Sudden Valley Stormwater Improvements
Database ID No. 13-004

Construction Funding Year(s): **2022**

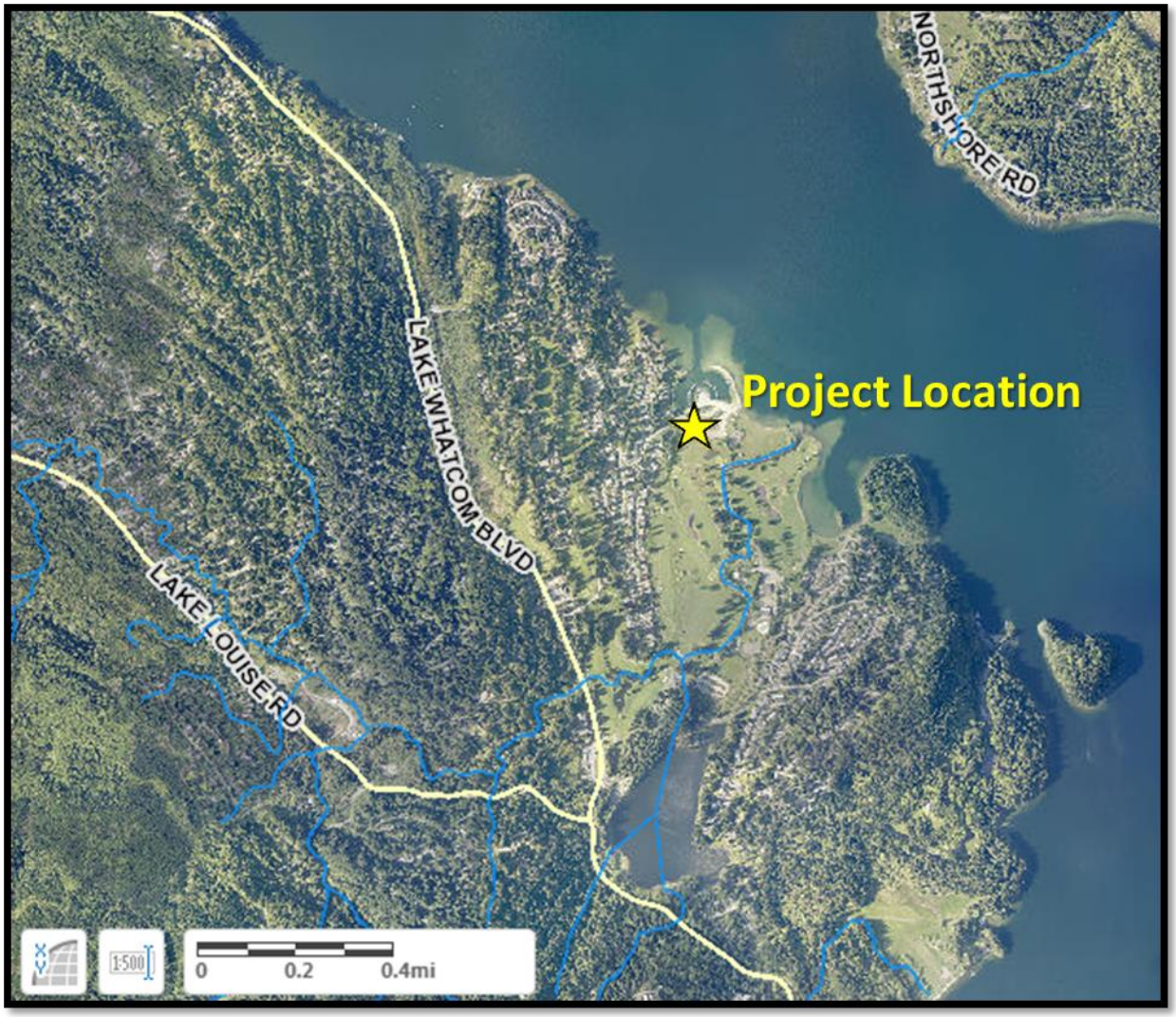
Project Narrative:

This project will construct drainage system upgrades and outfall retrofits in the Sudden Valley area of the Lake Whatcom watershed.

Project Status:

Design is anticipated in 2021 and construction scheduled to take place in 2022.

Total Estimated Project Cost: $700,000



Academy Road Stormwater Improvements
Database ID No. 20-005

Construction Funding Year(s): **2023**

Project Narrative:

Whatcom County and the City of Bellingham jointly developed this project to improve water quality from the Academy sub-basin of the Lake Whatcom Watershed. This project, originally constructed during the summer of 2015, will undergo an evaluation and perform recommended modifications to improve phosphorus removal. City of Bellingham will adopt the facility after the evaluation and improvements.

