share clear information **about the commercial farm enterprises and their land resource needs**. For example,

> The rich, deep, irreplaceable soils, soil health,[5] and the level valley floor of the Snoqualmie Valley Agriculture Production District (SVAPD) have been the location for a thriving agriculture sector for 175 years. The SVAPD is now home to 214 commercial farm enterprises[6] that are the foundation of the current agriculture economic sector. 160 or 75% of these farm operations own the land on which they farm. The majority by far of these farmland owners identify as White, but several identify as Asian. Another 54 operations or 25% lease the land on which they farm. Of the operations that lease land to farm, at least 21 are Hmong owned businesses, 15 are new or beginning businesses (operators farming 10 years or less), one is a Black owned business, and 17 are by experienced operators that are likely White owned businesses. With a quarter of operations leasing land to farm by a majority of socially underserved farmers, land access is an equity and social justice concern.
>
> The SVAPD is the 2nd largest APD by acreage and contains 35% of King County's total acreage farmed for food. The 214 operations currently farm on 7,417 acres with an additional 201 acres in farm infrastructure such as homes, barns, other ag buildings, and farm access roads, leaving only 1,060 acres fallow, but farmable in the SVAPD. Within this zone there are 8,668 farmable[7] acres and 6,263 unfarmable[8] acres.

Acreage: what we found, what we recommend & how we compensate for this inevitable loss

The Task Force found very little available quality acreage to replace existing farmable acreage converted to other uses, and verified that nearly every farm is confronted with immediate infrastructure needs, so to compensate for the loss of farmable land to other uses, the Task Force Acreage Recommendation is to:

1. **Increase the productivity of 8,668 farmable acres through infrastructure improvements and protections** as captured in strategies and timelines within Issue Papers 1-17 in the Plan,

2. **Expand the APD** to the Southwest by 278 farmable acres to preserve additional farmable land and valuable habitat, and

3. **Gain Regulatory Relief** to permit more agricultural infrastructure improvements on farmable land while quickening the pace and lowering the cost.

4. **Ensure predominant use of agriculture in the SVAPD by protecting at least 7,696 farmable acres to be permanently preserved** within the next 25 years to and long-term, commercial agriculture viability in the SVAPD.

5. **Target eligible 3,789 farmable acres currently unprotected by FPP** with King County's Farmland Preservation Program deed.

Significant funding and action are needed to improve farmland productivity through 283 strategies, beginning with the highest priority issues. Some of the strategies are easily accomplished and some will need multi-benefit collaboration, political willpower, and financial support.

While farms in the SVAPD are under immense pressure, additional pressure from Covid recovery, labor shortages, regulations for food safety, energy costs, and changing markets, this strategic plan focuses on the land resource and infrastructure needs that are also part of the pressure equation. Farmers need the ability to be flexible, to immediately change and react to pressures in order to succeed. Farmers also need regulatory improvement and flexible agriculture support systems to meet these changes. Without immediate attention to these issues within the SVAPD, the farming sector is under threat.

In acknowledging the evolution of this landscape and human history, we know the future must be collaborative. We look forward to working more closely with our environmental partners, staff from local Tribes, and County and State government to partner and accomplish multi-benefit projects. Ag lands are an integral part of the ecosystem, ag lands and habitat often border one another, and we have to work together to weather population growth and climate change impacts on the natural and agricultural environment.

[1] In 2013, King County, the Tulalip Tribes, the Snoqualmie Tribe, several cities, multiple organizations and agencies, including farmers representing the King County Agriculture Commission, Snoqualmie Valley Preservation Alliance and later the Snoqualmie Valley Watershed Improvement Project and Sno-Valley Tilth joined forces to work on improving the Snoqualmie Valley APD landscape together through **Fish, Farm, Flood (FFF)**. One missing element needed in this work was a strategic plan for the agriculture land resource to complement and equal the balance of the strategic plans for Salmon Recovery and Flood Hazard Management and their implementation. So, in the FFF initial agreement and recommendations to the King County Executive in June 2017, was the creation of the Agriculture Strategic Plan Task Force.
See Snoqualmie Fish, Farm Flood for more information on this group and their work [LINK]. Accessed 1/19/23. Especially Snoqualmie Fish, Farm Flood, "Final Agreement Package," June 12, 2017. [LINK]. Accessed 1/19/23. Page 14-19 [59-64].
[2] For more information about the other two plans that the Ag Strategic Plan is seeking to balance within FFF, see the Salmon Recovery Plan: Snohomish Basin Salmon Recovery Forum. June 2005. Snohomish River Basin Salmon Conservation Plan. Snohomish County Department of Public Works, Surface Water Management Division. Everett, WA. [LINK]. Accessed 1/19/23. And the Flood Hazard Management Plan: King County. 2013. *2013 Flood Hazard Management Plan Update: King County, Washington*. King County Department of Natural Resources and Parks, Water and Land Resources Division. Seattle, Washington. [LINK]. Accessed 1/19/23.
[3] Snoqualmie Fish, Farm Flood, "Final Agreement Package," June 12, 2017. [LINK]. Accessed 1/19/23. Page 14-19 [59-64].
[4] Ibid. Page 7 [21] and Page 11 [37].
[5] For more information on what soil health is and its importance, see the USDA NRCS [LINK]. Accessed on 2/14/23.
[6] King County Agriculture Program research conducted in 2019 by King County intern based on Current Use Agriculture Tax Enrollment, Commercial Farm listings such as Sno-Valley Tilth's Directory and Puget Sound Fresh, local farm knowledge by task force members and King County staff.
[7] Farmable classification is land that can be readily farmed. Farmable includes the sub-categories of currently farmed, fallow, and agriculture infrastructure.
[8] Unfarmable classification is land that can never be farmed again. Unfarmable includes the sub-categories of unfarmable (steep slope, forested, wetland, lakes, right of ways, non-ag buildings, recreation) mainstem, oxbow or channel, and roads+misc.

Acknowledgements

The task force brings experience from farmers and industry professionals in the commercial farm sector:

- farmer organizations: SnoValley Tilth and Snoqualmie Valley Preservation Alliance,
- agency agriculture policy advisors: King County Agriculture Commission,
- special purpose districts: Snoqualmie Valley Watershed Improvement District and King Conservation District,
- educational institutions: Washington State University Center for Sustainable Agriculture and Natural Resources and WSU Puyallup Research and Extension Center,
- and the FFF Implementation Oversight Committee (IOC).

The task force members and represented organizations and agencies (see table below) contributed 4 years to this process through volunteer hours, paid staff time, board updates, and unwavering commitment to represent the Snoqualmie Valley Agriculture Production District with a united vision for improvements and protections to the commercial agriculture sector for the next 25 years.

Agriculture Strategic Plan Task Force	
Name	**Affiliation**
Patrice Barrentine, Coordinator	King County Water & Land Resources Division
Janet Keller, Jordan Jobe, Carrie King	King County Agriculture Commission
Andrew Stout Erin Ericson, alternate	Snoqualmie Valley Watershed Improvement District
Janet Keller Lauren Silver, alternate	Snoqualmie Valley Preservation Alliance
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Jordan Jobe	Washington State University Center for Sustainable Agriculture and Natural Resources and Puyallup Research and Extension Center
Carrie King	King Conservation District
The task force would also like to recognize task force members who served earlier in the process including: Nayab Khan - Ag Commission, Cynthia Krass - SVPA and SVWID alternate, Marie Shimada - SVPA alternate. And later in the process, such as the addition of Carrie King – KCD.	

Technical experts answered our questions, shared information and data, met with us, conducted new research with us, managed GIS research and made innumerable maps for us.

Technical Experts

Todd Klinka (KC IT, GIS)

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Many times, during the course of this work, we have needed support for budget, staffing, timelines, expertise, coordinating with Fish, Farm, Flood, and more. These folks were invaluable in making what we needed happen time and time again.

Additional Fish, Farm, Flood Support

Richard Martin (KC WLRD)

Beth LeDoux (KC WLRD)

Tamie Kellogg (Kellogg Consulting)

Melissa Borsting (KC WLRD)

Joan Lee (KC WLRD)

Janne Kaje (KC WLRD)

Josh Baldi (KC WLRD)

Cover Photos
Audra Mulkern

This plan was funded by the King County Agriculture Commission with meeting space donated by SVPA

SVAPD Agriculture Land Resource Strategic Plan
Overview

The Plan starts with a vision statement describing the desired future for the Snoqualmie Valley Agriculture Production District Agriculture Land Resource.

The Vision of this plan is to elevate the land resource needs for infrastructure, policy, and regulatory improvements for commercial farmers in the SVAPD and King County so that farmers in the APD, policy makers and service providers alike, can understand the agricultural needs based on facts, implement the solutions, and gain the results needed in the next 25 years.

It also emphasizes guiding **principles** (see Appendix A) as well as **key values and themes** incorporated while achieving the vision and accomplishing **two overarching task force goals** from the Fish Farm Flood 1.0 agreement:

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*1) Long-term **farmland productivity**, with more acres in production, especially food production, and increased opportunities for farmers to develop the necessary infrastructure to support or increase their farm businesses.*

*2) Sufficient acreage of **permanently protected farmland** for a viable farming sector (FFF rec #32).*

Key values and themes incorporated into the plan highlight the lens through which the task force has developed goals and objectives including:

1. responsible stewardship/sustainable farming,
2. flood and climate change preparedness,
3. equity and social justice,
4. multi-benefit projects,
5. innovative thinking,
6. regulatory certainty,
7. resource investments, and
8. alignment with related plans and programs.

The plan has important links to and works to support other **plans, programs, organizations, and agencies** including:

- King County Plans
  - Comprehensive Plan and NEKC
  - Farm Fish Flood 1.0
  - Flood Hazard Management Plan
  - Local Food Initiative
  - Land Conservation Initiative

- Strategic Climate Action Plan

- Organization/Agency Strategic Plans, Missions, Programs
  - King Conservation District
  - King County Agriculture Commission
  - Snoqualmie Valley Preservation Alliance (SVPA)
  - Snoqualmie Valley Watershed Improvement District's (SVWID) / Wetness Prioritization Plan
  - SnoValley Tilth
  - The Tulalip Tribes Beaver Project
  - USDA Natural Resources Conservation Service (NRCS)
  - WSU Food System Program, CSANR, and Puyallup Research Center
  - WA State Department of Agriculture
  - WA State Department of Fish and Wildlife

The plan provides goals and sub-goals, objectives and measures, issue papers, and references.

Goals articulate the conditions we will create in the Snoqualmie Valley Agriculture Production District Agriculture Land Resource by 2046.

1. **Improved Farmland Productivity**
2. **Increased Farmland Protections**

A. It also includes nine **Sub-goals** (see Appendix B) on these topics:
   1. **Drainage**
   2. **Transportation**
   3. **Irrigation**
   4. **Flood safety**
   5. **Climate change**
   6. **Population growth and development**
   7. **Wildlife**
   8. **Farmland preservation**
   9. **Proposed farmable acres for a long-term, viable agriculture sector**

B. **Objectives** measure progress toward each sub-goal. See the table in Appendix C.

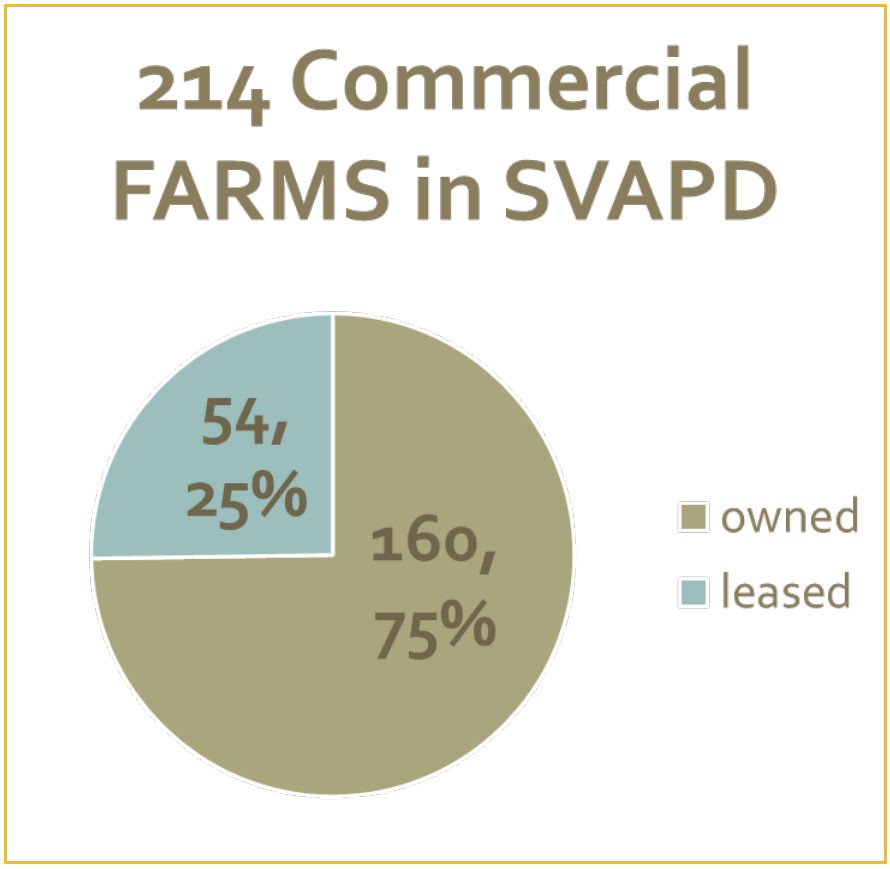
C. **Issue papers** include **17** farmland resource challenges arranged under the two main goals and each of the 9 sub-goals. They are numbered according to the goal number, sub-goal number, issue number. The issue papers contain specific action recommendations that planners and service providers will need to implement the plan.

D. The plan also includes **tables** that delineate and connect **issue papers and individual strategies with their values and themes as well as with their aligned plans, programs, organizations, and agencies.** See tables in Appendix D-G.

A. Introduction and Profile of the Commercial Agriculture Sector in the SVAPD

Current Condition

Figure 1. # Of Commercial Farms in SVAPD



Commercial farms leased and owned, demographics

The rich, deep, irreplaceable soils, soil health,[1] and the level valley floor of the Snoqualmie Valley Agriculture Production District (SVAPD) have been the location for a thriving agriculture sector for 175 years. The SVAPD is now home to 214 commercial farm enterprises[2] that are the foundation of the current agriculture economic sector. 160 or 75% of these farm operations own the land on which they farm. The majority by far of these farmland owners identify as White, but several identify as Asian. Another 54 operations or 25% lease the land on which they farm. Of the operations that lease land to farm, at least 21 are Hmong owned businesses, 15 are new or beginning businesses (operators farming 10 years or less), one is a Black owned business, and 17 are by experienced operators that are likely White owned businesses. With a quarter of operations leasing land to farm by a majority of socially underserved farmers, land access is an equity and social justice concern.

Acreage by crop type, scale of operations, and primary markets

The SVAPD includes three dairies, numerous u-pick berry and flower farms, small-scale livestock operations that raise meat, eggs and/or fiber, as well as operations that grow dozens of varieties of vegetables. These farm operations by acreage are primarily forage, livestock, vegetable and berries, and flower production in decreasing order.

From 1900-1950, dairies were the cornerstone of the ag sector in the APD. Today, the three remaining dairies sell to distributors, who then sell directly to the public.

Desired Condition by 2048

The Snoqualmie Valley Agricultural Production District is home to a thriving, diverse agriculture sector dedicated to improving and preserving farmable acres to optimize productivity, especially food production, today and for future generations.
Farmer/landowners have a shared focus and understanding of strategic farmland productivity needs and priorities, how to accomplish infrastructure improvements and preservation through service providers, committed long-term funding, regulatory advocacy, and multi-benefit partnerships. The collaboration and engagement between farmer/landowners and service providers routinely yields strategic plan results.

Timeline

2023
- Adopt the plan

2025
- Review plan progress and adaptively manage

2030
- Review plan progress and adaptively manage

2035
- Review plan progress and adaptively manage

2040
- Review plan progress and adaptively manage

2045-8
- Review plan progress, summarize progress, recommend next steps

However, the majority of farm businesses by number grow specialty crops (vegetables, berries, flowers, etc.) on small-scale farms consistent with the County's USDA NASS report of most farms being 1-9 acres or 10-49 acres in size,[3] and sell directly to the public. Farm stands, community supported agriculture (CSA), farmers markets, restaurants, and agri-tourism options are important business for these farms. King County boasts the strongest farm-direct marketplace in the state, with King County farmers markets reporting farm vendor sales of $16.6 million in 2021.[4] All of the SVAPD farms sell locally, whether to King County, Puget Sound, or Washington State customers.

Economic and employment indicators

There is no surprise that economic data for this small sub-region does not exist beyond the USDA NASS report for King County, as a whole, showing a market value of agriculture products sold as a minimum of $135,464,000.[5] Research was conducted to garner the economic impact of the SVAPD ag sector through agriculture support services and businesses for the surrounding zip codes of the SVAPD by soliciting state business listings by agriculture North American Industry Classification System (NAICS) codes.[6] However, the resulting business support service listing was inconclusive due to out-of-date information because business licensing can be renewed even when a business is no longer operating.

In 2010, Skagit County cites 1.5 or smaller as the likely economic multiplier for agriculture in their county.[7] If we use the economic multiplier 1.5 multiplied in correlation with King County's total agriculture sales of $135,464,000, that would translate into $203,196,000 of economic activity generated from agriculture in King County – an additional $67,732,000 beyond reported sales, from agricultural support services. Economic multipliers are tricky and the scale of agriculture production as well as markets are very different between Skagit and King Counties. However, this helps provide some context on the potential overall economic importance and impact of the local agriculture sector.

Looked at another way, King County has a total of 40,000 farmed acres with 25,000 acres being farmed for food. By taking King County's total agriculture sales of $135,464,000, and dividing that by 40,000 total farmed acres, and assuming all agricultural products are the same value, a per acre/sales value would equal roughly $3,387 and would then have an economic value in the SVAPD of $29,355,049. As mentioned above, the SVAPD has a majority of high value specialty crops known to make as much as $30,000/acre in sales. If we calculate $30,000/acre in sales for half of the SVAPD's farmable acreage and $3,387/acre for the other half of the acreage the total sales would be $144,697,524 or about ten million more than the self-reported number of total King County agriculture sales to USDA NASS. If we multiply the 1.5 economic multiplier with these estimated total sales, we have generated $217,046,287 of agriculture economic activity – an additional $72,348,762 beyond estimated sales.

Based on conversations with a subset of farming operations in the SVAPD, the SVAPD's 214 farm operations employ as many as 467 people year-round and an additional estimated 2,140 jobs seasonally.[8] If year-round jobs are calculated at $25-40/hour this equates to roughly $2.4 - 3.9M, and an additional estimated $20.5M in seasonal wages at $20/hour for twelve weeks,[9] for an estimated total of about $23.7M annually in economic activity from wages.

Acreage currently farmed and infrastructure

The SVAPD is the 2nd largest APD by acreage and contains 35% of King County's total acreage farmed for food. The 214 operations currently farm on 7,417 acres with an additional 201 acres in farm infrastructure such as homes, barns, other ag buildings, and farm access roads, leaving 1,060 acres fallow but farmable in the SVAPD. Within this zone there are 8,668 farmable[10] acres and 6,263 unfarmable[11] acres.

Challenges being felt by these commercial farmers

While farms in the SVAPD are under immense pressure, additional pressure from Covid recovery, labor shortages, regulations for food safety, energy costs, and changing markets,

this strategic plan focuses on the land resource and infrastructure needs that are also part of the pressure equation. Farmers need the ability to be flexible, to immediately change and react to pressures in order to succeed. Farmers also need regulatory improvement and flexible agriculture support systems to meet these changes. Without immediate attention to these issues within the SVAPD, the farming sector is under threat.		
Background	**Service Providers**	**Priority**
Where is it? What is it? Why it matters? The Snoqualmie Valley Agricultural Production District (SVAPD) encompasses 14,931 acres and is located along the Snoqualmie River in North Central King County, Washington. It is an hour's drive east of Seattle and stretches north from the unincorporated town of Fall City to the city of Carnation, extending north from Carnation to the city of Duvall and then further north to the county line with Snohomish. See Map 1. The SVAPD is located within the traditional territory of Coast Salish People who negotiated terms for ongoing co-existence with the United States in 1854-1855 and memorialized those terms by signing the Treaty of Point Elliott. The County continues to be home to the descendants of Coast Salish People, many of whom are present-day members of the Snoqualmie and Tulalip Tribes (and other tribes). The Snoqualmie and Tulalip Tribes are each federally recognized Indian tribes, who retain sovereign rights to govern themselves; maintain discrete homeland reservations; and interact with the landscape to meet their spiritual, subsistence, and economic needs. The SVAPD maintains a relationship with each of these Tribes structured on government-to-government principles and embraces the concept of tribal self-determination. The Snoqualmie Valley's "agriculture heritage began with seasonal berry and root crop harvests long before the first permanent non-Native settlements above Snoqualmie Falls in the 1850s and 1860s."[12] As the railroads to Seattle were completed, and the "logging and timber industry" declined, agriculture moved into the valley "near Fall City in the late 1870's" primarily with high value hops production until an aphid infestation in 1890. Valley farmers then primarily switched to dairying for the next 50 years.[13] From 1900-1950 "several factors were responsible for the success of dairy farming in the valley: the decline in land values after the aphid infestation resulted in smaller parcels requiring a more intensive form of farming, rail infrastructure expanded, and dairying technology advanced, making it economical for farmers."[14] Even with the early success of agriculture in the valley, "its agricultural distinction began a slow decline beginning in the 1950s as farmers experienced an increase in government regulations, the continued battle against flood control, and growing development pressure surrounding the valley."[15] The SVAPD is one of five APDs[16] in King County. The soils within the SVAPD include "prime farmland" as classified by the United Stated Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS).[17] Because of these high-quality soils and several other beneficial growing conditions, as part of WA's Growth Management Act in 1985, King County created the zoning protections of the Snoqualmie River Valley Agriculture Production District. This action designated the APD as farmland "of long-term commercial significance for agriculture" in Washington State and further protects this natural resource for food and fiber production.[18] Today, the SVAPD continues to make the most of smaller farming parcels, through high value crop production and by maximizing its proximity to high value direct and wholesale markets. The sector continues to be harmed by stringent regulations, flooding, and growing development pressure.	Lead: • KC WLRD Agriculture Program • King County Local Food Initiative Partners: • SnoValley Tilth • WSU	HIGH

In acknowledging the evolution of this landscape and human history, we know the future must be collaborative. We look forward to working more closely with our environmental partners, staff from local Tribes, and County and State government to partner and accomplish multi-benefit projects. Ag lands are an integral part of the ecosystem, ag lands and habitat often border one another, and we have to work together to weather population growth and climate change impacts on the natural and agricultural environment.

Strategies

The Task Force Scope of Work[19] laid out two main goals for the plan:

1) *Improve the long-term productivity of farmland, bring more acres into production, especially food production, and increase opportunities for farmers to develop the necessary infrastructure to support or increase their farm businesses* and

2) *Propose acreage to permanently protect for farming*[20].

Goal #1: Improved Farmland Productivity

1. All farmable acreage in the SVAPD is routinely improved through **drainage** so that the land can be productively farmed for the full length of the growing season.

2. **Transportation** infrastructure including revetments, roads and bridges is fully functioning to support the movement of agricultural products while managing traffic to increase safety for all and prioritize routine operation of farms every day.

3. Every commercial farm has sufficient access to water for **irrigation** and uses best management practices and technology to manage water usage. Farms keep existing water rights, continue water transfers through SVWID, and increase access to water transfers.

4. Every commercial farm has sufficient access (close proximity and enough space) to high ground for equipment, storage, and livestock, and every farm home below the base flood elevation is elevated to ensure **flood safety** and continued productivity on the farm. Farm homes in the APD that are safer from floods are saved so that families can live on the property or close to the property they farm while education about known patterns of flooding, climate change predictions, farm preparation and flood monitoring occurs in order to support **flood safety**.

5. Commercial farms maintain and increase agricultural productivity through adaptively managing changing plant pathogens, crop varieties, animal diseases, precipitation changes affecting water flows and irrigation needs through **climate change** research and education relevant to Western Washington and the Snoqualmie Valley APD.

Goal #2: Increased Farmland Protections

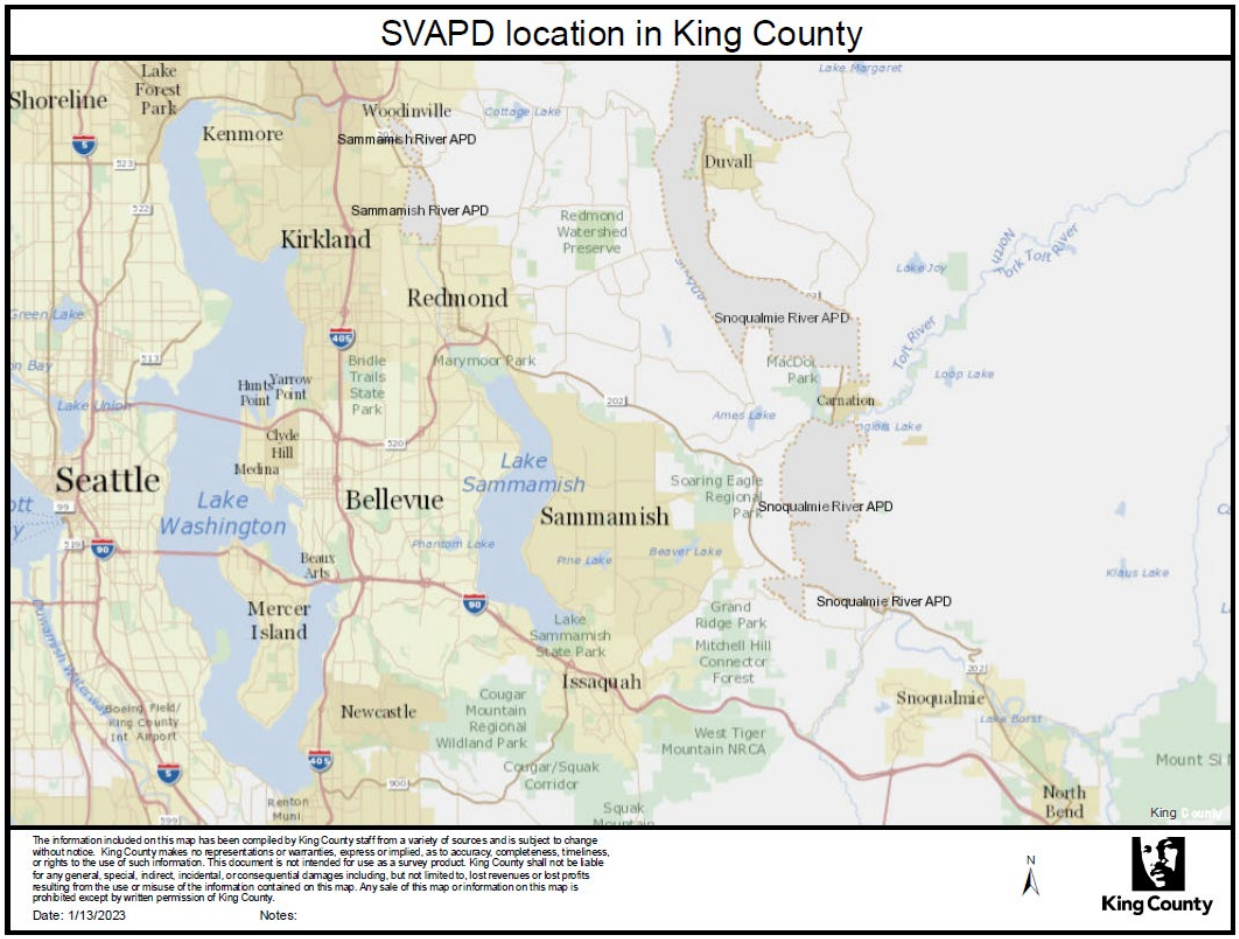
6. The APD is increasingly protected from **Population Growth and Development impacts,** through increased enforcement of unpermitted zoning uses that negatively affect productive farmland and traffic studies to limit interference with commercial farm activities. In addition, run-off from any new development is strenuously reviewed to prevent any negative impacts to the productive farmland in the floodplain or flood safety.

7. Protections for commercial farmland and crops in the APD allows for adaptive management of **wildlife** impacts using a variety of tools including policy, partnerships with Tribes and hunters, new research, and educational resources for BMPs, on-call service providers, cost-share programs, and enrollment in crop insurance to recover from wildlife damage.

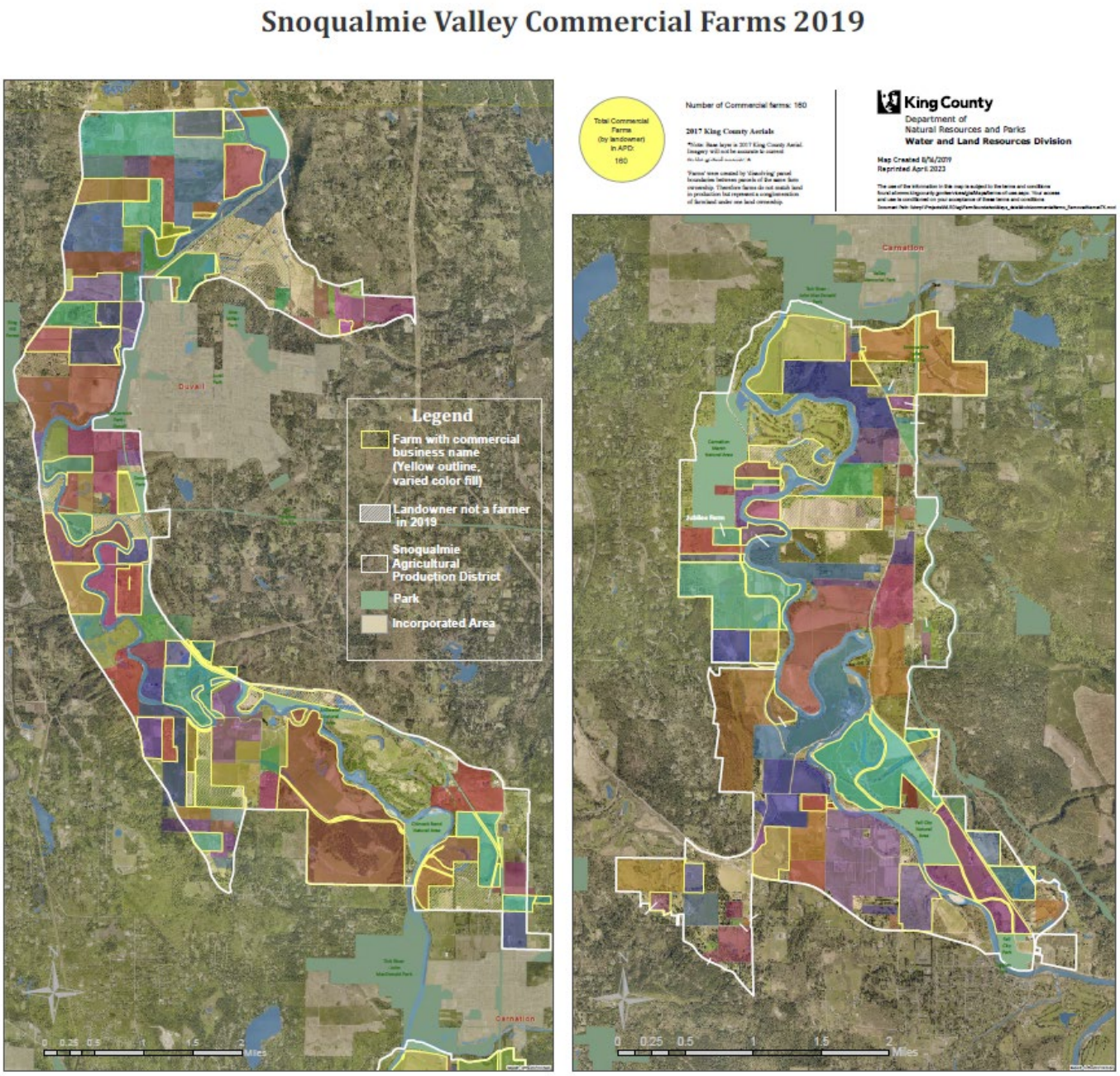
8. All farm properties in the APD are protected through King County **Farmland Preservation** Program easements to ensure farmability in perpetuity, testing new tools such as required farming of FPP properties to additionally limit land value escalation over time in order to improve the barrier to purchasing access to productive farmland.

9. SVAPD farmland is protected at the minimum of a **proposed 7,696 (7,700) farmable acres for a long-term, viable agriculture sector.**

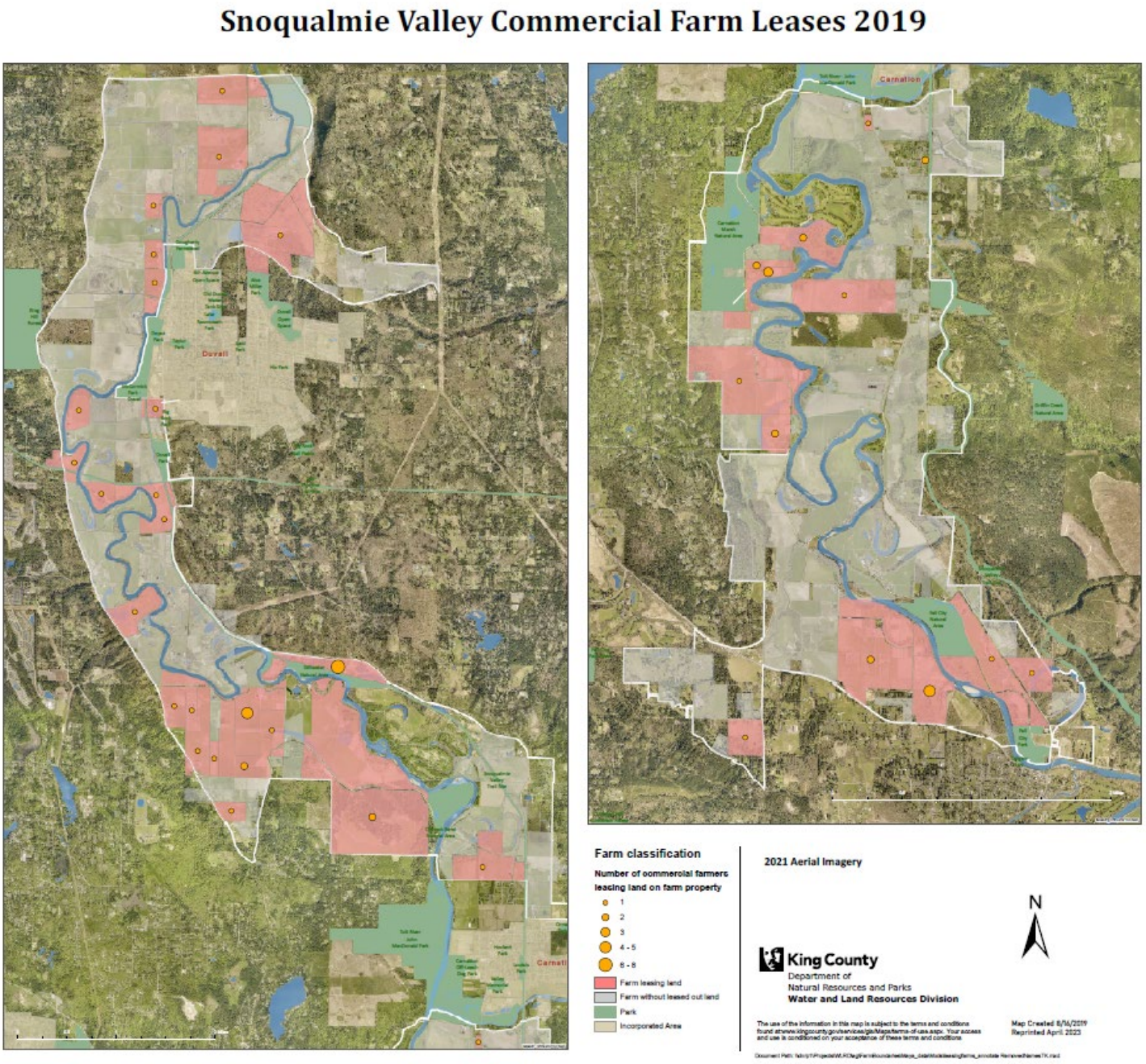
Map 1. Snoqualmie Valley Agriculture Production District location in King County, WA



Map 2. Snoqualmie Valley Commercial Farms 2019: Operations Grouped by Landowner



Map 3. Snoqualmie Valley Commercial Farm Leases 2019



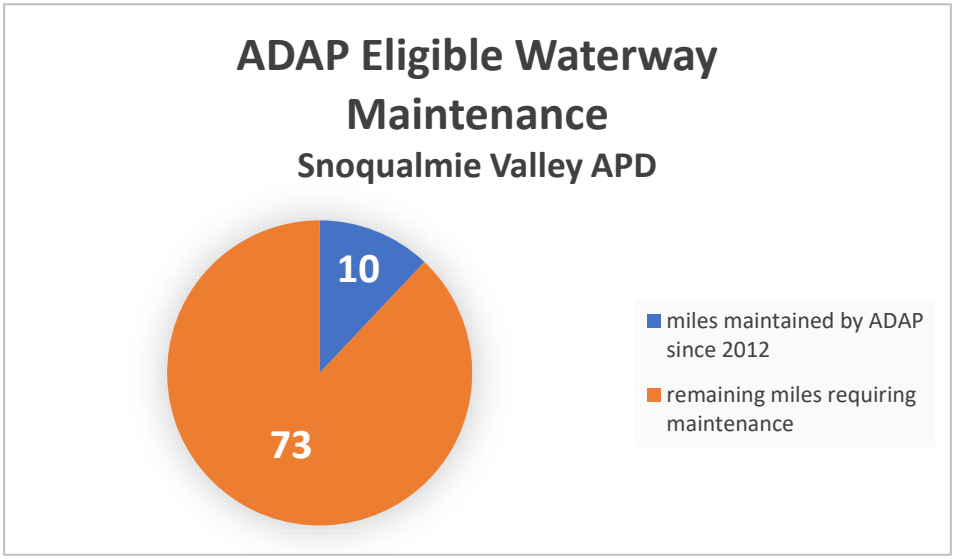
[1] For more information on what soil health is and its importance, see the USDA NRCS [LINK]. Accessed on 2/14/23.
[2] King County Agriculture Program research conducted in 2019 by King County intern based on Current Use Agriculture Tax Enrollment, Commercial Farm listings such as Sno-Valley Tilth's Directory and Puget Sound Fresh, local farm knowledge by task force members and King County staff.
[3] USDA NASS, "King County Washington: 2017 Census of Agriculture County Profile" [LINK]. Accessed 1.17.23.
[4] King County, "King County Farmers Markets: 2021", August 15, 2022. [LINK] Accessed 9.1.22. Report prepared for King County Department of Natural Resources, Water and Land Resources Division by Washington State Farmers Market Association.
[5] USDA NASS, "King County Washington: 2017 Census of Agriculture County Profile" [LINK]. Accessed 1.17.23. These are self-reported numbers and estimated systematically by NASS, but trend toward capturing the minimum sales due to under-reporting.

[6] NAICS is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.
[7] Buckley, Mark et. al, "Economic Indicators of Agriculture's Future in Skagit County" ECONorthwest, November 2010. Prepared for Skagit County. Page 10 [18]. [LINK]. Accessed 2/6/23.
[8] Estimate based upon each farm operation employing 2 people year-round (422) and 3 dairies employing an estimated 45 employees total year-round for a total of 467. In addition, each operation further employs 1-20 employees seasonally, based on type of production (using 10 x 214). Based on conversations with a subset of farming operations in the SVAPD.
[9] Estimate based upon 467 year-round jobs calculated at $25-40/hour for a minimum of 2,080 hours/year (this is an industry standard for a 5 day work week of 8 hour days and does not reflect the time farming takes 7 days week, for work days averaging 12 hours) this equates to roughly $2.4 - 3.9M, and an additional estimated $20.5M in seasonal wages at 2,140 seasonal jobs at $20/hour for twelve weeks, for an estimated total of about $24.3M annually in economic activity from wages. King County's minimum wage is $15.74 as of January 1, 2023, but many farms pay above minimum wage in order to remain competitive in recruiting and retaining workers. The Federal Adverse Effect Wage Rate (AEWR) for the H-2A Program is $17.97.
[10] Farmable classification is land that can be readily farmed. Farmable includes the sub-categories of currently farmed, fallow, and agriculture infrastructure.
[11] Unfarmable classification is land that can never be farmed again. Unfarmable includes the sub-categories of unfarmable (steep slope, forested, wetland, lakes, right of ways, non-ag buildings, recreation) mainstem, oxbow or channel, and roads+misc. .
[12] Shannon Sawyer, HistoryLink.Org, "Policy for watershed planning in the Snoqualmie Valley Agriculture Production District is added to the King County Comprehensive Plan on December 3, 2012," Essay 20793. Last updated 6/6/2019. [LINK]. Accessed 2/6/23.
[13] Shannon Sawyer, HistoryLink.Org, "Policy for watershed planning in the Snoqualmie Valley Agriculture Production District is added to the King County Comprehensive Plan on December 3, 2012," Essay 20793. Last updated 6/6/2019. [LINK]. Accessed 2/6/23.
[14] Ibid.
[15] Ibid.
[16] Per King County Comprehensive Plan R-643, Agricultural Production Districts are blocks of contiguous farmlands where agriculture is supported through the protection of agricultural soils and related support services and activities. Roads and natural features are appropriate boundaries for Agricultural Production Districts to reduce the possibility of conflicts with adjacent land uses.
[17] USDA NRCS, "Special Environmental Resource Concerns: Prime and Unique Farmlands." March 2012. [LINK]. Accessed 1/31/23.
[18] Washington State WAC 365-190-050 [LINK]. Accessed 1/21/23.
[19] Snoqualmie Fish, Farm Flood, "Final Agreement Package," June 12, 2017. [LINK]. Accessed 1/19/23. Page 14-19 [59-64].
[20] Ibid. Page 7 [21] and Page 11 [37].

1.1.1: Drainage Maintenance for ADAP Eligible Waterways

Current Condition

Figure 2. ADAP Eligible Waterway Maintenance: Snoqualmie Valley APD



There are 83 miles of King County's Agricultural Drainage Assistance Program (ADAP)[1] eligible waterways in the SVAPD. Each year, approximately 10,000 feet (~2 miles) of agricultural waterways are maintained in the Snoqualmie Valley, which equates to about 2% of all eligible waterways and a return interval of about 45 years. At the current rate of 2 miles each year it would take approximately 37 years to complete waterway maintenance on the remaining 73 miles of waterways in the SVAPD that have not been maintained recently.

Costs for agricultural waterway dredging can vary based on complexity of the project. As of 2018, projects cost about $50 per linear foot from the planning through the monitoring stages, meaning that initial dredging of the remaining 73 miles of the 83 miles of eligible waterways would cost roughly $19,272,000 (in current dollars). On average, 71% of these costs are covered by King County, 18% by King Conservation District or the SVWID, and 10% by landowners.

Desired Condition by 2048

All eligible waterways are maintained, on recurring schedule, with alternative mitigation options available.

Timeline

- 2024: Funding increased; additional ADAP crews added; timeline of dredging projects developed (starting with landowner requests in priority sub-basins); recurring maintenance interval for individual waterways is determined by evaluation criteria and scheduled for ongoing maintenance
- 2026: Alternative mitigation scenarios are tested, approved, and added to ADAP agreement
- 2034: Initial maintenance of remaining 73 miles completed
- 2035: Recurring maintenance continues per schedule and/or emergency needs

Background

Agricultural waterways direct water out of agricultural fields into larger waterways and streams. Over time, these waterways can fill with sediment and become blocked by overgrown weeds, slowing, or stopping the movement of water and leading to poorly drained fields.

ADAP works under a memorandum of understanding with Washington Department of Fish and Wildlife (WDFW) that incorporates best management practices (BMPs) to protect fish and water quality[2]. Through ADAP, landowners only need a single permit to conduct maintenance which can include dredging, beaver dam management, and culvert replacement. Currently, ADAP is the only permitted program for agricultural waterway maintenance in the Snoqualmie Valley. ADAP is limited to working on drainage improvements in artificial drainage channels and relatively small, modified waterways[3].

Service Providers

Lead:

- King County Stormwater Services Program: ADAP

Partners:

- SV Watershed Improvement District
- King Conservation District

Priority

High

Strategies

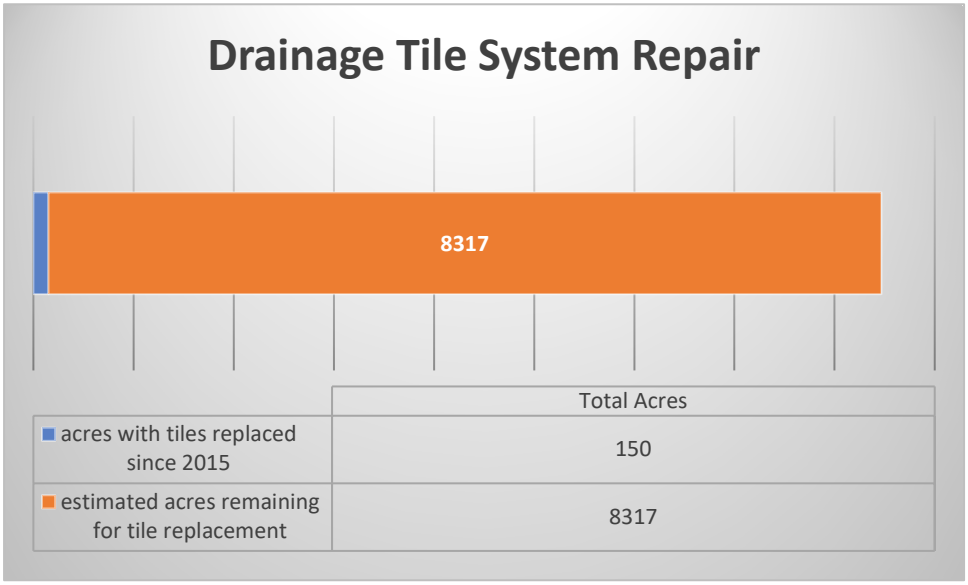
- Complete initial maintenance and establish recurring maintenance intervals on remaining 73 miles of unmaintained waterways within 10 years, which is a 3- to 4-fold increase over recent rates of maintenance.
- Secure stable funding of approximately $2 million per year from King County and project partners to achieve increased rate of maintenance.
- 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) to increase capacity for ADAP waterway maintenance in tandem with fish habitat and flood improvement projects.
- Reduce cost to landowners through creating or increasing cost-share programs to further help with farmer/landowner, planting, and fencing costs.
- Conduct maintenance through SVWID's priority basin or emergency needs rather than first come, first serve basis.
- While undergoing maintenance, waterways are assessed and scheduled for follow-up maintenance; not all waterways need to be maintained at the same frequency.
- Expand program's fish and water quality capacity to match increased pace and timeline.
- Add alternative mitigation strategies for required plantings to ADAP agreement.