Project Status:

Design is anticipated in 2021-2022 and construction scheduled to take place in the summer of 2023.

Total Estimated Project Cost: $533,000

Geneva Bioretention Pilot Project
Database ID No. 20-006

Construction Funding Year(s): **2023**

Project Narrative:

This project will utilize a Washington State Department of Ecology grant to install and monitor the performance of new bioretention soil media. The existing swales are approaching the end of the media's effective life. New media will be required to replace the existing depleted media in the near future.

A portion of the existing swales will be used to test the new media, which is designed to reduce the amount of phosphorus and other pollutants entering the lake. Preliminary testing has shown the new media is much more effective in removal of phosphorus than more traditional media. If tests show significant improvement over the original media, the media will be adopted as a Best Management Practice (BMP) and be included in the updated WDOE Stormwater Manual.

Project Status:

Design is anticipated in 2021-2022, construction in 2023, and monitoring performance in 2024 and 2025.

Total Estimated Project Cost: $1,021,000

Silver Beach Creek Phase 2
Database ID No. 07-095

Construction Funding Year(s): **2024**

Project Narrative:

This project will address the stream bank erosion found on Silver Beach Creek and other tributaries. The project will reduce the amount of erosion and bank material that has been generally associated with the sediment-laden phosphorus loading to Lake Whatcom. The project will reconfigure approximately 950 linear feet of stream channels with a more stable cross-section to reduce erosion and the export of sediment.

Project Status:

Design is anticipated to occur in 2021-2022 and construction scheduled to take place in 2024.

Total Estimated Project Cost: $750,000

Eagleridge Stormwater Improvements
Database ID No. 20-007

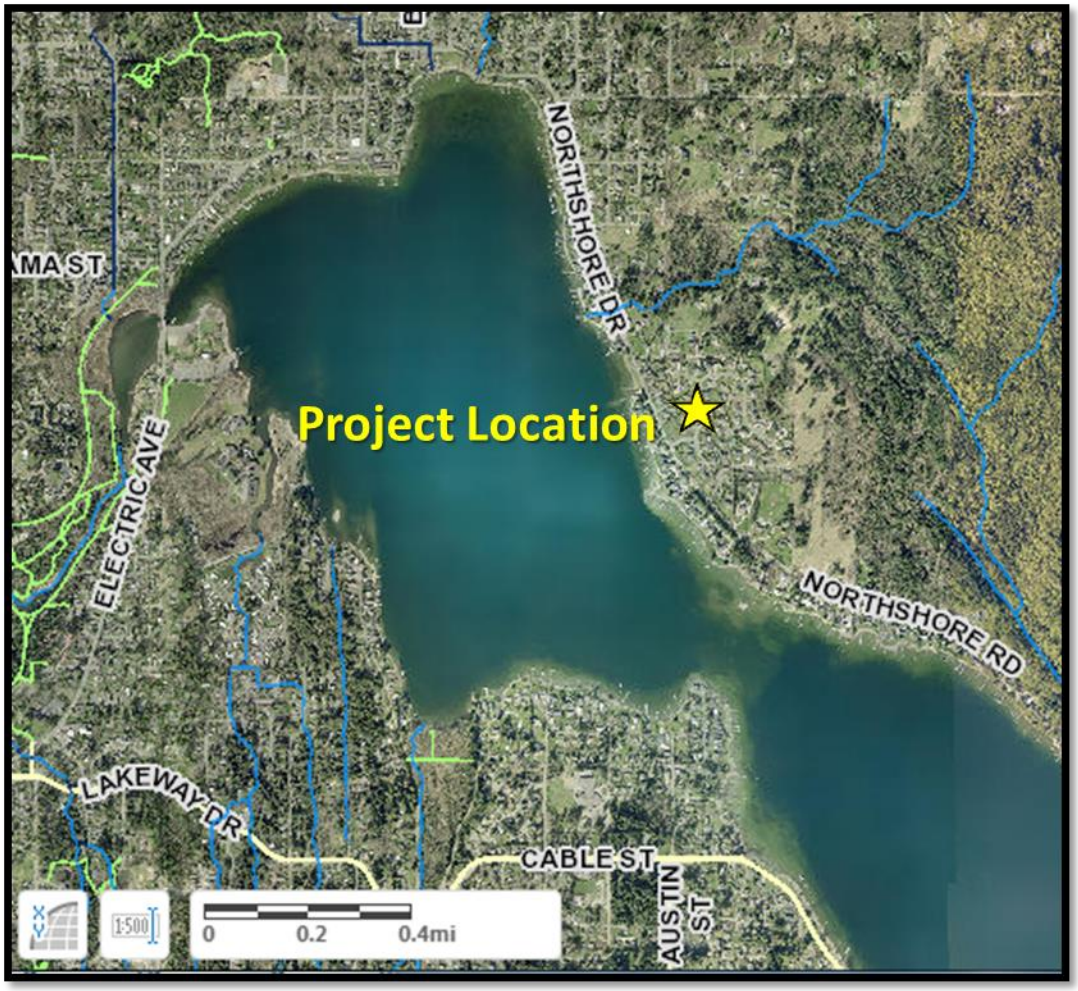
Construction Funding Year(s): **2025**

Project Narrative:
This project includes the installation of a water quality treatment facility associated with the Eagleridge neighborhood in the Lake Whatcom watershed. The Eagleridge development is approximately 34 acres and runoff from this development will be routed through a water quality facility to help remove sediments and phosphorus before entering Lake Whatcom.