[1] King County, "Agricultural Drainage Assistance Program (ADAP)"; [LINK]; last updated July 5, 2016; accessed 2/15/2022.
[2] King County Department of Natural Resources and Parks, "Hydraulic Permit Approval Memorandum of Understanding" December 2011. [LINK] Accessed 10/28/21.
[3] *Modified streams are human-made channels that carry a previously existing stream. Artificial ditches are human-made ditches that do not carry a previously existing stream.*

1.1.2: Drain Tiles

Current Condition

Figure 3. Drainage Tile System Repair



While a comprehensive inventory of subsurface drainage tiles, does not exist for the Snoqualmie Valley APD, historical records and maps of tile systems (held primarily by landowners) are available for some properties. We estimate that the 8,467 farmable acres (which does not include the 201 farmable acres of "farm infrastructure" buildings or farm access roads) in the SVAPD likely had tiles installed at one point. Since the SVWID replaced drain tiles on 150 acres through 7 projects since 2015, tile conditions on approximately 8,317 farmable acres in the SVAPD remain to be assessed and tiles potentially replaced.

Repair and replacement project costs vary greatly based on the complexity and extent of the project. With currently available tools, tile replacement costs about $10/foot, which can be cost prohibitive. For example, recent repair of a drainage tile system spanning 50 acres of farmland cost roughly $100,000.

Desired Condition by 2048

SVWID has capacity and funds to identify, inventory, assess, repair, and replace non-functional drain tile systems in the APD, ensuring all existing systems effectively redirect water out of agricultural fields. Water control structures are installed wherever drain tiles are present to allow for more efficient use of water and regulate flows into waterways.

Timeline

- 2024: Develop educational materials for best management practices for water control structures.
- 2025: Explore options for farmer (rather than landowner) initiated drainage tile repair.
- 2026: Identify funding mechanisms to support SVWID and partner operating capacity and budget for drainage tile projects. Secure funding and service provider to own and maintain drainage tile installation equipment.
- 2028: Develop comprehensive inventory and assessment of drainage tiles on private land in the APD.
- 2029-2048: Implement drain tile repair and replacement projects at rate of 1-2 per year at an average of 35 acres total.

Background

Subsurface drain tile systems were originally installed between the 1930's to 1970's on nearly every farm field in the APD to improve a property's drainage by directing water out of farm fields to ditches or water bodies thereby extending seasonal productivity. While they are a good option to improve drainage on a farm property and provide an overall benefit to drainage of the APD, they do not significantly affect sub-basin scale drainage.

Over time, these systems require repair or replacement to effectively re-direct water. While federal regulations make the installation of new drainage tiles complicated and cost prohibitive, replacing, supplementing, improving, and maintaining existing systems can be exempt from federal permits on a case-by-case basis. A WDFW floodplain development permit is needed for all tile repair projects in the floodplain.

In many cases, maintenance of the receiving waterway, such as dredging through ADAP, is required to allow proper drainage from the tile system outflow before drainage tile

Service Providers

Lead:

- Snoqualmie Valley Watershed Improvement District (SVWID)

Partners:

- King Conservation District

Priority

MEDIUM /HIGH

maintenance can begin. Water control structures are installed whenever possible when repairing tile systems, which allows farmers/landowners to regulate the amount of water flowing in and out of the field throughout the year. Active management of tile systems and water control structures can also benefit water quality and fish habitat. Data indicate that drainage tiles can reduce sediment transport and correspondingly reduce phosphorus and nitrate discharge to streams.[1] Tiling can be described as a conservation practice or as ecosystem services serving to filter nutrients and pesticides while improved drainage contributes to improved soil health.[2]

SVWID focuses work in sub-basins with the greatest drainage need. Drainage tile replacement projects within the priority sub-basins are identified through outreach to farmers, direct requests from farmers, and referrals from the King County ADAP program. King Conservation District provides support with initial watercourse maintenance.

Strategies

- Secure multi-benefit partnerships and long-term funding to increase SVWID and partner program capacity, allowing for expanded drainage tile repair projects in the APD.
- Secure long-term funding for service providers to purchase equipment for drainage tile installation.
- Explore options for King County water quality cost share funding for water control structures.
- Research, test, and implement innovative practices for improving subsurface drainage.
- Continue testing the capping of drain tiles as a BMP solution for dryland farming and as a method for keeping moisture in soils longer.
- Provide education and outreach to farmers on multi-benefit approaches to managing water flow through water control structures including retaining groundwater.

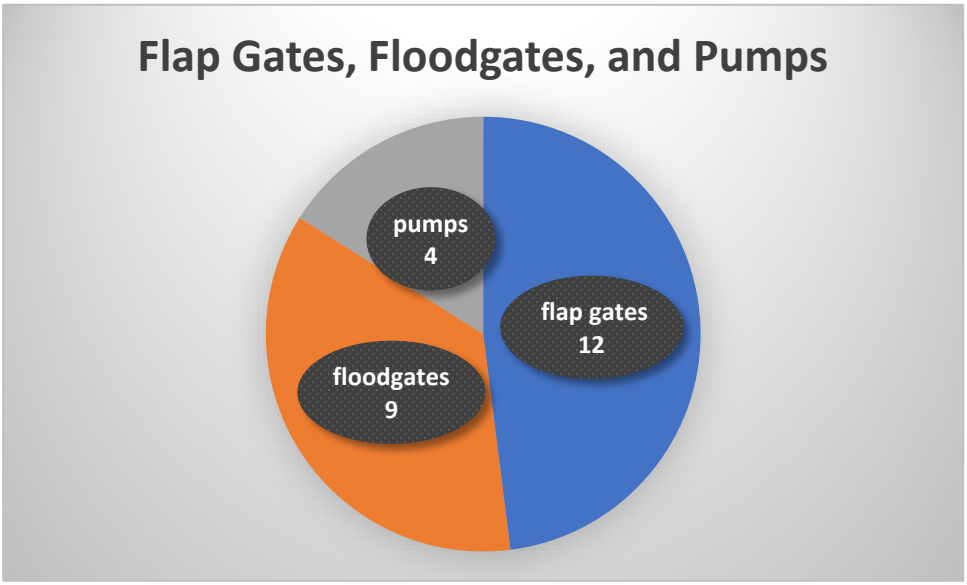
[1] Vermont Agency of Agriculture, Food and Markets and Vermont Agency of Natural Resources, "Vermont Subsurface Agricultural Tile Drainage Report" January 31, 2017.[LINK]. Page 9; accessed 3/22/23. Report Prepared for the Vermont General Assembly in Accordance with 2015 Act 64, Section 5.

[2] United States Department of Agriculture Natural Resources Conservation Service, "Conservation Practice Standard: Drainage Water Management, CODE 554" January 2021, NRCS, WA. [LINK].

1.1.3: Flap gates, Floodgates and Pumps

Current Condition

Figure 4. Flap Gates, Floodgates, and Pumps



King County conducted a survey in 2018[1] of the 12 flap gates, 9 floodgates, and 4 pumps that were visible from the lower Snoqualmie River and its main tributaries. Evidence of a 10th floodgate was found, but the structure is no longer intact or functioning. Of these 25 drainage structures, seen in Figure 4 and Map 4, appropriate partnerships for ownership and maintenance are still being determined. King County engineers are also working to assess the effectiveness and functionality of these structures. The SVWID and King County are working on pilot projects to determine a process, costs and funding sources for replacement or repair of existing gates and installation of new pumps.

Desired Condition by 2048

Functional flap gates, floodgates, and pumps strategically located throughout Snoqualmie Valley to minimize flooding of farm fields. Inspection and maintenance schedule agreed to by the responsible parties, SVWID, and King County's Integrated Drainage Program. Maintenance and repair conducted regularly to ensure longevity of structures.

Timeline

- 2024: Complete assessment of ownership, functionality, and permitting.
- 2025-2027: Develop plan and identify long-term funding resources for repair, replacement, or new pump installations and routine maintenance cycles.
- 2032: All replacement and repairs completed.
- 2037: New pump installations completed.
- 2027-2048: Routine, ongoing maintenance on gates and pumps

Background

Flap and flood gates prevent water from flowing from main stem rivers back into ditches or culverts during high flows. Pumps actively move water from behind the gates into the river preventing backwatering. Many flap and flood gates in the Snoqualmie APD were installed in the late 1930s and maintenance has not been consistently recorded.

Service Providers

Lead:

- Snoqualmie Valley Watershed Improvement District (SVWID)

Partners:

- KC Integrated Drainage Program

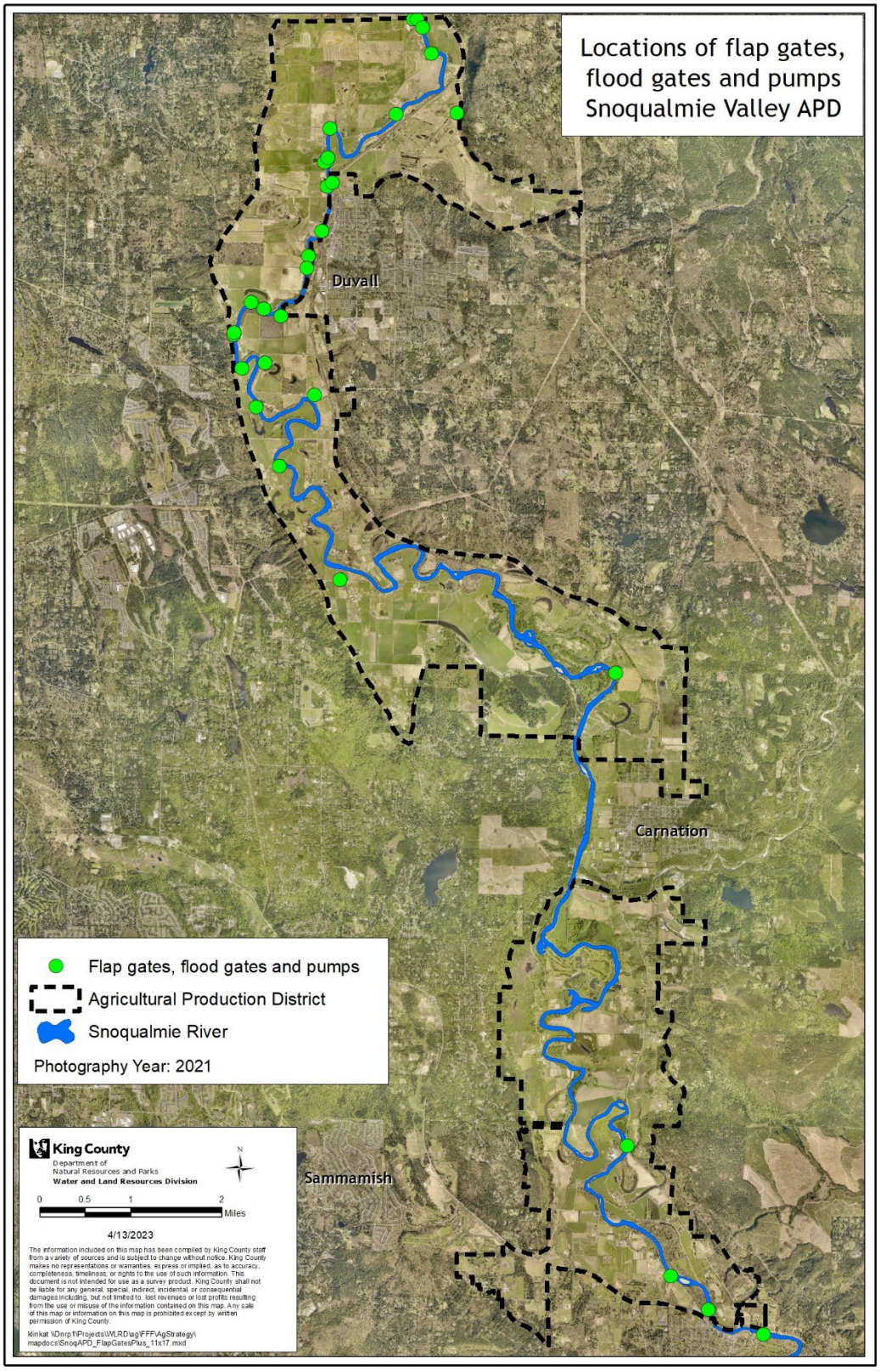
Priority

MEDIUM /HIGH

Strategies

- Clarify and streamline permitting process for installation, replacement, and repair to ensure regulatory certainty.
- Use sub-basin hydrological analysis to identify key points and strategic locations for gate repair and pump installation.
- Secure long-term funding for installation, replacement, and repair projects as needed throughout the Snoqualmie APD.

Map 4. Locations of Flap gates, Floodgates and Pumps in the Snoqualmie Valley APD

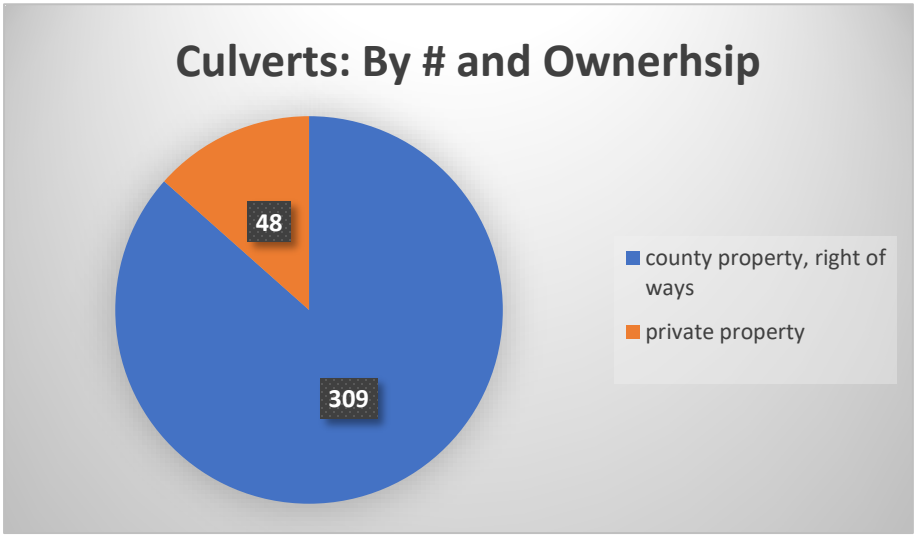


[1] Large drainage outfalls to the Snoqualmie River (or as noted) north of Fall City (from FFF Regulatory Task Force "Comprehensive Drainage Assistance" Issue Paper, Table 2).

1.1.4: Culverts

Current Condition

Figure 5. Culverts: By # and Ownership



There are 357 known culverts within the SVAPD identified on public and private property (see Figure 5). While an in-depth analysis of culvert functionality on private lands in the APD does not yet exist, WDFW maintains data on 48 culverts on private property in the SVAPD, of which 18 have been replaced since 2015 by KC ADAP, SVWID and KCD, at the rate of approximately 3 culverts each year, but with 14 more needing replacing[1].

Costs for culvert replacement on farmland can vary based on the length, diameter, and culvert construction as well as the complexity of the project. The average costs of installing a 3' to 4' foot culvert is $7,000, while installation of a farm bridge in place of a culvert costs on average $30,000. Funding for culvert replacement is most often tied to fish passage but can also be part of a drainage project. If all 14 culverts on private land are replaced, it would cost approximately $100,000 and take about 5 years to complete, at the current replacement rate.

In addition, there are 309 culverts on county property, primarily right of ways in the APD, that have been evaluated by King County for fish passage barriers which we are correlating roughly with poor drainage. The evaluation shows many barriers including 42 problem culverts (see Map 5 below for sites and analysis), for which the County is developing a priority implementation plan and timeline[2].

Desired Condition by 2048

Culverts on public and private property are maintained, replaced, and removed as prioritized to ensure proper drainage, vehicle passage throughout the year, and safe fish passage when applicable.

Timeline

- 2025: Pursue additional funding from Flood Control District and other sources, exploring options for funding multiple, FFF bundled/multi-benefit projects that improve drainage.
- 2027: Wild Fish Conservancy to complete assessment of private property culvert functionality and any barriers to drainage or fish passage
- 2030: Develop plan for regular inspection and maintenance of culverts: permits required, landowner permission, funding resources
- 2032-2048: Implement plan and replace/remove non-functional culverts throughout APD

Background

Damaged or undersized culverts can slow or stop water flow, affecting drainage from agricultural fields. Culvert replacement on private land is most often conducted by SVWID and ADAP when damaged or poorly performing culverts are encountered while conducting waterway maintenance. Service providers work with KC fish passage restoration program, KC Road Services Division, KC Parks, Wild Fish Conservancy, and WDFW. A WDFW Hydraulic Permit Approval (HPA) and a King County floodplain development permit from Department of Local Service (DLS) Permitting Division is required for all culvert replacement projects, in addition to a large wood installation required by the Tulalip Tribes. SVWID culvert replacement

Service Providers

Lead:
- Snoqualmie Valley Watershed Improvement District (SVWID)

Partners:
- King County Integrated Drainage Program

Priority

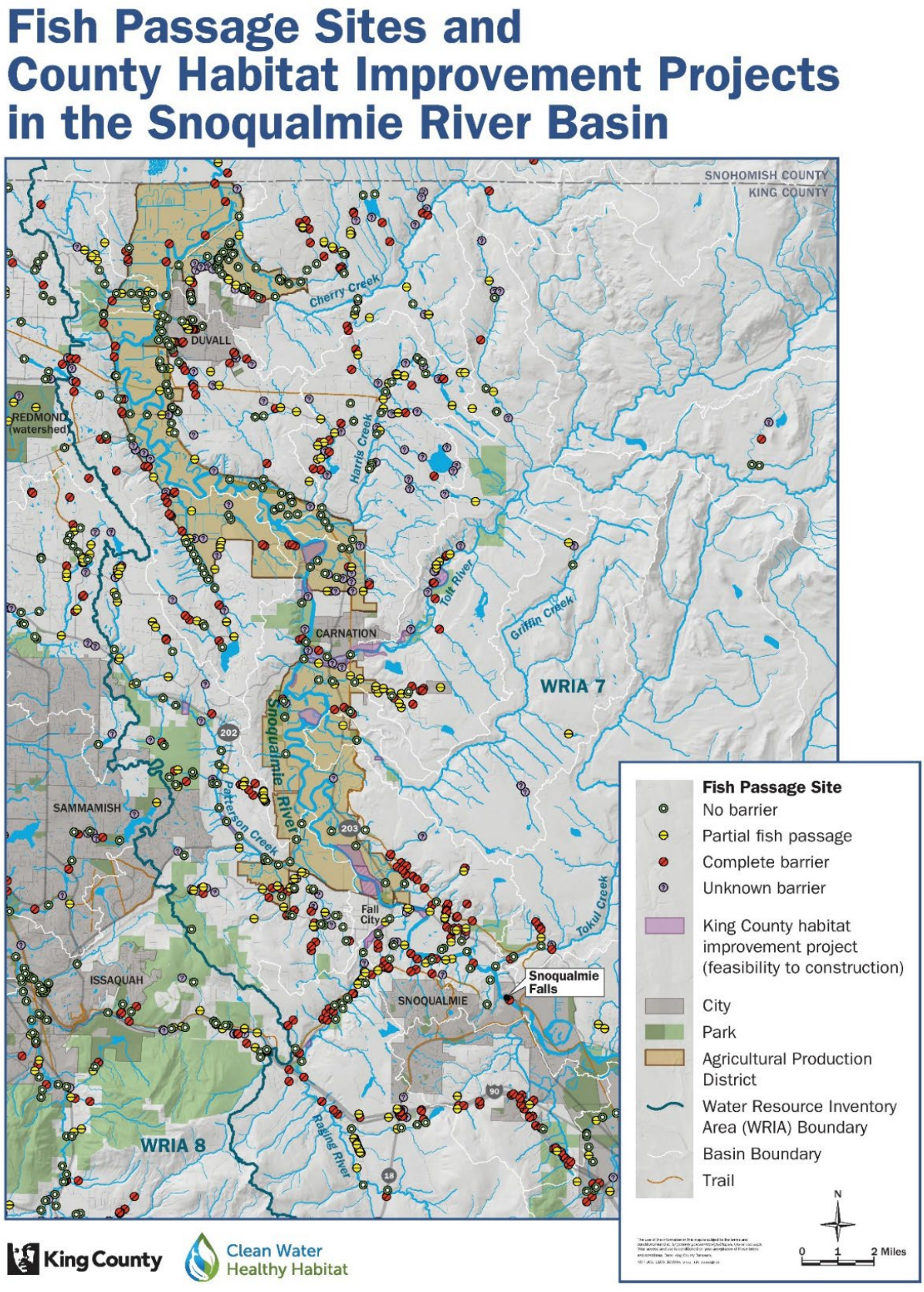
HIGH

projects within priority sub-basins are identified through outreach to farmers, collaboration with ADAP, or direct requests from farmers.	• King Conservation District	

Strategies

- Strengthen collaboration between SVWID, KC programs, KCD, and other partners and secure multi-benefit partnerships and long-term funding to increase capacity and efficiency and reduce costs for culvert replacement.
    - Identify or create long-term culvert replacement funding source for improving water quality and hydraulic processes, decoupled from fish passage, riparian buffer width, large woody debris placement, or multiple landowner involvement.
    - Prioritize replacement of culverts that are identified as important fish barriers and are also needed to improve farm drainage systems.
- Pursue additional funding mechanisms that allow for multiple culvert projects with a single funding source.
- Explore options for pre-approval of standard culverts and bridge designs.
- Streamline permitting process to accelerate project timelines.
- Prioritize culvert replacement within the ADAP program.

Map 5. Fish Passage Sites and County Habitat Improvement Projects in the Snoqualmie River Basin. Fish passage sites include culverts, piped systems, bridges, etc.



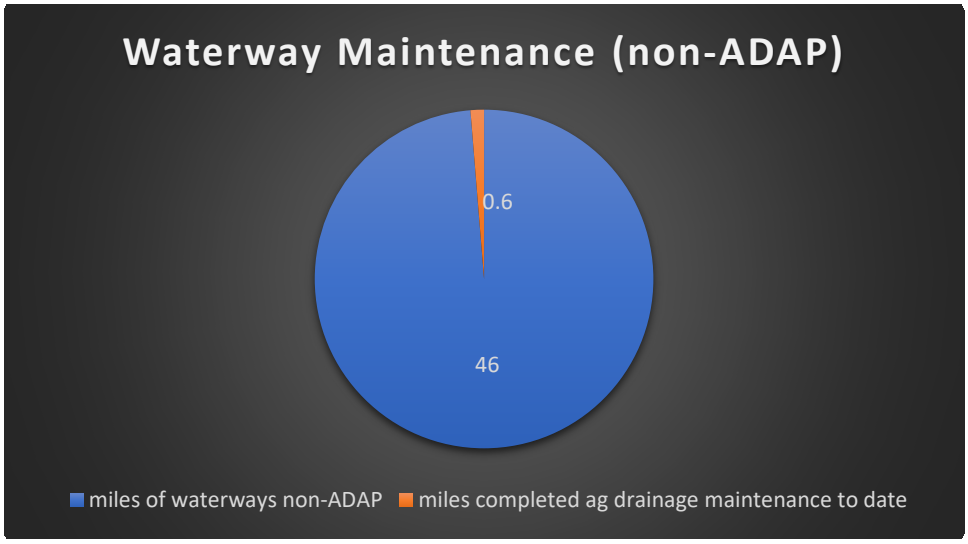
[1] WDFW has a record of 48 culverts on private property, at least 14 of which are barriers to fish. This record is incomplete and requires a more comprehensive assessment. Wild Fish Conservancy and SVWID have plans to assess private culverts in select sub-basins, in coordination with KC, WDFW, and WSDOT. If successful, this assessment will expand to the entire APD.

[2] King County Fish Passage teams estimate that 309 culverts are located on County property or rights-of-way in the Snoqualmie Valley APD. While many of these culverts do not always have active streams, 67 of them are known to be fish passage sites and, of those, 42 are barriers to fish passage. This work is in progress at the time of this writing.

1.1.5: Drainage Maintenance for Non-ADAP[1] Waterways

Current Condition

Figure 6. Waterway Maintenance (non-ADAP)



There are 156 miles of waterways in the Snoqualmie Valley Agriculture Production District (APD). We are dividing these into three waterway categories for agriculture drainage: 1) 27 miles of the Snoqualmie River along which there are flood gates and culverts, 2) 83 miles of Agriculture Drainage Assistance Program[2] (ADAP) eligible waterways, and 3) 46 miles (241,659 linear feet) of waterways in the APD that are non-ADAP eligible. In this third category of non-ADAP eligible waterways (specifically excluding the river miles), drainage assessment is needed and may require maintenance for agriculture drainage. These include four perennial streams (see Figure 7) that are being assessed for inclusion in King County's Integrated Drainage Program (IDP).

There are also three additional streams, several oxbows, and lakes which fall in this category. There are waterways outside the APD (currently unquantified) which also need to be assessed. There is currently no permit available for drainage maintenance in these waterways. However, two pilot projects are underway (2021). These pilots are multi-benefit projects, improving fish habitat, providing flood hazard mitigation *and* drainage improvements. Fish habitat and flood hazard mitigation projects do have a permit process under existing King County Code.

To date, just over half of one mile, or .6 miles total (2,275 linear feet), have been maintained for drainage on Cherry Creek (875 linear feet) and Indian Creek (1,400 linear feet). Indian Creek was completed under allowed flood hazard mitigation for vegetation management of noxious weeds[3].

Desired Condition by 2048

Permitting and processes to maintain all waterways are well defined and landowners can access service providers to improve agriculture drainage and protect farm infrastructure from flooding.

Timeline

- 2024: Complete pilot project to identify regulatory barriers and clarify permitting requirements
- 2025: Monitor flows and further study waterways that may meet ADAP standards. If waterways meet ADAP standards, re-classify as ADAP eligible (update Waterway Classifications Map 8, ADAP eligible waterways Map, and non-ADAP eligible waterways Map 6 & 7)
- 2026: Complete assessment of waterways in the APD
- 2028: Test and secure long-term funding mechanisms for cost-share and overall project funding for waterway maintenance
- 2035: Complete initial maintenance cycle and begin recurring maintenance cycle

Background

Service Providers

Priority

Waterways (non-ADAP) are streams usually larger than ADAP eligible waterways and/or natural waterways (e.g., those with headwaters and that are primarily unmodified by human activity or more natural conditions). ADAP ineligible waterways may have Chinook salmon present, which means they are protected by the Endangered Species Act (ESA). There is no clear way to permit agricultural drainage maintenance in these systems under existing King County Code. Two pilots are underway, King County Stormwater Services on Griffin Creek and the Snoqualmie Valley Watershed Improvement District (SVWID) is conducting pilot projects on Cherry Creek to understand the regulatory barriers better, clarify permitting requirements and identify opportunities for code changes. Because waterway classification is subject to change as more information is gained, prioritize Stormwater Services to monitor flows on waterways and see if they meet ADAP standards and then re-classify them. Some of these waterways that need further study for re-classification include Tuck Creek, Ames Creek, Waterwheel Creek, and others. Waterway maintenance activities include in-stream sediment management, vegetation management (noxious weed management), culvert replacement, and beaver dam management.	Lead: • King County Stormwater Services IDP • Snoqualmie Valley Watershed Improvement District (SVWID) Partners: • King Conservation District	MEDIUM /HIGH

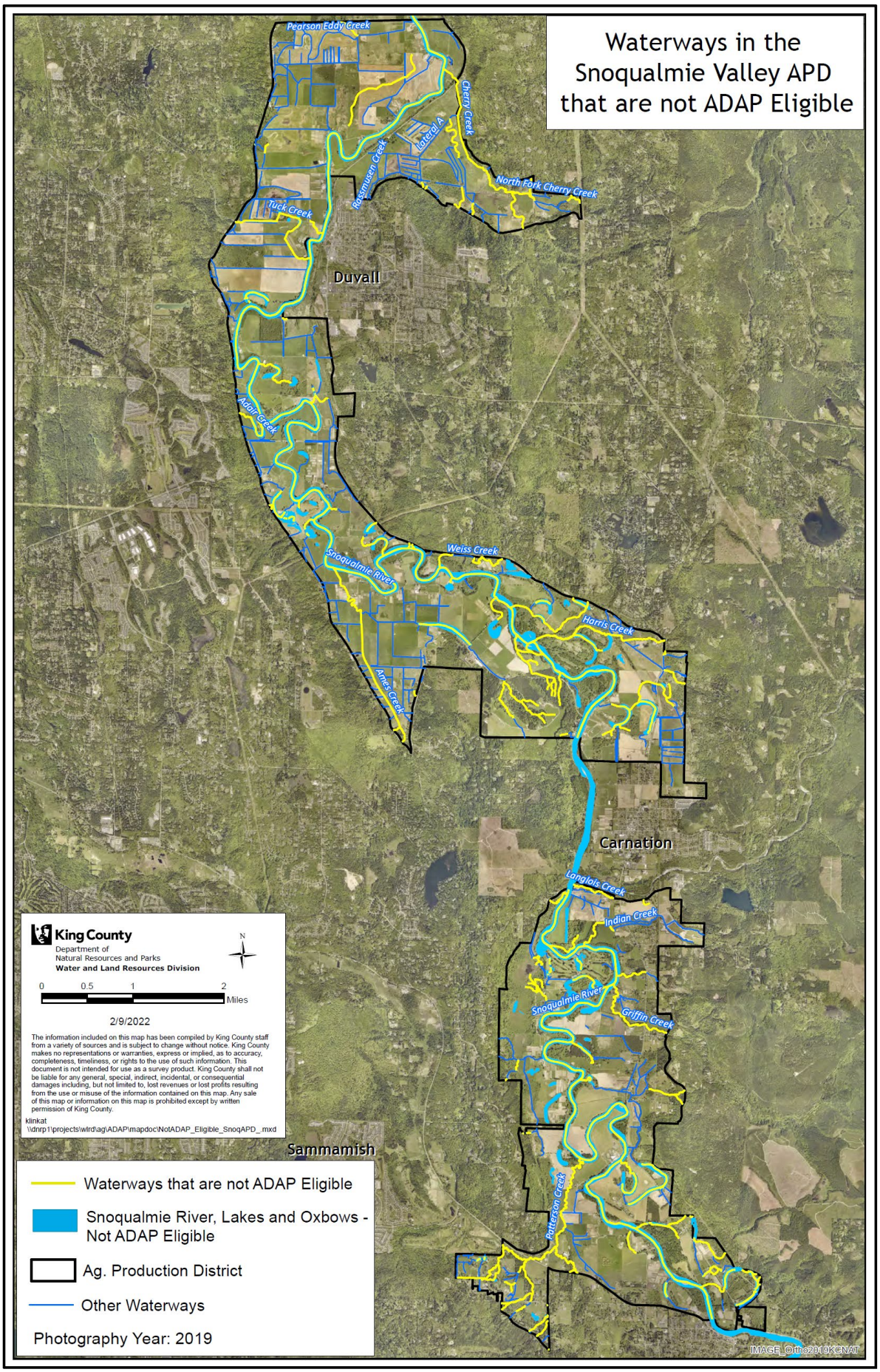
Strategies

- Monitor flows and further study waterways that may meet ADAP standards. If waterways meet ADAP standards, re-classify as ADAP eligible (update Waterway Classifications Map 8, ADAP eligible waterways Map, and non-ADAP eligible waterways Map 6 & 7).
- Complete pilot studies to identify regulatory barriers, clarify permitting requirements and identify opportunities for code revisions.
- 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 non-ADAP waterway maintenance in tandem with fish habitat and flood improvement projects.
- Assess waterways for drainage maintenance/flood impacts to APD and conduct maintenance where required.

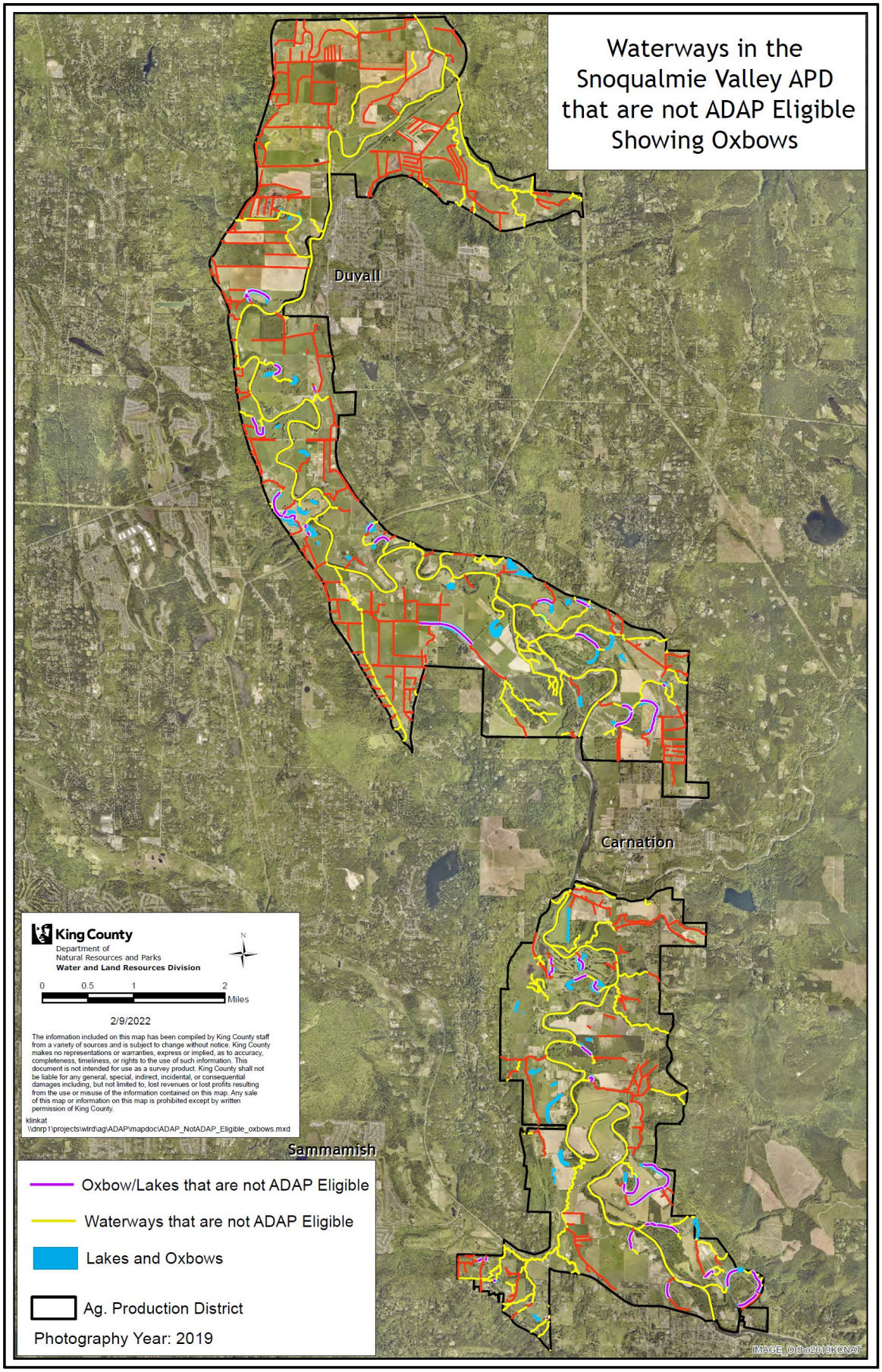
Figure 7. Non-ADAP waterways being assessed for inclusion in King County's Integrated Drainage Program (IDP).

Snoqualmie Valley APD		Waterway Classification[4]		Chinook Present
Water Body (non-ADAP)		Channel	Fish Presence	
Per FFF Farm 2, being researched for permits through multi-benefit pilot projects and added to KC Integrated Drainage Program (IDP)	Griffin Creek	Modified	High	YES
	Tuck Creek	Modified	High	NO
	Cherry Creek	Modified/Natural	High	YES
	Ames Creek	Modified/Natural	Moderate	NO
Need to be assessed for barriers to agricultural drainage and permitting developed to allow ag drainage maintenance	Harris Creek	Natural	High	NO
	Patterson Creek	Natural	High	YES
	Langlois/Indian Creek	Modified/Natural	High	YES

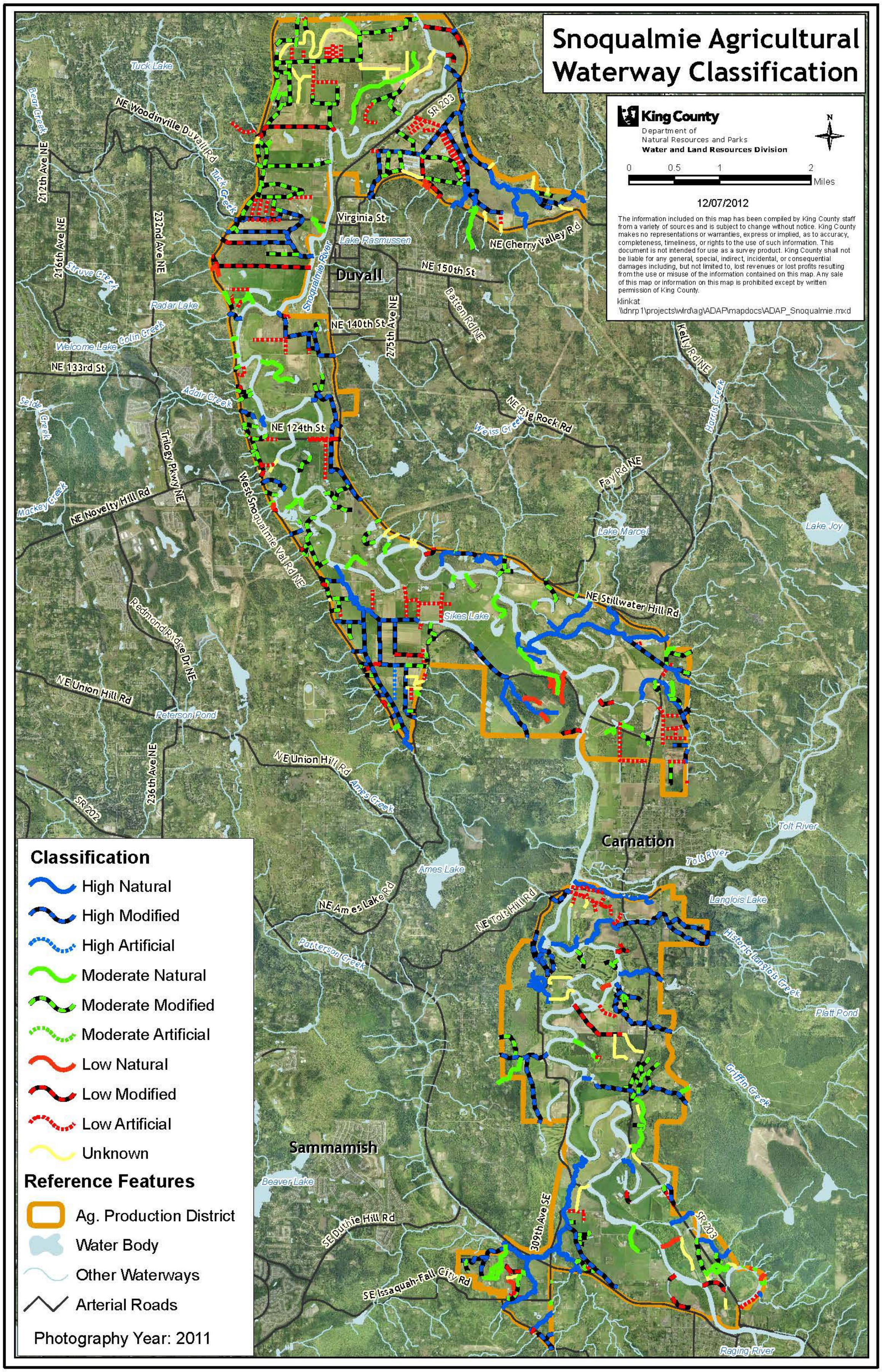
Map 6. Waterways in the Snoqualmie Valley APD that are not ADAP eligible



Map 7. Waterways in the Snoqualmie Valley APD that are not ADAP Eligible Showing Oxbows (in linear feet count, other lakes not in linear feet count)



Map 8. Snoqualmie Waterway Classification in relation to ADAP eligible and non-ADAP eligible Waterways

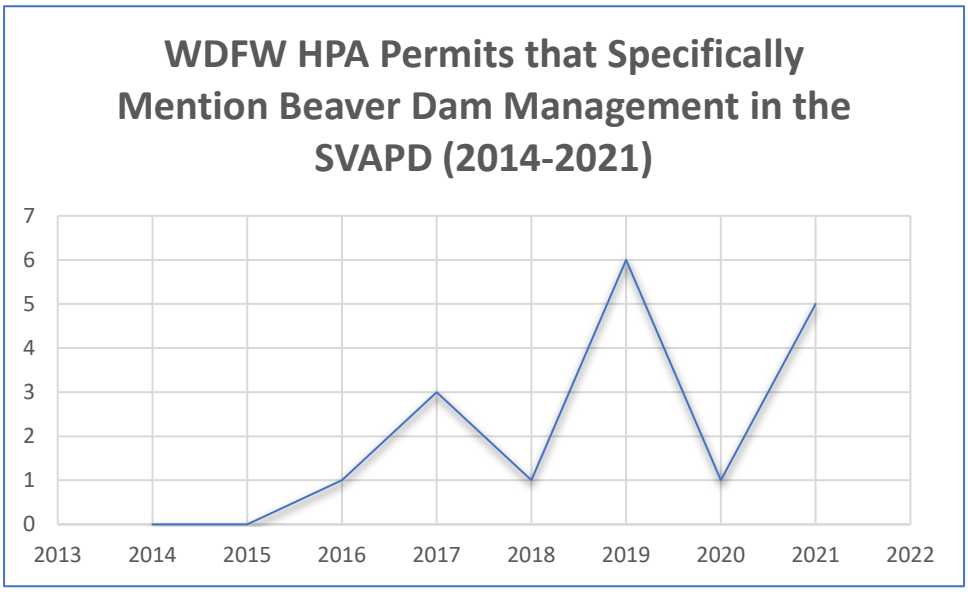


[1] Agricultural Drainage Assistance Program (ADAP) is a King County program that assists farmer/landowners with drainage technical support for ADAP eligible waterway maintenance. See issue paper 1.1.1 for more details.
[2]King County Department of Natural Resources and Parks, "Hydraulic Permit Approval Memorandum of Understanding" December 2011. [LINK] Accessed 10/28/21.
[3] Erin Ericson, Executive Director, Snoqualmie Valley Watershed Improvement District, personal communication, January 10, 2022.
[4] King County Department of Natural Resources and Parks, "Snoqualmie Waterway Classification" December 7,2012. [LINK] Accessed 10/28/21.

1.1.6: Beavers

Current Condition

Figure 8. WDFW HPA Permits Mentioning Beaver Dam Management[1]



In the last 5-10 years, the beaver population in the Snoqualmie Valley APD appears to have grown while policy for management of beavers has not yet caught up. Beavers can move into areas where dams and/or beavers were removed within as little as six hours. Impoundment of water by beaver dams can be a benefit for farms as it rebuilds surface and ground water supplies, helping with climate change impacts[2]. However, the water table is so close to the surface in the Snoqualmie Valley it is often above the surface where it remains during the growing shoulder seasons and sometimes into the main season and limits farmers abilities to plant and harvest under optimal conditions.

As shown in Figure 8, Washington Department of Fish and Wildlife (WDFW) reports an increase in 2019 and 2021 (note: 2020 Covid-19 pandemic outbreak) in the SVAPD for Hydraulic Project Approval (HPA) permits specific to beaver dam removal. WDFW also reports 612 beavers were trapped and culled in King County as a whole, between 2014-2021, 275 for recreational harvest and 337 for conflict-related trapping.[3] See Figure 9.

The SVWID offers a variety of services for drainage related to beavers including beaver trapping.[4] SVWID self-reports trapping 392 beavers in the SVAPD from February 1, 2017, through February 15, 2023.[5] The Tulalip Tribes offer free trapping and relocation of beavers to the uplands.[6] Since 2016, sixteen beavers have been relocated from the Snoqualmie Valley by the program.[7] In addition, the organization Beavers Northwest provides services on beaver coexistence solutions such as notch exclusion fences, flow devices, and installation assistance.[8] In 2022, Beavers Northwest worked on two beaver coexistence projects in the Snoqualmie Valley and met with one additional landowner who self-managed beaver impacts without removing the animals.[9]

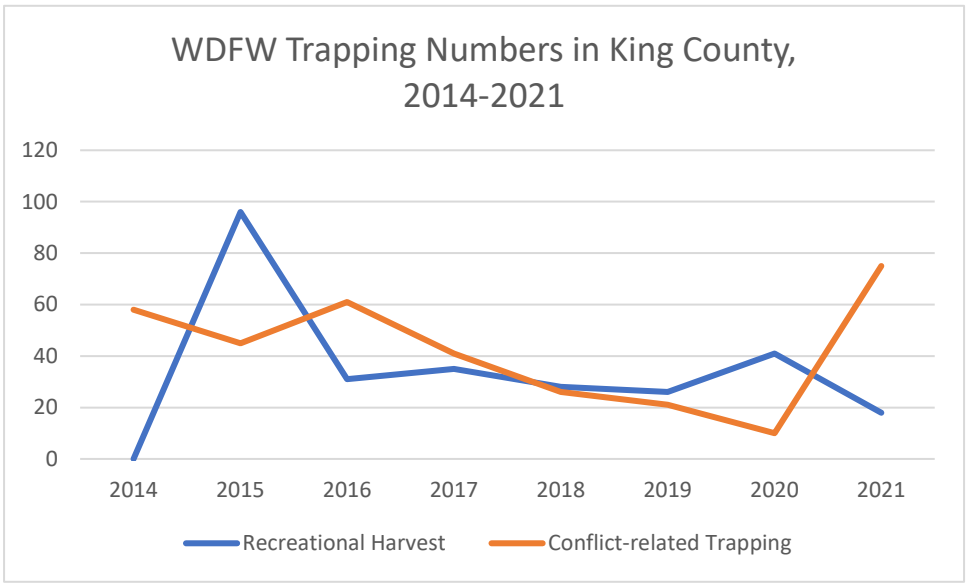
Desired Condition by 2048

Farmers manage beaver dams, beaver dam related flooding, and beaver populations on farm properties to ensure food production is not diminished while taking advantage of surface and groundwater captured by beaver dams for agriculture production when possible.

Timeline

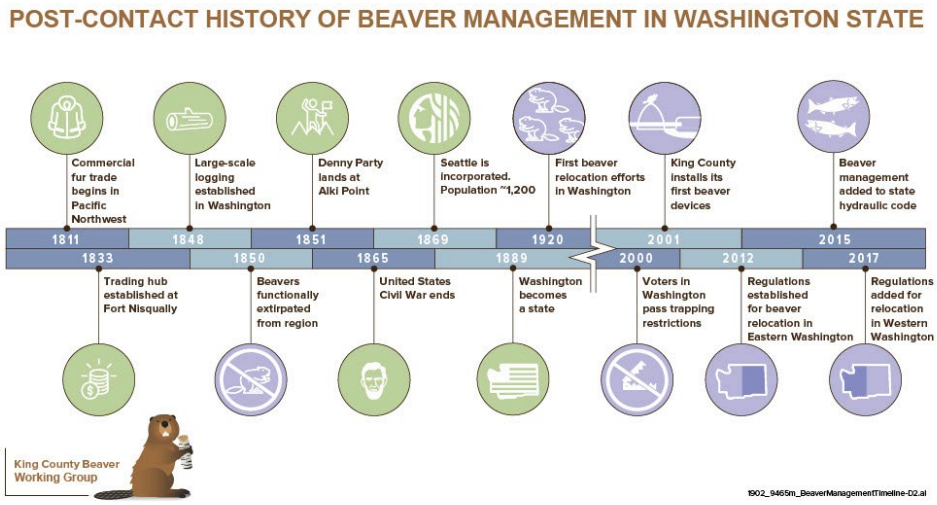
- 2025: Develop King County legislation to allow greater flexibility for managing beaver dams on farms
- 2026: Create guidance on regulations
- 2027: Adopt King County legislation
- 2028: Secure additional funding for technical assistance and research
- 2029: Conduct expanded research and technical assistance, including Population Study

Figure 9. WDFW Trapping Numbers in King County 2014-2021[10]



Background	Service Providers	Priority

Figure 10. Post-Contact History of Beaver Management in Washington State



Beavers are known as “ecosystem engineers” because they physically alter their environment by building dams in waterways, which leads to the creation of wetlands, changes in riparian vegetation, absorption of pollutants, and many other changes that increase stream complexity and contribute to ecosystem health. Beavers are found throughout the lower Snoqualmie Valley in agricultural waterways. Their presence in these waterways can create localized flooding, which inundates farm fields and leads to drainage problems for farming, some fields remain underwater throughout the season, and fence damage can be caused from beaver felled trees. ADAP will remove dams when encountered during projects, work with the Tulalip Tribes to trap and relocate beavers, or the SVWID to trap and cull beavers, and attempt to find longer-term solutions such as devices.

Leads:

- Snoqualmie Valley Watershed Improvement District
- King County ADAP
- King County Beaver Working Group

Partners:

- The Tulalip Tribes
- Beavers Northwest

HIGH

The King County Beaver Working Group has developed technical papers and other tools to help landowners living near beavers[11]. Beaver dam management requires a Hydraulic Project Approval (HPA) from WDFW. King County currently has no formal policy and no established permitting system for specifically responding to beaver-related issues including backwater flooding that can result in the creation of or reversion to prior converted wetlands; currently they are regulated on a case-by-case basis under the King County Critical Areas Ordinance.		

Strategies

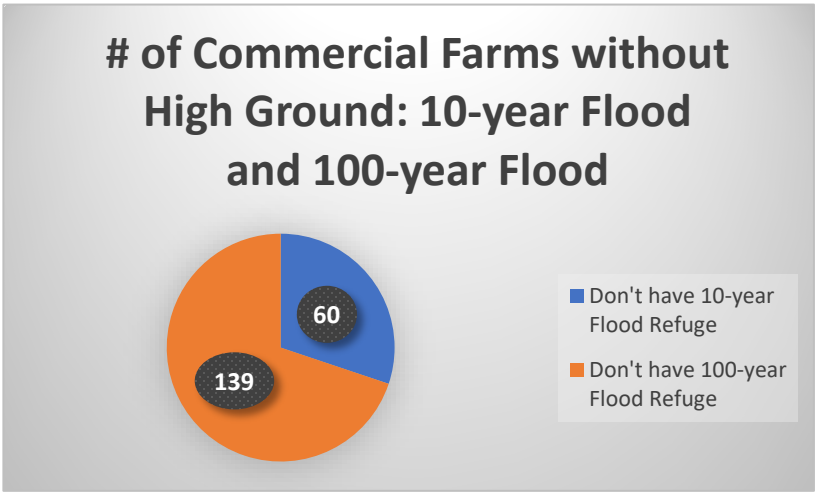
- Manage beaver dams and beaver populations on agricultural lands to increase farmland productivity.
- Leverage ADAP to provide maximum allowable range of drainage services (year-round) for beaver management, including dredging after beaver dam removal to solve sediment build up in emergencies.
- Streamline the King County permitting process within APDs for beaver dam removal so that clearing and grading permit for critical areas is not required and only WDFW HPA is needed.
- Streamline the existing King County clearing and grading permit process for critical areas by developing guidance that scales the County clearing and grading permitting requirements for non-ADAP-eligible waterways based on potential critical areas impacts from beaver dam management. (Note: No new permits are required for this process.)
- Create guidance on regulations for farmer/landowners showing what can be done to manage beaver dams with and without permits.
- Secure long-term funding to increase long-term beaver-related technical assistance, including educational workshops and cost-share options for landowners.
- Secure long-term funding to support research and pilot projects that explore alternatives to trapping and removal, such as increasing depth and width of ag waterways, pond levelers[12], water notch exclusion fencing, crop and planting modifications, new ideas and technology, and population studies over time.
- For buffer plantings, limit willows and tree species that beavers love to eat in favor of conifers and other species they don't like to eat.
- Ensure King County regulations continue to match the State regulations for fur-bearing trapping seasons and rules.

[1] Washington Department of Fish and Wildlife, "Hydraulic Project Approval (HPA) Issued Permits" [LINK]. Accessed 1.11.22.
[2] Climate Change Adaptation and Beaver Management Team. 2014. National fish, wildlife, and plants climate adaptation strategy: report of the climate change adaptation and beaver management team to the joint implementation working group implementing the national fish, wildlife, and plant climate change adaptation strategy. 25 pp.
[3] Washington Department of Fish and Wildlife, "Number of Beavers Trapped in King County since 2014". Public Records Request. February 2, 2023.
[4] Snoqualmie Valley Watershed Improvement District "Management Options for Snoqualmie Valley Beavers" [LINK]. Accessed 1.24.22.
[5] Ericson, Erin. Email Interview. March 20, 2023.
[6] The Tulalip Tribes, "The Tulalip Beaver Project"[LINK]. Accessed 5.6.21.
[7] Collins, Dylan. Email Interview. March 20, 2023.
[8] Beavers Northwest, "Conflict Resolution" [LINK]. Accessed 12.8.22.
[9] Kerr, Elyssa. Email Interview. December 7, 2022.
[10] Ibid.
[11] King County Beaver Working Group, "Post-Contact History of Beaver Management in Washington State" [LINK] Accessed 5.6.21.
[12] Lee, S.Y. et. al, "The Impacts of Pond Levelers on Beaver Dam Flow & Overtopping Frequency," Senior Design Team ENSC 22.1, Seattle University, 2021. Prepared for the Snoqualmie Valley Watershed Improvement District. Page 3-4.

1.2.7: Flood Safety for Farms: High Ground Refuge and Farm Pads

Current Condition

Figure 11. # of Commercial Farms Without High Ground Flood Refuge: 10-year Flood and 100-year Flood



Over 75% of the Snoqualmie Valley APD is within the mapped flood hazard area. Therefore, flooding is one of the biggest challenges for valley farmers. Flood season typically begins in October and stretches through March. While floods of any size can cause damage, farms without access to high ground to store crops, livestock, and equipment, can be economically devastating. With climate change predicting changing precipitation patterns, future peak flows in the Snoqualmie are forecast to be 30-40% higher by 2050, exacerbating the need for high ground refuge and more farm pads for Snoqualmie Valley APD farms.[1]

Of the 214 commercial farm operations in the Snoqualmie Valley APD (SVAPD), 139 farms have no refuge in a 100-year flood (see Maps 10 & 11) and 60 commercial farms have no refuge for a 10-year flood (see Figure 11). Focusing on the 100-year flood level, many of these 139 farms will likely need high ground refuge from flooding to continue farming. There are currently 60 farm pads for 214 commercial farm operations in the SVAPD (see Map 9, Figure 12).[2] This means that 58 commercial farm operations have a total of 60 farm pads.

Figure 12. # of Commercial Farms with Farm Pads SVAPD

Desired Condition by 2048

Every commercial farm has sufficient access (close proximity) to high ground with enough, secure, space for equipment, storage, and livestock.

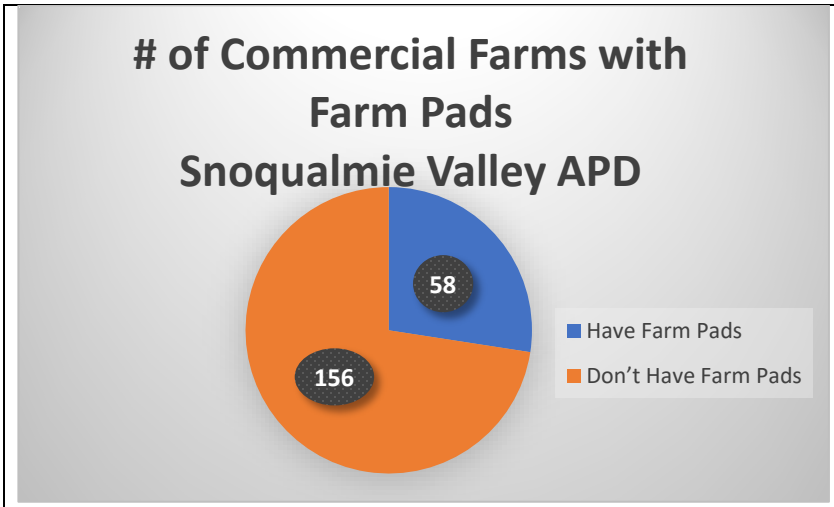
Timeline

2024

- KC adopts farm pad prioritization
- Study 139 farm operations for high ground need
- Workshops and technical assistance:
  - Emergency Flood plan creation
  - Technical and legal support for sharing high ground
  - Case Studies
  - Central reporting system for farm losses from floods
  - Increase climate change impacts education and mental health support for farmers and farm employees
  - Increase participation in crop, livestock, and NFIP insurance programs

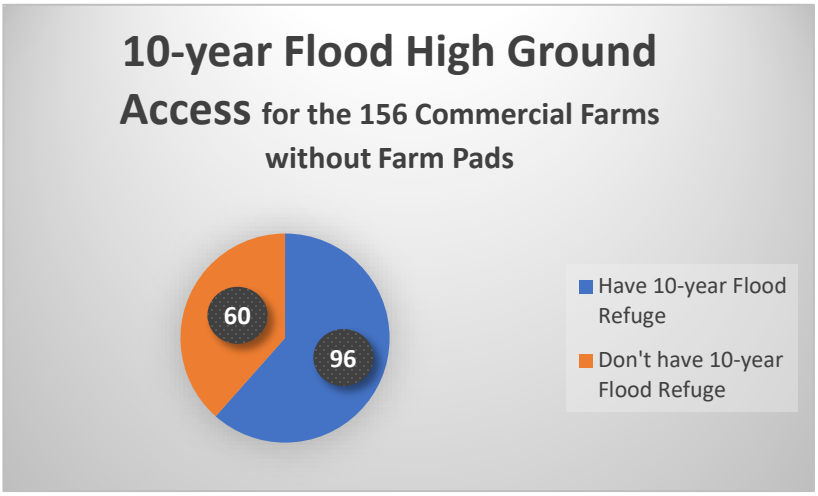
2025

- Ensure future farm pad potential is determined, prioritized when compensatory storage is available, and equitably distributed



Of the 156 commercial farms without farm pads, about 96 farms have 7,000-8,000 sq ft of dry refuge above the 10-year floodplain boundary (see Maps 10 & 11; Figure 13),

Figure 13. 10-year Flood High Ground Access for the 156 Commercial Farms without Farm Pads



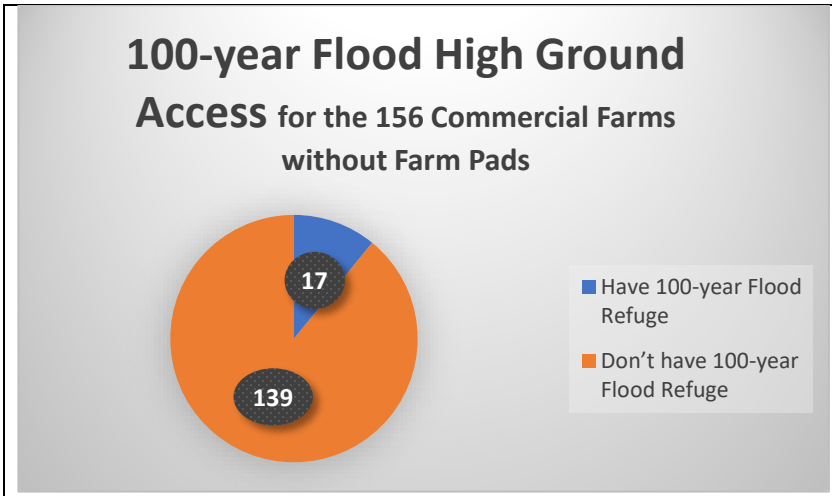
and only 17 commercial farms have access to high ground on their property within the 100-year floodplain boundary (see Figure 14).

Figure 14. 100-year Flood High Ground Access for the 156 Commercial Farms without Farm Pads

- Assess compensatory storage and conduct 2-D modeling
- Identify long-term, shared high ground refuge in proximity for farms in the SVAPD
- Commission third party study to evaluate the zero-rise standard and County's FEMA CRS flood insurance rating impact on agriculture in SVAPD
- Support, fund, and expand Floodzilla flood monitoring system to pilot and test for most needed locations for future farm pads based on how quickly waters rise to flood level
- 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
- King County policy adopted to prioritize comp storage for farm pads
- King County Emergency Management activates animal flood refuge operations at Monroe Fairgrounds and Enumclaw Expo Center when floods are forecast
- More gauges to the Lower Snoqualmie Valley

2026

- Explore the use of public sites such as nearby Snoqualmie Valley Trail, the County's Duvall Park for emergency storage, and Snohomish and King Fairgrounds for animal



Since 2019, under current county policies, there has been no flood storage capacity to build additional farm pads in the APD. Flood storage capacity in the valley can only be created through excavation and potentially with better future modeling technology. Unfortunately, new farm pads will be limited, and will have to be located near excavation sites that create capacity, unless regulations are changed.

To secure the future of farming in the SVAPD, creating new farm pad capacity and shared high ground to ensure that the 139 farm operations without high ground in a 100-year flood, can access known, dedicated, and secure sites for livestock, crop, and equipment storage when floods occur is fundamentally necessary. Moving livestock or equipment off-farm 5-6 times/year is economically unfeasible, so farm pads are more desired than high ground sites further away from farms. Several parcels of these 139 operations in the APD will struggle to be commercially farmed without high ground or a farm pad, leading to decreased farmability of these lands.

Finally, USDA crop and livestock insurance programs that provide payouts caused by natural disasters could provide relief for farms that do not have high ground and suffer losses on crops, livestock, and sales. However, these programs are complex and extremely underutilized by King County farmers.[3] Outreach and education are needed to support farmer participation in these programs.

refuge (through Emergency Management) and if feasible, allocate funding to make sites operational and secure
- Develop five to ten-year schedule of regular renewal agreements and/or needed improvements of high ground refuge for farmers

2027
- Secure shared high ground refuge for farms in the SVAPD to secure long-term safety and productivity of commercial farming operations
- List public and private agricultural high ground refuge locations available to farmers

2032
- Pilot water storage and sediment removal in floodplain lakes
- New farm pads and high ground working well for farmers in SVAPD

Background	Service Providers	Priority
After the flood in 1990, Washington State and King County approved emergency permitting for the installation of "critter pads."[4] Farm pads, in King County code, are raised mounds of compacted earth regulated by the County, to provide flood refuge for farm operations, especially for livestock, harvested crops, and	**Lead:** King County DNRP WLRD **Partners:**	HIGH

farm equipment. However, the county's farm pad program, created as a pilot program to help mitigate flood damages to farming operations in the SVAPD, was never approved by FEMA, and in 2019, FEMA found that the pilot program was not administered in compliance with FEMA NFIP minimum standards. Since the 2019 FEMA finding, there has been no available comprehensive storage in the floodplain to allow for two permitted farm pads to be constructed, nor any new farm pads. Prior to 2019, in an effort to address this complicated issue, King County Water and Land Resources Division, with financial support from the King County Flood Control District (FCD), implemented a pilot Farm Pad Program[5] to help mitigate flood damages to farming operations in the SVAPD. The Farm Pad Program provided preliminary engineering and design assistance, flood modeling for project permitting, logistical support for farm pad construction, and support assessing alternative means of mitigating flood risks without placing fill material in the floodplain. Assistance was provided for roughly 2-3 farm pads each year. USDA Natural Resource Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) provided some construction funding to landowners. Farm pads that were installed during the pilot period, however, were not installed on the basis of greatest need, but rather on a first come, first served basis. Further, land use is not regulated in a way that ensures farm pad infrastructure remains accessible to farm operations in the future. In addition, with the challenge of creating new farm pads since 2019, and maintaining existing ones for agricultural uses, creating high ground refuge that can be shared off-farm is the best long-term solution for farms needing high ground refuge for flood safety. King County has a Class 2 rating in FEMA's Community Rating System (CRS), for adopting standards above FEMA's National Flood Insurance Program (NFIP), King County residents are granted discounted flood insurance rates[6]. Unlike private flood insurance, NFIP cannot cancel policies due to multiple claims over time, reaching a certain threshold of damage, or to weather forecasts. There are nine areas within the SVAPD insured by the National Flood Insurance Program cited in the 2022 FEMA Repetitive Loss Area Analysis.[7] One of many standards the County has adopted to get this excellent rating is a "zero-rise" policy. This means, in part, that farm pads (or other fill) may not contribute to any flood rise (thus, the name, zero-rise) in the flood plain. "King County was the first county in the nation to achieve this rating under CRS and remains one of only two counties in the country with this rating. As of January 2022, about 1,500 flood insurance policyholders in	• SVPA • SVWID • SnoValley Tilth • KC Emergency Management • KC Flood Control District • King Conservation District	

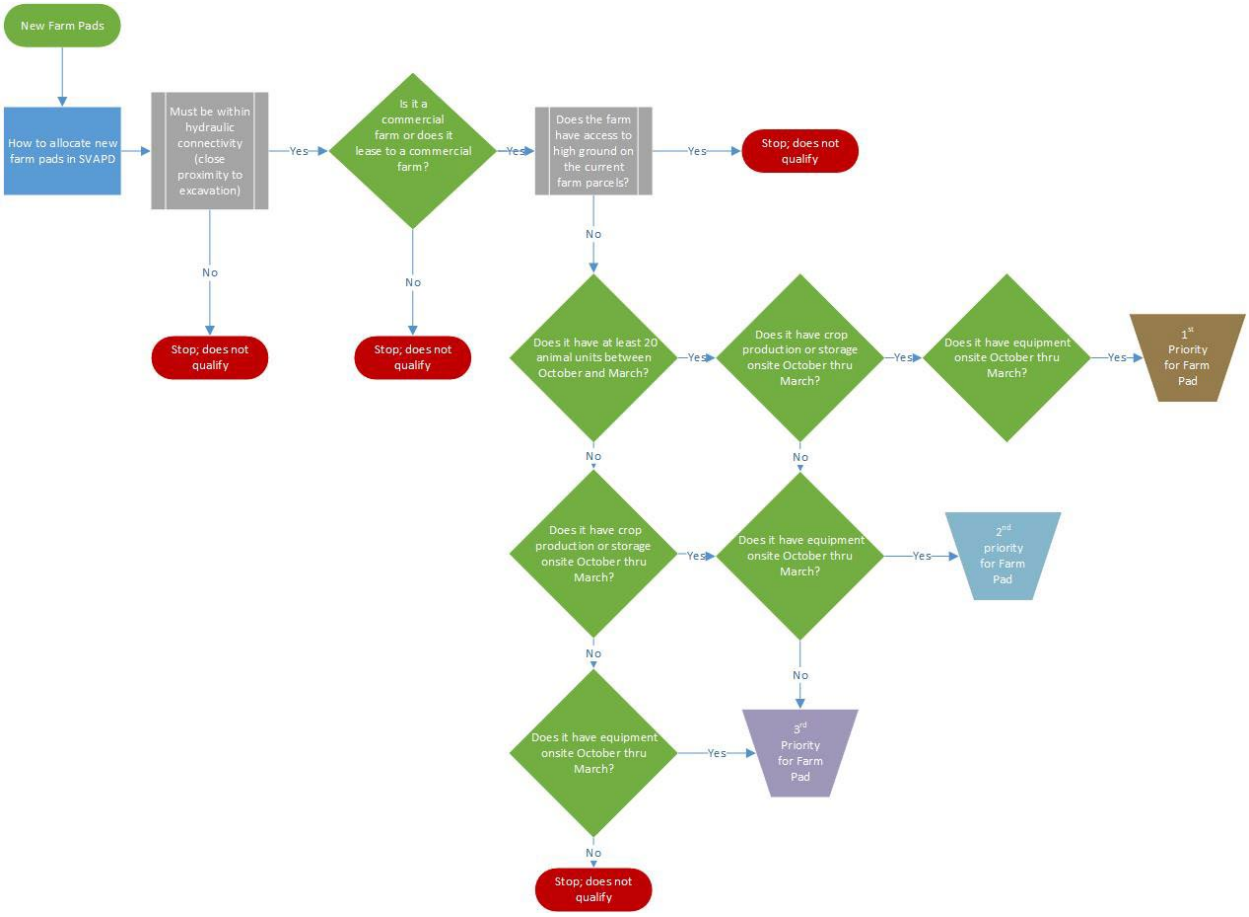
unincorporated King County saved $1 million, an average of $667 per policy"[8]. However, several SVAPD farmers would prefer to spend more money on insurance each year in order to have a farm pad to protect their operations from floods long-term. While King County's CRS rating is positive for many residents of King County, the standards applied to the SVAPD may have a detrimental effect on protecting these high-value agricultural resource lands by limiting farm pads.		

Strategies

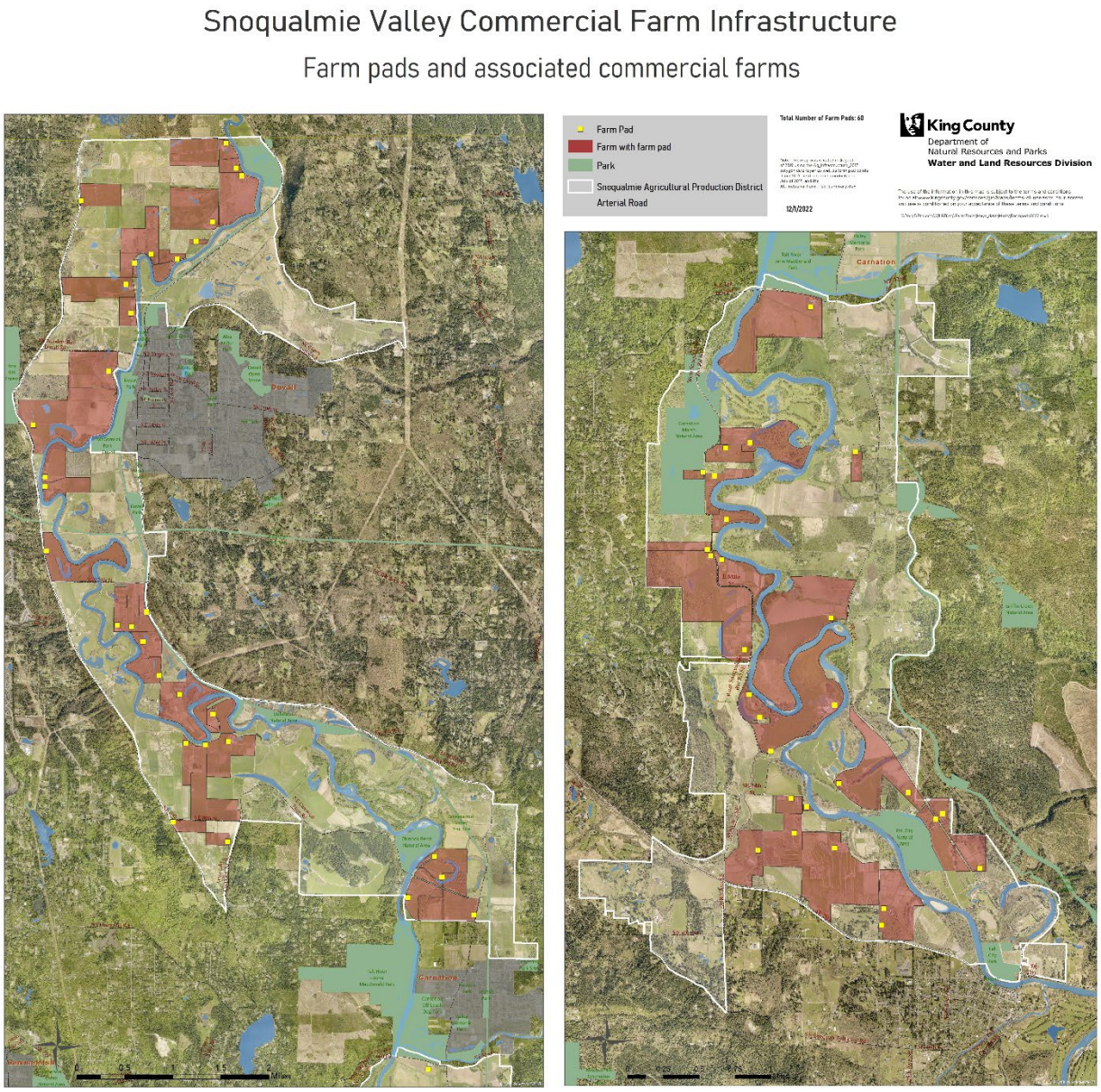
- Ensure future farm pad potential is determined, prioritized when compensatory storage is available, and equitably distributed.
    - Conduct and analyze 2D modeling for better understanding of compensatory storage for FEMA requirements to determine capacity for additional farm pads in SVAPD or any properties added to SVAPD including:
        - design flood event modeling for historical and future conditions
        - evaluation of current and future road flooding
        - cumulative infrastructure analysis
    - Study 139 farm operations for high ground need.
    - Commission third party study to evaluate the zero-rise standard and County's FEMA CRS flood insurance rating impact on agriculture in SVAPD, including:
        - Analyze economic impacts and recommend financial trade-offs for preserving agricultural resource lands, and the farm business sector in comparison with rate reductions for residents.
        - Analyze ways to maintain safety while limiting financial impacts to agricultural sector, agricultural resource lands and flood insurance rates.
        - Recommendations on how the zero-rise standard or County's CRS rating could be modified to support new farm pads.
    - Establish King County policy that includes agriculture as a high priority for any new compensatory storage opportunities from near-term slate of planned large capital projects.
    - King County adopts Agricultural Land Resource Strategic Plan Task Force's prioritization criteria for future farm pads (see Figure 15) so that they are equitably distributed to commercial farms with the greatest need.
    - King County records farm pads on title to preserve and protect farm pads as critical agriculture infrastructure including the language "farm pad shall be for agricultural use".
    - King County implements all recommendations for King County Use of Gauge Data for Flood Warning[9] including adding more gauges to the Lower Snoqualmie Valley.
    - King County Emergency Management activates animal flood refuge operations at Monroe Fairgrounds and Enumclaw Expo Center when floods are forecast.
    - Ensure King County's Emergency Flood Hazard Management Plan includes these strategies.
        - Encourage commitments from FCD to these strategies.
- Secure shared high ground refuge for farms in the SVAPD to secure long-term safety and productivity of commercial farming operations.

    - Based on known high ground, further evaluate farmer/landowner need for high ground and willingness to share access to high ground in certain areas.
    - Facilitate farmers to work together, sharing existing farm pads and high ground as legally feasible.
    - Explore the use of public sites such as nearby Snoqualmie Valley Trail, the County's Duvall Park for emergency storage, and Snohomish and King Fairgrounds for animal refuge (through Emergency Management) and if feasible, allocate funding to make sites operational and secure.
    - List public and private agricultural high ground refuge locations available to farmers.
    - Develop five to ten-year schedule of regular renewal agreements and/or needed improvements of high ground refuge for farmers.
- Pilot water storage and sediment removal in lakes to increase floodplain comprehensive storage for farm pads.
- Continue King County's monitoring of sediment deposition in the Snoqualmie River in reaches near Carnation and Fall City to inform potential future flood risk reduction actions.[10]
    - 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.
- Service lead and partners work to:
    - Create case studies of farm operations with and without farm pads and high ground in SVAPD to show time and costs of preparing for and recovering from flood impacts.
    - Create a central reporting system for farm operation losses from floods that shows economic impacts per event and over time.
    - Increase participation in crop and livestock insurance programs.
    - For homeowners in the SVAPD floodplain, increase participation in FEMA's National Flood Insurance Program.
    - Add Emergency Flood Plan for farms to all new Farm Conservation Plans and conduct Emergency Flood Plan workshops for farms that already have farm plans.
    - Maintain existing programs that support technical assistance and cost-share for flood safety.
    - Support, fund, and expand Floodzilla flood monitoring system to pilot and test for most needed locations for future farm pads based on how quickly waters rise to flood level.
    - Protect the farming sector in the APD, by putting more emphasis on evaluating comprehensive storage, maintaining through scheduled modeling, and active enforcement on any encroachments that lessen the ability to have more farm pads.
    - Increase climate change impacts education and mental health support for farmers and farm employees.
    - Study the impacts of zero-rise policy on other agricultural infrastructure such as roads, pack houses, and composting.
    - Examine feasibility for shared "flood safe" crop/cold storage for farm products.

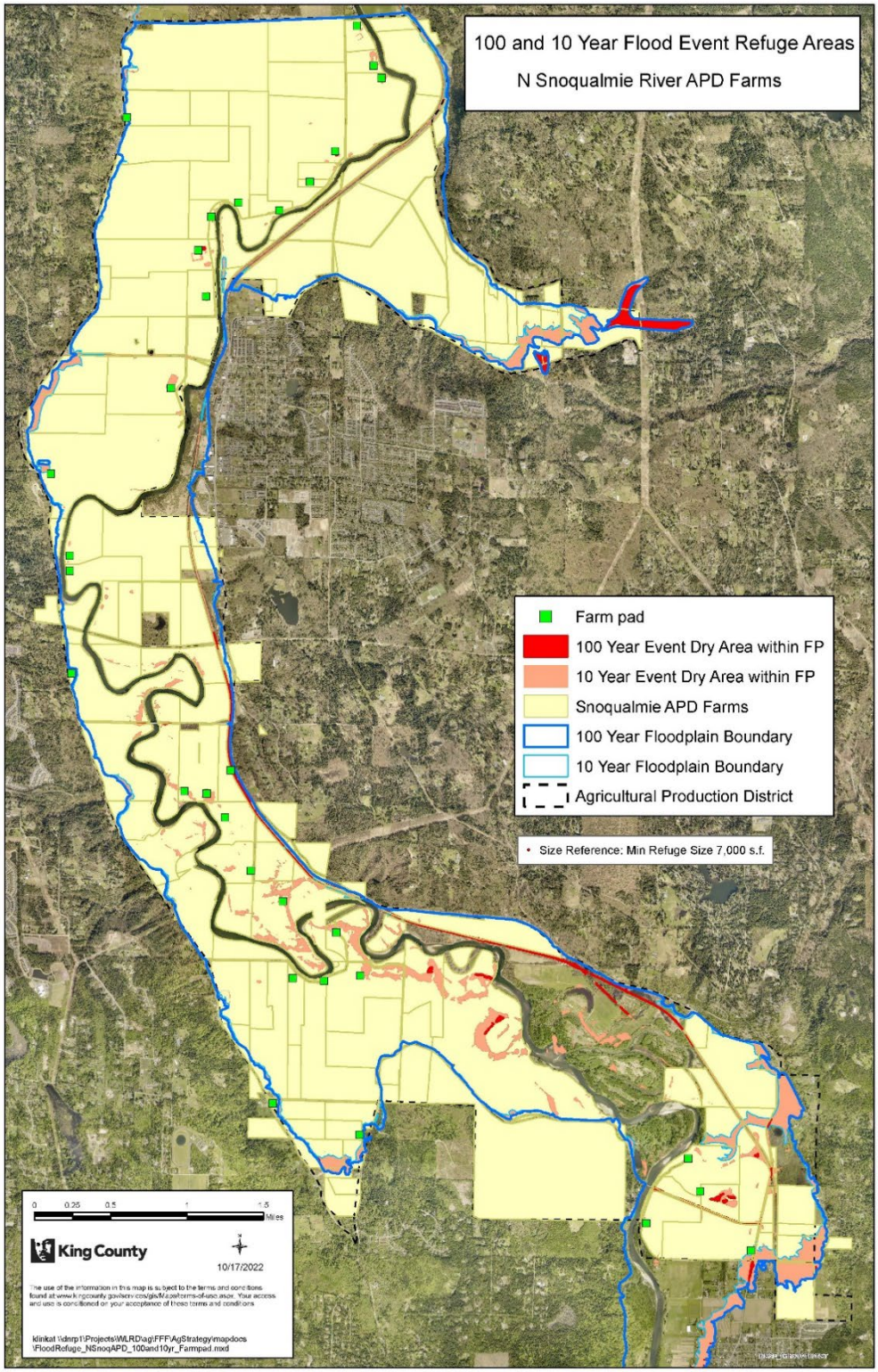
Figure 15. Prioritization criteria for future farm pads' equitable distribution to commercial farms. Task Force's proposed flowchart to King County for future farm pad prioritization.



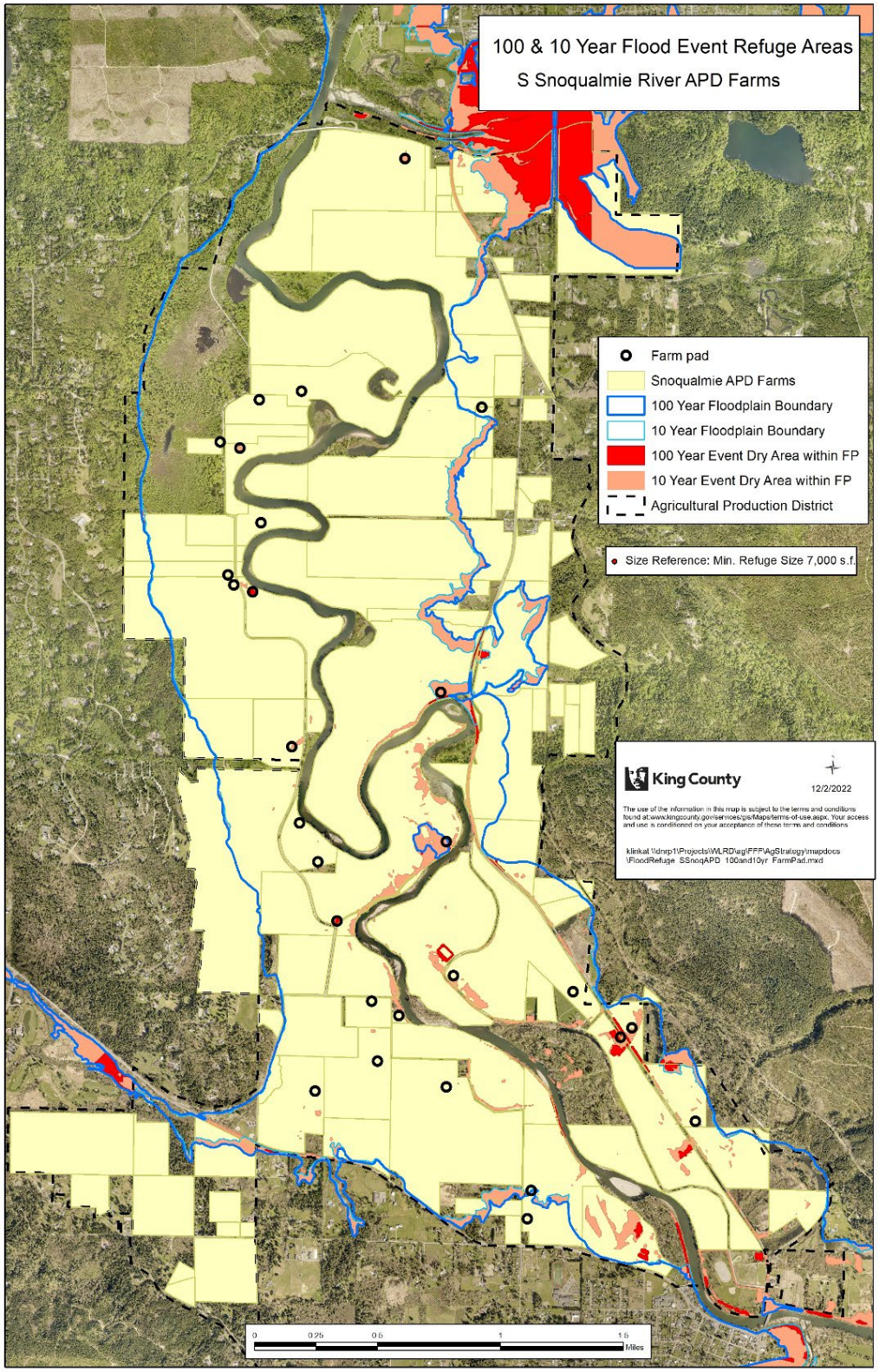
Map 9. Snoqualmie Valley Commercial Farm Infrastructure: Farm Pads and Associated Commercial Farms



Map 10. North Snoqualmie Valley APD Commercial Farms: Flood Refuge Areas in 100- and 10-Year Flood Events



Map 11. South Snoqualmie Valley APD Commercial Farms: Flood Refuge Areas in 100- and 10-Year Flood Events

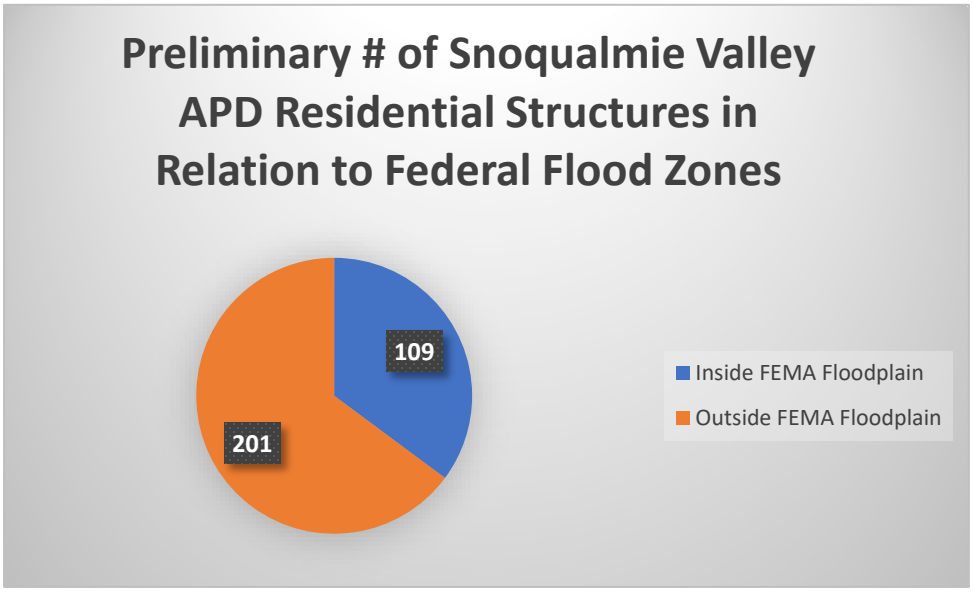


[1] Se-Yeun, L., Mauger, G., and Won, J., 2018. Effect of Climate Change on Flooding in King County Rivers: Using New Regional Climate Model Simulations to Quantify Changes in Flood Risk, 2018. Page 46. Report Prepared for King County Flood Control District. University of Washington Climate Impacts Group.
[2] As of July 2020, two commercial farms in the SVAPD have two farm pads each, therefore 214 commercial farms - 60 farm pads = 156 commercial farms without a farm pad.
[3] Dwaine Schettler, Program Specialist Washington State, USDA Farm Service Agency, email communication "King County NAP Participation", November 2021.
[4] Federal Emergency Management Agency, "Moo-ving On Up: Critter Pads Keep Farm Animals Safe from Floods"; [LINK]; last updated 2/11/2021; accessed 11/29/21.
[5] King County, "Farm Pad Program"; [LINK]; last updated July 11, 2018; accessed 2/15/2022.
[6] King County, "Community Rating System"; [LINK]; last updated September 24, 2015; accessed 2/7/2022.
[7] King County, "Repetitive Loss Area Analysis" External Version, July 26, 2022. [LINK]. Report Prepared for King County Department of Natural Resources and Parks, Water and Land Resources Division, River and Floodplain Management Section. Perteet and O'Neill Service Group.
[8] King County, "Community Rating System"; Ibid.
[9] King County, "Snoqualmie River Hydrologic Study: Evaluation of Flooding Trends and Current Conditions" July 13, 2018. [LINK] Page 25-26 [47-48]; accessed 2/22/22. Report Prepared for King County Department of Natural Resources and Parks, Water and Land Resources Division. Watershed Science and Engineering and Herrera Environmental Consultants.
[10] King County, "Snoqualmie River Hydrologic Study: Evaluation of Flooding Trends and Current Conditions" July 13, 2018. [LINK] Page 54 [76]; accessed 2/17/22. Report Prepared for King County Department of Natural Resources and Parks, Water and Land Resources Division. Watershed Science and Engineering and Herrera Environmental Consultants.

1.2.8 Home Preservation in the APD

Current Condition

Figure 16. Preliminary # of Snoqualmie Valley APD Residential Structures in Relation to Federal Flood Zones



Homes in the SVAPD are an important and limited public resource for the agriculture sector. Escalating real estate values, flood safety, and competing uses are three significant challenges to securing and maintaining home infrastructure in the SVAPD for farming operations. With 214 commercial farm operations in the SVAPD, many farmers prefer to live on or near their farm, but do not or are unable to live in one of the 310 homes in the SVAPD.

Real estate values for farmland and homes in the SVAPD are increasing. In 2022, based on the last three years of home sales for the eighteen homes with no farmable acreage, the median home value in the SVAPD was $699,900 and the mean was $686,603.[1] Many of these homes are too expensive for new and beginning as well as historically underserved farmers to buy. Since 2020, several larger farms (more than 50 acres in size) in the SVAPD have been on the market for many months at costs exceeding $2M. This value increase also creates challenges given speculation of increased prices, thereby driving up easement costs. Proposed King County legislation concerning zoning and requirements for wineries, breweries, and distilleries (WBDs) would not allow WBDs in APDs to further protect APDs from these impacts. This may help stabilize some of the real estate speculation that has plagued farmable land values in APDs. However, there is a real need to push for further protections in the Farmland Preservation Program such as option to purchase at agricultural value (OPAV)[2] easements and pilot land tenure alternatives that would grant long-term (20–99-year leases), allow more farmers on a parcel, or allow for cooperative ownership, in order to keep the homes on or near SVAPD farms affordable for farmers.

Flooding impacts put at risk up to an estimated 109 homes located in the FEMA floodplain including about 91 in the FEMA floodway[3]. See Map 12. To protect homes from flooding, King County offers the King County Flood Buyout and Elevation Program[4].

19 of the homes in the floodplain have been elevated since 1999 through the home elevation program, with 15 of those completed since 2007 (see Figure 17). Three homes are now in the planning phase for elevation. While 22 homeowners have or are pursuing home elevations, this means that roughly 87[5] homes in the 100-year floodplain need to be

Desired Condition by 2048

Every home in the APD is protected from other uses, is made affordable to farmers and farm employees, and is elevated in the floodplain to support commercial farm operations.

Timeline

2025

- King County DNRP (Parks, WLRD, etc.) and DLS (Roads) ag land acquisitions with homes added into WLRD acquisition review
- Study home removal from floodplain and the impact (potential increase) on comprehensive storage. If capacity is gained, allot only to farm pad program

2026

- Home elevations - Conduct needs assessment, create priority implementation structure for home elevations
- When a home is removed from the APD, including flooding tributaries, invest in low-income/affordable farmworker housing within 5 miles of APD for farm housing

2027

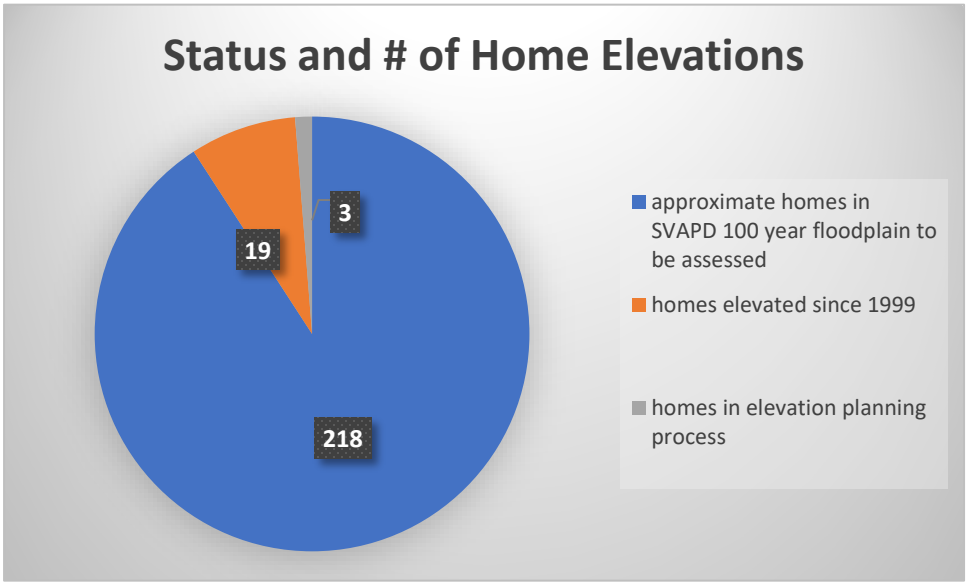
- Launch improved home elevation program - Increase participation, outreach and partnerships, improve process, increase funding for technical support staff
- King County adopts policies to preserve homes in SVAPD from competitive uses

2029

- Increase pace of home elevations to 4-10/year
- Restore the Barn Elevation Pilot Project and utilize home elevation strategies to structure a permanent

assessed for elevation. However, the exact number of homes needing elevation or mitigation to be safe in floods, is unknown until a new assessment is completed. The pace of home elevations over 22 years has been nearly 1/year.

Figure 17. Status and # of Home Elevations to Date



In addition, five homes have been acquired by the Flood Control District for flood safety purposes within the APD since 2008. While these homes were surplused to move to new locations, there were no viable bids, resulting in the homes being demolished. As of 2019, all such acquisitions are first assessed to ensure homes remain in the APD to support agriculture whenever it is safe enough to do so.

Competing uses to farming in the APD, as well as utility infrastructure and habitat projects has resulted in losing homes in the APD for farming. Uses such as recreation for duck clubs and parks (Snoqualmie trail extension north of Duvall), habitat, water pipeline projects, means additional APD homes have been purchased or removed. King County Agriculture Program and SnoValley Tilth are now planning to improve the elevated home at the County owned Snoqualmie River Farm to support farm uses.