Project Status:

Design is anticipated in 2023-2024 and construction scheduled to take place in 2025.

Total Estimated Project Cost: $480,000



Strawberry Point/ Lake Whatcom Blvd Stormwater Improvements
Database ID No. 17-001

Construction Funding Year(s): **2026**

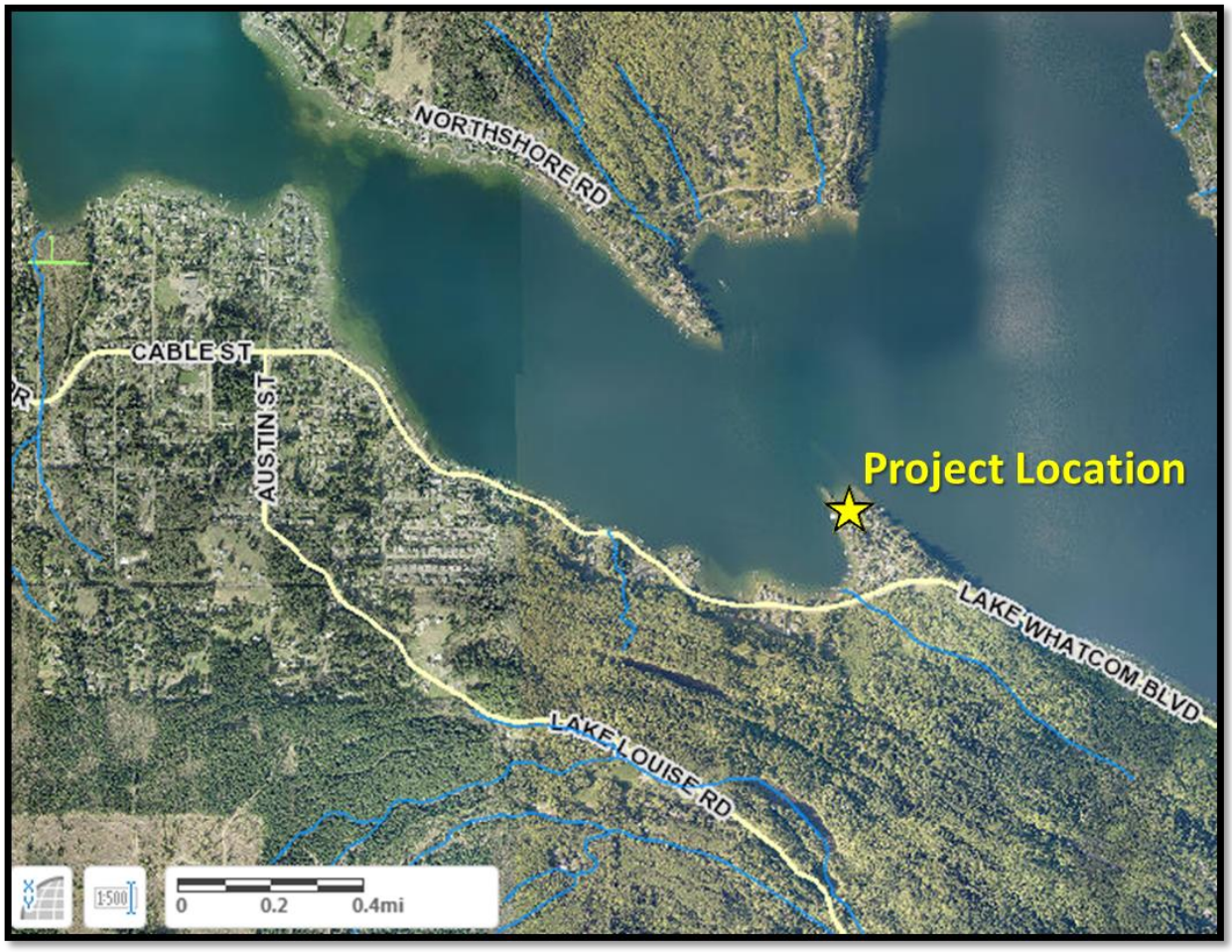
Project Narrative:

This project will involve the installation of a water quality facility to treat approximately three acres of residential area. Project elements may include: bioinfiltration swales, filter vaults, media filter drains, and rain gardens in order to improve water quality.