Home preservation in the SVAPD is critical for farm operations. Because homes may no longer be built in the floodway due to FEMA regulations, any home that comes out of the floodway, may not be replaced, and that option is lost forever. With climate change impacting flood patterns and existing homes in the floodplain, real estate values skyrocketing and not reflecting agricultural land value, and competing land uses in the APD, there is a housing crisis for farmers.

agricultural building elevation program

2030

- Increase succession planning resources and funding to assist current landowners to transition their businesses to new farmers and keep homes occupied and livable
- Conduct outreach about creative financing and business ownership models for farm and home transition

2030, 2035, 2040, 2045

- Survey SVAPD farm operations every 3-5 years to evaluate the challenges and cost of housing

2048

- Complete 100 elevations (87 homes + 13 farm buildings)

Background	Service Providers	Priority
The success of a farming business in the SVAPD is reduced when it does not have a home as part of its infrastructure. Managing day-to-day and emergency operations[6] on a farm, including weather conditions, deliveries, staff, wildlife, invasive species, security, and more, requires residence on the farm (most desired) or close by (alternatively). Farmers who have to commute to the farm are at an extreme disadvantage and may not be able to farm viably or respond to flood safety or security emergencies such as fuel spillage, contamination, theft, or animal abuse. Affordable housing is required in surrounding towns to support the farm sector, especially year-round farmers, and farm employees. On-farm, seasonal farmworker housing[7] is also needed. Many farm employees used to live in Seattle and commute to work in the valley, but	Lead ○ King County DNRP River and Floodplain Management Section (RFMS) Partners ○ SVPA ○ SnoValley Tilth ○ WA Farm Bureau	HIGH

higher housing costs in the city, cost of living increases for utilities and food, and fuel hikes, as well as competitive employment opportunities in the region, make this a less feasible option for farm employees, causing farmers increased difficulty for securing and retaining farm employees. Home elevations (see Figures 18-21) began in 1999 to ensure floodplain residents could more safely survive and recover from flood impacts. Due to the nature of upheaval and expense even with the technical assistance and cost-share of the King County Home Elevation program[8] funded by the King County Flood Control District, the planning, permitting, expense, and contractor services to lift, landscape, and reconnect services to a home, can be daunting. In addition to the home elevation program, in 2012 there was also a Barn Elevation Pilot Project[9] that elevated a 4,000 square foot livestock barn and a 1,250 square foot elevated farm platform in the SVAPD. See Figures 20 and 21.	○ Local Housing Organizations	

Strategies

- Home Elevations
  - Examine infrastructure vulnerability, especially from increased flooding (SCAP).
  - Conduct needs assessment for home elevations; survey all homes in the APD for eligibility, including flooding tributaries, and include external agriculture input in the process.
  - From needs assessment, utilize 2D modeling overlay, including climate change models, to help create priority implementation for home elevations and/or re-elevations.
  - Increase participation in home elevation program through outreach and partnerships.
  - Improve home elevation process for homeowners through increased cost-share, sliding scale option that offers payments up front or directly pays service providers, and list of service providers including architects and contractors.
  - Further incentivize landowners in the SVAPD to do a home elevation by increasing the cost-share allowance to include reimbursement to landowners for hours logged in managing the project and contractors, as well as for required accessories such as on-site or off-site storage rentals, temporary housing, etc.
  - Increase funding for technical support staff to do outreach and education to landowners in APD about the program.
  - Increase funding to increase pace of home elevations to 4-10/year so that 100 more homes are protected in the next 25 years.
- Barn and Agricultural Building Elevations
  - Restore the Barn Elevation Pilot Project and utilize home elevation strategies to structure a permanent agricultural building elevation program.
- Flood Home Buyouts
  - Purchases shall not be made within an APD without King County DNRP WLRD acquisition decision memo process (in place since 2019).
  - Study home removal from floodplain and the impact (potential increase) on comprehensive storage. If capacity is gained, allot only to farm pad program.
  - When a home is removed from the APD, invest in low-income/affordable, long-term farmer and farmworker housing within 5 miles of APD for farm housing because short-term rentals versus long-term ownership of housing limits long term investment in the land.
- King County adopts policies to preserve homes in SVAPD from competitive uses
  - King County Departments and Divisions must protect farming by participating in the DNRP WLRD land acquisition decision memo process for approval prior to purchase of a home or property with a home in the APD.
  - Work cooperatively with Land Trusts, King County and NGOs to find long-term solutions such as multi-generational leases for farmland and homes in the APD.
  - For homes in the floodplain owned by King County, convert to rental homes through third party for farmers and farm employees for the public benefit of food security.
  - Utilize strategic boundary line adjustments to preserve affordable homes for agriculture in SVAPD.
  - Research, test and trial additional public/private partnerships, including tax incentives or rebates to homeowners to offer homes for rent to farm employers and farm employees.
  - Ensure Farmland Preservation Program offers protections that preserve affordable homes.
  - Support pilot projects to explore new land tenure models.

    - In code, require the primary use of APD properties to be farming before secondary use of recreation, such as hunting/duck clubs.
- Increase succession planning resources and funding to assist current landowners to transition their businesses to new farmers and keep homes occupied and livable.
- Conduct outreach about creative financing and business ownership models for farm and home transition.
- Survey SVAPD farm operations every 3-5 years to evaluate the challenges and cost of housing.
- Strategically capture and share surveying monuments and benchmarks to support efforts regarding road flooding, home and barn elevations and Floodzilla monitoring system.

Map 12. Residential Structures Snoqualmie Valley APD

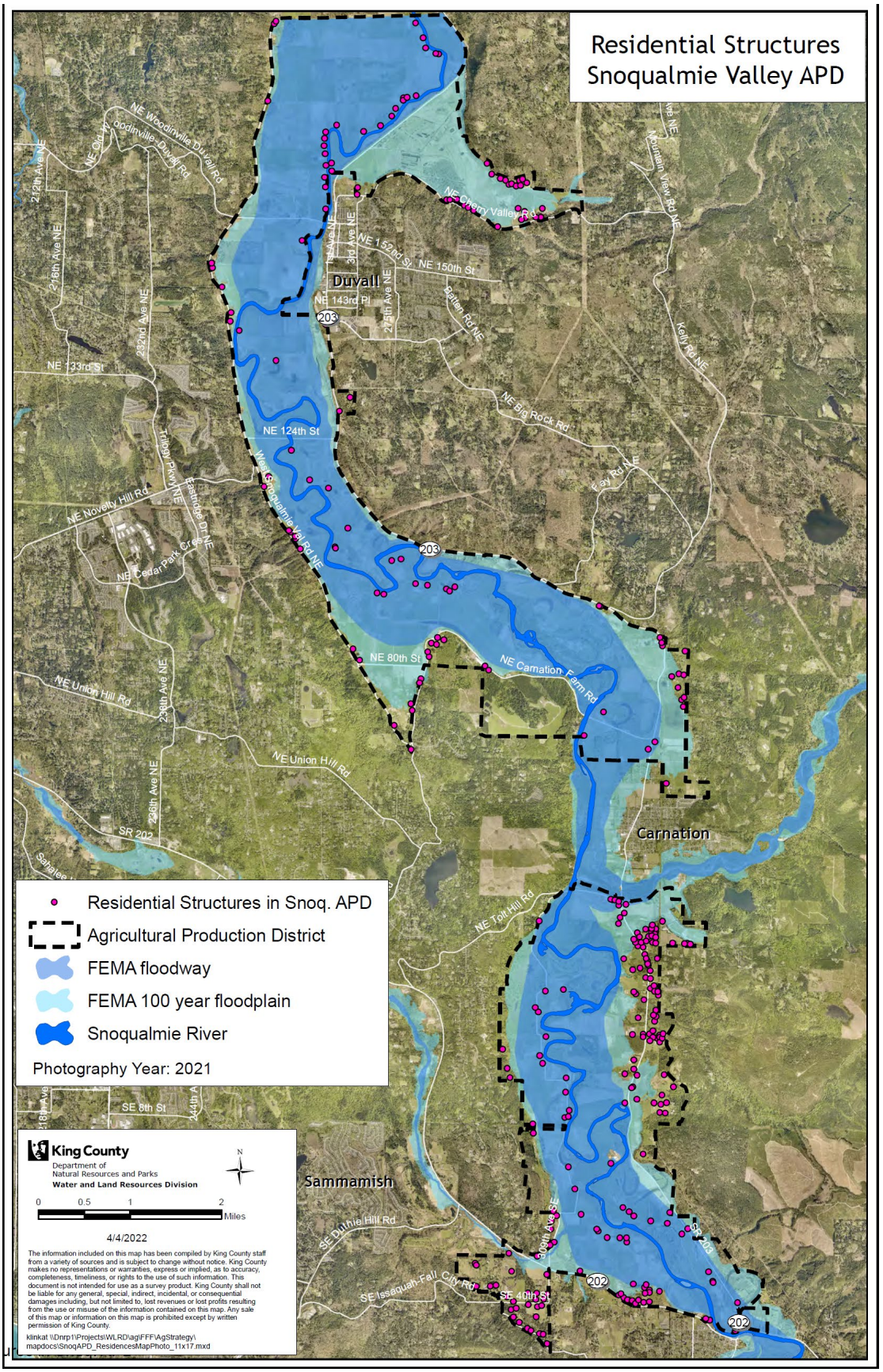


Figure 18. Before Home Elevation, 2015

Figure 19. After Home Elevation, 2017

Figure 20. Elevated Home with Flooding, Nov. 2006

Figure 21. Home Elevation Project During Construction

Figure 22. Barn Elevation Pilot Project Platform

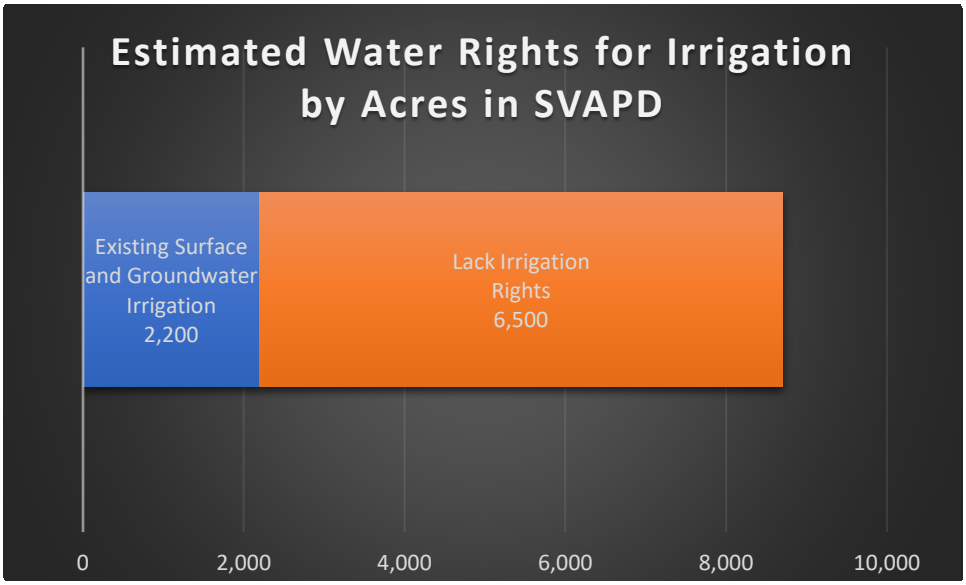
Figure 23. Barn Elevation Pilot Project Livestock Barn

[1] King County Farmland Preservation Program, Unpublished Report, October 2022. The analysis is based on aggregated mean sales price/acre and median sales price/acre from the last 3 years of sales, March 2019-2022, in the SVAPD. Accessed March 2022 from King County's iMAP, "last three years of sales" layer.
[2]Center for Agriculture and Food Systems at Vermont Law School, Farmland Access Legal Toolkit, "What Is an OPAV?". [LINK] Accessed 5.20.22
[3] Preliminary numbers based on 2021 GIS aerial analysis conducted in 2022; new assessment needed by DNRP WLRD RFMS as noted in strategies.
[4] King County Flood Buyout and Elevation Program. Last Updated September 24, 2015. [LINK] Accessed 5/2/2022.
[5] GIS analysis shows 109 homes in floodway, minus 19 already elevated, minus 3 in process of being elevated by KC Home elevation program = 87 remaining to be assessed for elevation.
[6] Emergency operations refers to flood safety and security events in regard to spillage and contamination, as well as to extreme weather events and other types of emergencies.
[7] See Farm King County's, "Farmworker Housing" last updated 2022 for more information on farmworker housing options and required licenses and permitting. [LINK]. Accessed 3/21/22.
[8] King County Flood Buyout and Elevation Program. Last Updated September 24, 2015. [LINK] Accessed 5/2/2022.
[9] King County Flood Control District Annual Report 2012 and 2013 First Quarter Performance Report, April 2013.[LINK] Page 6 [7]. Accessed 5.20.22

1.3.9: Water Rights and Irrigation

Current Condition

Figure 24. Estimated Water Rights for Irrigation by Acres in SVAPD[1]



In a study commissioned by the Snoqualmie Valley Watershed Improvement District (SVWID), of roughly 8,780 farmed acres in the SVAPD, "existing surface and groundwater irrigation…[rights] might total 2,200 acres. Approximately 6,500 acres may then lack irrigation rights."[2] While these are rough estimates, they are the best estimates to date. [3] This would mean about 74% of *farmable* acreage has no water rights.

With the SVWID's water bank capacity at roughly 157-acre feet (AF), approximately 313 acres of additional farmable land adjoining the Snoqualmie River can be irrigated. Without an approved hydrological analysis, farmable land that does not adjoin the Snoqualmie River, is not eligible for water bank transfers at this time.

Therefore, the SVWID is also looking at water storage options in uplands that would serve additional farmable lands in the SVAPD and SVWID special service district, such as those along eastern valley tributaries. The SVWID's upland multi-benefit water storage performance goal is a minimum of 104 AF projected at a cost of $3.5 million and a maximum of 3,311 AF (6,622 acres) projected at a cost of $112 million.[4] Because upland water storage is multi-benefit, reducing seasonal flooding while benefitting both in-stream flows and farms, the allocation of water storage for irrigation will vary, but if half of the storage were to be approved for each beneficial use equally, that would irrigate approximately 104 acres and 3,311 acres of additional farmland, respectively.

While water needs vary widely based on crops grown, "if, on average, each acre needed 0.5 AF (6 inches), then the maximum need would be approximately 3,250 AF"[5]. In 2013, Washington Water Trust (WWT) "assessed ground and surface water irrigation water rights within the Snoqualmie APD" using GIS and aerial photos.[6] They cite Department of Ecology records indicating "105 irrigation water rights/claims in the APD, accounting for 3,144 ac-ft/yr and 3,403 acres of authorized and asserted acreage."[7] While their 2009 aerials showed about 1,645 acres of irrigation occurring, 2011 showed about 2,081.[8] Because water rights must be used to maintain them, or held in trust, about half of the water rights showed weak evidence of beneficial use.[9]

Desired Condition by 2048

Every commercial farm has ample access to legal water for irrigation and is supported to maximize efficiency of water usage.

Timeline

2023

- Support collaboration between SVWID and King County WLRD regarding water and irrigation goals and solutions
- Initiate and gain partner support needed for water storage pilot

2024

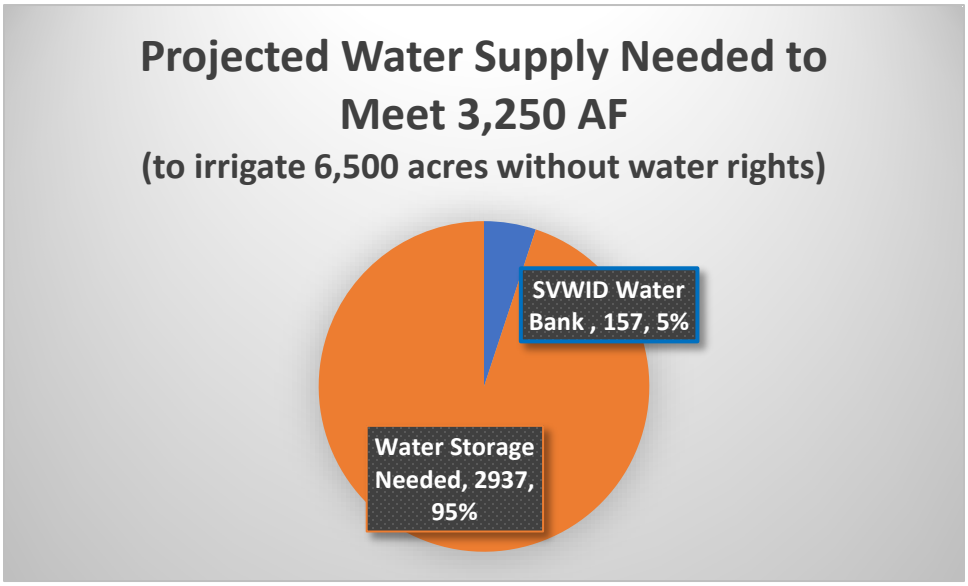
- Continue water transfers and serve additional farms, including beginning and historically underserved farmers
- Expand water bank and add interruptible water rights and water storage
- Education and Technical Assistance: Round 1
- Explore multi-benefit partnerships and funding opportunities to continue and expand SVWID irrigation program capacity
- King County records water rights in APDs on title
- King County sends notification to new owners and the SVWID upon land sales with water rights in SVAPD

2025

- Secure funding for water storage pilot project
- Ensure SVAPD landowners' (public and private) water rights are maintained
- First manure lagoon conversion for irrigation storage

2026

- Education and Technical Assistance: Round 2
- Pilot alternative, large-scale

The SVAPD needs water even for crops that have not traditionally required irrigation. Crops such as feed corn, hay, and silage, where dairy waste is used to fertilize and irrigate the crop, are now requiring additional irrigation to weather unusual early spring drought or longer summer drought periods in order to maintain yields or not lose entire harvests. Most high-value specialty crops (berries, vegetables, and flowers) need irrigation currently to grow well and will need more irrigation as temperatures increase through extreme weather events and climate change. While some agricultural practices can improve crop resiliency in the face of extreme weather or drought they do not eliminate the need for irrigation. With irrigation needs growing with climate change, the SVWID is also looking at water transfers to support non-traditional crop irrigation and is conveying this growing need to the WA State Department of Ecology (ECY) and others. Without water storage, it will be impossible to meet even 95% of the irrigation needs of the SVAPD. The SVWID is also actively pursuing water storage[10] as flooding mitigation and to meet irrigation needs during seasonal low flow. To meet the total 3,250 AF estimated need, the SVWID is proposing utilizing 157 AF of their water bank and pursuing upland water storage to meet the remaining 2,937 AF of need (see Figure 25). The SVWID is working with partners and regulatory agencies to pursue water storage in a range of projects from a minimum goal of 104 AF potential to a maximum goal (project size) of 3,311 AF for irrigation potential. See Map 13 for potential upland water storage locations. **Figure 25. Projected Water Supply Needed to Meet 3,250 AF**  Finally, irrigation under FDA's Food Safety Modernization Act (FSMA)[11] may limit some of the kinds of water that may be used or how they are utilized and applied for crops eaten raw.	water storage, technology and innovation Develop and utilize an agreement outlining a mitigation program such as the Dungeness Water Exchange 2030 • Complete water storage pilot, share with stakeholders, Ecology, and gain political support needed • Education and Technical Assistance: Round 3 2035 • Education and Technical Assistance: Round 4

Background	Service Providers	Priority
Water rights in the Snoqualmie Valley APD are limited, and western water law is complex. Many farmers do not have access to water in the APD which limits their ability to cultivate annual vegetable crops, reduces yields of hay, vegetables, and berries and is exacerbated by periods of drought during the summer and shoulder seasons which may destroy entire plantings of annual vegetable or flower seedlings. New wells are not allowed in the floodway. Outside of the floodway, exempt wells allow for livestock watering and/or 5,000 gallons of irrigation water per day for industrial use (which includes agriculture).	Lead: • Snoqualmie Valley Watershed Improvement District (SVWID) Partners: • King County WLRD	HIGH

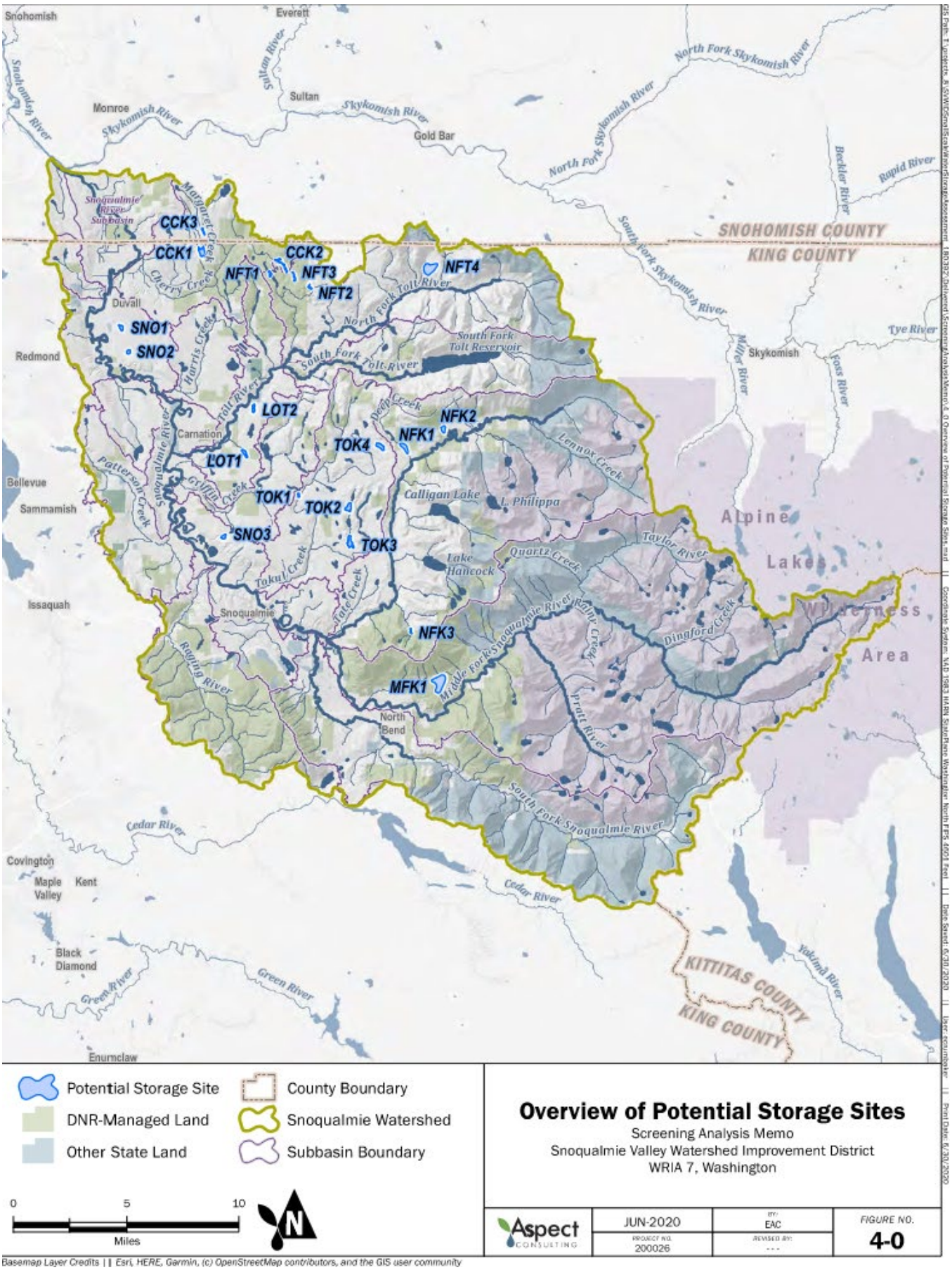
The Metropolitan King County Council voted unanimously to approve the formation of the Snoqualmie Valley Watershed Improvement District (SVWID) on December 7, 2015. The SVWID is a special purpose district created to focus on drainage and irrigation with the aim to increase access to irrigation water by acquiring new, mitigated water rights and voluntary, market-based transfer of existing water rights.[12] SVWID purchased a Tokul Creek water right, created a water bank, and now leases water to farmers downstream for 1–5-year terms.[13] In addition, SVWID does private consultations with landowners who have or need water rights. While 56.71 AF is held via the SVWID's Tokul Creek surface water right,[14] the SVWID is working with other landowners with privately owned water rights to add additional capacity to their water bank in the form of water transfers. Two such transfers add about another 100 AF primarily March through November.[15] By banking water through purchase and transfers, annually offering that irrigation water at market rate bids, and working with landowners to maintain their water rights, the SVWID is building capacity to meet commercial farms' needs. The Washington State Department of Ecology (ECY) manages all water resources in the state and is responsible for allocation of water. SVWID works closely with ECY to approve temporary transfers of water rights for their water bank each year through their water leasing program.	• SVPA • SnoValley Tilth • WA Water Trust • WA Dept of Ecology • King Conservation District • USDA NRCS EQIP • WA State Dept of Agriculture (WSDA) • King County Flood Control District and/or KC RFMS	

Strategies

- Advocate and gain political support with FEMA, Tribes, WA Dept of Ecology, WA Fish and Wildlife, WSDA, KC WLRD, KC Council Members, King Conservation District, WA Conservation Commission, and others to accomplish multi-benefit water storage as related to climate change and irrigation needs.
    - Fund water storage partnership.
    - Identify key decision-makers and policies in agencies and Tribes and existing limitations for those partnerships.
    - Start the due diligence to fund water storage studies, analyses, and test strategies that gain ground.
    - Advocate for water storage in King County plans.
- Support collaboration between SVWID and King County WLRD regarding water and irrigation goals and solutions.
- Support SVWID to
    - Ensure SVAPD landowners' (public and private) water rights are maintained.
    - Continue water transfers and serve additional farms, including beginning and historically underserved farmers.
    - Expand water bank and add interruptible water rights and water storage.
- Streamline permitting through Ecology for water rights and water storage.
- Secure multi-benefit project partnerships to achieve irrigation goals and long-term funding.
- King County records water rights in APDs on title to preserve and protect water rights as critical agriculture infrastructure.
- For land sales with water rights, King County sends notification to new owners and the SVWID upon sale, so that water rights are maintained through the land transition.
- Education, Technical and Financial Assistance
    - Trainings on Water Rights 101 for Ag Sector and SVAPD landowners (KCD, WSU, SVT, etc.)
    - Trainings regarding leasing, and land costs, uses, allowable uses and services, i.e., fish screens and metered water rights.
    - Technical and financial assistance for continued funding for irrigation efficiencies (such as infrastructure, wells, fish screens) from King County Ag Water Quality Cost-Share Program, King Conservation District, etc.
    - Workshops on water conservation and re-use on farms, capturing water run-off for recycling and filtering to increase multi-benefits through water quality improvements.
    - Conduct outreach to farms about USDA NRCS EQIP and other grants or cost-share funding for irrigation systems.
    - Conduct education regarding irrigation sources under FDA's Food Safety Modernization Act which may dictate requirements such as testing for some kinds of water that may be used or how they are utilized and applied for crops eaten raw.
    - Incentivize landowners to prove and preserve water rights in trust to preserve and for potential transfer.
    - Water Meter/Fish screen cost-share campaign.
    - Create water usage reporting and info storage at SVPA annually to preserve water rights.

- Pilot manure lagoon conversion[16] to water storage for irrigation.
- Pilot alternative, large-scale water storage, technology, and innovation.
- Pilot testing water rights for temporary permits such as on FPP property, closed stream, etc.
- Pilot water storage, share with stakeholders, Ecology, and gain political support needed.
- Pilot storing flood waters to offset surface water diversion.[17]
- Develop and utilize an agreement outlining a mitigation program such as the Dungeness Water Exchange, a partnership between the Dungeness River Agricultural Water Users Association, Washington Water Trust, and Washington State Department of Ecology.[18]

Map 13. SVWID's Proposed Upland Water Storage Locations[19]



[1] Pilz, David et. al, "Initial Conditions and Needs Assessment for Design of a Snoqualmie Valley Water Bank" AMP Insights, Final Draft, December 2016. Prepared for the Snoqualmie Valley Watershed Improvement District. Page 20.
[2] Ibid.
[3] Ibid.
[4] Anchor QEA, "Comprehensive Storage Study," January 2022. [LINK]. Accessed 3/1/23. Prepared for the Snoqualmie Valley Watershed Improvement District. Appendix E: Opinions of Probable Cost.
[5] Pilz, David et. al, "Initial Conditions and Needs Assessment for Design of a Snoqualmie Valley Water Bank" AMP Insights, Final Draft, December 2016. Prepared for the Snoqualmie Valley Watershed Improvement District. Page 20.
[6] Ibid, Page 15.
[7] Ibid.
[8] Ibid.
[9] Ibid.
[10] See Snoqualmie Valley Watershed Improvement District's Water Storage page for more information [LINK]. Accessed 2/13/23
[11] U.S. FDA FSMA "Requirements for Harvest and Post-Harvest Agricultural Water in Subpart E for Covered Produce Other than Sprouts," January 13, 2023. [LINK].Accessed 3/14/23.
[12] Snoqualmie Valley Watershed Improvement District, "About Us" [LINK]. Accessed 12/16/21.
[13] Snoqualmie Valley Watershed Improvement District, "Irrigation: Water Right Leasing Program" [LINK]. Accessed 12/16/21
[14] Associated Earth Sciences Incorporated, "Water Right Evaluation King County, Washington," Final Draft Report, February 19, 2018. Prepared for the Snoqualmie Valley Watershed Improvement District. Page 2.
[15] Ibid.
[16] Anchor QEA, "Small-Scale Storage Study Summary Report," January 2020. Prepared for the Snoqualmie Valley Watershed Improvement District.
[17] See Snoqualmie Valley Watershed Improvement District's Water Storage page for more information [LINK]. Accessed 2/13/23
[18] Dungeness Water Exchange, "Who We Are" [LINK]. Accessed 10/21/22.
[19] Anchor QEA, "Comprehensive Storage Study," January 2022. [LINK]. Accessed 3/1/23. Prepared for the Snoqualmie Valley Watershed Improvement District. Page 38 [58].

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

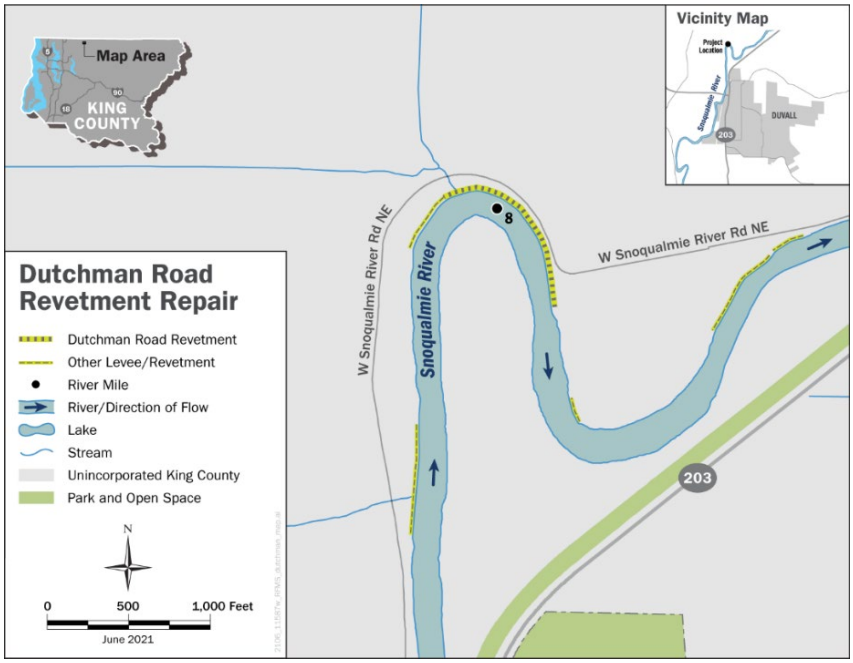
- Correct disparity that includes urban but not rural streams in the flood hazard management plan, and add rural streams, so that "agricultural bank stabilization and berms" are permitted, rather than having to qualify as a "habitat berm".
- In the Flood Hazard Management Plan, protect the farm sector 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.

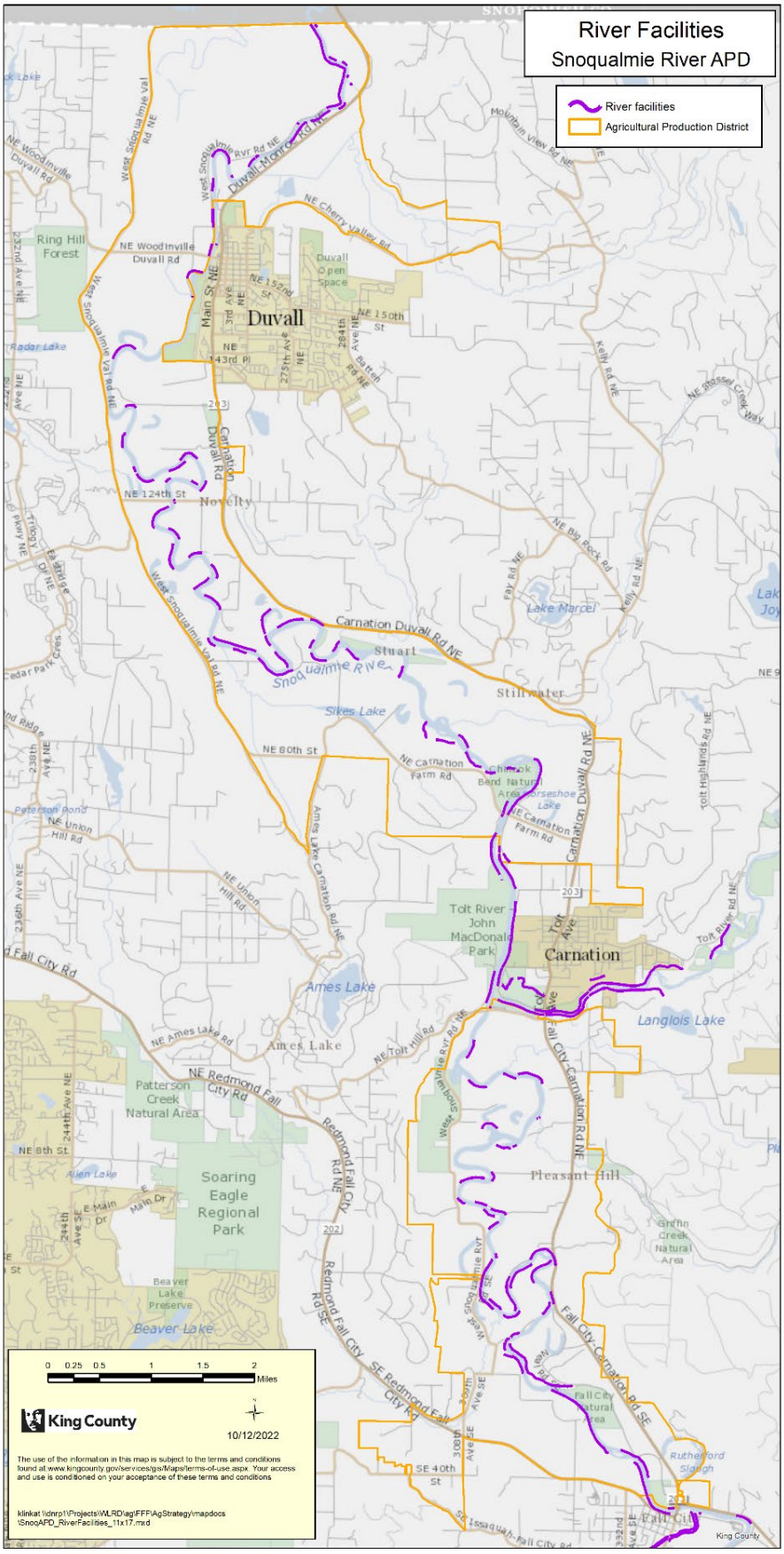
New facilities are regulated under King County Code K.C.C. 21A.25.170[7] and are only allowed under limited circumstances, i.e., public roadways, sole access routes, residual structures at imminent risk.

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.

1.4.11 Transportation Corridors and Bridges

Current Condition

Figure 27. Ames Lake Trestle Bridge No. 1320A

There are about 30 King County roads and 29 bridges maintained by King County in the SVAPD (see Map 16). Roads and bridges provide critical transportation corridors for the 214 commercial farms and the greater agriculture sector that sources products from and provides services to these commercial farms. The quality, reliable traffic flow, and routine maintenance of these roads and bridges, providing year-round access to heavy farm vehicles and their suppliers is critically important to maintain operations and food and farm supply chains. Keeping transportation corridors open to commercial farms by managing traffic flow, repairs and flooding is extremely important.

However, "King County continues to experience a roads funding crisis….Conditions on the road system will continue to deteriorate, and Roads must focus resources on critical safety needs. Reduced service levels result in a growing backlog of infrastructure maintenance, preservation, and replacement needs. Some examples are weight restricted bridges, failing or undersized road drainage systems, roads in need of reconstruction, and other deteriorating road conditions that impact local and regional mobility".[1]

Since October 2017, 2 bridges in the SVAPD have been posted with weight restrictions which can negatively impact farming operations using heavy vehicles for day-to-day operations. Horseshoe Lake Creek Bridge has a 4 axle single unit weight limit of 24 tons up to a 7 axle weight limit of 33 tons.[2] Ames Lake Trestle Bridge has a 4 axle single unit weight limit of 19 tons up to a 7 axle weight limit of 28 tons. Ames Lake Trestle Bridge is currently ranked #4[3] in the highest priority list, and is slated for construction in 2023.[4] See Figure 27. On that same list, Horseshoe Lake Creek Bridge ranks 23 out of 30 and was targeted for a load upgrade project in 2022.[5]

Because the SVAPD agriculture sector requires operational roads and bridges that can bear higher gross vehicle weights (GVW), this is a major concern and growing problem requiring funding solutions for Roads that enable more maintenance beyond critical safety needs and that serve the agriculture economy. Beyond bridges and roads, drainage and vegetation management along roadways as well as flooding mitigation are also key areas of need for the agriculture sector.

As part of the 2018 "Snoqualmie River Hydrologic Study," road closures were reported as caused by severe flooding. Figure 28 shows the roads closed during the highest floods to date in the Snoqualmie

Desired Condition by 2048

Transportation infrastructure including roads and bridges is fully functioning to support the movement of agricultural products while managing traffic to increase safety for all and prioritize routine operation of farms every day.

Timeline

2024

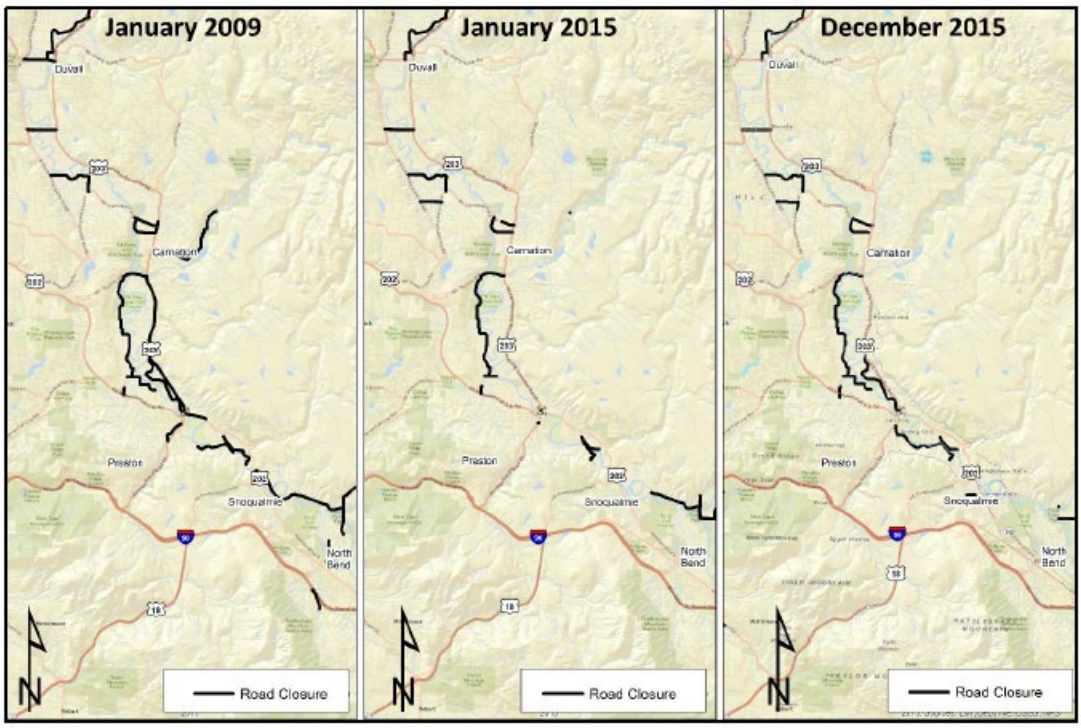
- Post new and more road signage for farm traffic safety and APD boundaries and use digital signage to highlight farm activities/events

2025

- SVAPD Bridges repaired/replaced and functioning without weight restrictions
- Implement ditch and culvert maintenance/ replacement to increase fish passage and keep waterways open for agricultural drainage
- Prioritize capital and maintenance improvements to roads and bridges along agricultural corridors and manage traffic to increase safety for all and allow routine operation of farms
- Increase roadside maintenance
- Strategically capture and share surveying monuments and benchmarks to support efforts regarding road flooding, home and barn elevations and Floodzilla monitoring system.

Valley. While "road closures totaled 37.5 miles of roads in the lower valley in January 2009 (82,900 cfs, the largest flood in record[6]), 21 miles in January 2015 (53,900 cfs[7]), and 24.6 miles in December 2015" (56,200 cfs[8]) stretching from North Bend to the County Line north of Duvall, most road closures occurred within the SVAPD.[9] The report also states that "the average road closure lasted approximately 4.6 days in January 2009, 1.8 days in January 2015, and 4.4 days in December 2015."[10] Other road closures occur for road, bridge, and revetment maintenance. While many of these closures are temporarily inconvenient, they are often long-term investments in the transportation corridors needed for the agriculture sector.

Figure 28. Snoqualmie River Flood Event Comparison Road Closures[11]



In addition to maintenance, traffic volumes, competing with cars and trucks that pass too closely/dangerously, and people recreating on roads within the SVAPD are the other largest problems. Of the other components of the roads and bridges network managed by King County including "sidewalks and pathways, bike lanes, guardrails, drainage and water quality facilities, traffic control equipment, and traffic cameras",[12] bike lanes, drainage and water quality facilities, and traffic control equipment are topics of strategies below. See the Population Growth issue paper for more details on the problems of traffic safety, stormwater and recreation.

- 2026
  - Evaluate the King County Capital Improvement Program (CIP) to recommend projects that may provide strategic transportation relief
  - Include and seek to solve increased traffic and visitation impacts that affect agriculture in local transportation plans
  - Planning review of over-tourism/over-visitation impacts
  - Increase roadside maintenance for mowing and tree trimming
- 2027
  - Study and capture pollutants from road run-off before reaching agricultural fields and waterways
  - Continue increased roadside maintenance and multi-benefit approach

2030
- Periodically review transportation corridors in relation to agricultural needs
- Implement all transportation strategies from planning review and strategies
- Continue increased roadside maintenance and multi-benefit approach
- Update and replace APD and safety signage as needed

2040-2048
- Periodically review transportation corridors in relation to agricultural needs
- Implement all

	transportation strategies from planning review and strategies ○ Continue increased roadside maintenance and multi-benefit approach ○ Update and replace APD and safety signage as needed

Background	Service Providers	Priority
King County has laid out its plans for roads and bridges in the 2014 Strategic Plan for Road Services[13] Declining roads funding "due to municipal annexations, the 2008 recession, declines in gas tax revenues, the effects of voter initiatives, and an aging bridge and road system"[14] is now below half of what is needed annually. Without "$6 million from REET for the CIP" projects "and a commitment for REET to hold and pay debt service on approximately $28 million of general obligation bonds to fund the 2018-2019 Bridge Safety Program"[15], reduced bridge safety and maintenance would have resulted. Roads also leverages Surface Water Management fees for drainage preservation work that protects roads and culverts from failure, promotes improved water quality and fish passage.[16] In 2018, Puget Sound Regional Council's (PSRC) Regional Transportation Plan stated the hazards of not being able to maintain the region's existing transportation infrastructure would have " serious economic, environmental, performance, safety, and financial consequences down the line."[17]	Lead ○ King County Department of Local Services Partners ○ Pedestrian and/or Bicycle Safety groups (Cascade Bicycle Club) ○ Duvall Days ○ King County Parks ○ SVWID	Medium

Strategies

- Prioritize capital and maintenance improvements to roads and bridges along agricultural corridors and manage traffic to increase safety for all and allow routine operation of farms. Periodically review transportation corridors in relation to agricultural needs.
- Include and seek to solve increased traffic and visitation impacts that affect agriculture in local transportation plans, such as adding bike lanes on rural routes, permits for bike events, responding to parking on the side of roads with law enforcement, particularly illegal parking around float and jet ski areas, the SnoValley trail, and by bird watchers and photographers.
- Post new standard signage to delineate the APD at every street, trail and river entrance to the APD, traffic safety signage for tractors/farm vehicles at entrances to APD and throughout the APD (see Figures 29-31 below).
- Increase farm/tractor safety signage on APD entrances and roads, including bicycle warnings to stay to the right side of the road at all times, and maintain speed limits. Consider striping roads with bike lanes to increase safety.
- Evaluate the King County Capital Improvement Program (CIP) to recommend projects that may provide strategic transportation relief, such as added bike lanes or trail enhancements to keep cyclists safe from passing farm machinery; on Hwy 203 prohibit bicycles, add passing lanes for slow traffic such as tractors, and wildlife viewing turnouts.
- Manage traffic along 203 and in the APDs regarding tourism and recreation events, including parking, that interfere with farm vehicles. Consider re-routing bicycle races and other events in busiest times of the farm season.
- Setup roadworks digital signage to encourage safer driving and highlight farm season, wildlife, etc.
- Study and capture pollutants from road run-off before reaching agricultural fields and waterways.
- With two Roads service centers in SVAPD primarily for snow and ice,
    - Increase roadside maintenance in SVAPD for mowing to keep spread of weeds down, and vegetation back from guardrails and bike lanes to prevent accidents.
    - Increase tree maintenance over key SVAPD roadways to ensure commerce is not impacted.
- Pursue FCD revenue and use SWM revenue systematically in APDs to prioritize and couple ditch and culvert

maintenance/replacement to increase fish passage and keep waterways open for agricultural drainage.

- Pursue multi-benefit projects when re-surfacing roads in the SVAPD such as flood mitigation, elevating roadways that benefit agriculture.
- Strategically capture and share surveying monuments and benchmarks to support efforts regarding road flooding, home and barn elevations and Floodzilla monitoring system.
- Better collaboration among recreational groups with the agriculture sector to minimize conflicts.
- See additional, related strategies in **Population Growth** Issue Paper.

Figure 29. New Caution Farm Area signage

Figure 30. New APD signage

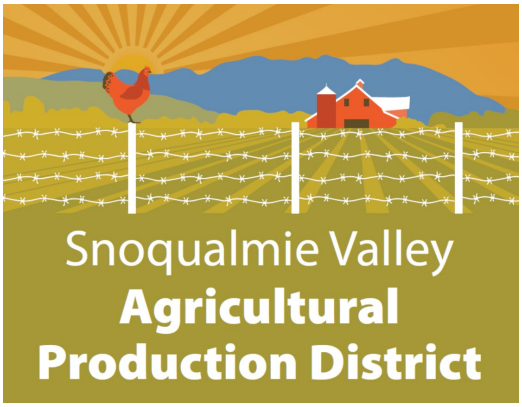
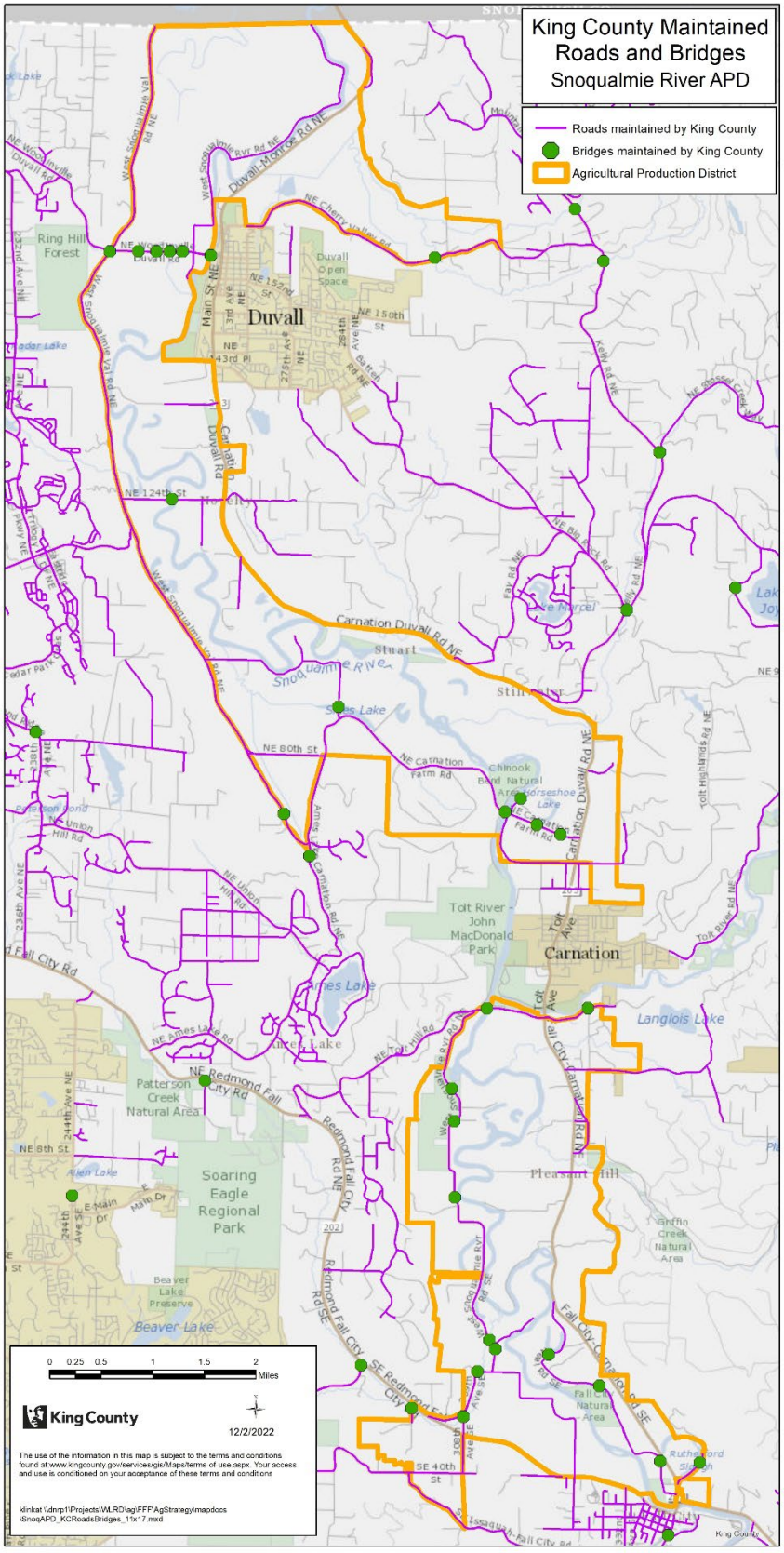


Figure 31. Drive Carefully signage

Map 16. King County Maintained Roads and Bridges Snoqualmie River APD



[1] King County, "Road Services Division 2021-2022 Business Plan", April 2020. [LINK]. Accessed 11/28/22. Page 4 [7].
[2] King County, "King County Restricted Bridges" [LINK]. Accessed 12/2/22. Page 1.
[3] King County, "2021 Annual Bridge Report" , August 2022. [LINK]. Accessed 12/2/22. Page 11 [14]. King County Department of Local Services, Roads Division.
[4] Ibid, 25 [28].
[5] Ibid, 12 [15].
[6] King County, "2013 King County Flood Hazard Management Plan Update and Progress Report" [LINK]. Accessed 12/1/22. Page 52 [63]. King County Department of Natural Resources and Parks, Water and Land Resource Division, River and Floodplain Management Unit.
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[9]King County, "Road Services Division 2021-2022 Business Plan", April 2020. [LINK]. Accessed 11/28/22. Page 75 [97].
[10] Ibid.
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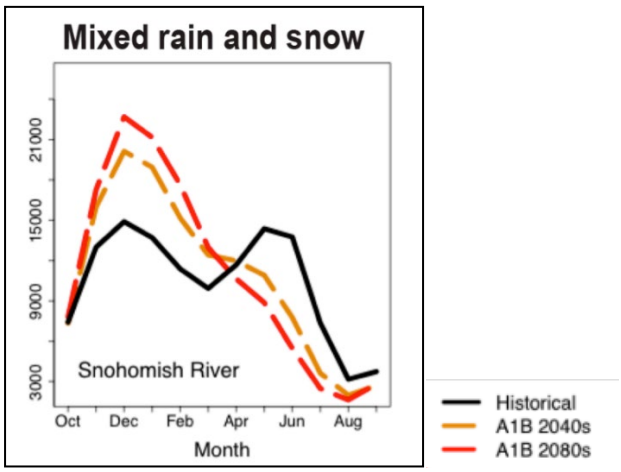
[12] King County Department of Transportation, "Strategic Plan for Road Services," July 2014 Update. [LINK]. Accessed 11/28/22. Page 9 [15].
[13] Ibid.
[14] King County, "Road Services Division 2021-2022 Business Plan", April 2020. [LINK]. Accessed 11/28/22. Page 4 [7].
[15] King County, "Road Services Division 2021-2022 Business Plan", April 2020. [LINK]. Accessed 11/28/22. Page 7 [10].
[16] Ibid, 8 [11].
[17] Puget Sound Regional Council, "The Regional Transportation Plan -2018" [LINK]. Accessed 11/28/22. Page 26 [38].

1.5.12 Climate Change Predictions, Impacts and Response

Current Condition

Figure 32. Climate Prediction for the Snohomish River into which the Snoqualmie River and Skykomish River Flow[1] (predicted flow by Cubic Feet per Second [CFS] vertical axis)



The results of extreme weather on farms in the APD have already been felt as our climate changes to a new, warmer, normal. Climate models are showing significantly increased winter flows and reduced summer flows in the next 20-60 years on the Snohomish River into which the Snoqualmie River and Skykomish River Flow (see Figure 32). And while the traditional, normal weather patterns that farmers relied upon are disrupted, farmers are on an immediate, steep learning curve to adjust planting schedules, modify varietals for annual plantings, add protections for workers, and plan for and react to a myriad of unknown weather patterns and events year-round. While many farmers are making shifts and implementing practices to accommodate the future, these weather pattern changes have had an immediate physical, mental, and economic impact on producers[2], and will continue to require substantial investment, research and educational support by agencies, universities, and other partners.

Some specialty crops are seeing earlier flowering when pollinators are less available. Summer extreme heat stress has led to scald on vegetables, leaves, tree fruit, berries, as well as lower forage production such as hay and corn, and reduced milk production. Labor & Industries (L&I) has already issued temporary emergency rules for labor when there is extreme heat and wildfire smoke and is contemplating permanent labor laws.[3] There will continue to be significant economic risk for farms with these changing weather patterns, including increased flooding and increased drought, from now on.

The Cascade snowpack has a uniquely high predominance of "warm snow" that is barely frozen, and disproportionately affected by temperature change. The Snohomish watershed, which includes the Snoqualmie and Skykomish Rivers, is considered a "mixed rain and snow basin." Such basins are predicted to experience significant increases in winter flows (November – February) and decreases in spring /summer flows from more winter precipitation falling as rain, rather than snow.[4] In addition, with more rain events and increased peak flows, modelling shows increased sediment shifts within the river which may cause flooding in new places in the APD as well as faster flows scouring flooded lands in the APD.

The year, 2015, is a tell-tale example of how our climate is expected to normalize in the next 20-40 years. A milder winter with more rain and less snow brought more winter flooding with three high flows, in January, November, and December, falling into the top eight high flows since 1995. Less snow melt led to extreme low flows in the Snoqualmie River and extensive drought in summer.

Desired Condition by 2048

Farmers have equitable and easy access to programs and funding and are implementing practices that promote agricultural resilience and mitigate climate change impacts.

Timeline

- 2024
  - Farm plans include regenerative ag practices and emergency evacuation plans
  - Workshops
    - federal disaster and crop insurance programs
  - Climate change impacts, resilience practices, and mental health education and support for farmers and farm employees
  - Develop, support, and increase farmer participation in programs that pay for carbon/capture ecosystem services and climate smart practices.
  - Support, fund, and expand Floodzilla.
- 2025
  - Conduct climate change impacts study in the APD; flood monitoring starts
  - Capital project recommendations are made based on the countywide irrigation water needs assessment.
  - Increased farmer participation in

"The ten warmest years on record have all occurred since 1998, and 2015 was the warmest year on record for Washington State since 1895. What we experienced in the Puget Sound region in 2015 was just a rehearsal of what we expect to come – warming temperatures and more extreme heat events…. These shifts will all influence the health and economic well-being of our region."[5] Western Washington is believed to be less vulnerable to climate change impacts than central and eastern Washington overall, though local agricultural adaptations will still face challenges. The Agriculture Resilience Plan for Snohomish County provided a striking context, using WSU climate modelling, that by the 2040s the area is predicted, "to have similar growing conditions to Santa Cruz County, CA, just south of San Jose."[6] Due to climate change, Puget Sound agriculture is generally projected to experience, "a lengthening of the growing season, shifts in crop production, increasing water supply challenges, changing risks from pests, increasing winter flood risk…. … [Impacts will] vary by production type but generally point to increasing suitability of some crops (e.g., grapes) and declining suitability of others (e.g., berries) ..."[7] Heat stress may also decrease livestock health and increase parasites, with drier summers impacting forage quality and quantity. For the Snoqualmie Valley APD, climate change will exacerbate many existing environmental issues for agriculture, such as increased flooding, periods of drought, and extreme heat and will likely drive changes in crop selection, livestock care, and production methods. Facing these numerous changes will require substantial investment by farmers and service providers as well as increased funding to ensure continued food production and food security.[8] While farms in the SVAPD face many challenges with climate change, they also offer many climate change solutions. USDA states, "The American agriculture sector has an incredible potential to reduce greenhouse gas emissions, sequester carbon, and deliver lasting solutions to the climate crisis. America's producers are already leading the way…thanks to their voluntary conservation efforts".[9] Many producers are already implementing "climate -smart conservation practices such as no-till, cover crops, prescribed grazing, and silvopasture. This empowers producers to both strengthen their operation's resilience to climate-related disaster events while leveraging their land's potential to sequester and store carbon, thereby delivering lasting climate solutions".[10]	○ federal disaster insurance programs and in federal crop insurance programs ○ climate resilient programs and practices • 2026 • First manure lagoon conversion for irrigation storage. • Study completed for infrastructure vulnerability especially from increased flooding. • Expand broadband service in APD • Funding plan and research underway for new practices. • Pilot for upland water storage complete. • King County emergency systems in place for continuity of farm productivity during climate change • 2035: Increased farmer participation in insurance and resilient programs and practices • 2036-2048: Remaining actions in progress and adjustments made based on research and trials.

Background	Service Providers	Priority
Predictions from modelling by UW Climate Impacts Group and WSU Center for Sustainable Agriculture and Natural Resources (CSANR) indicate a need for an area-specific study of climate change impacts on farming in the APD, including 2-D modeling and flood hazard planning, evaluation of water supplies to buffer low-flow periods, developing infrastructure, and education, information, and funding to support agricultural transitions in crop varieties and improved livestock resilience. While flooding frequency has not changed significantly in the last 30 years on the Snoqualmie River (see Figure 34 and 35), the SVWID's study on Cherry Creek tells another story (Figure 36).[11] Annual peak flows in Cherry Creek show the largest historic flows since 1945 occurring in 2019 and 2020. While there have been studies to collect information on flow changes or inundation levels on farms in the SVAPD, more information and completing recommendations from those studies is needed.	Lead ○ King County Agriculture Program Partners ○ King Conservation District ○ University of Washington ○ Washington State University	HIGH

With UW flood modeling pointing to increased winter flows of 30-40% on the Snoqualmie River[12], planning for flood safety and access to farm pads and high ground will be extremely important. 2-D modeling to highlight areas of inundation concern and potentially point to new flood storage capacity is needed. See the WSU climate change model, Map 17, showing projected inundation from flooding in the SVAPD. Many regions of the U.S. will experience worse climate change impacts than the Puget Sound, and King County farms may need to produce more food to ensure food security for the region[13] just as SVAPD farms were instrumental in supporting direct to consumer sales through the Covid-19 pandemic. Because of climate change, farmland preservation and a thriving agriculture sector in the SVAPD will become even more important.	○ SV Watershed Improvement District ○ SnoValley Tilth ○ KC Emergency Management	

Strategies

- Conduct a climate change impact assessment for agriculture in the Snoqualmie Valley APD (SCAP).
- Prepare farm plans that stress regenerative agriculture and that incorporate emergency evacuations (SCAP).
- Examine infrastructure vulnerability, especially from increased flooding (SCAP).
- Develop capital project recommendations based on the countywide irrigation water needs assessment (SCAP).
- Increase farm participation in federal disaster insurance programs (SCAP) and in federal crop insurance programs.
- Assess carbon sequestration and climate change mitigation potential of agricultural land in the SVAPD.
- Develop and support programs that reward and pay farmers for climate smart practices and ecosystem services.
- Increase farm participation in local, state, and federal programs where farms are paid for carbon capture/ecosystem services such as USDA NRCS Conservation Service Program (CSP) Climate-smart conservation activities including Soil Health , Nitrogen Management, Livestock Waste Management, and Grazing Land Management with minimum payments of $1,500 annually for compost use, cover cropping, etc.
- Increase financial support to help farmers implement environmentally sound practices that may require service providers to conduct costly studies/analyses of the property in order to meet FEMA and Surface Water Design Manual Requirements (i.e. engineers to conduct a drainage review).
- Increase climate change impacts education workshops and mental health support for farmers and farm employees.
- Support, fund, and expand Floodzilla flood monitoring system to ensure flood data collection and community-wide data remain accessible to all Floodzilla users and to ensure the community-based flood monitoring program is completely built-out, updated, and operational for the next 25 years.
- Expand broadband service to the APD in order to aid reliance and usage of technology such as Floodzilla, and precision farming practices.
- Develop funding plan and secure funding to research, design, test, trial, and implement new practices such as:
  - Dry-farming techniques to evaluate their efficacy in local climates for drought-resistant crops.
  - Seed bank resource; assess existing varietals and/or heirlooms for climate-change-resistant genes.
  - Livestock resiliency through environmental, nutritional, and breeding interventions.
  - Heat-resistant crops; begin advance cultivation of new climate-resilient crop varieties (viticulture; hemp).
  - Infrastructure for processing new crop alternatives.
- Pilot water storage and sediment removal in lakes to increase floodplain comprehensive storage for farm pads, clarify King County and FEMA regulations and examine flexibility in regulations, modify regulations as needed.
- Pilot water storage in the uplands, to increase flows in summer for irrigation and fish and to decrease flood impacts.
- Pilot manure lagoon conversion to water storage for irrigation.
- Put King County emergency systems in place such as emergency building permits, emergency water deliveries, emergency local garbage collection sites, emergency activation of Monroe Fairgrounds and Enumclaw Expo for animal holding, etc. to accommodate farming so that food production continues in the midst of changing weather norms, extreme weather events, and ultimately climate change.

Figure 33. Monthly average naturalized flows for the Snoqualmie River near Snoqualmie for the 1980s (1970-1999) and the 2080s (2070-2099). The Representative Concentration Pathways (RCPs) are a set of four new pathways developed for the climate modeling community as a basis for long-term and near-term modeling experiments.[14] RCP 4.5 Dynamical Downscaling plot shows the results for just one model (ACCESS 1.0). The other three plots show the median, minimum, and maximum for all DHSVM simulations. A separate line is included in the RCP 8.5 Dynamical Downscaling plot for the GFDL CM3 results.[15]

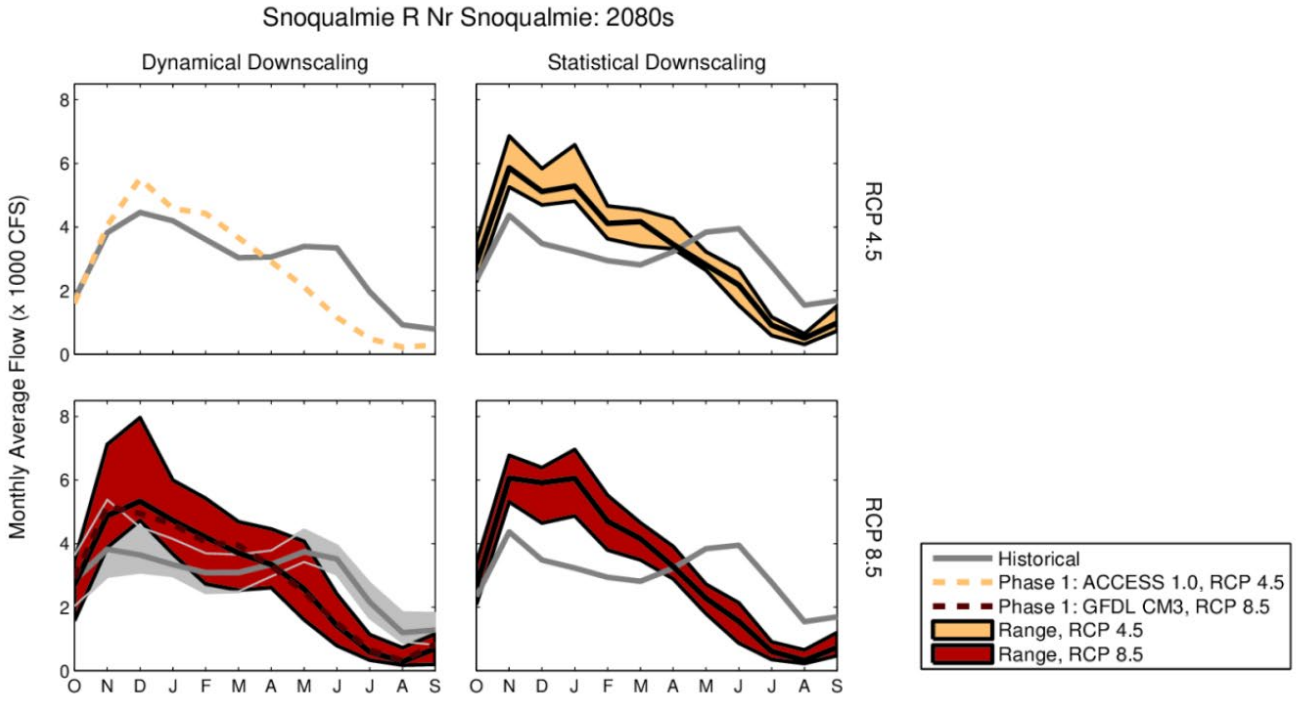


Figure 34. Recent High Flow Data (in CFS) Since 1995: Snoqualmie River near Carnation

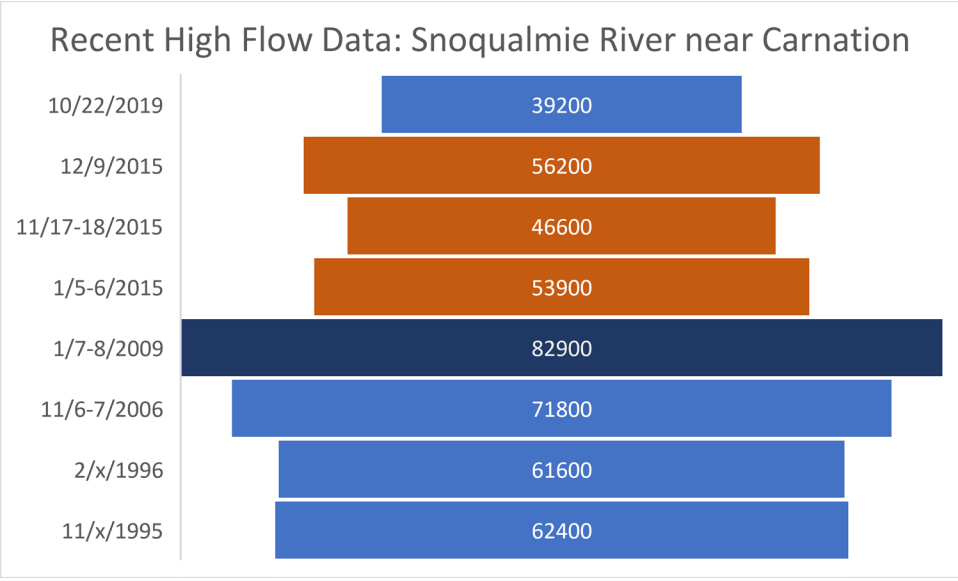


Figure 35. Number of Times Flood Levels Have Been Reached in each 3-year Period (1988-2021): Snoqualmie River near Carnation (USGS 12149000 Flow Gage)

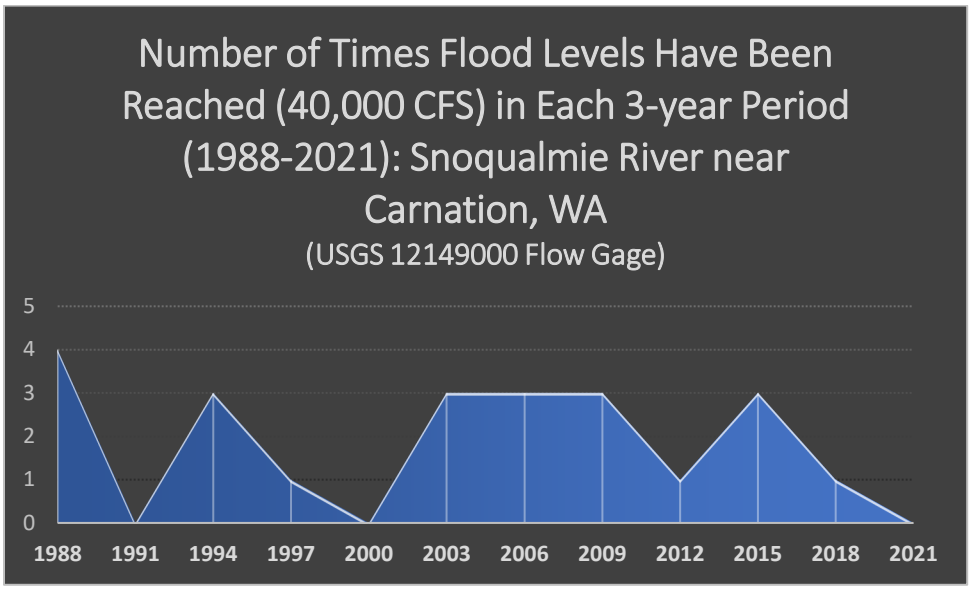
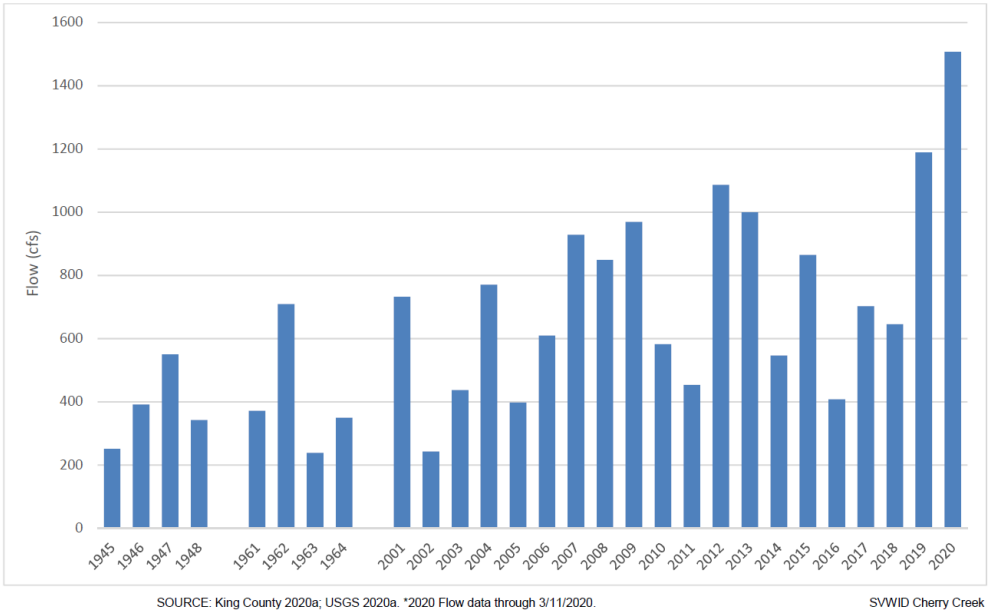
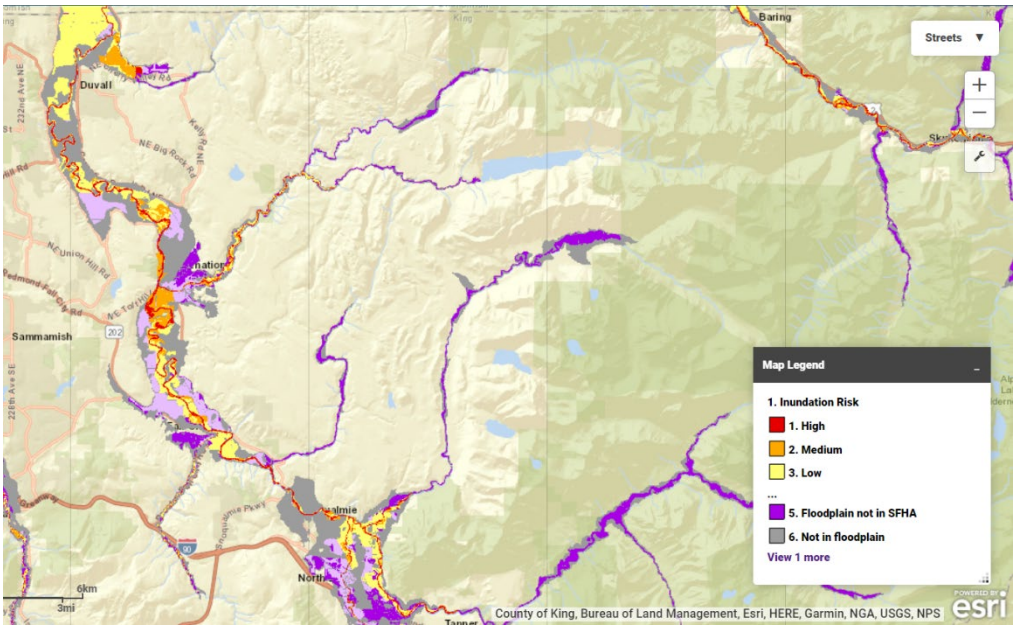


Figure 36. Annual Peak Flows from SVWID's Cherry Creek Basin Study: 19445-2020



Map 17. Inundation Risk Map: Climate Projection for Flooding[16]



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7 Snohomish Conservation District, "Agriculture Resilience Plan for Snohomish County," December 2019. [LINK]. Page x. Accessed 9/7/2021.

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[8] Mauger, G.S. et. al, "State of Knowledge: Climate Change in Puget Sound," Ibid. Page 8-6 - 8-7 (128-129)

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[10] Ibid.

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[13] IPCC, 2022: *Climate Change 2022: Impacts, Adaptation, and Vulnerability.* Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. In Press. [LINK]. Accessed 3/3/22. Page 5-134 [959].

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1.5.13: Invasive species, pathogens, and diseases

Current Condition

Figure 37. Adult Apple Maggot[1]

Climate change and globalization have increased the impact and costs[2] of invasive species[3], pathogens, and diseases[4] for agriculture and the environment.

Climate change has the potential to exacerbate existing issues with invasive species. For example, knotweed (Fallopia japonica) does not have mandated control above the high-water mark on certain rivers and is not managed at all on others and "recent and projected future flooding could certainly spread invasive knotweeds more widely through the overall landscape and impact agriculture, flood control, and fish habitat."[5]

Even without climate change, globalization has added agricultural pressures by increasing the rate of pest and disease migration from ports and other transportation nodes. Recent examples include the spotted wing drosophila that arrived from Asia in the continental US in 2008 and in the Pacific Northwest in 2010;[6] the Asian Giant Hornet that threatens pollinators, first detected in the U.S. and Washington State in 2019, whose sting can also be fatal to humans;[7] and nutria, 12–40-pound rodents spreading quickly in western Washington that feed on wetland plants, "burrow in levees… and embankments, causing bank collapse and erosion."[8]

The Washington State Department of Agriculture (WSDA) currently sets up to over 45,000[9] traps annually to track over 120 pests and diseases in the state, including the spongy moth, Asian giant hornet, apple maggot (see Figure 37) and Japanese beetle.[10] Although WSDA has programs to limit the spread of pests and disease arrival, local climate-informed planning can help further reduce future impacts to the Snoqualmie Valley APD.

Desired Condition by 2048

Farmers, through active involvement in a direct response network, have the information, monitoring systems and scientific network in place to proactively prepare for and mitigate invasive species, pathogens, and diseases arriving in this area.

Timeline

- 2024: Ongoing outreach and education
- 2028: Develop climate change invasive species strategy for SVAPD agriculture
- 2029: Establish response network
- 2030: Establish pest & disease research and education priorities
- 2031: Continue deploying strategy recommendations
- 2036: All invasive species, pathogen, and disease prevention actions are in place & are updated on a regular basis

Background

Along with much of Western Washington in nearby latitudes, the Snoqualmie Valley APD is predicted, "to have similar growing conditions to Santa Cruz County,

Service Providers

Leads:

- WA State Dept. of Agriculture

Priority

Medium/Low

CA….” by 2040.[11] The changing climate will influence crop selection, as well as the pest and disease threats farmers must face. Studies have found that pests and disease on agricultural crops migrate north/south at roughly 1.6 miles annually, very close to the rate of warming caused by climate change (though this rate varies for different groups and species).[12] It should be noted that surface temperatures have been rising since the 1880’s, and the rate of warming has doubled since 1981.[13] As such, pests and diseases have already been advancing towards the Washington, and their rate of travel will potentially increase in coming years. While the arrival of more invasive species in the APD is inevitable, some current, potential invasive species and diseases have already been identified, though determining whether they will migrate to the APD requires further study. Initial concerns include the European Chafer (grass and crops)[14] Fall Armyworm (most vegetable crops, hay[15]), the Western Corn Rootworm (corn)[16] as well as African Swine disease.	○ WA Invasive Species Council Partners: ○ King County WLRD ○ King County Emergency Management ○ University of Washington ○ Washington State University ○ USDA APHIS ○ USDA FSA	

Strategies

- Increase soil health[17] education, cost-share, and incentive programs in order to combat pest and pathogens.
- Provide tools and technical assistance for farmers to develop Integrated Pest Management plans, partnering with WSU Extension and others.
- Encourage farmer to farmer meetings to discuss what they are seeing on farm, pest management strategies, etc.
- Increase SVAPD farmer enrollment with USDA FSA so farmers are eligible for invasive species disaster relief from the federal government.
- Support a population study/inventory of invasive species in SVAPD including pests, pathogens, and diseases.
- Support and participate in development of a direct response network to include the WA State Department of Agriculture, WA Invasive Species Council, USDA APHIS, WA university research and identification testing programs, King County WLRD, King County Emergency Management, and King County farmers to support a climate impacts strategy implementation such as:
    - Monitor pest, pathogens, and disease with expanded network of farmer participation
    - Establish and highlight network of plant pest and disease testing facilities,
    - Mitigate impacts, conduct research to mitigate impacts,
    - Conduct outreach, training, and education on proactive techniques to reduce impacts from pest, disease and pathogens moving into this region, and
    - Liaise with universities, state department of agriculture, WA Invasive Species Council, and USDA APHIS on invasive species, pathogens, and diseases harmful to agriculture.
- Support development of a Western Washington climate change and invasive species (pest, pathogen, and disease) strategy for agriculture. The strategy should utilize climate modelling and anticipated projected crop selection changes due to changing climate conditions[18], newly detected invasive species, as well as integrating existing tools for mitigation such as pheromones, sterile insects, pest-eating insect releases for pests[19] and pursuing phenotyping to predict pest and disease-resistant traits and proactively breed resistance.[20]

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[5] Justin Bush, Executive Coordinator, Washington Invasive Species Council, Washington Recreation and Conservation Office, email communication, November 2021.
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[16] de Sousa, Agnieszka, and Michael Hirtzer, "The Six Pests Coming to Eat Your Crops," Bloomberg Green, December 15, 2020, [LINK].]. Accessed 8/23/21
[17] Snohomish Conservation District, "Agriculture Resilience Plan for Snohomish County," December 2019. [LINK]. Page x. Accessed 9/7/2021.
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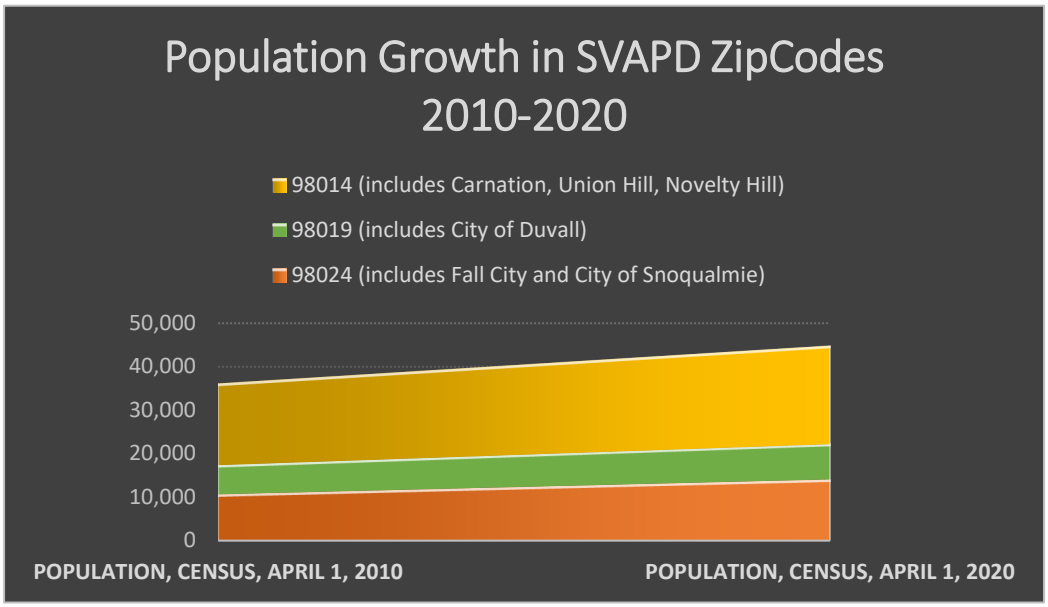
[19] Weinberger, Hannah, "Climate change forces WA apple cider industry to adjust," Crosscut, October 12, 2021. [LINK]. Accessed 10/20/2021.
[20] Doody, Alison, "Pests and diseases and climate change: Is there a connection?" International Maize and Wheat Improvement Center (CIMMYT), News Feature, February 27, 2020. [LINK]. Accessed 10/27/2021.

2.2.14 Population Pressure

Current Condition

Figure 38. U.S. Census Population Growth in SVAPD Zip Codes, 2010-2020[1]



Increased population and visitation can strain local resources, economic sectors such as agriculture, and even the local culture. King County's population has grown more than 50% since 1990[2], and is now the 12th most populous county in the U.S. at an estimated 2,317,700 people in 2021[3] Most population growth is in incorporated areas (see Figure 39). More locally to the SVAPD, in King County Council District 3,[4] which includes the SVAPD and surrounding cities and towns from North Bend to Bothell and Skykomish to Issaquah, there are 251, 999 residents.[5] Drilling down still further, there are three zip codes covering the APD and Duvall, Carnation, Snoqualmie and Fall City. These zip codes (98019 Duvall, 98014 Carnation/Novelty Hill, and 98024 Fall City/Snoqualmie) show that the total population was 36,170 in 2010 and has grown by 8,668 to a new total of 44,838 in 2020, a 24% increase.[6] See Figure 38.

Growth in the Snoqualmie Valley was focused in its neighboring cities. The population of Carnation grew by 365 people or 20%, Duvall grew by 1,340 people or 20%, and Snoqualmie grew by 3,447 people or 32% between 2010 and 2020. The rural town of Fall City grew by 39 people, or 2%, between 2010 and 2020.[7] Growth in these three cities and the Fall City rural town accounted for 1.5% of King County's total growth between 2010 and 2020.

Recent growth has been influenced by regional and local planning efforts, including the Puget Sound Regional Council's VISION 2050 plan and local growth targets in the King County Countywide Planning Policies.[8] Figure 40 illustrates the relationship of state, regional, and local growth management planning. The VISION 2050 Regional Growth Strategy includes numerical guidance on how different groups of jurisdictions are expected to grow through 2050. Smaller cities in King County, including Carnation, Duvall, Snoqualmie, and 16 other cities, are a part of the Cities and Towns Regional Geography, which is expected to accommodate 5% of King County's population growth through 2050.

Growth targets implement the VISION Regional Growth Strategy and state the amount of growth each jurisdiction is planning for in its comprehensive plan. Under the current growth targets in the Countywide Planning Policies, the cities of Carnation, Duvall, and Snoqualmie are planning for approximately 1% of countywide housing growth, a collective increase of approximately 3,200 housing units over 25 years. Growth targets for cities in the rural area (not contiguous to the Urban

Desired Condition by 2048

Importance of agriculture, farming practices, and the zoning protections of the APD are commonly understood by the public. Population impacts on farmers and farmland are analyzed and addressed so that farmers are able to do business safely and efficiently on farm and in roadways while making the most of population growth in agritourism, sales revenues, farm support and advocacy.

Timeline

2024
- Post new and more road signage for farm traffic safety and APD boundaries

2025
- Require real estate sales in or near the APD to have notification to prospective buyers about the agricultural zone, working farms, and environmental hazards
- Evaluate Capital Improvement Projects for potential project recommendations

2026
- Planning review of over-tourism/over-visitation impacts
- Implement environmental services cost-share/payments to farmers

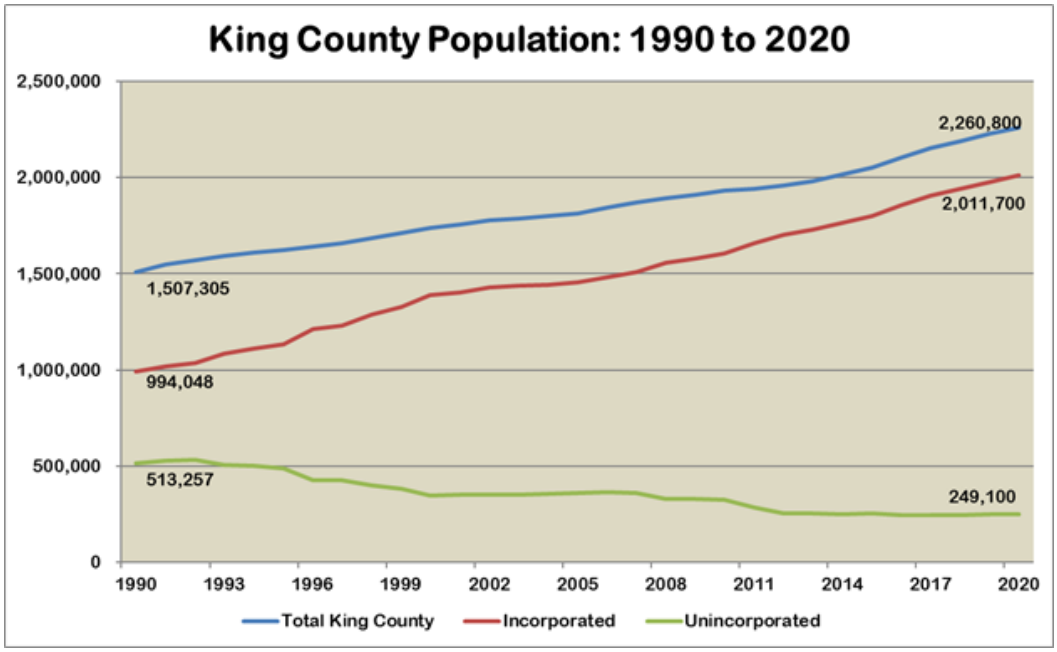
2027
- Develop Agritourism Resources, Outreach and Education

2030

Growth Area) include the urban unincorporated area adjacent to the city. The King County Urban Growth Capacity Report is a countywide assessment of how jurisdictions and collectively, urban King County, are performing relative to their growth targets and in providing capacity for growth.[9] The 2021 Urban Growth Capacity Report found that the cities neighboring the SVAPD were mostly growing on pace with their adopted growth targets for 2035. Carnation was growing at 89% of its targeted rate of growth, Duvall at 105% of the targeted rate.[10] Growth in Snoqualmie had already met their 20-year growth target, owing to the build out of the Snoqualmie Ridge master planned community. With this development complete, the pace of development in Snoqualmie has recently slowed.[11] Countywide, King County has achieved 104% of the planned growth under the 2035 growth targets.

Managed home building growth will continue to add to population pressure in the SVAPD, with household sizes in the cities neighboring the SVAPD range from 2.8 to 3.1, averaging higher than King County as a whole.[12]

Figure 39. Demographic Trends of King County: King County Population: 1990 to 2020[13]



Just an hour from downtown Seattle, the Snoqualmie Valley Agriculture Production District (SVAPD) is bordered by major east-west routes of Interstate 90 and Hwy 2 and north-south routes of State Highway 203, and the West Snoqualmie Valley Road NE to NE Novelty Hill Road taking commuters to Redmond. Population pressures have increased congestion along these routes and throughout the APD, causing interruptions to the SVAPD agriculture sector. American Farmland Trust states in their "Farms Under Threat" data for Washington State that 26% or 2,800 acres of King County's "best agricultural land" will be converted to other uses by 2040 in their "business as usual" scenario, in large part due to population pressures on zoning.[14] This report also cites the importance of "planning for agriculture" including "inventory resources" and "incorporate agriculture into community plans".[15]

While increased visitation to the SVAPD supports many agritourism businesses including farm stands, u-pick, dinners, classes, and tours, increasing visitor and residential populations in Duvall and surrounding areas also impact farming in several ways including:

- Traffic Safety: congestion; speeding vehicles; bicyclists backing up traffic due to slower speeds or cycling in the middle of the roadway; road maintenance; parking; as well as tractor and farm equipment competing with cars and trucks that pass too closely/dangerously.
- Stormwater: runoff from increased impervious surfaces impacts water quality, impacts soil health, and may cause farmland contamination from debris and fuel spills.

- Implement and refine remaining transportation strategies

2035

- Implement stormwater and flood strategies for stormwater flow solutions, upland water storage pilot, payments and cost-share programs

• Water Supply (quantity and quality): water withdrawals can affect fish, wildlife & farms. • Wildlife: habitat degradation; disrupted feeding and breeding activities. • Pollution: increased local air and water pollutants; increased litter; increased noise pollution scaring farm animals; unsubstantiated complaints against agriculture. • Recreation: different forms and approaches to recreation can disturb farm animals and routine farm activities including farm to market commerce, harvesting, or polluting the river used for irrigation, i.e., bicycle racing, motorized paragliding (paramotoring), river activities such as floating and jet skis, lost recreationists who climb the river bank into fields, walk or bike through fields or along roadways, or land hot air balloons, and using the roads like a trail for roller skating, walks with strollers, biking. • Real estate: growing market costs for agricultural land and farms; conversion of agricultural soils to open space or recreation; difficult for farmers and employees to find affordable housing. • Cost of Living: cost increases for housing, goods, and services; employee hiring more difficult compounded by equitable and wage competitiveness. • Security: trespassing, theft, biosecurity and food safety.		
Background	**Service Providers**	**Priority**
The majority of SVAPD's 214 commercial farms sell directly to consumers and utilize some form of agritourism. Farm agritourism revenues tripled from 2002 to 2017 in the U.S.; while farms closer to urban areas often experience higher revenues.[16] King County boasts the strongest farm-direct marketplace in the state with King County farmers markets reporting farm vendor sales of $16.6 million in 2021.[17] In addition, during the beginning of the Covid-19 pandemic, King County's farmers drastically increased their u-pick, farm stand sales, and CSA program memberships. Washington State's population has more than tripled in the last 70 years, going from 2.3 million to 7.7 million[18] – and roughly 20% of that growth occurred in the central Puget Sound region since 2000.[19] This growth has increased the number of persons living within or near the Snoqualmie Valley, as well as those visiting the valley from both the greater Puget Sound area and from destinations outside the state. Per the King County Countywide Planning Policies and PSRC's VISION 2050 Multicounty Planning Policies, growth targets form the basis for the amount of growth a jurisdiction plans for in its comprehensive plan. Jurisdictional growth targets are developed from a regional forecast apportioned to King County and then groups of cities with similar characteristics (Regional Geographies), per the growth shares in the VISION 2050 Regional Growth Strategy. Collaboratively, jurisdictions consider a variety of local factors including capacity, size, and infrastructure constraints to select and determine city-level targets. Jurisdictions are held accountable for planning consistently with growth targets through PSRC plan certification. If a jurisdiction uses growth assumptions in its plan that are substantively inconsistent with the growth targets, PSRC could conditionally certify a plan, meaning the jurisdiction must take steps to bring the plan into compliance with regional policy before receiving transportation funding (although it would still be eligible to apply for funding). PSRC could also not certify the plan, meaning it would be ineligible to receive transportation funding. Jurisdictions that are not achieving rates of growth consistent with their growth targets, are held accountable through the King County Urban Growth Capacity (or "buildable lands") Report. In this study, jurisdictions with rates of growth significantly lower than the targeted rate could be required to adopt "reasonable measures," or additional planning actions to permit or incentivize growth, and report on progress in meeting growth targets. Currently, there are no accountability measures for jurisdictions where growth exceeds targeted amounts. As jurisdictions begin to develop their comprehensive plan updates due to the state in 2024, members of the public have opportunities to weigh in and ensure that jurisdictions are planning consistent with adopted growth targets and regional policy through the public participation processes run by each jurisdiction. The Washington Growth Management Act requires public participation to be early and continuous throughout the development of the comprehensive plan.	Lead ○ King County Department of Local Services and Department of Natural Resources Partners ○ SnoValley Tilth ○ SVPA ○ Savor Snoqualmie ○ King Conservation District ○ Washington State Parks and Recreation Commission ○ WDFW ○ King County Sheriff's Office	Medium

After plans are developed, PSRC plan certification and the development of the King County Urban Growth Capacity Report are public processes with opportunities for public comment.

Presently, the state growth management plans guide regional multi-county plans, which guide county plans and then local plans. See Figure 40.

Figure 40. Planning Policies for Development Growth[20]

Population growth is expected to continue in this region. Planning strategies and enforcement are needed to further protect the agriculture sector in the Snoqualmie Valley APD and help reduce negative population growth impacts.

Strategies

Protect farming activities in King County permitting and planning efforts

- Evaluate programs, activities, and event permits in local planning efforts with consideration of critical agricultural production times to limit the impacts of over-visitation.
- Create strategies to address over-visitation and over-tourism in general planning for the area (NEKC plan).
- Develop agritourism resources, outreach, and education that:
    - Direct tourism to focused farm locations and away from farm areas that are not open to the public.
    - Help interested farmers capitalize on increased local visitation.
    - Adopt management strategies for parking by adding or increasing parking prices at hiking, scenic, and visitor destinations and disperse visitation throughout the day.
        - Provide resident-only parking, or reduced entry costs, for local attractions.
        - Create timeslots for popular attractions, maybe with real-time monitoring.
- Increase signage about the APD, open farm activities and to improve traffic safety and flow (see Figure 29-31).
- Create policy to further protect farming activities in the APD by requiring real estate sales in or within 1,000 feet of the APD to have:
    - "Notification to prospective buyers (in the purchase and sales agreement) that they are considering purchasing property in close proximity to farms and may experience farm-related"[21] sounds, smells, and activities, including traffic.
    - Information about APD zoning, floodplain permitting and restrictions, including water and wells.
    - Farmland Preservation Property easement encumbrances.
    - Current Use Taxation and Public Benefits Rating System agricultural programs.
- Require a notice to be e/mailed at least every three years to all residences in or within 1,000 feet of the APD[22] to describe the protections in the zone and how residents can support agricultural uses in the zone to protect food production resources (i.e., drive slower, wait for farm vehicles and customers at turn outs, etc.).
- Increase succession planning resources and funding to assist current landowners to transition their businesses to new farmers and keep homes occupied and livable.
- Include agricultural permit updates, both submitted and approved, regularly to King County Agriculture Commission.
- Explore adding APD buffer overlay zones to protect boundaries of the APD.
- Evaluate and incorporate transportation, traffic, water availability, drainage, stormwater and other negative impacts on the APD from cities into County and local planning processes.

Transportation

- Include and seek to solve increased traffic and visitation impacts that affect agriculture in local transportation plans, such as adding bike lanes on rural routes, permits for bike events, responding to parking on the side of roads with law enforcement, particularly illegal parking around float and jet ski areas, the SnoValley trail, and by bird watchers and photographers.
- New standard signage to delineate the APD at every street, trail, and river entrance to the APD, traffic safety signage for tractors/farm vehicles at entrances to APD and throughout the APD.
- Evaluate the King County Capital Improvement Program (CIP) to recommend projects that may provide strategic transportation relief, such as added bike lanes or trail enhancements to keep cyclists safe from passing farm machinery; on Hwy 203 prohibit bicycles, add passing lanes for slow traffic such as tractors, and wildlife viewing turnouts.
- Setup roadworks digital signage to encourage safer driving and highlight farm season, wildlife, etc.
- Study and capture pollutants from road run-off before reaching agricultural fields and waterways.
- Designate "farm to market" roads and/or overlays for further protection of commercial farm activities from recreation and traffic.

Stormwater and Flooding

- Continue to research, test, and implement stormwater flow solutions for the APD and surrounding area including possible new requirements for retrofitting existing developments.
- Pilot water storage in the uplands, to increase flows in summer for irrigation and fish and to decrease flood impacts.
- Payments and/or cost-share for
    - Pollutant clean-up including heavy metals, toxic materials such as fuels, herbicides, fecal coliform, sewage overflow, noxious weeds, etc.
    - Lost farm production days due to increased development (traffic, flooding from upland runoff will increase flooding severity, etc.).
    - Ecosystem services for flood water capture and flow, filtration.
    - Flood debris removal and local garbage and recycling service in the form of dumpsters; woodchippers.
    - Portion of SVAPD SWM fee allocated to ag projects in the APD, including contracted to ag orgs for outreach and education.
    - Ecosystem service credit to farmers, grants, etc. from SWM fee.
    - Solicitation for public donations to ag orgs in SVAPD.

Figure 29. New Caution Farm Area signage

Figure 30. New APD signage

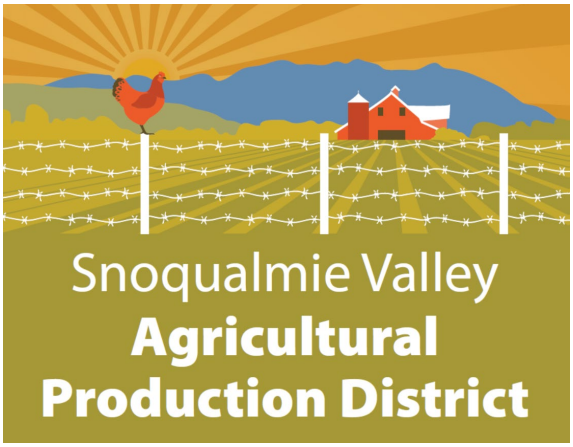


Figure 31. Drive Carefully signage

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[17] King County, "King County Farmers Markets: 2021", August 15, 2022. [LINK] Accessed 9.1.22. Report prepared for King County Department of Natural Resources, Water and Land Resources Division by Washington State Farmers Market Association.
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[20] Puget Sound Regional Council, "Vision 2050," October 2020. [LINK]. Accessed 8.23.22
[21] King County Farm and Forest Report, "Chapter 5: A Strategy to Preserve Farms and Farming," 1995. [LINK]. Accessed 3/17/22. Page 41.
[22] Ibid, page 41.

2.2.15: Elk and Deer

Current Condition

Figure 41. Elk Herd on SVAPD Farm Pasture

Farmland in the Snoqualmie Valley provides important habitat for a wide range of native wildlife species. Since agriculture moved into the valley in the 1870's population levels of most wildlife have been manageable. However, as wildlife populations increase and profit margins tighten, farmers' tolerance for loss to wildlife diminishes and farmers need options to keep losses to a manageable level.

An initial survey of wildlife damage to farms in King County was conducted in 2021.[1] Although the response rate was low (only 35 farmers contacted), virtually all respondents reported significant damage by wildlife. Nearly half of all respondents reported significant crop losses to deer, with a mean annual crop loss estimated at approximately $4,500. Because elk distribution is more local, only 20 percent of respondents reported crop losses due to elk; however, mean annual losses on those farms was approximately $12,500. Extrapolated county wide, mean crop losses to deer and elk is approximately $5-10 million annually. Farms located adjacent to or near larger blocks of upland forest (virtually all farms in the Snoqualmie Valley) are most at risk to damage from deer and elk.

Those numbers are in line with reported losses from nearby counties. For example, Skagit county reported annual crop losses to elk at approximately $13,000 to $15,000 for each farm that had elk present.[2] As elk populations grow, farms in the eastern Puget Sound region are under increasing pressure.

Inexpensive options to control crop losses to deer and elk are limited. Both species can be effectively excluded by constructing sturdy fences around the farmed areas,

Desired Condition by 2048

Crop loss to elk and deer is considered manageable by individual farmers, and farmers have options that can reduce crop losses and compensate for excessive loss.

Timeline

2023
- Pilot alternative fencing designs

2024
- Amend King County Code to allow construction of seasonal/wildlife fences without obtaining building permit
- Conduct a more complete survey of farmers to better understand crop losses to deer and elk and effectiveness of employed exclusion practices
- Expand availability of compensation for deer and elk damage and simplify process for qualification
- Pilot growing specific crops in areas to pull elk and deer away from commercial farms

2025
- Increase special hunts when populations exceed target or if depredation losses are extreme
- Increase access to depredation permits
- Expand access to federal, state and local cost-share for non-lethal deer and elk exclusion options
- Initiate at least two projects that focus on reducing elk vehicle collisions in high collision areas
- Complete at least two projects that enhance the public's ability to observe and appreciate elk in their natural

but those are expensive to construct for large farms, require a building permit if taller than six feet (typically need to be seven to eight feet tall to be an effective barrier), and can be a management and permitting challenge in the floodway/floodplain (need to be removed during flood season). Multi-strand electric fences are a cost-effective alternative for smaller farms, but they are a bit more challenging to construct and require more frequent maintenance. Other options to reduce crop depredation by deer and elk are less effective. Hunting, either during the regular hunting season or with a special permit often may eliminate a few problem animals, but deer and elk will often adjust behavior and only visit farms at night. Non-lethal tactics have been effective in some places, but typically for limited time. Those options include scare tactics (e.g., scarecrows, bright lights, noise makers, motion sensor sprinklers), repellants applied around the perimeter of fields (e.g., predator urine, blood meal), and application of taste aversion mixes (commercial and home-made). Applying a combination of non-lethal strategies is likely to have the best long-term effect.[3,4]	habitat or increase public understanding of elk biology and their habitat requirements 2026 • Work with WDFW to find alternative hunting options on private land • Expand availability for deer and elk hunting clubs willing to pay farm landowners

Background	Service Providers	Priority
Deer and elk damage to commercial crops is a growing problem throughout the western US and it is difficult to balance the goal of maintaining healthy (often growing) populations of deer and elk with the need to protect farmland. There are an estimated 750 elk in Game Management Area 460 (GMU 460), which essentially covers the area between Interstate 90 and Highway 2, east of the Snoqualmie River.[5] Over half of that population is found between Fall City and North Bend (GMU 4601). Although elk in this region are concentrated in the southern portion of the APD, farmers as far north as the county line have experienced high levels of elk use/damage. Additionally, there are an estimated 400 elk in GMU 454, which covers the area between Enumclaw/Auburn and Everett, west of the Snoqualmie River. Combined, the elk population in those three GMUs meets the total target of 1,100 animals that was established in the 2020 herd management plan. Population data for black-tailed deer are lacking although the deer population in GMUs 460 and 454 are considered stable, based upon reported hunter harvest.[6] Elk and deer have a naturally diverse diet of plants, including grasses, forbs, and buds, leaves and stems of woody plants. Many commercial crops are attractive to elk and/or deer, especially when natural forage is in low supply, such as during periods of extended drought. Farmers in the Snoqualmie Valley have reported significant deer and elk damage to a broad spectrum of crops, including berries, pasture grass, legume-dominated cover crops, corn, flowers (including sunflowers, dahlias, lilies, and tulips), beans, tomatoes, peppers, lettuce, and brassicas. Deer and elk are also known to forage an many other commercial crops, including apples, pears, and industrial hemp. Direct crop loss is not the only challenge created by excessive numbers of deer and elk on farms. Those challenges can be classified as “overt” and “hidden,” and include damage to livestock fencing, increased collisions, crop and soil contamination and food safety concerns, opportunity cost by diverting attention from other farm management needs, not being able to grow preferred crops that can increase profits, and the emotional toll crop losses can have on farmers and their families.	Leads: • King County and WDFW Partners: • WSU Extension • WSDA • KCD • USDA NRCS • Upper Snoqualmie Valley Elk Management Group	HIGH

After obtaining a permit issued by WA State Department of Fish and Wildlife, a property owner or the owner's immediate family, employee or tenant may kill a deer if it is damaging crops RCW 77.36.030 and WAC 232-36-310. Property owners that have annual gross sales or harvested value of agricultural products of at least $10,000, who experience repeated crop damage from deer may be eligible to receive cash compensation. To qualify for compensation, a farm owner must have an active Damage Prevention Cooperative Agreement or provide an approved checklist of the preventative and nonlethal means that have been employed to abate crop damage from deer or elk.[7] Farm owners need to work with their local WDFW wildlife conflict specialist, located in the North Puget Sound Regional Office in Mill Creek.		

Strategies

- Conduct a more complete survey of farmers to better understand crop losses to deer and elk and effectiveness of employed exclusion practices.
- Expand availability of compensation for deer and elk damage and simplify process for qualification.
- Pilot alternative fencing designs.
- Amend King County Code to allow construction of seasonal and/or wildlife fences without obtaining building permit.
- Pilot growing specific crops in areas to pull elk and deer away from commercial farms.
- Expand access to federal, state and local, including KCD, cost-share for non-lethal deer and elk exclusion options.
- Increase access to depredation permits.
- Increase special hunts when populations exceed target or if depredation losses are extreme.
- Work with WDFW to find alternative hunting options on private land such as Michigan's Hunting Access Program[8] (see Figure 42).
- Expand availability for deer and elk hunting clubs willing to pay farm landowners.
- Initiate at least two projects that focus on reducing elk vehicle collisions in high collision areas.[9]
- Complete at least two projects that enhance the public's ability to observe and appreciate elk in their natural habitat or increase public understanding of elk biology and their habitat requirements.[10]

Figure 42. Michigan Department of Natural Resources Hunting Access Program Sign [11]

[1] Parekh, J. 2021. Assessment of impacts of wildlife damage on farmers. Unpublished report. King County, Department of Natural Resources and Parks.

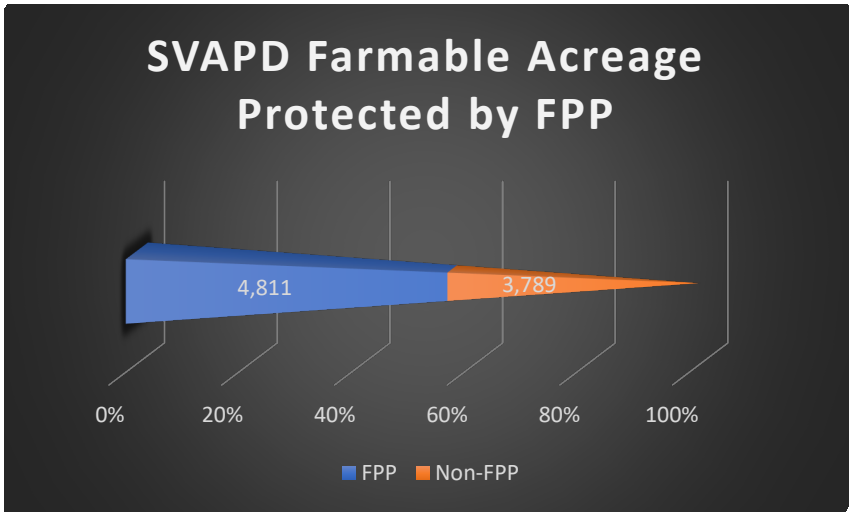
[2] Capital Press, "Washington County Tallying Elk Damage to Farms", August 15, 2018. Updated December 13, 2018. [LINK]. Accessed 9/26/22.

[3] Walter, D.W., M. . Lavelle, J. W. Fischer, T.L. Johnson, S.E. Hygnstrom, and K. C. VerCauteren. "Management of damage by elk (Cervus elaphus) in North America: a review" (2010). Wildlife Research 37(8): 630-646. [LINK]. Accessed 9/26/22.
[4] Johnson, H.E., J.W. Fischer, M. Hammond, P.D. Dorsey, W.D. Walter, C. Anderson, and K.C. VerCauteren. "Evaluation of techniques to reduce deer and elk damage to agricultural crops" (2014). Wildlife Society Bulletin 38(2): 358-365. [LINK]. Accessed 9/26/22.
[5] Washington Department of Fish and Wildlife, "North Rainier Elk Herd Management Plan". (2020). Wildlife Program, Washington Department of Fish and Wildlife, Olympia. [LINK]. Accessed 9/26/22. Page102.
[6] Washington Department of Fish and Wildlife, "2015-2017 Ungulat Assessment" (2016). Wildlife Program, Washington Department of Fish and Wildlife, Olympia. [LINK]. Accessed 9/26/22. Page 184.
[7] Washington Department of Fish and Wildlife, "Qualifying for a deer or elk damage claim". [LINK]. Accessed 9/26/22.
[8] Michigan Department of Natural Resources, "Hunting Access Program". [LINK]. Accessed 3/28/23.
[9] Washington Department of Fish and Wildlife, "North Rainier Elk Herd Management Plan". (2020). Wildlife Program, Washington Department of Fish and Wildlife, Olympia. [LINK]. Accessed 9/26/22. Page ix.
[10] Ibid.
[11] Michigan Department of Natural Resources, "Hunting Access Program". [LINK]. Accessed 3/28/23.

2.3.16: Farmland Preservation

Current Condition

Figure 43. Farmland Preservation Program: SVAPD Farmable Acreage Permanently Protected



Since 1982, there have been 6,139 acres (204 parcels) protected by purchase of King County Farmland Preservation Program (FPP) easements by Deed on property in the SVAPD. Washington Farmland Trust also holds easements by Deed on 239 acres of SVAPD farmland. Of the 6,139 acres under FPP Deed, 4,811 acres are farmable, with 4,273 being currently farmed and 538 currently fallow. Approximately, 1,176 acres of FPP Deed protect unfarmable land in the SVAPD as open space. 56% of the 7,514 acres of currently farmed, private land in the SVAPD is protected by Deed. See Figure 43. There are approximately 3,789 acres of farmable land still unprotected in the APD.

FPP is designed to protect farmable soils in perpetuity as well as influence market value to keep the price of encumbered property more affordable for farmers. By analyzing the aggregated last three years of sales in the SVAPD for a total of 37 farm property[1] sales, the mean of farm properties protected by FPP Deed sold for $41,821/acre, 37% less than the mean of properties without an FPP easement that sold for $66,690/acre.[2] By using the same data and calculating the median sale price/acre, the median sale price of an FPP property sold for $8,404/acre, a 77% decrease from a non-FPP median sale price of $36,977/acre.[3] See Figure 44.

FPP continues to pursue purchase of Deeds on remaining farms in the SVAPD and surrounding areas to further protect the SVAPD.

Of the 6,139 acres of FPP land in the SVAPD, 98.7% is participating in current use taxation (CUT), such as Public Benefit Rating System (PBRS) [4] farm and agricultural land program that requires commercial production, or the forestland program. Acreage participating in CUT in the SVAPD is approximately 10,728 acres.

FPP has traditionally been a development right removal or purchase. New FPP Deeds protect against loss of water rights. The next level will be easements that protect farmland from rising real estate costs and obligate farming/agricultural activities.

Desired Condition by 2048

All SVAPD farmable acreage is protected, as well as that near the APD, with FPP Deeds, and/or other long-term protections. FPP monitoring is increased, new programs are in place to keep ag lands affordable and in production. FPP properties are first in line for agricultural improvement programs. Farmers utilize best management practices.

Timeline

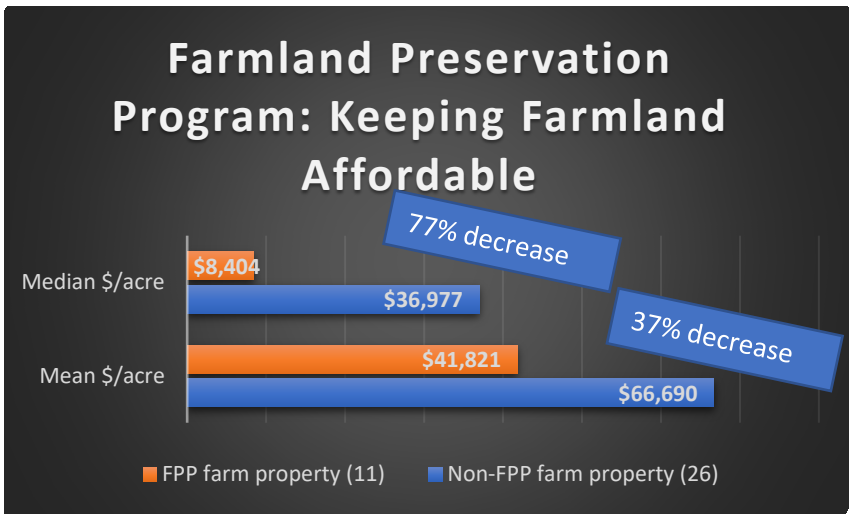
2024

- Convene farmland preservation partner organizations to understand and implement preservation strategies
- Incorporate these goals into Comp Plan
- Use the impetus of the Local Food Initiative and the Land Conservation Initiative to maximize the needs and preserve more farmland in SVAPD.
- FPP pursue purchase of Deeds on all remaining, high priority unprotected farms, with development rights to sell, including APD expansion areas
- Monitor and maintain existing FPP Deed protections to ensure compliance
- Ensure FPP Present Conditions Report, which are part of new Deed purchases, detail high value salmonid habitat areas for potential and voluntary restoration on protected land

2025

- Invest in infrastructure to keep open space properties and FPP properties in farming, being farmed
- Increase program capacity of FPP for monitoring, new easement creation, funding, and outreach
- Annual monitoring of FPP Deeds
- Research and create additional FPP easements/encumbrances

Figure 44. Farmland Preservation Program: Keeping Farmland More Affordable – Sales/Acre and % Value Reduction in SVAPD[5]



With expanding the SVAPD a high-level priority of this plan, ensuring FPP deeds are pursued and realized on the expanded APD parcels is also critical to ensure protections in perpetuity for productive agriculture.

In addition to FPP, preserving farmland has been integral to King County government and residents for decades. King County has delivered groundbreaking policy and programs that have become models throughout the country. For example, King County created:

- Agriculture Production Districts through zoning protections in 1985,
- King County Agriculture Commission in 1994 to advise the County Executive and Council on agriculture policy,
- County agriculture program staffed to support farmers,
- Farmland lease program
- Agricultural drainage program (ADAP),
- Farm pad program,
- Transfer of Development Rights (TDR) program,
- Fish Farm Flood watershed planning process,
- the Executive's Local Food Initiative in 2014 followed by the Land Conservation Initiative to protect an additional 65,000 acres of natural resource lands, and
- further protections and preservation of agriculture embedded in the County's Comprehensive Plan, and agricultural code delineating allowed agricultural activities and protecting the right to farm and the land on which to farm.

This work is ongoing and continued commitment to these programs and the implementation of this plan is needed because outside organizations have moved out of the County because the County has done so much, so any reversal of this course, would be absolutely detrimental to agriculture.

2026

- Overlay original FPP easement deed with additional easement/ encumbrances where appropriate
- Utilize existing and pursue new revenue for enhancement of FPP Deeds
- Increase outreach and education about FPP opportunities, to farmers and landowners
- Add signage to properties that are FPP protected

2030

- Continue to overlay original FPP easement deed with additional easement/encumbrances
- Ensure FPP deeds continue to be primarily for farming purposes, encourage landowners to farm and retain farmable lands as open space in general.
- Ensure FPP offers protections that preserve affordable homes.

2036-2046

On-going FPP Deed purchases on remaining unprotected land; stacking protections on protected lands when appropriate; annual Deed maintenance/monitoring

Background	Service Providers	Priority
Beginning with the farmer revolt to sell directly to customers that started Pike Place Market in 1907, farmers have battled against growth and profiteers to preserve farmland and farming in our region. There are many things that farmers, residents, policymakers, and NGOs still need to do to ensure farmland in the Snoqualmie Valley is preserved. King County's Farmland Preservation Program (FPP) is a voluntary program that since 1984 has purchased development rights from property/farmland in order to permanently preserve it for agriculture or open space uses. Covenants contained in an agricultural conservation easement known as the Deed of Agreement Relating to Development Rights ("Deed") restricts the land's use. King County is the grantee of the Deed and holds the development rights in trust on behalf of the citizens in perpetuity. The covenants placed on a property "run with the land" and remain in effect even if the property is sold, rented, bequeathed, or annexed by another jurisdiction. The covenants restrict the land to agricultural or open space uses, permanently limit the number of dwelling units, and require that 95 percent of the property remain open and available for cultivation (i.e., 5% maximum non-tillable). Although these covenants do not require a property be actively farmed, they do prohibit any activities that would permanently impair the use of the property and its soils for agriculture. Ordinance 4341 (codified as Chapter 26.04 of the King County Code) outlined the objectives and parameters of FPP and instructed the Executive to put a bond initiative before the voters in the early 1980's. The ordinance recognized the economic, aesthetic, and unique benefits agriculture provides to the citizens of King County and stated land suitable for farming is an irreplaceable resource. The ordinance acknowledged current policies and regulations did not provide adequate protection and therefore, permanent acquisition of voluntarily offered interests in farm and open space lands would provide long-term protection of the public interests these lands served. King County voters ultimately passed a $50 million Farmlands and Open Space Bond (79' Bond) Initiative that authorized the sale of bonds to finance the purchase of development rights on high quality farmlands[6]. During the mid-1980s, the County began the purchase of Deeds and development rights on priority farms, ultimately protecting 12,600 acres, primarily in the five Agricultural Production Districts (APDs). The County continued to acquire farmland development rights using remaining 1979 Farmlands and Open Space Bonds, but mainly using funds generated through the Conservation Futures levy (CFT), the Transfer of Development Rights (TDR) program, as well as federal and state funding. Recently, the Local Food Initiative and Land Conservation Initiative have guided FPP Deed purchases. To date, the County has purchased development rights on over 16,127 acres located throughout the County, in the rural areas as well as APDs.	Lead: • King County DNRP Farmland Preservation Program Partners: • Landowners • DNRP WLRD (RRSS, RFMS, TDR, CFT) • DNRP Parks • SnoValley Tilth • SVPA • SVWID • Washington Farmland Trust • Forterra • Mountains to Sound Greenway Trust • WA State Conservation Commission • USDA NRCS • King Conservation District	HIGH

Strategies

King County Farmland Preservation Program

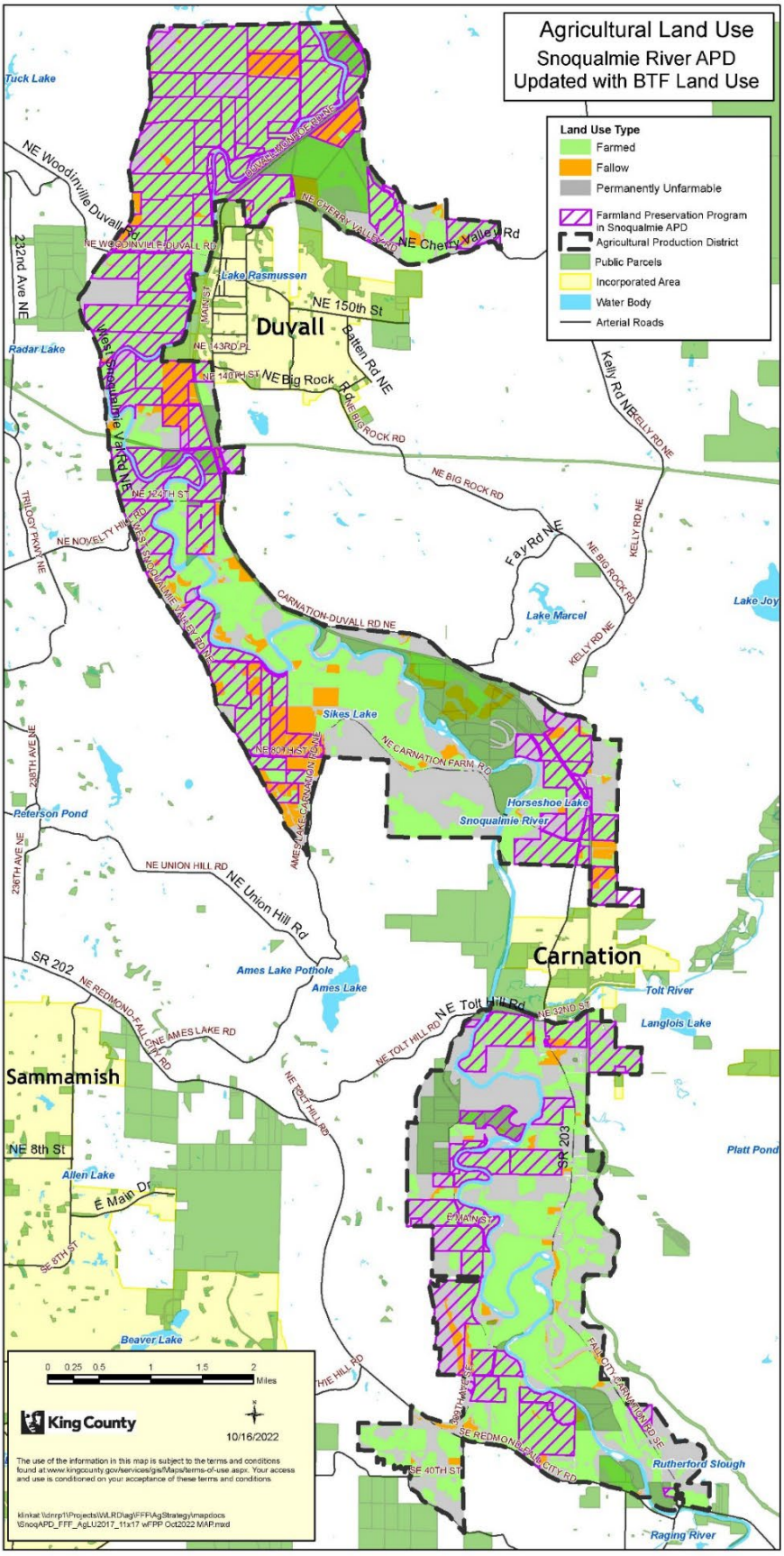
- Engage with remaining property owners in SVAPD and SVAPD expansion areas to purchase FPP/TDR Deeds.
- Monitor and maintain existing Deed protections in regard to farming and agriculture activities (i.e., adaptive management, ADAP, permit assistance, etc.) to ensure compliance.
- Increase program capacity of FPP for monitoring, new easement creation, funding, and outreach.
- Annual monitoring of Deeds.
- Research and create additional easements/encumbrances (purchase of additional Deed restrictions).
    - Affirmative easements that encourage or require farming, such as require maintaining taxation enrollment or higher standard in FPP Deed.

    - Assist with lowering price of farmland and homes, such as Option to Purchase at Agricultural Value (OPAV).
    - Protect land and farm infrastructure with a deed or easement, such as homes or farm pads.
- Overlay original FPP easement deed with additional easement/encumbrances to preserve farmland (the complete package).
- Continue to utilize existing and pursue new financing for enhancement of Deeds.
- Increase outreach and education about FPP opportunities, to farmers and landowners.
- Add signage to properties that are FPP protected.
- Ensure FPP deeds continue to be primarily for protection of agriculture and farming purposes.
- Ensure FPP offers protections that preserve affordable homes.
- Ensure FPP Present Conditions Report plans for and details high value salmonid habitat areas for potential voluntary restoration, which is referenced in the Deed.
- FPP properties are prioritized and first in line for agricultural improvement and infrastructure programs.
- Advocate for a person with agricultural expertise on CFT committee award group.
- Add Farmland preservation 100% easement to CFT funding allowances.
- Prioritize FPP properties for all agricultural maintenance and infrastructure improvements so that the land can be in food production. LFI Strategy 1.2: Improve farmland productivity and 1.4: Preserve farmland for food production.

Food Production and Farmland Access

- Invest in infrastructure (including permitting technical assistance and cost-share) to keep open space properties and FPP properties in farming, being farmed.
- Incentivize and educate about best management practices and agro-ecological production principles[7] that will help preserve farmland.
- Use the impetus of the Local Food Initiative and the Land Conservation Initiative to maximize the needs and preserve more farmland in SVAPD.
    - Support farm employees with education and training to become farm managers. (LFI Strategy 1.3: Enhance recruiting, training, and technical assistance programs for new farmers, with consideration of diverse cultural and language needs.)
    - Improve infrastructure for food storage, food processing and marketing [specifically for dairy, vegetables, fruit, and flowers]. (LFI Strategy 2.3: Improve the local food processing, distribution, and marketing infrastructure in King County to accommodate and increase aggregated food distribution.)
- Convene farmland preservation partner organizations to understand and implement these strategies:
    - Enhance King County's Working Farmland Partnership to create and promote innovative land bank and business models for new and beginning farmers. (LFI Strategy 1.4: Preserve farmland for food production.)
    - Increase tax incentive programs for commercial food production and include the taxation savings in the bill/mailer.
    - Create long-term annual incentive/rebate to encourage succession and ag production.
    - Create an essential business priority and rebate program for food production from fuel, utility and energy companies, or other sources.
    - From real estate sales, create an extra contribution option to fund farmland succession/acquisition fund.
    - Modeled on the "School impact fee", bill new building permits (excluding commercial farm operation building permits), for improvements needed by their development to King County owned agricultural open spaces and roads, i.e., road pull-outs in APD for slower vehicles/wildlife viewing areas, or drainage improvements for increased stormwater, or fencing to protect crops from wildlife pushed onto farms from population growth.
    - Create "community foundation" fund to apply to offset farming costs and respond with emergency funding grants to farm businesses in SVAPD.
    - Increase succession planning resources and funding to assist current landowners to transition their businesses to new farmers and keep homes occupied and livable.
    - Conduct outreach about creative financing and business ownership models for farm and home transition.
    - Research, test, and trial additional public/private partnerships, including tax incentives or rebates to homeowners to offer homes for rent to farm employers and farm employees.

Map 18. FPP Properties by Farmed, Fallow and Unfarmable Status



[1] For this analysis, farm property is defined as an active farm, which could include home and/or ag improvements/structures.
[2] King County Farmland Preservation Program, Unpublished Report, October 2022. The analysis is based on aggregated mean sales price/acre and median sales price/acre from the last 3 years of sales, March 2019-2022, in the SVAPD. Accessed March 2022 from King County's iMAP, "last three years of sales" layer.
[3] Ibid.
[4] King County Current Use Taxation Programs. Last updated November 28, 2016. [LINK]. Accessed 8/4/22.
[5] Ibid.
[6] Kit Oldham, HistoryLink.Org, "King County Farmland Preservation Program," Essay 7691. Last updated 3/15/2006. [LINK]. Accessed 8/4/22.
[7] Food and Agriculture Organization of the United Nations, "The 10 Elements of Agroecology Guiding the Transition To Sustainable Food And Agricultural Systems" [LINK]. 8/4/22.

2.4.17: Acreage to Preserve for Commercial Farm Sector

Current Condition

Table 1. Current SVAPD Acreage Farmable and Unfarmable Totals by Sub-category

Category	Acres
Total APD	**14,931**
Farmable Total	**8,668**
Farmable Currently Farmed	7,407
Farmable Fallow	1,060
Farm Infrastructure	201
Unfarmable Total	**6,263**
Unfarmable	5,033
Unfarmable Mainstem	705
Unfarmable Oxbow or Channel	273
Unfarmable Roads+Misc	252

The King County Snoqualmie Valley Agricultural Production District (SVAPD)[1] encompasses 14,931 acres. Within this zone there are 8,668 farmable[2] acres and 6,263 unfarmable[3] acres.

Farmable acres of high-quality agricultural soils are divided into three categories: currently farmed,[4] fallow,[5] and farm infrastructure.[6] Within farmable acres there are 7,407 acres currently farmed, 1,060 acres are fallow, and 201 acres of farm infrastructure. A commercial farm needs both agricultural soils and physical infrastructure.

Unfarmable acres are divided into four categories: unfarmable (steep slope, forested, existing buffers, wetland, lakes, right of ways, non-ag buildings, recreation) mainstem, oxbow or channel, and roads+misc. Within unfarmable acres there are 5,033 acres of the sub-category unfarmable, 705 acres of mainstem, 273 acres of oxbow or channel, and 252 acres of roads+misc.

Figure 45. Local Food Initiative Strategies for Increasing Food Production in King County[7]

Strategy 1.1	Decrease start-up and expansion costs and **remove barriers in food production (land**, equipment, **related infrastructure**, taxes, insurance, capital investment)
Strategy 1.2	**Improve farmland productivity**
Strategy 1.3	Enhance recruiting, training, and technical assistance programs for new farmers, with consideration of **diverse cultural and language needs**.
Strategy 1.4	**Preserve farmland** for food production, building on the recommendations of the King County Farms and Food Roundtable
Strategy 1.5	Improve **drainage** to bring more land into production
Strategy 1.6	**Improve availability and efficiency of irrigation water**: save what we have, share what we have, and if possible, find more.

Desired Condition by 2048

Regulatory relief quickens the pace and lowers the cost of infrastructure improvements to farmable land. Protections and zoning in place to permanently preserve 7,696 farmable acres by expanding the APD and through FPP easements.

Timeline

2023

- Increase the productivity of 8,668 farmable acres through infrastructure improvements and protections as captured in strategies and timelines within Issue Papers 1-17 of the Plan
- Convene an Agricultural Strategic Plan Implementation Working Group to make and track progress on the Plan, coordinate grant opportunities, and assist in multi-benefit projects

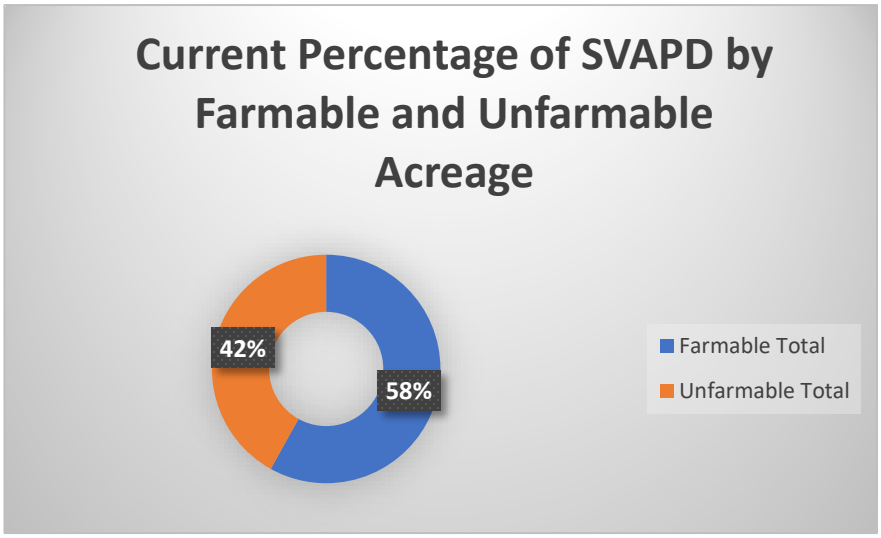
2024

The King County Comprehensive Plan states that agriculture "should be the principal"[8] and "predominant" [9] use within an APD[10]. In 2020, R-656a introduces mitigation for replacement of agricultural land removed from the APD as acre for acre replacement of "comparable in size, soil quality and agricultural value" as well as "restoration" of acres, when land cannot be added.[11] The 2015 Local Food Initiative seeks to expand farm acres in food production, while increasing the number of new and beginning farmers through six strategies. See Figure 45.

In addition, the Land Conservation Initiative in partnership with the King County Farmland Preservation Program seeks to preserve an additional 13,000 acres of farmland in King County in the next 25 years.

Based upon the acreages in Table 1, farmable land is the predominant use in the SVAPD at this time, with 58% of the acreage classified as farmable and 42% classified as unfarmable. See Figure 46.

Figure 46. Current Percentage of SVAPD by Farmable and Unfarmable Acreage



Agriculture Strategic Plan Task Force research shows that in the face of multiple pressures to farming (see issue papers 1-17) every commercial farm operation in the SVAPD needs infrastructure improvements and/or further protections on their farmable land to be more productive and/or viable. In addition, due to various constraints on fallow land in the SVAPD such as an owner not being interested in farming or leasing to a farmer, or an ownership transition, 1,060 fallow acres are difficult if not impossible to lease for farming.

SVAPD commercial farm operations are already constrained and cannot find new land to lease or buy to grow their operations. They must comply with tighter Federal Emergency Management Agency (FEMA) regulations in the floodplain, new Food Safety Modernization Act (FSMA) regulations in regard to on-farm production, employee management, and marketing, as well as the constraint that new farm operations cannot find land to start farming. Farm operations that lease farmland are operating on shifting sands as owners weather the Covid and world economic downturn. Simply put, there is a very real land constraint for the 214 commercial farms in the SVAPD currently farming on 7,407 acres.

In order to create succession in farming operations, new and beginning farmers, as well as immigrant and historically underserved farmers need long-term farmable land to lease. There are few to no options. With 25% of SVAPD farms leasing the land on which they farm,

- Target eligible 3,789 farmable acres with King County's Farmland Preservation Program deed.

2026

- Every three - five years, complete an inventory of farmland conversion and loss, including plantings, in the Snoqualmie Valley

2028

- Every five years, review infrastructure improvement and protections through issue paper strategies and timelines, and issue progress report on achievements and challenges

2030

- Expand the APD by 278 farmable acres

- Gain Regulatory Relief to permit more agricultural infrastructure improvements on farmable land while quickening the pace and lowering the cost

2045

and a significant concentration of Hmong immigrants farming in the SVAPD, farmable land access is a clear equity and social justice concern. For commercial farm operations, productivity is dictated by the amount of limited resource, high-quality, prime agricultural soils and farm infrastructure available, noted in this plan as farmable land located within the zoning protections of the APD. Farmable land is required for good agricultural practices such as crop and fallow rotations to minimize pathogens, to increase soil health, and increase agricultural yields. Farmable land is needed to expand production in strong market years or years of need when supply chains breakdown and food security becomes more difficult. Farmable land is also needed to weather climate change with increased flooding, invasive species, and higher temperatures and summer drought. Farmable land is needed when wildlife damage crops or create areas to wet too farm by damming waterways. Farmable land is needed when population pressures cause non-farmers to buy homes or acreage in the APD for allowed uses other than farming, and non-allowed uses, or merely real estate speculation. Farmable land is needed when productivity is adversely impacted by backlogs that limit infrastructure and flood safety improvements on farmland (e.g.: drainage, agriculture building improvements, home elevations, high ground refuge and farm pads). In the face of so many pressures on commercial agriculture in the SVAPD, it is critical to maintain the agricultural land resource and agriculture sector.	• Ensure predominant use of agriculture by permanently protecting 7,696 acres

Background	Service Providers	Priority
In order to analyze and propose the number of acres needed for a viable commercial agriculture sector, per the Task Force Scope of Work[12] and FFF Farm 4,[13] the Task Force utilized the 2017 Ag Land Use Survey conducted by the King County DNRP WLRD Ag Program as a GIS base layer for designating land use within the SVAPD. The Task Force then reviewed this base layer and updated information to match the FFF Ag Task Force Scope of Work. The Task Force took timing into account regarding farming in the SVAPD: What is happening now? What has happened historically? What is predicted to happen? The Task Force studied and discussed the farmable and unfarmable acreage, gathered economic development records,[14] studied mitigation, potential APD farmable acreage expansions, King County Comprehensive Plan, King County Code, and King County Initiatives, and the FFF Buffer Task Force recommendations and crafted a formula to convey SVAPD farmable acreage and needs at a scale and complexity never before delineated within King County. Then, because of different mapping scales and methodology used by Farm, Fish, Flood task forces, King County GIS staff worked to match the scales and methodologies along waterways, the area understood to have the most potentially conflicting uses. In this work, the Ag Task Force map resolution and classifications were updated along all waterways in the APD and enhanced from a scale of 1 acre to 200 ft. More than 2,000 acres were reviewed in this task from December 2021 through October 2022. See Figure 48 and Figure 49 for examples. With the foundational map work complete on the Agriculture Strategic Plan Acreage Delineation Map by Farmable and Unfarmable Land in the SVAPD,[15] the Task Force completed their assessment in Fall 2022. Because 6,263 permanently unfarmable acres already exist within the APD and preclude farming, the Task Force recommends that habitat recovery efforts for endangered and threatened salmon and trout species focus projects on unfarmable acreage whenever possible. If, however, high-quality habitat is needed on farmable acres the task force recommends a multi-benefit mitigation or offset[16] approach. The FFF Buffer Task Force has	**Lead** • King County WLRD **Partners** • SVWID • SVPA • KCD	HIGH

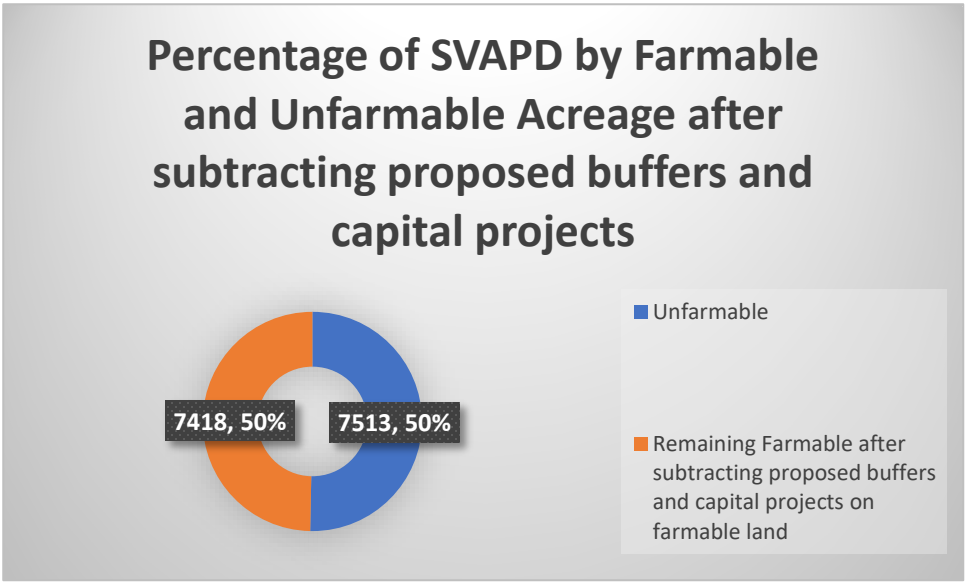
indicated in their minimum buffer width recommendations that 950 acres of farmable land, are recommended for voluntary buffers along waterways. King County is proposing habitat capital projects[17]on 300 acres of farmable land. See Table 2.

Table 2. Farmable Acreage Subtracting Voluntary Buffer Plantings and Proposed Capital Projects on Farmable Land

Category	Acres
Total SVAPD	14931
Farmable acres	8668
subtract proposed maximum width voluntary Habitat Buffers on farmable land	950
subtract proposed Capital Project buffers	300
Remaining Farmable	7418
Unfarmable	7513

When subtracting proposed voluntary buffer widths needed on farmable land and future capital project buffers, farmable land drops below the primary or predominant use in the SVAPD by 95 acres, roughly diminishing the predominance of agriculture to the same level or percentage of SVAPD land as other uses, tipping the scales beyond the comfort of the Task Force and King County policies. See Figure 47.

Figure 47. Percentage of SVAPD by Farmable and Unfarmable Acreage after subtracting proposed buffers and capital projects



The Ag Task Force Scope specifies that the recommendation must be more than what is currently preserved through the King County Farmland Preservation Program,[18] and "Snoqualmie Valley landowners and residents are willing to give up some farmland for wildlife habitat. However, there needs to be certainty that enough land remains for active and viable farm production."[19] With all of these complexities in mind, the task force considered all of the following. See Table 3.

Table 3. Acreage Considerations for Farmland Acreage Preservation Recommendation

	Scenario A	Scenario B
Total SVAPD	14931	14931
Farmable acres	8668	8668
subtract proposed maximum width voluntary Habitat Buffers on farmable land	950	950
subtract proposed Capital Project buffers	300	300
Remaining Farmable	**7418**	**7418**
Unfarmable	**7513**	**7513**
Expand the APD		278
Currently Farmed		237
Fallow		41
New Proposed Farmable Total to preserve in perpetuity	**7418**	**7696**
Added acres from proposed habitat back into farmable		
Predominant APD use?	**No**	**Yes**
	-95	**183**

To secure the future of the SVAPD agriculture sector and agricultural land resource as the predominant use in the SVAPD, no net loss of farmable lands must be achieved through infrastructure improvements on farmable land, expansion of the APD to the southwest to secure a farmable acreage reserve, as well as regulatory relief to allow more agricultural infrastructure improvements.

Recommendations and Strategies

Task Force Acreage Recommendation

1. **Increase the productivity of 8,668 farmable acres through infrastructure improvements and protections** as captured in strategies and timelines within Issue Papers 1-17 in the Plan,
2. **Expand the APD** to the Southwest by 278 farmable acres[20] to preserve additional farmable land and valuable habitat,[21] and
3. **Gain Regulatory Relief** to permit more agricultural infrastructure improvements on farmable land while quickening the pace and lowering the cost.
4. **Ensure predominant use of agriculture in the SVAPD by protecting at least 7,696 farmable acres to be permanently preserved** within the next 25 years to and long-term, commercial agriculture viability in the SVAPD.
5. **Target eligible 3,789 farmable acres currently unprotected by FPP** with King County's Farmland Preservation Program deed.

Strategies

- Convene an Agricultural Strategic Plan Implementation Working Group made up of Plan service providers [or the Task Force make-up OR Both], to make and track progress on the Plan, coordinate grant opportunities, and assist in multi-benefit projects.
    - Every three or five years, complete an inventory of farmland conversion and loss, including plantings, in the Snoqualmie Valley (FFF 1.0 Farm 4).

Every five years, review infrastructure improvement and protections through issue paper strategies and timelines, and issue progress report on achievements and challenges. Permanently protect a certain amount of land for farm use (FFF 1.0 Farm 4).

Figure 48. Reconciled Agriculture Task Force (ATF) and Buffer Task Force (BTF) Maps: Methodology, Scale, and Classifications. Originally, due to the nature of previously funded mapping research, the BTF and ATF maps utilized different methods, scales, and classifications. In order to match the two and work from the same data, the ATF utilized King County GIS staff to reconcile the differences and consolidate the data into a new GIS layer. This work took over a year and was fundamental to the land use specifics informing the ATF's acreage understanding and recommendation. This figure shows on the left at the top, an example of the ATF original mapping classifications and below that, the BTF original mapping and classifications of the same location. The figure on the right shows the ATFBTF maps and classifications reconciled.

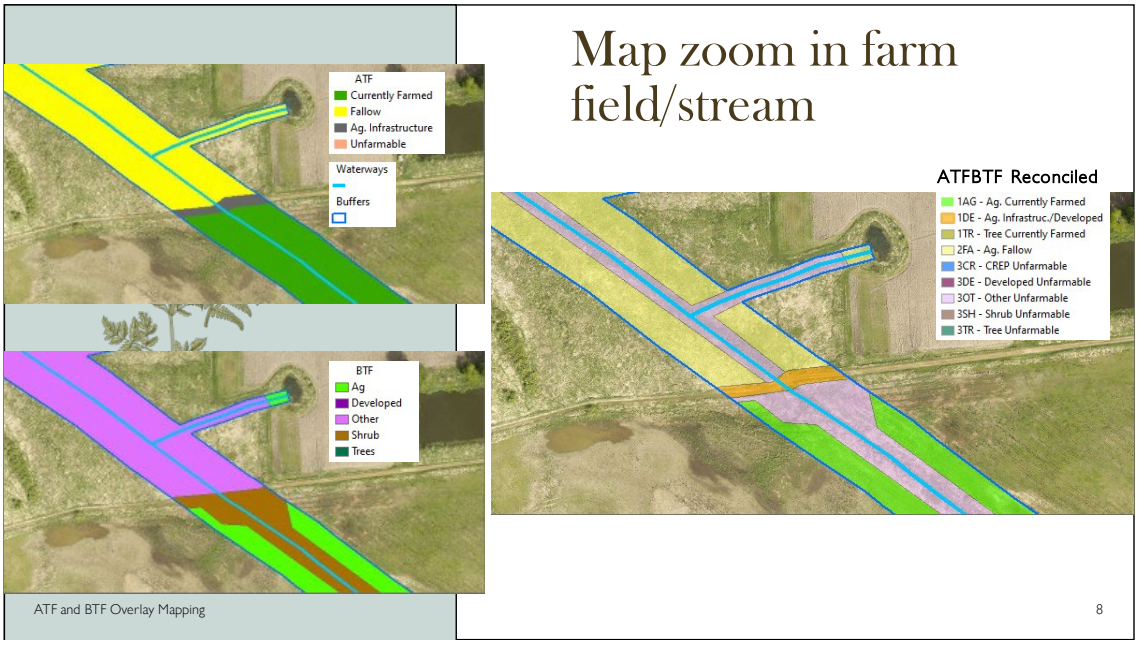


Figure 49. Completed Section of Map with Reconciled Methodology, Scale, and Classifications within Waterway Areas. This is another example of the reconciled mapping with easier to read legend for a section of the APD along the mainstem of the Snoqualmie River. Note the specificity of categories within 200 ft each side of the river.

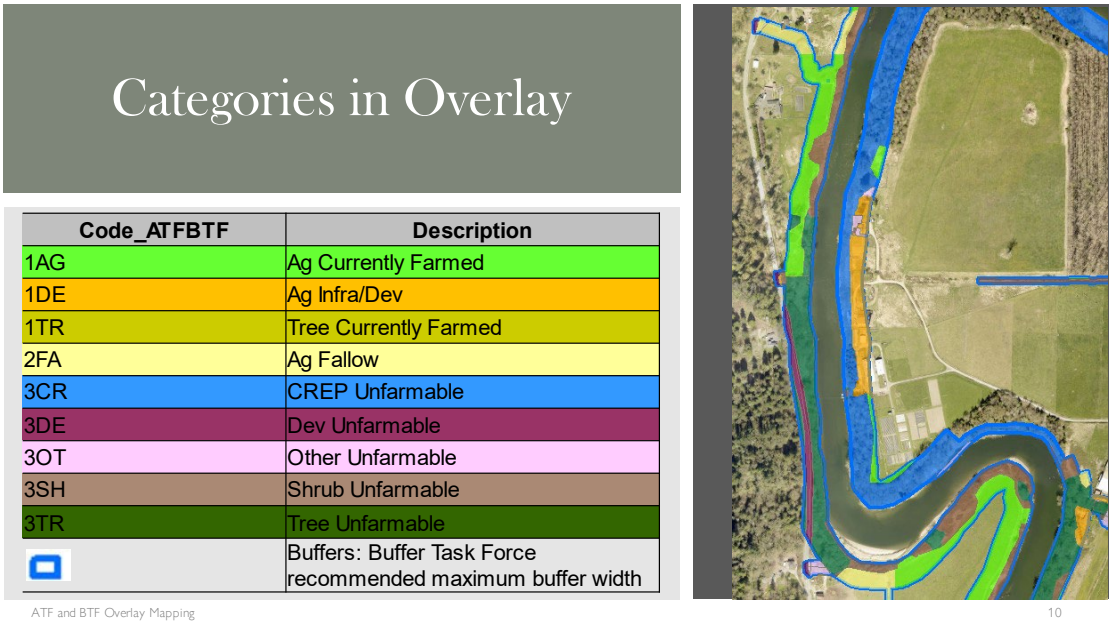
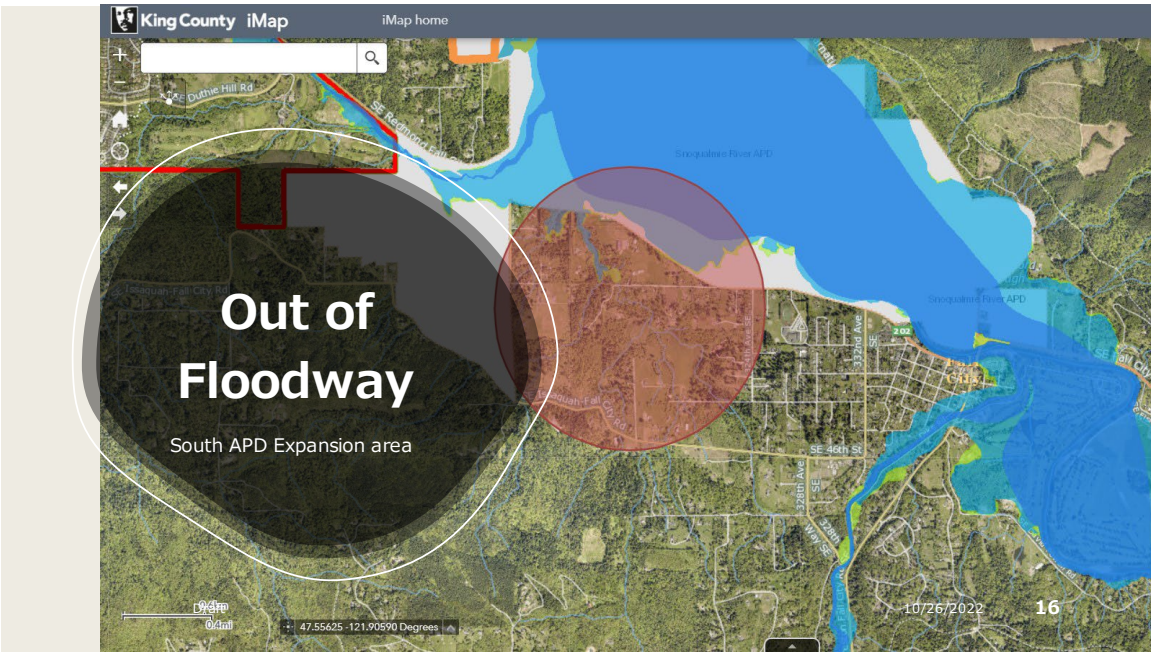
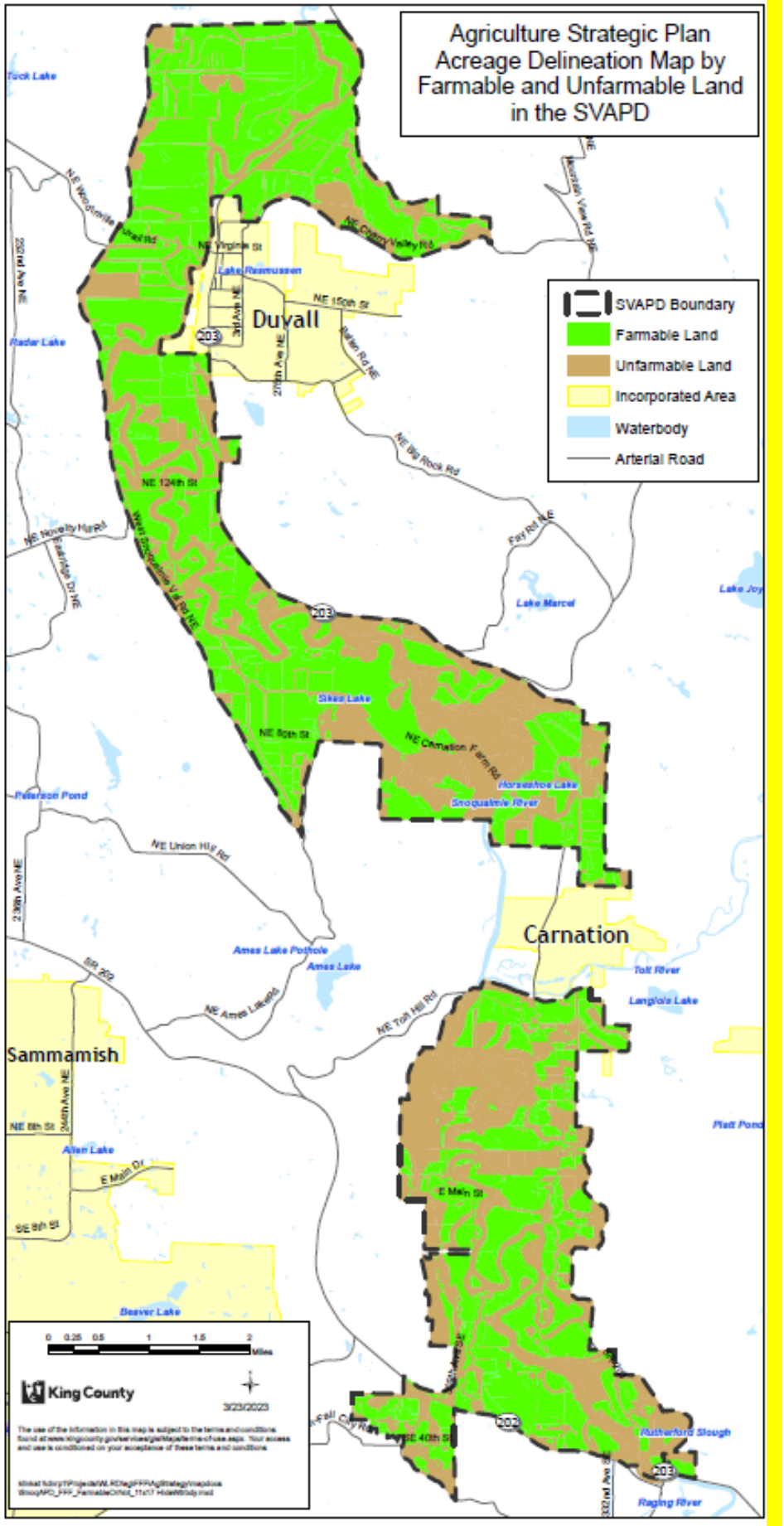


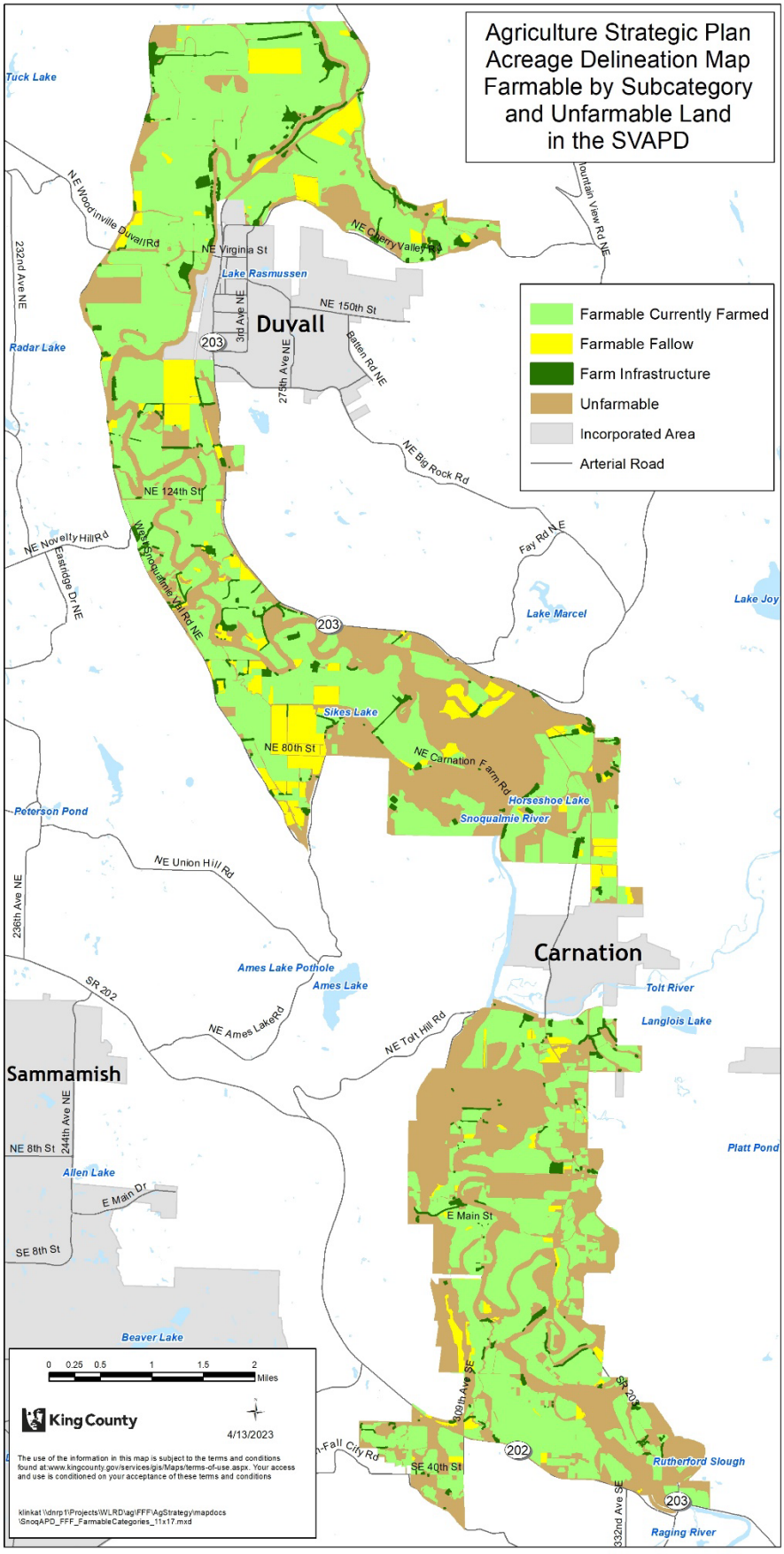
Figure 50. Proposed South SVAPD Expansion Area. General farmable area outside of the floodway recommended for expanding the APD.



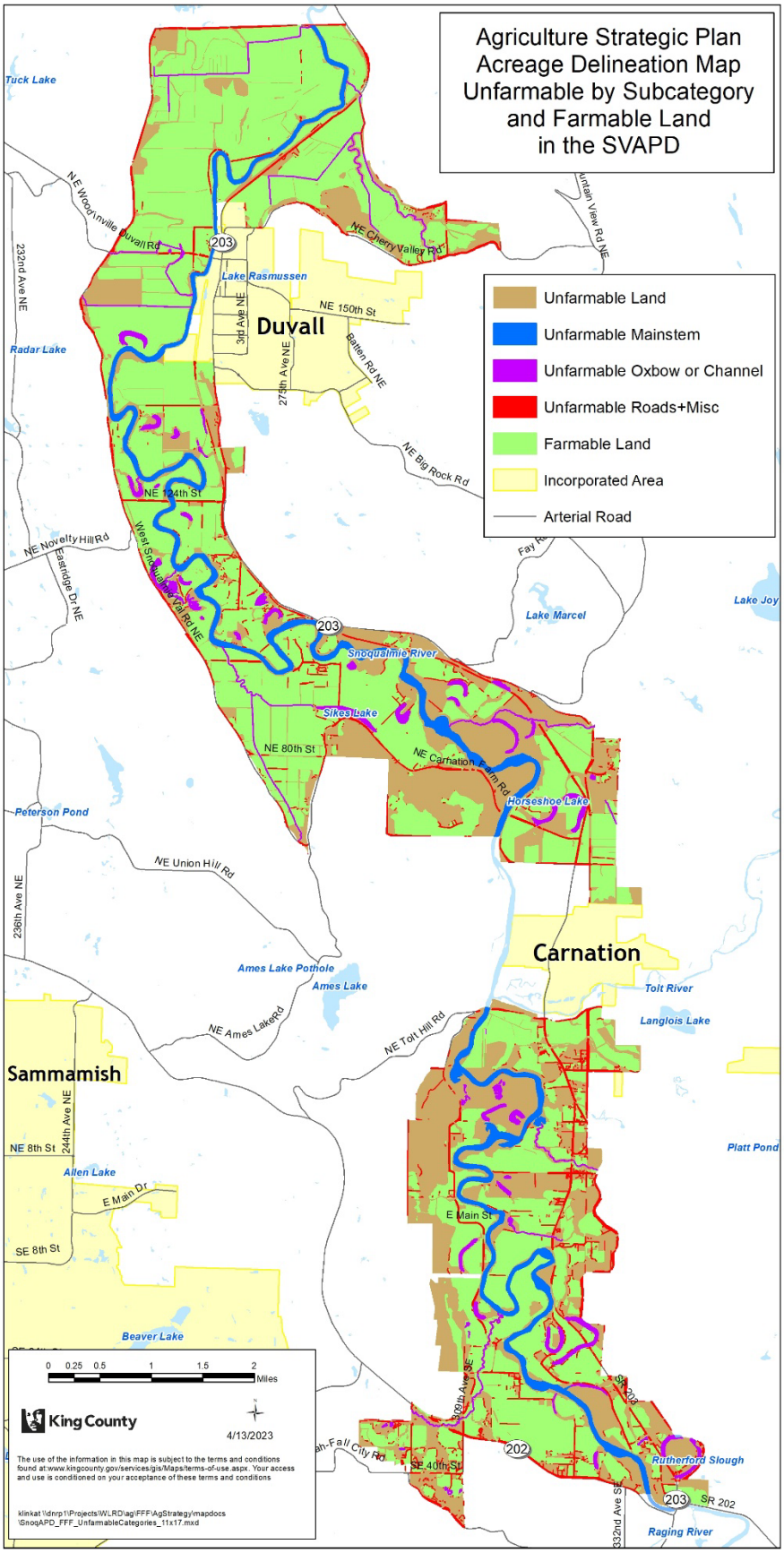
Map 19. Agriculture Strategic Plan Acreage Delineation Map by Farmable and Unfarmable Land in the SVAPD[22]



Map 20. Agriculture Strategic Plan Acreage Delineation Map Farmable by Subcategory and Unfarmable Land in the SVAPD



Map 21. Agriculture Strategic Plan Acreage Delineation Map Unfarmable by Subcategory and Farmable Land in the SVAPD



[1] The Snoqualmie Valley Agriculture Production District is a zone encompassing 14,931 acres. Designated through King County zoning as an agriculture production district (APD) to protect its high-quality soils for farming. It is one of five APDs in King County. Per King County Comprehensive Plan R-643, Agricultural Production Districts are blocks of contiguous farmlands where agriculture is supported through the protection of agricultural soils and related support services and activities. Roads and natural features are appropriate boundaries for Agricultural Production Districts to reduce the possibility of conflicts with adjacent land uses.
[2] Farmable classification is land that can be readily farmed. Farmable includes the sub-categories of currently farmed, fallow, and agriculture infrastructure.
[3] Unfarmable classification is land that can never be farmed again. Unfarmable includes the sub-categories of unfarmable (steep slope, forested, wetland, lakes, right of ways, non-ag buildings, recreation) mainstem, oxbow or channel, and roads+misc. .
[4] Actively being farmed by the 214 commercial farm operations in the SVAPD primarily for forage, livestock, crop, and flower production.
[5] Fallow ground is designated as farmable ground that is idle and currently not being farmed due to owner or management transition. Owner may need assistance to find farmers to operate on this land. Additional infrastructure improvements may be needed to make this ground productive when it has been fallow over time.
[6] Farm infrastructure includes farm buildings on farm properties such as homes, barns, loafing sheds, manure lagoons, farm access roads, etc.
[7] King County, "Local Food Initiative: A Roadmap to strengthening King County's local food system and increasing access to healthy, affordable food". [LINK]. Pages 15-16 [18-19].
[8] King County, "R-647" [LINK]. 2016 Comprehensive Plan. Updated July 24, 2020. Page 3-55 [143].
[9] King County, "R-649" [LINK]. 2016 Comprehensive Plan. Updated July 24, 2020. Page 3-58 [146].
[10] King County, "R-650" [LINK]. 2016 Comprehensive Plan. Updated July 24, 2020. Page 3-58 – 3-59. [146-147].
[11] King County, "R656a" [LINK]. 2016 Comprehensive Plan. Updated July 24, 2020. Page 3-62 [150].
[12] Snoqualmie Fish, Farm, Flood Advisory Committee Final Agreement Package, "Snoqualmie Valley Agricultural Land Resource Strategic Plan" [LINK]. Task Force Scopes, Appendix V. Page 14 [59].
[13] Snoqualmie Fish, Farm, Flood Advisory Committee Final Agreement Package, "Farm 4, Action 1, A and B" [LINK]. Committee Action Recommendations. Page 7 [21].
[14] A public disclosure request was made to the WA State Department of Revenue for all farm and agriculture related businesses via more than 120 North American Industry Classification System (NAICS) Codes including codes for Agriculture, Food Manufacturing, Commercial, Industrial Machinery and Equipment Repair and Maintenance, within six zip codes within or near the SVAPD (98014 Carnation, 98019 Duvall, 98024 Fall City, 98050 Preston, 98065 Snoqualmie, and 98053 Redmond) to assess economic impact and health of the ag sector. The task force reviewed and discussed past, current and future local supply chain, repair, and processing challenges within the sector that limit certain types of production, i.e., tractor repair businesses, viable markets, feed and farm suppliers, etc.
[15] Disclosure: About the Map Overlay

- This map overlay is a visual representation of the landscape for a moment in time. Things have changed since we created the data and they will continue to change.
- The data along waterways was generated mostly from aerials from 2019, with some updates using 2021 aerials.
- Away from waterways, the Ag Task Force map used the 2017 Ag Land Use Survey as a foundation with the addition and some changes to capture farmable land in the two sub-categories of currently farmed and fallow, as well as unfarmable lands based on developed, natural, or recreational uses and ownership.
- While we've worked hard to ensure the information is up to date and accurate as of 2019, there may be changes that have occurred that have not been captured in data.

[16] Mitigation is offsetting or countering the adverse effects that other land uses cause to the environment or in this case, to the agricultural land resource. Mitigation is typically a framework of actions taken that match the impact or degradation.
[17] 301 acres of proposed salmon habitat restoration capital projects includes the Fall City Restoration Project.
[18] King County's Farmland Preservation Program protects 6,139 acres under FPP Deed in the SVAPD. 4,811 acres are farmable, with 4,273 being currently farmed and 538 currently fallow. Approximately, 1,176 acres of FPP Deed protect unfarmable land in the SVAPD as open space.
[19] Snoqualmie Fish, Farm, Flood Advisory Committee Final Agreement Package, "Farm 4, Action 1, A and B" [LINK]. Committee Action Recommendations. Page 7 [21].
[20]

Location	Farmed	Fallow	Total
Patterson Creek	29	8	**37**

South APD	208	33	**241**
Total	**237**	**41**	**278**

[21] Targeted Expansion of the APD to increase farmable acreage reserve: 1) To add farmable acreage to replace already lost (permanently unfarmable) acreage in the APD. 2) To further expand the APD's farmable acreage as a risk management strategy so that farms have the land base to manage the many pressures (floods, climate change, population growth and development, fish and wildlife) they face and ensure a viable farming sector for years to come.

[22] Disclosure: About the Map Overlay and about proposed buffers and constraints

- While blue lines denote Buffer Task Force recommended maximum buffer width along all waterways in the SVAPD, not all properties are available for the proposed buffer widths either due to constraints in ownership, easements on deed, roads, and right of ways, etc.

APPENDIX A

Principles of the Plan

Principles of the Plan

1. The Ag Strategic Plan provides data and analysis, contains specific proposals for projects, funding strategies, and a timeline for implementation that includes adequate time for equitable negotiation and problem-solving in current and future multi-objective planning processes.
2. It complements other related efforts, such as King County's Local Food Initiative which is an economic development and marketing plan for food and agriculture in the region, as well as Snohomish Conservation District's Ag Resiliency Plan which features climate change planning.
3. The strategic plan for Snoqualmie Valley agriculture will represent the agricultural needs in future Fish Farm Flood (FFF)-related decision-making, similar to how the Salmon Recovery Plans and the Flood Plan represent the needs for salmon recovery and flood risk reduction, respectively.
4. The strategic plan will present a timeline for implementation in relation to #2 and #3 above.
5. The Ag Strategic Plan will serve a generation of agricultural production (25 years), with reviews every 5 years to address progress.
6. Soil health is essential to productivity.
7. Recommendations for acreage targets (net acreage over period of time) will be created through a systematic approach.
8. This plan supports all crops/livestock and utilizes the King County Code definition of agriculture in relation to productivity.
9. While informed by science, policy and economic models, much of the systematic process requires best professional judgement.

APPENDIX B

Sub-goals of the Plan

Sub-Goals of the Plan

Goal #1 Improved Farmland Productivity

1. All farmable acreage in the SVAPD is routinely improved through **drainage** so that the land can be productively farmed for the full length of the growing season.

2. **Transportation** infrastructure including revetments, roads and bridges is fully functioning to support the movement of agricultural products while managing traffic to increase safety for all and prioritize routine operation of farms every day.

3. Every commercial farm has sufficient access to water for **irrigation** and uses best management practices and technology to manage water usage. Farms keep existing water rights, continue water transfers through SVWID, and increase access to water transfers.

4. Every commercial farm has sufficient access (close proximity and enough space) to high ground for equipment, storage, and livestock, and every farm home below the base flood elevation is elevated to ensure **flood safety** and continued productivity on the farm. Farm homes in the APD that are safer from floods are saved so that families can live on the property or close to the property they farm while education about known patterns of flooding, climate change predictions, farm preparation and flood monitoring occurs in order to support **flood safety**.

5. Commercial farms maintain and increase agricultural productivity through adaptively managing changing plant pathogens, crop varieties, animal diseases, precipitation changes affecting water flows and irrigation needs through **climate change** research and education relevant to Western Washington and the Snoqualmie Valley APD.

Goal #2: Increased Farmland Protections

6. The APD is increasingly protected from **Population Growth and Development impacts,** through increased enforcement of unpermitted zoning uses that negatively affect productive farmland and traffic studies to limit interference with commercial farm activities. In addition, run-off from any new development is strenuously reviewed to prevent any negative impacts to the productive farmland in the floodplain or flood safety.
7. Protections for commercial farmland and crops in the APD allows for adaptive management of **wildlife** impacts using a variety of tools including policy, partnerships with Tribes and hunters, new research, and educational resources for BMPs, on-call service providers, cost-share programs, and enrollment in crop insurance to recover from wildlife damage.

8. All farm properties in the APD are protected through King County **Farmland Preservation** Program easements to ensure farmability in perpetuity, testing new tools such as required farming of FPP properties to additionally limit land value escalation over time in order to improve the barrier to purchasing access to productive farmland.

9. SVAPD farmland is protected at the minimum of a **proposed 7,696 (7,700) farmable acres for a long-term, viable agriculture sector**.

APPENDIX C

Objectives Table

Goal 1: Improved Farmland Productivity Objectives			
	Sub-goals (desired condition)		**Objective (how it will be measured)**
1	Drainage	All farmable acreage in the SVAPD is routinely improved through **drainage** so that the land can be productively farmed for the full length of the growing season.	Acreage put back into production after drainage maintenance: • ADAP eligible waterways, linear feet • Multi-benefit waterways • Culverts • Flood Control Gates and Pumps • Tiles
2	Transportation	**Transportation** infrastructure including revetments, roads and bridges is fully functioning to support the movement of agricultural products while managing traffic to increase safety for all and prioritize routine operation of farms every day.	No net loss of operational and load bearing capacity of bridges in APD and adjacent transportation corridors: • DLS Roads Report on bridges and roads • DNRP Rivers report on revetments to protect APD roads and bridges • Increase of APD signage and tractor safety signage
3	Irrigation	Every commercial farm has sufficient access to water for **irrigation** and uses best management practices and technology to minimize water usage. Farms keep existing water rights, continue water transfers through SVWID, and increase access to water transfers.	Measure combination of water access, education and technology adopted for water saving: • SVWID's water bank meets 100% of farmer demand • Increased water usage technology education and participation by valley farmers • Increased irrigation technology adoption on farms through cost-share programs (NRCS, KCD, SVWID, KC) including fish screens by technology adopted

4	Flood Safety	Every commercial farm has sufficient **access** (close proximity and enough space) **to high ground** for equipment, storage, and livestock, and **every farm home** below the base flood elevation **is elevated** to ensure **flood safety** and continued productivity on the farm. Farm homes in the APD that are safer from floods are saved so that families can live on the property or close to the property they farm while education about known patterns of flooding, climate change predictions, farm preparation and flood monitoring occurs in order to support **flood safety**.	Measure combination of increased high ground access and home elevations:
			• Increased high ground access including farm pads for commercial farm storage to areas currently without sufficient access
			• Increased home elevations through
			  ○ Outreach
			  ○ Contractor list
			  ○ Public/Private partnership
			  ○ Outside funding sources for participants

5	Climate Change	Commercial farms maintain and increase agricultural productivity through adaptively managing changing plant pathogens, crop varieties, animal diseases, precipitation changes affecting water flows and irrigation needs through **climate change** research and education relevant to Western Washington and the Snoqualmie Valley APD.	Measure research, education and practices adopted for climate change impacts on farm productivity: • Increased climate change research specific to SVAPD/Western WA • Increased climate change education and participation by valley farmers • Increased climate change strategies and practices implemented on farms
Goal 2: Increased Farmland Protections			
6	Population Growth, Development	The Agricultural Production District is increasingly protected from **Population Growth and Development impacts,** through increased enforcement of unpermitted zoning uses that negatively affect productive farmland, traffic studies	Measures show how increased protection is in place as the population grows. Items to include in this measurement are: • US Census • DLS Permitting Division Enforcement cases reported

		to limit interference with commercial farm activities, and stormwater run-off from any new development should be strenuously reviewed to prevent any negative impacts to the productive farmland.	• DLS Permitting Enforcement cases resolved • DLS Roads and WSDOT Traffic Studies • DLS Permitting Building Permits/Stormwater compliance
7	Wildlife	Protections for commercial farmland and crops in the APD allow for adaptive management of **wildlife** impacts using a variety of tools including policy, partnerships with Tribes and hunters, new research and educational resources for BMPs, on-call service providers, cost-share programs, and enrollment in crop insurance to recover from wildlife damage.	Measure research, education and practices adopted for adaptive management of wildlife impacts on farm productivity: • Increased (beaver), elk, and waterfowl research specific to SVAPD (similar to the DNRP Beaver Working Group [2018]) • Increased wildlife management education (WSU, WID, WDFW, DNRP, Tribes) • SVWID's beaver services utilization over time, including cost-share(?) • Increased crop insurance enrollment such as USDA RMA and FSA programs
8	Farmland Preservation	All farm properties in the APD are protected through King County **Farmland Preservation** Program easements to ensure farmability in perpetuity, testing new tools such as required farming of FPP properties to additionally limit land value escalation over time in order to improve the barrier to purchasing access to productive farmland.	Measure easements, education and new tools adopted for farmland preservation: • Increased # of FPP easements • Expanded education and outreach about KC FPP program easements • Impacts of additional tools that limit farmland value escalation

9	Proposed acreage needs for long-term, viable sector	SVAPD farmland is protected at the minimum of a **proposed 7,696 farmable acres for a long-term, viable agriculture sector.** Any farmable acres removed by other uses such as development, road expansions, other infrastructure, and salmon habitat needs are mitigated through infrastructure improvements and by expanding the APD to the south.	Using current acreage maps designed for this process, measure impacts to the overall acreage: • Monitor bi-annually via GIS, • With further review and recommendations every five years to ensure farmland acres are protected • Progress on expanding and preserving expanded APD acreage

APPENDIX D

Table Linking Issue Papers with Values and Themes

Table D: Issue Papers by Key Values and Themes	1. Responsible stewardship/ sustainable farming	2. Flood and climate change preparedness	3. Equity and social justice	4. Multi-benefit projects	5. Innovative thinking	6. Regulatory certainty	7. Resource investments	8. Alignment with related plans and programs
A1. Profile of the Commercial Agriculture Sector	x	x	x	x	x	x	x	x
1. Improved Farmland Productivity								
1.1 Drainage								
1.1.1 Drainage Maintenance for ADAP Eligible Waterways	x			x	x		x	x
1.1.2 Drain Tiles	x	x		x	x		x	x
1.1.3 Flap gates, Floodgates, and Pumps		x				x	x	x
1.1.4 Culverts	x			x		x	x	x
1.1.5 Drainage Maintenance for non-ADAP Waterways	x	x		x	x	x		x
1.1.6 Beavers	x	x		x		x	x	x
1.2 Flood Safety								
1.2.7 High Ground Refuge and Farm Pads		x	x		x	x	x	x
1.2.8 Home Preservation in the APD		x	x		x		x	x
1.3 Irrigation								
1.3.9 Water Rights and Irrigation	x	x	x	x	x	x	x	x
1.4 Transportation								
1.4.10 Revetments		x		x		x	x	x
1.4.11 Transportation Corridors and Bridges	x			x	x		x	
1.5 Climate Change								
1.5.12 Climate Change Predictions	x	x			x	x	x	x
1.5.13 Invasive Species	x							x
2. Increased Farmland Protections								
2.1 Population Growth and Development Impacts								
2.1.14 Population Pressure		x		x	x	x		x
2.2 Wildlife								
1.1.6 Beavers	x	x		x		x	x	x
2.2.15 Elk and Deer	x		x		x			x
2.3 Farmland Preservation								
2.3.16 Farmland Preservation	x			x			x	x
2.4 Proposed acreage for a long-term, viable sector								
2.4.17 Acreage Challenges, Needs and Recommendation	x	x	x	x	x	x	x	x

APPENDIX E

Table E: Issue Papers by Plans and Entities

Table E: Issue Papers by Organization/Agency Strategic Plans, Missions, Programs	King County Strategic Plans							Organization/Agency Strategic Plans, Missions, Programs												
	Comprehensive Plan & NEKC	Equity and Social Justice Strategic Plan	Farm, Fish, Flood 1.0	Flood Hazard Management Plan	Land Conservation Initiative	Local Food Initiative	Strategic Climate Action Plan	Beavers NW	King Conservation District	King County Agriculture Commission	Snohomish Conservation District's Agriculture Resiliency Plan	Snoqualmie Valley Preservation Alliance (SVPA)	Snoqualmie Valley Watershed Improvement District (SVWID) / Wetness Prioritization Plan	SnoValley Tilth	The Tulalip Tribes Beaver Project	USDA Natural Resources Conservation Service (NRCS)	WA State Department of Agriculture	WA State Department of Fish and Wildlife / North Rainier Elk Herd Plan	WA State Farm Bureau	WSU Food System Program and CSANR
A1. Profile of the Commercial Agriculture Sector		x	x			x				x			x	x		x				x
1. Improved Farmland Productivity																				
1.1 Drainage																				
1.1.1 Drainage Maintenance for ADAP Eligible Waterways			x			x			x	x			x					x		
1.1.2 Drain Tiles			x						x	x			x			x		x		
1.1.3 Flap gates, Floodgates, and Pumps			x							x			x							
1.1.4 Culverts			x						x	x			x					x		
1.1.5 Drainage Maintenance for non-ADAP Waterways									x	x			x							
1.1.6 Beavers			x					x		x			x		x			x		
1.2 Flood Safety																				
1.2.7 High Ground Refuge and Farm Pads			x	x					x	x		x	x	x						
1.2.8 Home Preservation in the APD		x	x	x			x			x		x		x					x	
1.3 Irrigation																				
1.3.9 Water Rights and Irrigation		x							x	x		x	x	x		x	x			x
1.4 Transportation																				
1.4.10 Revetments			x							x										
1.4.11 Transportation Corridors and Bridges										x		x	x							
1.5 Climate Change																				
1.5.12 Climate Change Predictions	x						x			x	x	x	x			x				x
1.5.13 Invasive Species										x	x						x			x
2. Increased Farmland Protections																				
2.1 Population Growth and Development Impacts																				
2.1.14 Population Pressure	x									x		x		x				x		
2.2 Wildlife																				
1.1.6 Beavers			x					x		x			x		x					
2.2.15 Elk and Deer								x	x	x						x	x	x		x
2.3 Farmland Preservation																				
2.3.16 Farmland Preservation	x	x			x	x				x		x		x		x				
2.4 Proposed acreage for a long-term, viable sector																				
2.4.17 Acreage Challenges, Needs and Recommendation	x	x	x		x	x		x	x	x		x	x							

APPENDIX F

Table F: Strategies by Values and Themes

Table F: Strategies by Key Values and Themes

Strategy #	Strategy is located in the following issue paper(s) by number	Individual Strategies grouped in 5 categories: Farmland **Infrastructure and Productivity:** strategies for specific improvements to the land resource for agriculture **Education, Outreach, Technical and Financial Assistance (cost-share):** strategies for any of these components **Water Storage:** strategies to manage flood waters for increased summer flows for fish and crop irrigation **Policy:** strategies to change policy or code **Planning, Studies and Collaboration:** strategies for planning, studies and partnerships to accomplish goals	1. Responsible stewardship/ sustainable farming	2. Flood and climate change preparedness	3. Equity and social justice	4. Multi-benefit projects	5. Innovative thinking	6. Regulatory certainty	7. Resource investments	8. Alignment with related plans and programs
		Farmland Infrastructure and Productivity								
1	1.1.1	Complete initial maintenance and establish recurring maintenance intervals on remaining 73 miles of unmaintained waterways within 10 years, which is a 3- to 4-fold increase over recent rates of maintenance.	x							
2	1.1.1	Secure stable funding of approximately $2 million per year from King County and project partners to achieve increased rate of maintenance.	x						x	
5	1.1.1	Conduct maintenance through SVWID's priority basin or emergency needs rather than first come, first serve basis.			x					x
6	1.1.1	While undergoing maintenance, waterways are assessed and scheduled for follow-up maintenance; not all waterways need to be maintained at the same frequency.	x							
7	1.1.1	Expand ADAP's fish and water quality capacity to match increased pace and timeline.				x			x	
8	1.1.1	Add alternative mitigation strategies for required plantings to ADAP agreement.					x			
10	1.1.2	Secure long-term funding for service providers to purchase equipment for drainage tile installation.							x	x
11	1.1.3	Use sub-basin hydrological analysis to identify key points and strategic locations for gate repair and pump installation.					x			

Strategy #	Strategy is located in the following issue paper(s) by number	Individual Strategies grouped in 5 categories: Farmland **Infrastructure and Productivity:** strategies for specific improvements to the land resource for agriculture **Education, Outreach, Technical and Financial Assistance (cost-share):** strategies for any of these components **Water Storage:** strategies to manage flood waters for increased summer flows for fish and crop irrigation **Policy:** strategies to change policy or code **Planning, Studies and Collaboration:** strategies for planning, studies and partnerships to accomplish goals	1. Responsible stewardship/ sustainable farming	2. Flood and climate change preparedness	3. Equity and social justice	4. Multi-benefit projects	5. Innovative thinking	6. Regulatory certainty	7. Resource investments	8. Alignment with related plans and programs
12	1.1.3	Secure long-term funding for installation, replacement, and repair projects as needed throughout the Snoqualmie APD.	x						x	
13	1.1.4	Identify or create long-term culvert replacement funding source for improving water quality and hydraulic processes, decoupled from fish passage, riparian buffer width, large woody debris placement, or multiple landowner involvement.							x	x
14	1.1.4	Prioritize replacement of culverts that are identified as important fish barriers and are also needed to improve farm drainage systems.				x				
15	1.1.4	Pursue additional funding mechanisms that allow for multiple culvert projects with a single funding source.					x		x	
16	1.1.4	Explore options for pre-approval of standard culverts and bridge designs.					x	x		
17	1.1.4	Prioritize culvert replacement within the ADAP program.				x				
18	1.1.5	Assess waterways for drainage maintenance/flood impacts to APD and conduct maintenance where required.		x						
19	1.1.6	Manage beaver dams and beaver populations on agricultural lands to increase farmland productivity.	x				x			
20	1.1.6	Leverage ADAP to provide maximum allowable range of drainage services (year-round) for beaver management, including dredging after beaver dam removal to solve sediment build up in emergencies.	x				x	x		
21	1.1.6	For buffer plantings, limit willows and tree species that beavers love to eat in favor of conifers and other species they don't like to eat.	x				x			

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22	1.2.7	List public and private agricultural high ground refuge locations available to farmers.		x			x			
23	1.2.8	Increase funding to increase pace of home elevations to 4-10/year so that 100 more homes are protected in the next 25 years.		x						
24	1.2.8	When a home is removed from the APD, invest in low-income/affordable, long-term farmer and farmworker housing within 5 miles of APD for farm housing because short-term rentals versus long-term ownership of housing limits long term investment in the land.		x	x		x			
25	1.2.8	For homes in the floodplain owned by King County, convert to rental homes through third party for farmers and farm employees for the public benefit of food security.		x	x					
26	1.2.8	Utilize strategic boundary line adjustments to preserve affordable homes for agriculture in SVAPD.			x		x			
27	1.2.8 2.3.16	Ensure Farmland Preservation Program offers protections that preserve affordable homes.	x		x					
28	2.3.16	Engage with remaining property owners in SVAPD and SVAPD expansion areas to purchase FPP/TDR Deeds.	x						x	
29	2.3.16	Monitor and maintain existing Deed protections in regard to farming and agriculture activities (i.e., adaptive management, ADAP, permit assistance, etc.) to ensure compliance.	x						x	
30	2.3.16	Annual monitoring of Deeds.	x						x	
31	2.3.16	Overlay original FPP easement deed with additional easement/encumbrances to preserve farmland (the complete package).	x				x		x	

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32	2.3.16	Continue to utilize existing and pursue new financing for enhancement of Deeds.	x				x		x	
33	2.3.16	Add signage to properties that are FPP protected.	x				x		x	
34	2.3.16	Ensure FPP deeds continue to be primarily for protection of agriculture and farming purposes.	x						x	
35	2.3.16	Ensure FPP Present Conditions Report plans for and details high value salmonid habitat areas for potential voluntary restoration, which is referenced in the Deed.	x			x	x		x	
36	2.3.16	Advocate for a person with agricultural expertise on CFT committee award group.	x				x		x	
37	2.3.16	Use the impetus of the Local Food Initiative and the Land Conservation Initiative to maximize the needs and preserve more farmland in SVAPD.	x						x	x
38	2.3.16	Improve infrastructure for food storage, food processing and marketing [specifically for dairy, vegetables, fruit, and flowers]. (LFI Strategy 2.3)	x						x	x
39	2.4.17	Increase the productivity of 8,668 farmable acres through infrastructure improvements and protections as captured in strategies and timelines within Issue Papers 1-17 in the Plan.	x				x		x	
40	2.4.17	Expand the APD to the Southwest by 278 farmable acres to preserve additional farmable land and valuable habitat.	x	x		x	x		x	
41	2.4.17	Gain Regulatory Relief to permit more agricultural infrastructure improvements on farmable land while quickening the pace and lowering the cost.					x	x		

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42	2.4.17	Ensure predominant use of agriculture in the SVAPD by protecting at least 7,696 farmable acres to be permanently preserved within the next 25 years to and long-term, commercial agriculture viability in the SVAPD.	x						x	
43	2.4.17	Target eligible 3,789 farmable acres currently unprotected by FPP with King County's Farmland Preservation Program deed.	x				x		x	
		Education, Outreach, Technical and Financial Assistance (cost-share)								
44	1.1.1	Reduce cost to landowners through creating or increasing cost-share programs to further help with farmer/landowner, planting, and fencing costs.			x				x	
45	1.1.2	Provide education and outreach to farmers on multi-benefit approaches to managing water flow through water control structures including retaining groundwater.	x	x			x			
46	1.1.6	Secure long-term funding to increase long-term beaver-related technical assistance, including educational workshops and cost-share options for landowners.	x						x	
47	1.1.6	Create guidance on regulations for farmer/landowners showing what can be done to manage beaver dams with and without permits.	x					x		
48	1.2.7	Maintain existing programs that support technical assistance and cost-share for flood safety.		x					x	x
49	1.2.7	Add Emergency Flood Plan for farms to all new Farm Conservation Plans and conduct Emergency Flood Plan workshops for farms that already have farm plans.	x	x			x			x
50	1.2.7	Increase climate change impacts education and mental health support for farmers and farm employees.		x	x		x			

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51	1.2.7	Create case studies of farm operations with and without farm pads and high ground in SVAPD to show time and costs of preparing for and recovering from flood impacts.		x			x			
52	1.2.7	Create a central reporting system for farm operation losses from floods that shows economic impacts per event and over time.	x	x	x		x			
53	1.2.7	Increase participation in crop and livestock insurance programs.	x	x						
54	1.2.7	For homeowners in the SVAPD floodplain, increase participation in FEMA's National Flood Insurance Program.	x	x		x				
55	1.2.8	Increase participation in home elevation program through outreach and partnerships.		x	x					
56	1.2.8	Increase funding for technical support staff to do outreach and education to landowners in APD about the home elevation program.		x	x		x			
57	1.2.8	Conduct outreach about creative financing and business ownership models for farm and home transition.			x		x			
58	1.2.8	Improve home elevation process for homeowners through increased cost-share, sliding scale option that offers payments up front or directly pays service providers, and list of service providers including architects and contractors.		x	x		x			
59	1.2.8	Further incentivize landowners in the SVAPD to do a home elevation by increasing the cost-share allowance to include reimbursement to landowners for hours logged in managing the project and contractors, as well as for required accessories such as on-site or off-site storage rentals, temporary housing, etc.		x	x		x			

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60	1.2.8	Support pilot projects to explore new land tenure models.					x			
61	1.2.8	Increase succession planning resources and funding to assist current landowners to transition their businesses to new farmers and keep homes occupied and livable.	x		x		x			
62	1.3.9	Conduct outreach to farms about USDA NRCS EQIP and other grants or cost-share funding for irrigation systems.	x						x	x
63	1.3.9	Trainings on Water Rights 101 for Ag Sector and SVAPD landowners (KCD, WSU, SVT, etc.)	x					x		x
64	1.3.9	Trainings regarding leasing, and land costs, uses, allowable uses and services, i.e., fish screens and metered water rights.	x			x		x		
65	1.3.9	Technical and financial assistance for continued funding for irrigation efficiencies (such as infrastructure, wells, fish screens) from King County Ag Water Quality Cost-Share Program, King Conservation District, etc.	x		x	x		x	x	
66	1.3.9	Workshops on water conservation and re-use on farms, capturing water run-off for recycling and filtering to increase multi-benefits through water quality improvements.	x			x		x		
67	1.3.9	Conduct education regarding irrigation sources under FDA's Food Safety Modernization Act which may dictate requirements such as testing for some kinds of water that may be used or how they are utilized and applied for crops eaten raw.	x					x		
68	1.3.9	Incentivize landowners to prove and preserve water rights in trust to preserve and for potential transfer.	x						x	
69	1.3.9	Water Meter/Fish screen cost-share campaign.	x			x			x	

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70	1.3.9	Create water usage reporting and info storage at SVPA annually to preserve water rights.	x				x	x		
71	1.4.10	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).	x	x		x			x	x
72	1.4.10	Stabilize banks with working buffers, USDA Conservation Reserve Enhancement Program (CREP), or flexible, multi-tiered incentivized riparian buffers to reduce erosion.	x			x				x
73	1.4.10	Conduct outreach to farmers and landowners to identify additional areas in need of revetments or buffer planting.	x	x		x				
74	1.4.10	When feasible, post monitoring reports of revetment work to be public facing.	x	x						
75	1.4.10	Reduce cost to landowners through creating or increasing cost-share programs to further help with farmer/landowner buffer planting, maintenance, and monitoring costs.	x		x	x			x	
76	1.5.12	Increase farm participation in federal disaster insurance programs (SCAP) and in federal crop insurance programs.	x	x						x
77	1.5.12	Increase farm participation in local, state, and federal programs where farms are paid for carbon capture/ecosystem services such as USDA NRCS Conservation Service Program (CSP) Climate-smart conservation activities including Soil Health , Nitrogen Management, Livestock Waste Management, and Grazing Land Management with minimum payments of $1,500 annually for compost use, cover cropping, etc.	x	x						x
78	1.5.12	Increase climate change impacts education workshops and mental health support for farmers and farm employees.	x	x	x					

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79	1.5.12	Develop and support programs that reward and pay farmers for climate smart practices and ecosystem services.	x	x						
80	1.5.12	Increase financial support to help farmers implement environmentally sound practices that may require service providers to conduct costly studies/analyses of the property in order to meet FEMA and Surface Water Design Manual Requirements (i.e. engineers to conduct a drainage review).	x						x	
81	1.5.13	Conduct outreach, training, and education on proactive techniques to reduce impacts from pest, disease and pathogens moving into this region.		x						
82	1.5.13	Increase soil health education, cost-share, and incentive programs in order to combat pest and pathogens.	x	x					x	
83	1.5.13	Provide tools and technical assistance for farmers to develop Integrated Pest Management plans, partnering with WSU Extension and others.	x	x						
84	1.5.13	Encourage farmer to farmer meetings to discuss what they are seeing on farm, pest management strategies, etc.	x	x						
85	1.5.13	Increase SVAPD farmer enrollment with USDA FSA so farmers are eligible for invasive species disaster relief from the federal government.	x	x						
86	2.2.14	Develop agritourism resources, outreach, and education that:	x				x			
87	2.2.14	Direct tourism to focused farm locations and away from farm areas that are not open to the public.	x				x			

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88	2.2.14	Help interested farmers capitalize on increased local visitation.	x				x			
89	2.2.14	Portion of SVAPD SWM fee allocated to ag projects in the APD, including contracted to ag orgs for outreach and education.		x			x			
90	2.2.14	Payments and/or cost-share for							x	
91	2.2.14	Pollutant clean-up including heavy metals, toxic materials such as fuels, herbicides, fecal coliform, sewage overflow, noxious weeds, etc.	x	x					x	
92	2.2.14	Lost farm production days due to increased development (traffic, flooding from upland runoff will increase flooding severity, etc.).	x				x		x	
93	2.2.14	Ecosystem services for flood water capture and flow, filtration.	x	x			x		x	
94	2.2.14	Flood debris removal and local garbage and recycling service in the form of dumpsters; woodchippers.	x	x			x		x	
95	2.2.14	Ecosystem service credit to farmers, grants, etc. from SWM fee.		x			x			
96	2.2.14	Solicitation for public donations to ag orgs in SVAPD.					x		x	
97	2.2.15	Expand access to federal, state and local, including KCD, cost-share for non-lethal deer and elk exclusion options.	x				x			

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98	2.3.16	Support farm employees with education and training to become farm managers. (LFI Strategy 1.3)	x		x		x			x
99	2.3.16	Increase program capacity of FPP for monitoring, new easement creation, funding, and outreach.	x						x	
100	2.3.16	Increase outreach and education about FPP opportunities, to farmers and landowners.	x							
101	2.3.16	Conduct outreach about creative financing and business ownership models for farm and home transition.			x		x			
102	2.3.16	Create "community foundation" fund to apply to offset farming costs and respond with emergency funding grants to farm businesses in SVAPD.					x		x	
103	2.3.16	Increase succession planning resources and funding to assist current landowners to transition their businesses to new farmers and keep homes occupied and livable.	x		x		x			
104	2.3.16	Incentivize and educate about best management practices and agro-ecological production principles that will help preserve farmland.	x				x			
		Water Storage								
105	1.2.7 1.5.12	Pilot water storage and sediment removal in lakes to increase floodplain comprehensive storage for farm pads, clarify King County and FEMA regulations and examine flexibility in regulations, modify regulations as needed.		x				x		
106	1.3.9	Pilot alternative, large-scale water storage, technology, and innovation.				x		x		x

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107	1.3.9	Pilot water storage, share with stakeholders, Ecology, and gain political support needed.				x		x		x
108	1.3.9	Pilot storing flood waters to offset surface water diversion.		x		x				x
109	1.3.9	Advocate and gain political support with FEMA, Tribes, WA Dept of Ecology, WA Fish and Wildlife, WSDA, KC WLRD, KC Council Members, King Conservation District, WA Conservation Commission, and others to accomplish multi-benefit water storage as related to climate change and irrigation needs		x		x				x
110	1.3.9	Fund water storage partnership.				x			x	x
111	1.3.9	Identify key decision-makers and policies in agencies and Tribes and existing limitations for those partnerships.				x				x
112	1.3.9	Start the due diligence to fund water storage studies, analyses, and test strategies that gain ground.				x	x		x	x
113	1.3.9	Advocate for water storage in King County plans.				x		x		x
114	1.3.9	Expand water bank and add interruptible water rights and water storage.		x			x	x		x
115	1.3.9	Streamline permitting through Ecology for water rights and water storage.		x			x	x		x

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116	1.3.9	Pilot testing water rights for temporary permits such as on FPP property, closed stream, etc.		x			x			x
117	1.3.9	Develop and utilize an agreement outlining a mitigation program such as the Dungeness Water Exchange, a partnership between the Dungeness River Agricultural Water Users Association, Washington Water Trust, and Washington State Department of Ecology.		x			x	x		x
118	1.3.9 1.5.12	Pilot manure lagoon conversion to water storage for irrigation.						x		x
119	1.5.12 2.2.14	Pilot water storage in the uplands, to increase flows in summer for irrigation and fish and to decrease flood impacts.		x		x				x
		Policy								
120	1.1.5	Complete pilot studies to identify regulatory barriers, clarify permitting requirements and identify opportunities for code revisions.					x	x		
121	1.1.6	Ensure King County regulations continue to match the State regulations for fur-bearing trapping seasons and rules.						x		
122	1.2.7	Establish King County policy that includes agriculture as a high priority for any new compensatory storage opportunities from near-term slate of planned large capital projects.		x			x	x		
123	1.2.7	Study the impacts of zero-rise policy on other agricultural infrastructure such as roads, pack houses, and composting.		x				x		
124	1.2.7	King County adopts Agricultural Land Resource Strategic Plan Task Force's prioritization criteria for future farm pads (see Figure 5) so that they are equitably distributed to commercial farms with the greatest need.		x	x		x			

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125	1.2.7	King County records farm pads on title to preserve and protect farm pads as critical agriculture infrastructure including the language "farm pad shall be for agricultural use".	x	x			x	x		
126	1.2.7	King County implements all recommendations for King County Use of Gauge Data for Flood Warning including adding more gauges to the Lower Snoqualmie Valley.		x			x			
127	1.2.7	King County Emergency Management activates animal flood refuge operations at Monroe Fairgrounds and Enumclaw Expo Center when floods are forecast.		x						
128	1.2.7	Ensure King County's Emergency Flood Hazard Management Plan includes these strategies.		x						x
129	1.2.7	Encourage commitments from FCD to these strategies.		x					x	
130	1.2.8	In code, require the primary use of APD properties to be farming before secondary use of recreation, such as hunting/duck clubs.						x		
131	1.2.8	Restore the Barn Elevation Pilot Project and utilize home elevation strategies to structure a permanent agricultural building elevation program.		x						
132	1.2.8	Flood Home Buyout Program purchases shall not be made within an APD without King County DNRP WLRD acquisition decision memo process (in place since 2019).		x						
133	1.2.8	King County adopts policies to preserve homes in SVAPD from competitive uses.		x						
134	1.2.8	King County Departments and Divisions must protect farming by participating in the DNRP WLRD land acquisition decision memo process for approval prior to purchase of a home or property with a home in the APD.		x			x			

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135	1.3.9	King County records water rights in APDs on title to preserve and protect water rights as critical agriculture infrastructure.	x				x	x		
136	1.3.9	For land sales with water rights, King County sends notification to new owners and the WID upon sale, so that water rights are maintained through the land transition.	x				x			
137	1.4.10	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.		x			x	x		
138	1.4.10	In the Flood Hazard Management Plan, protect the farm sector by prioritizing maintenance projects that will protect agriculture or have an agriculture benefit.		x				x		x
139	1.4.10	In the Flood Hazard Management Plan, within agricultural land protections, prioritize Farmland Preservation Program properties, farmable agriculture lands, and food production.	x	x			x	x		x
140	1.4.10	Allow “agricultural bank stabilization and berms” as a permitted activity, rather than having to qualify as a “habitat berm”.		x				x		
141	1.4.10	On agricultural farmable properties, add private revetments to property title as critical agriculture infrastructure.	x				x	x		
142	1.5.12	Put King County emergency systems in place such as emergency building permits, emergency water deliveries, emergency local garbage collection sites, emergency activation of Monroe Fairgrounds and Enumclaw Expo for animal holding, etc. to accommodate farming so that food production continues in the midst of changing weather norms, extreme weather events, and ultimately climate change.		x					x	
143	2.2.14	Create policy to further protect farming activities in the APD by requiring real estate sales in or within 1,000 feet of the APD to have:					x	x		

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144	2.2.14	"Notification to prospective buyers (in the purchase and sales agreement) that they are considering purchasing property in close proximity to farms and may experience farm-related" sounds, smells, and activities, including traffic.					x	x		
145	2.2.14	Information about APD zoning, floodplain permitting and restrictions, including water and wells.				x	x	x	x	
146	2.2.14	Farmland Preservation Property easement encumbrances.					x	x	x	
147	2.2.14	Current Use Taxation and Public Benefits Rating System agricultural programs.					x	x	x	
148	2.2.14	Require a notice to be e/mailed at least every three years to all residences in or within 1,000 feet of the APD to describe the protections in the zone and how residents can support agricultural uses in the zone to protect food production resources (i.e., drive slower, wait for farm vehicles and customers at turn outs, etc.).					x	x	x	
149	2.2.14	Protect farming activities in King County permitting and planning efforts.						x		
150	2.2.14	Evaluate programs, activities, and event permits in local planning efforts with consideration of critical agricultural production times to limit the impacts of over-visitation.	x					x		
151	2.2.14	Create strategies to address over-visitation and over-tourism in general planning for the area (NEKC plan).	x					x		x
152	2.2.15	Amend King County Code to allow construction of seasonal and/or wildlife fences without obtaining building permit.	x					x		

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153	2.3.16	Add farmland preservation 100% easement to CFT funding allowances.					x		x	
154	2.3.16	FPP properties are first in line for all agricultural maintenance and infrastructure improvement programs so that the land can be in food production. (LFI Strategy 1.2, 1.4)	x				x		x	x
155	2.3.16	Invest in infrastructure (including permitting technical assistance and cost-share) to keep open space properties and FPP properties in farming, being farmed.	x				x		x	
		Planning, Studies and Collaboration								
156	1.1.1	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) to increase capacity for ADAP waterway maintenance in tandem with fish habitat and flood improvement projects.				x			x	
157	1.1.2	Secure multi-benefit partnerships and long-term funding to increase SVWID and partner program capacity, allowing for expanded drainage tile repair projects in the APD.				x				x
158	1.1.2	Explore options for King County water quality cost share funding for water control structures.			x		x		x	
159	1.1.2	Research, test, and implement innovative practices for improving subsurface drainage.				x	x			
160	1.1.2	Continue testing the capping of drain tiles as a BMP solution for dryland farming and as a method for keeping moisture in soils longer.	x	x			x			

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161	1.1.3	Clarify and streamline permitting process for installation, replacement, and repair to ensure regulatory certainty.					x	x		
162	1.1.4	Strengthen collaboration between SVWID, KC programs, KCD, and other partners and secure multi-benefit partnerships and long-term funding to increase capacity and efficiency and reduce costs for culvert replacement.				x				
163	1.1.4	Streamline permitting process to accelerate culvert project timelines.					x	x		
164	1.1.5	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 non-ADAP waterway maintenance in tandem with fish habitat and flood improvement projects.				x			x	
165	1.1.5	Monitor flows and further study waterways that may meet ADAP standards. If waterways meet ADAP standards, re-classify as ADAP eligible (update Waterway Classifications Map, ADAP eligible waterways Map, and non-ADAP eligible waterways Map).	x				x	x		
166	1.1.6	Secure long-term funding to support research and pilot projects that explore alternatives to trapping and removal, such as increasing depth and width of ag waterways, pond levelers, water notch exclusion fencing, crop and planting modifications, new ideas and technology, and population studies over time.					x		x	
167	1.1.6	Streamline the King County permitting process within APDs for beaver dam removal so that clearing and grading permit for critical areas is not required and only WDFW HPA is needed.					x	x		x
168	1.1.6	Streamline the existing King County clearing and grading permit process for critical areas by developing guidance that scales the County clearing and grading permitting requirements for non-ADAP-eligible waterways based on potential critical areas impacts from beaver dam management. (Note: No new permits are required for this process.)					x	x		

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169	1.2.7	Conduct and analyze 2D modeling for better understanding of compensatory storage for FEMA requirements to determine capacity for additional farm pads in SVAPD or any properties added to SVAPD including:		x			x	x		
170	1.2.7	Design flood event modeling for historical and future conditions		x						
171	1.2.7	Evaluation of current and future road flooding		x						
172	1.2.7	Cumulative infrastructure analysis		x						
173	1.2.7	Study 139 farm operations for high ground need.		x						
174	1.2.7	Commission third party study to evaluate the zero-rise standard and County's FEMA CRS flood insurance rating impact on agriculture in SVAPD, including:		x				x		
175	1.2.7	Analyze economic impacts and recommend financial trade-offs for preserving agricultural resource lands, and the farm business sector in comparison with rate reductions for residents.		x	x		x	x		
176	1.2.7	Analyze ways to maintain safety while limiting financial impacts to agricultural sector, agricultural resource lands and flood insurance rates.		x	x	x	x			
177	1.2.7	Recommendations on how the zero-rise standard or County's CRS rating could be modified to support new farm pads.		x			x	x		
178	1.2.7	Support, fund, and expand Floodzilla flood monitoring system to pilot and test for most needed locations for future farm pads based on how quickly waters rise to flood level.		x			x			x

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179	1.2.7	Ensure future farm pad potential is determined, prioritized when compensatory storage is available, and equitably distributed.		x	x					
180	1.2.7	Secure shared high ground refuge for farms in the SVAPD to secure long-term safety and productivity of commercial farming operations.		x			x			
181	1.2.7	Based on known high ground, further evaluate farmer/landowner need for high ground and willingness to share access to high ground in certain areas.		x			x			
182	1.2.7	Facilitate farmers to work together, sharing existing farm pads and high ground as legally feasible.		x			x			
183	1.2.7	Explore the use of public sites such as nearby Snoqualmie Valley Trail, the County's Duvall Park for emergency storage, and Snohomish and King Fairgrounds for animal refuge (through Emergency Management) and if feasible, allocate funding to make sites operational and secure.		x			x			
184	1.2.7	Develop five to ten-year schedule of regular renewal agreements and/or needed improvements of high ground refuge for farmers.		x			x			
185	1.2.7	Continue King County's monitoring of sediment deposition in the Snoqualmie River in reaches near Carnation and Fall City to inform potential future flood risk reduction actions.		x		x				
186	1.2.7	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.		x		x				
187	1.2.7	Protect the farming sector in the APD, by putting more emphasis on evaluating comprehensive storage, maintaining through scheduled modeling, and active enforcement on any encroachments that lessen the ability to have more farm pads.		x				x		

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188	1.2.7	Examine feasibility for shared "flood safe" crop/cold storage for farm products.		x			x			
189	1.2.8	Strategically capture and share surveying monuments and benchmarks to support efforts regarding road flooding, home and barn elevations and Floodzilla monitoring system.		x			x		x	
190	1.2.8	Work cooperatively with Land Trusts, King County and NGOs to find long-term solutions such as multi-generational leases for farmland and homes in the APD.	x		x		x			
191	1.2.8	Study home removal from floodplain and the impact (potential increase) on comprehensive storage. If capacity is gained, allot only to farm pad program.		x			x			
192	1.2.8	Research, test and trial additional public/private partnerships, including tax incentives or rebates to homeowners to offer homes for rent to farm employers and farm employees.			x		x			
193	1.2.8	Examine home elevation infrastructure vulnerability, especially from increased flooding (SCAP).		x						x
194	1.2.8	Conduct needs assessment for home elevations; survey all homes in the APD for eligibility, including flooding tributaries, and include external agriculture input in the process.		x						
195	1.2.8	From home elevation needs assessment, utilize 2D modeling overlay, including climate change models, to help create priority implementation for home elevations and/or re-elevations.		x						
196	1.2.8	Survey SVAPD farm operations every 3-5 years to evaluate the challenges and cost of housing.			x					
197	1.3.9	Support collaboration between SVWID and King County WLRD regarding water and irrigation goals and solutions.		x						

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198	1.3.9	Support SVWID to ensure SVAPD landowners' (public and private) water rights are maintained.	x	x						
199	1.3.9	Support SVWID to continue water transfers and serve additional farms, including beginning and historically underserved farmers.		x	x					
200	1.3.9	Support SVWID to secure multi-benefit project partnerships to achieve irrigation goals and long-term funding.				x			x	
201	1.4.10	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) to increase capacity for revetment maintenance in tandem with fish habitat and flood improvement projects.		x		x	x			
202	1.4.10	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.	x	x		x				
203	1.4.10	Conduct and Complete Channel Migration Zone study and map; Utilize Channel Migration Zone study to identify banks at risk of erosion.		x					x	x
204	1.4.10	Coordinate with RFMS to elevate priority of vulnerable revetments in the APD for maintenance and repair.		x					x	
205	1.4.10	Revetments on private land have process guidance, clear permitting, and funding support to accomplish projects.		x				x		
206	1.4.10	Conduct cost/benefit analysis of bank stabilization techniques (FFF 1.0).		x					x	x

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207	1.4.10	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.	x	x					x	
208	1.4.10	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.	x	x		x			x	
209	1.4.10	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.	x					x		
210	1.4.11	Prioritize capital and maintenance improvements to roads and bridges along agricultural corridors and manage traffic to increase safety for all and allow routine operation of farms. Periodically review transportation corridors in relation to agricultural needs.							x	
211	1.4.11	Include and seek to solve increased traffic and visitation impacts that affect agriculture in local transportation plans, such as adding bike lanes on rural routes, permits for bike events, responding to parking on the side of roads with law enforcement, particularly illegal parking around float and jet ski areas, the SnoValley trail, and by bird watchers and photographers.				x	x		x	
212	1.4.11	Post new standard signage to delineate the APD at every street, trail and river entrance to the APD, traffic safety signage for tractors/farm vehicles at entrances to APD and throughout the APD (see Images 1-3 below).	x				x		x	
213	1.4.11	Increase farm/tractor safety signage on APD entrances and roads, including bicycle warnings to stay to the right side of the road at all times, and maintain speed limits. Consider striping roads with bike lanes to increase safety.	x				x		x	
214	1.4.11	Evaluate the King County Capital Improvement Program (CIP) to recommend projects that may provide strategic transportation relief, such as added bike lanes or trail enhancements to keep cyclists safe from passing farm machinery; on Hwy 203 prohibit bicycles, add passing lanes for slow traffic such as tractors, and wildlife viewing turnouts.	x						x	
215	1.4.11	Manage traffic along 203 and in the APDs regarding tourism and recreation events, including parking, that interfere with farm vehicles. Consider re-routing bicycle races and other events in busiest times of the farm season.	x						x	

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216	1.4.11	Setup roadworks digital signage to encourage safer driving and highlight farm season, wildlife, etc.	x				x		x	
217	1.4.11	Study and capture pollutants from road run-off before reaching agricultural fields and waterways.	x				x		x	
218	1.4.11	Increase roadside maintenance in SVAPD for mowing to keep spread of weeds down, and vegetation back from guardrails and bike lanes to prevent accidents.	x				x		x	
219	1.4.11	Increase tree maintenance over key SVAPD roadways to ensure commerce is not impacted.	x						x	
220	1.4.11	Pursue FCD revenue and use SWM revenue systematically in APDs to prioritize and couple ditch and culvert maintenance/replacement to increase fish passage and keep waterways open for agricultural drainage.	x			x			x	
221	1.4.11	Pursue multi-benefit projects when re-surfacing roads in the SVAPD such as flood mitigation, elevating roadways that benefit agriculture.	x	x		x			x	
222	1.4.11	Strategically capture and share surveying monuments and benchmarks to support efforts regarding road flooding, home and barn elevations and Floodzilla monitoring system.		x			x			x
223	1.4.11	Better collaboration among recreational groups with the agriculture sector to minimize conflicts.	x				x			
224	1.5.12	Conduct a climate change impact assessment for agriculture in the Snoqualmie Valley APD (SCAP).		x						x
225	1.5.12	Prepare farm plans that stress regenerative agriculture and that incorporate emergency evacuations (SCAP).	x	x						x

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226	1.5.12	Examine infrastructure vulnerability, especially from increased flooding (SCAP).		x						x
227	1.5.12	Develop capital project recommendations based on the countywide irrigation water needs assessment (SCAP).		x						x
228	1.5.12	Assess carbon sequestration and climate change mitigation potential of agricultural land in the SVAPD.	x	x						
229	1.5.12	Support, fund, and expand Floodzilla flood monitoring system to ensure flood data collection and community-wide data remain accessible to all Floodzilla users and to ensure the community-based flood monitoring program is completely built-out, updated, and operational for the next 25 years.		x			x		x	x
230	1.5.12	Expand broadband service to the APD in order to aid reliance and usage of technology such as Floodzilla, and precision farming practices.	x	x					x	x
231	1.5.12	Develop funding plan and secure funding to research, design, test, trial, and implement new practices such as:	x	x			x		x	
232	1.5.12	Dry-farming techniques to evaluate their efficacy in local climates for drought-resistant crops.	x	x			x		x	
233	1.5.12	Seed bank resource; assess existing varietals and/or heirlooms for climate-change-resistant genes.		x			x		x	
234	1.5.12	Livestock resiliency through environmental, nutritional, and breeding interventions.	x	x			x		x	

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235	1.5.12	Heat-resistant crops; begin advance cultivation of new climate-resilient crop varieties (viticulture; hemp).	x	x			x		x	
236	1.5.12	Infrastructure for processing new crop alternatives.		x			x		x	
237	1.5.13	Support a population study/inventory of invasive species in SVAPD including pests, pathogens, and diseases.		x						
238	1.5.13	Support and participate in development of a direct response network to include the WA State Department of Agriculture, WA Invasive Species Council, USDA APHIS, WA university research and identification testing programs, King County WLRD, King County Emergency Management, and King County farmers to support a climate impacts strategy implementation such as:		x					x	x
239	1.5.13	Monitor pest, pathogens, and disease with expanded network of farmer participation.		x						
240	1.5.13	Establish and highlight network of plant pest and disease testing facilities.		x						
241	1.5.13	Mitigate impacts, conduct research to mitigate impacts.		x						
242	1.5.13	Liaise with universities, state department of agriculture, WA Invasive Species Council, and USDA APHIS on invasive species, pathogens, and diseases harmful to agriculture.		x						

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243	1.5.13	Support development of a Western Washington climate change and invasive species (pest, pathogen, and disease) strategy for agriculture. The strategy should utilize climate modelling and anticipated projected crop selection changes due to changing climate conditions, newly detected invasive species, as well as integrating existing tools for mitigation such as pheromones, sterile insects, pest-eating insect releases for pests and pursuing phenotyping to predict pest and disease-resistant traits and proactively breed		x						
244	2.2.14	Adopt management strategies for parking by adding or increasing parking prices at hiking, scenic, and visitor destinations and disperse visitation throughout the day.	x				x			
245	2.2.14	Provide resident-only parking, or reduced entry costs, for local attractions.	x				x			
246	2.2.14	Create timeslots for popular attractions, maybe with real-time monitoring.	x				x			
247	2.2.14	Increase signage about the APD, open farm activities and to improve traffic safety and flow (see Images 1-3 below).	x				x			
248	2.2.14	Increase succession planning resources and funding to assist current landowners to transition their businesses to new farmers and keep homes occupied and livable.	x				x		x	
249	2.2.14	Include agricultural permit updates, both submitted and approved, regularly to King County Agriculture Commission.						x		
250	2.2.14	Explore adding APD buffer overlay zones to protect boundaries of the APD.	x					x		
251	2.2.14	Evaluate and incorporate transportation, traffic, water availability, drainage, stormwater and other negative impacts on the APD from cities into County and local planning processes.					x	x	x	

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252	2.2.14	Include and seek to solve increased traffic and visitation impacts that affect agriculture in local transportation plans, such as adding bike lanes on rural routes, permits for bike events, responding to parking on the side of roads with law enforcement, particularly illegal parking around float and jet ski areas, the SnoValley trail, and by bird watchers and photographers.	x				x			
253	2.2.14	New standard signage to delineate the APD at every street, trail, and river entrance to the APD, traffic safety signage for tractors/farm vehicles at entrances to APD and throughout the APD.	x				x			
254	2.2.14	Evaluate the King County Capital Improvement Program (CIP) to recommend projects that may provide strategic transportation relief, such as added bike lanes or trail enhancements to keep cyclists safe from passing farm machinery; on Hwy 203 prohibit bicycles, add passing lanes for slow traffic such as tractors, and wildlife viewing turnouts.	x				x	x		
255	2.2.14	Setup roadworks digital signage to encourage safer driving and highlight farm season, wildlife, etc.	x				x			
256	2.2.14	Study and capture pollutants from road run-off before reaching agricultural fields and waterways.	x	x						
257	2.2.14	Designate “farm to market” roads and/or overlays for further protection of commercial farm activities from recreation and traffic.	x				x	x		
258	2.2.14	Continue to research, test, and implement stormwater flow solutions for the APD and surrounding area including possible new requirements for retrofitting existing developments.		x				x		
259	2.2.15	Conduct a more complete survey of farmers to better understand crop losses to deer and elk and effectiveness of employed exclusion practices.	x				x		x	
260	2.2.15	Expand availability of compensation for deer and elk damage and simplify process for qualification.	x				x			

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261	2.2.15	Pilot alternative fencing designs.	x				x			
262	2.2.15	Pilot growing specific crops in areas to pull elk and deer away from commercial farms.	x				x			
263	2.2.15	Increase access to depredation permits.					x			
264	2.2.15	Increase special hunts when populations exceed target or if depredation losses are extreme.					x			
265	2.2.15	Work with WDFW to find alternative hunting options on private land such as Michigan's Hunting Access Program.					x			x
266	2.2.15	Expand availability for deer and elk hunting clubs willing to pay farm landowners.					x			
267	2.2.15	Initiate at least two projects that focus on reducing elk vehicle collisions in high collision areas.					x			x
268	2.2.15	Complete at least two projects that enhance the public's ability to observe and appreciate elk in their natural habitat or increase public understanding of elk biology and their habitat requirements.					x			x
269	2.3.16	Research and create additional easements/encumbrances (purchase of additional Deed restrictions).	x						x	
270	2.3.16	Affirmative easements that encourage or require farming, such as require maintaining taxation enrollment or higher standard in FPP Deed.	x				x		x	

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271	2.3.16	Assist with lowering price of farmland and homes, such as OPAV.	x		x		x		x	
272	2.3.16	Protect land and farm infrastructure with a deed or easement, such as homes or farm pads.	x				x		x	
273	2.3.16	Convene farmland preservation partner organizations to understand and implement these strategies:	x				x		x	
274	2.3.16	Enhance King County's Working Farmland Partnership to create and promote innovative land bank and business models for new and beginning farmers. (LFI Strategy 1.4)	x		x		x			x
275	2.3.16	Increase tax incentive programs for commercial food production and include the taxation savings in the bill/mailer.	x				x		x	
276	2.3.16	Create long-term annual incentive/rebate to encourage succession and ag production.	x				x			
277	2.3.16	Create an essential business priority and rebate program for food production from fuel, utility and energy companies, or other sources.	x				x			
278	2.3.16	From real estate sales, create an extra contribution option to fund farmland succession/acquisition fund.	x				x			
279	2.3.16	Modeled on the "School impact fee", bill new building permits (excluding commercial farm operation building permits), for improvements needed by their development to King County owned agricultural open spaces and roads, i.e., road pull-outs in APD for slower vehicles/wildlife viewing areas, or drainage improvements for increased stormwater, or fencing to protect crops from wildlife pushed onto farms from population growth.					x		x	

Strategy #	Strategy is located in the following issue paper(s) by number	Individual Strategies grouped in 5 categories: Farmland **Infrastructure and Productivity:** strategies for specific improvements to the land resource for agriculture **Education, Outreach, Technical and Financial Assistance (cost-share):** strategies for any of these components **Water Storage:** strategies to manage flood waters for increased summer flows for fish and crop irrigation **Policy:** strategies to change policy or code **Planning, Studies and Collaboration:** strategies for planning, studies and partnerships to accomplish goals	1. Responsible stewardship/ sustainable farming	2. Flood and climate change preparedness	3. Equity and social justice	4. Multi-benefit projects	5. Innovative thinking	6. Regulatory certainty	7. Resource investments	8. Alignment with related plans and programs
280	2.3.16	Research, test, and trial additional public/private partnerships, including tax incentives or rebates to homeowners to offer homes for rent to farm employers and farm employees.			x		x			
281	2.4.17	Convene an Agricultural Strategic Plan Implementation Working Group made up of Plan service providers [or the Task Force make-up OR Both], to make and track progress on the Plan, coordinate grant opportunities, and assist in multi-benefit projects.	x			x	x		x	
282	2.4.17	Every three or five years, complete an inventory of farmland conversion and loss, including plantings, in the Snoqualmie Valley (FFF 1.0 Farm 4).	x			x	x	x	x	x
283	2.4.17	Every five years, review infrastructure improvement and protections through issue paper strategies and timelines, and issue progress report on achievements and challenges. Permanently protect a certain amount of land for farm use (FFF 1.0 Farm 4).	x				x		x	x

APPENDIX G

Table G: Sub-goals and Issue Papers by Priority Ranking of Importance

Table G: Sub-goals and Issue Papers by Priority Ranking of Importance	
Sub-goals and Issue Papers	Priority Ranking of Importance
A1. Profile of the Commercial Agriculture Sector	High
1. Improved Farmland Productivity	
1.1 Drainage	High
1.1.1 Drainage Maintenance for ADAP Eligible Waterways	High
1.1.2 Drain Tiles	Medium/High
1.1.3 Flap gates, Floodgates, and Pumps	Medium/High
1.1.4 Culverts	High
1.1.5 Drainage Maintenance for non-ADAP Waterways	Medium/High
1.1.6 Beavers	High
1.2 Flood Safety	High
1.2.7 High Ground Refuge and Farm Pads	High
1.2.8 Home Preservation in the APD	High
1.3 Irrigation	High
1.3.9 Water Rights and Irrigation	High
1.4 Transportation	Medium
1.4.10 Revetments	Medium
1.4.11 Transportation Corridors and Bridges	Medium
1.5 Climate Change	Medium
1.5.12 Climate Change Predictions	High
1.5.13 Invasive Species	Medium/Low
2. Increased Farmland Protections	
2.1 Population Growth and Development Impacts	Medium
2.1.14 Population Pressure	Medium
2.2 Wildlife	High
1.1.6 Beavers	High
2.2.15 Elk and Deer	High
2.3 Farmland Preservation	High
2.3.16 Farmland Preservation	High
2.4 Proposed acreage for a long-term, viable sector	High
2.4.17 Acreage Challenges, Needs and Recommendation	High

APPENDIX H

Common Acronyms

Common Acronyms	
ADAP	King County Agricultural Drainage Assistance Program
AF	Acre Feet
AFI	King County Agriculture, Forestry and Tax Incentives Program
APD	Agriculture Production District
APHIS	Animal and Plant Health Inspection Service
BMP	Best Management Practice
CFS	Cubic Feet per Second
CFT	King County Conservation Futures Tax
CIP	Capital Improvement Projects
CREP	Conservation Reserve Enhancement Program
CRS	FEMA Community Rating System
CSA	Community Supported Agriculture
CSANR	WSU Center for Sustaining Agriculture and Natural Resources
CSP	Conservation Service Program
CUT	Current Use Taxation
DLS	King County Department of Local Services
DNRP	Department of Natural Resources and Parks
DNRP	King County Department of Natural Resources and Parks
ECY	WA Dept of Ecology
EQIP	Environmental Quality Incentives Program
FbD	Floodplains by Design
FCD	King County Flood Control District
FDA	U.S. Food and Drug Administration
FEMA	Federal Emergency Management Agency
FFF	Fish Farm Flood
FFF2P	Family Forest Fish Passage Program
FPP	King County Farmland Preservation Program
FSA	Farm Service Agency
FSMA	Food Safety Modernization Act
GIS	Geographic Information System
GMU	Game Management Unit
GVW	Gross Vehicle Weight
HPA	Hydraulic Permit Approval
IDP	King County Integrated Drainage Program
KCD	King Conservation District
L&I	Labor and Industries
LCI	Land Conservation Initiative
LFI	Local Food Initiative
NAICS	North American Industry Classification System
NASS	National Agriculture Statistics Service

NFIP	FEMA National Flood Insurance Program
NGO	Non-Governmental Organization
NRCS	Natural Resources Conservation Service
OEM	King County Emergency Management
OPAV	Option to Purchase at Agricultural Value
PBRS	King County Public Benefit Rating System
PSRC	Puget Sound Regional Council
RCW	Revised Code of Washington
REET	Real Estate Excise Tax
RFMS	River and Floodplain Management Section
RFMS	King County River and Floodplain Management Section
SVAPD	Snoqualmie Valley Agriculture Production District
SVPA	Snoqualmie Valley Preservation Alliance
SVT	SnoValley Tilth
SVWID	Snoqualmie Valley Watershed Improvement District
SWM	King County Stormwater Management
SWS	King County Stormwater Services Program
TDR	Transfer of Development Rights
USDA	United States Department of Agriculture
UW	University of Washington
WAC	Washington Administrative Code
WBD	Winery, Brewery Distillery
WDFW	WA State Department of Fish and Wildlife
WLRD	King County Water and Land Resources Division
WSCC	WA State Conservation Commission
WSDA	WA State Dept of Agriculture
WSU	Washington State University
WWT	Washington Water Trust

APPENDIX I

List of Leads and Partners for Plan Implementation

List of Leads and Partners for Plan Implementation

- This list includes entities designated as a service provider specifically within an issue paper in the plan, OR
- If in italics, the entity is not specifically mentioned in the plan, but the task force is keen to work with these additional service providers for implementation.
- Leads and partners are alphabetized within each category.

Farmers and Members of the Public

Farmers
Landowners

Intergovernmental

Snoqualmie Forum/ Snohomish Basin Salmon Recovery Plan

King County

Department of Local Services (DLS)
- Community Service Areas Division
- Permitting Division
- Road Services Division

Emergency Management
Sheriff's Office
Department of Natural Resources and Parks (DNRP)
- Parks Division
- Water and Land Resources Division (WLRD)
  - Agriculture, Forestry and Tax Incentives Program (AFI)
    - Agriculture Program
    - Farmland Preservation Program (FPP)
  - Beaver Working Group
  - Conservation Futures Tax (CFT)
  - River and Floodplain Management Section (RFMS)
  - Stormwater Services Program
    - Agricultural Drainage Assistance Program (ADAP)
    - Integrated Drainage Program (IDP)
  - Transfer of Development Rights (TDR)

King County Flood Control District

Non-Government Organizations (NGOs)

Beavers Northwest
Duvall Days
Forterra

Mountains to Sound Greenway Trust
Pedestrian and/or Bicycle Safety groups (Cascade Bicycle Club)
Savor Snoqualmie
Snoqualmie Valley Preservation Alliance (SVPA)
SnoValley Tilth
Upper Snoqualmie Valley Elk Management Group
WA State Farm Bureau
WA Water Trust
Washington Farmland Trust

Special Districts

King Co Drainage District No. 7 (Cherry Creek)
King Conservation District
Snohomish Conservation District's Agriculture Resiliency Plan
Snoqualmie Valley Watershed Improvement District (SVWID)

Tribes

Snoqualmie Tribe
The Tulalip Tribes
  Tulalip Beaver Project

Universities

Washington State University (WSU)
  WSU Center for Sustaining Agriculture and Natural Resources (CSANR)
  WSU Extension
  WSU Food System Program
  WSU Puyallup Research and Extension Center
University of Washington (UW)
  UW Climate Impacts Group

United States Department of Agriculture (USDA)

Animal and Plant Health Inspection Service (APHIS)
Environmental Quality Incentives Program (EQIP)
Farm Service Agency (FSA)
Natural Resources Conservation Service (NRCS)

Washington State Agencies, Councils and Commissions

WA Dept of Ecology (ECY)
WA Invasive Species Council
WA State Conservation Commission
WA State Department of Fish and Wildlife (WDFW) / North Rainier Elk Herd Plan

APPENDIX J

Table J: Tables, Figures, and Maps

List of Tables, Figures, and Maps

Located in the following issue paper(s) by number	Table #	Figure #	Map #	Name or Description of Figures, Images and Maps
1.A		1		# Of Commercial Farms in SVAPD
1.A			1	Snoqualmie Valley Agriculture Production District location in King County, WA
1.A			2	Snoqualmie Valley Commercial Farms 2019: Operations Grouped by Landowner
1.A			3	Snoqualmie Valley Commercial Farm Leases
1.1.1		2		ADAP Eligible Waterway Maintenance: Snoqualmie Valley APD
1.1.2		3		Drainage Tile System Repair
1.1.3		4		Flap Gates, Floodgates, and Pumps
1.1.3			4	Locations of Flap gates, Floodgates and Pumps in the Snoqualmie Valley APD
1.1.4		5		Culverts: By # and Ownership
1.1.4			5	Fish Passage Sites and County Habitat Improvement Projects in the Snoqualmie River Basin
1.1.5		6		Waterway Maintenance (non-ADAP)
1.1.5		7		Non-ADAP waterways being assessed for inclusion in King County's Integrated Drainage Program (IDP)
1.1.5			6	Waterways in the Snoqualmie Valley APD that are not ADAP eligible
1.1.5			7	Waterways in the Snoqualmie Valley APD that are not ADAP Eligible Showing Oxbows
1.1.5			8	Snoqualmie Waterway Classification in relation to ADAP eligible and non-ADAP eligible Waterways
1.1.6		8		WDFW HPA Permits Mentioning Beaver Dam Management

1.1.6		9		WDFW Trapping Numbers in King County 2014-2021
1.1.6		10		Post-Contact History of Beaver Management in Washington State
1.2.7		11		# of Commercial Farms Without High Ground Flood Refuge: 10-year Flood and 100-year Flood
1.2.7		12		# of Commercial Farms with Farm Pads SVAPD
1.2.7		13		10-year Flood High Ground Access for the 156 Commercial Farms without Farm Pads
1.2.7		14		100-year Flood High Ground Access for the 156 Commercial Farms without Farm Pads
1.2.7		15		Prioritization criteria for future farm pads' equitable distribution to commercial farms
1.2.7			9	Snoqualmie Valley Commercial Farm Infrastructure: Farm Pads and Associated Commercial Farms
1.2.7			10	North Snoqualmie Valley APD Commercial Farms: Flood Refuge Areas in 100- and 10-Year Flood Events
1.2.7			11	South Snoqualmie Valley APD Commercial Farms: Flood Refuge Areas in 100- and 10-Year Flood Events
1.2.8		16		Preliminary # of Snoqualmie Valley APD Residential Structures in Relation to Federal Flood Zones
1.2.8		17		Status and # of Home Elevations to Date
1.2.8			12	Residential Structures Snoqualmie Valley APD
1.2.8		18		Before Home Elevation, 2015
1.2.8		19		After Home Elevation, 2017
1.2.8		20		Elevated Home with Flooding, Nov. 2006
1.2.8		21		Home Elevation Project During Construction
1.2.8		22		Barn Elevation Pilot Project Platform
1.2.8		23		Barn Elevation Pilot Project Livestock Barn
1.3.9		24		Estimated Water Rights for Irrigation by Acres in SVAPD
1.3.9		25		Projected Water Supply Needed to Meet 3,250 AF
1.3.9			13	SVWID's Proposed Upland Water Storage Locations
1.4.10		26		Sinnema Quaale Project Overview, 2015
1.4.10			14	Dutchman Road Revetment Repair Project
1.4.10			15	King County levees and revetments in the SVAPD

1.4.11		27		Ames Lake Trestle Bridge No. 1320A
1.4.11		28		Snoqualmie River Flood Event Comparison Road Closures
1.4.11 2.1.14		29		New Caution Farm Area signage
1.4.11 2.1.14		30		New APD signage
1.4.11 2.1.14		31		Drive Carefully signage
1.4.11			16	King County Maintained Roads and Bridges Snoqualmie River APD
1.5.12		32		Climate Prediction for the Snohomish River into which the Snoqualmie River and Skykomish River Flow
1.5.12		33		Monthly average naturalized flows for the Snoqualmie River near Snoqualmie for the 1980s (1970-1999) and the 2080s (2070-2099)
1.5.12		34		Recent High Flow Data (in CFS) Since 1995: Snoqualmie River near Carnation
1.5.12		35		Number of Times Flood Levels Have Been Reached in each 3-year Period (1988-2021): Snoqualmie River near Carnation (USGS 12149000 Flow Gage)
1.5.12		36		Annual Peak Flows from SVWID's Cherry Creek Basin Study: 1945-2020
1.5.12			17	Inundation Risk Map: Climate Projection for Flooding
1.5.13		37		Adult Apple Maggot
2.1.14		38		U.S. Census Population Growth in SVAPD Zip Codes, 2010-2020
2.1.14		39		Demographic Trends of King County: King County Population: 1990 to 2020
2.1.14		40		Planning Policies for Development Growth
2.2.15		41		Elk Herd on SVAPD Farm Pasture
2.2.15		42		Michigan Department of Natural Resources Hunting Access Program Sign
2.3.16		43		Farmland Preservation Program: SVAPD Farmable Acreage Permanently Protected
2.3.16		44		Farmland Preservation Program: Keeping Farmland More Affordable – Sales/Acre and % Value Reduction in SVAPD
2.3.16			18	FPP Properties by Farmed, Fallow and Unfarmable Status
2.4.17	1			Current SVAPD Acreage Farmable and Unfarmable Totals by Sub-category

2.4.17		45		Local Food Initiative Strategies for Increasing Food Production in King County
2.4.17		46		Current Percentage of SVAPD by Farmable and Unfarmable Acreage
2.4.17	2			Farmable Acreage Subtracting Voluntary Buffer Plantings and Proposed Capital Projects on Farmable Land
2.4.17		47		Percentage of SVAPD by Farmable and Unfarmable Acreage after subtracting proposed buffers and capital projects
2.4.17	3			Acreage Considerations for Farmland Acreage Preservation Recommendation
2.4.17		48		Reconciled Agriculture Task Force (ATF) and Buffer Task Force (BTF) Maps: Methodology, Scale, and Classifications
2.4.17		49		Completed Section of Map with Reconciled Methodology, Scale, and Classifications within Waterway Areas
2.4.17		50		Proposed South SVAPD Expansion Area
2.4.17			19	Agriculture Strategic Plan Acreage Delineation Map by Farmable and Unfarmable Land in the SVAPD
2.4.17			20	Agriculture Strategic Plan Acreage Delineation Map Farmable by Subcategory and Unfarmable Land in the SVAPD
2.4.17			21	Agriculture Strategic Plan Acreage Delineation Map Unfarmable by Subcategory and Farmable Land in the SVAPD