Project Status:

Design is anticipated in 2024-2025 and construction scheduled to take place in 2026.

Total Estimated Project Cost: $910,000



Austin Court Stormwater Improvements
Database ID No. 20-008

Construction Funding Year(s): **2027**

Project Narrative:

This project includes the installation of a large filter vault to improve water quality in the existing Austin Court stormwater system. The tributary area is approximately three acres and the water quality system will remove sediments and phosphorus prior to entering Lake Whatcom.
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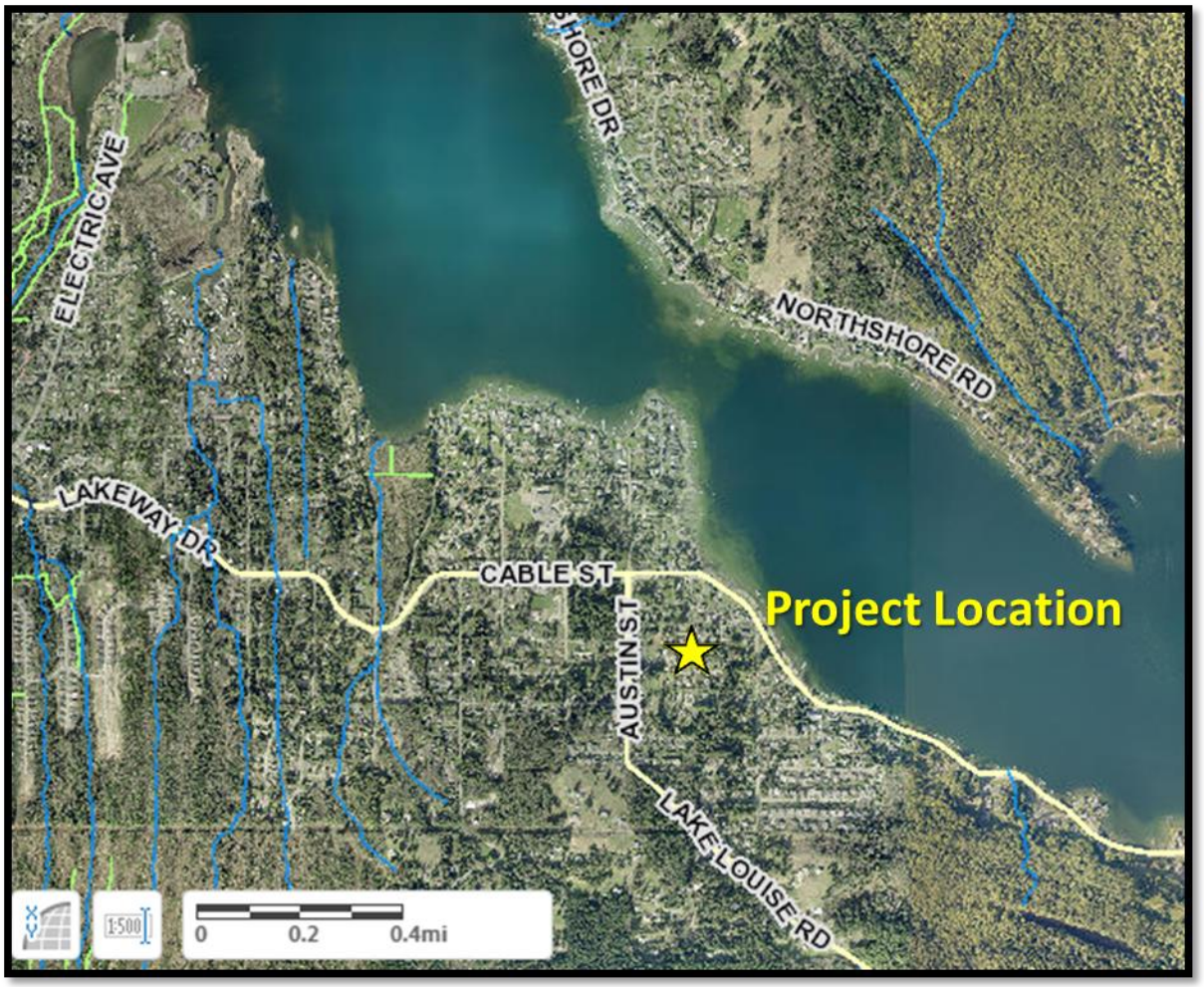
Project Status:

Design is anticipated in 2025-2026 and construction scheduled to take place in 2027.

Total Estimated Project Cost: $442,000



Viewhaven Lane Water Quality & Conveyance Improvements
Database ID No. 20-009

Construction Funding Year(s): **2027**

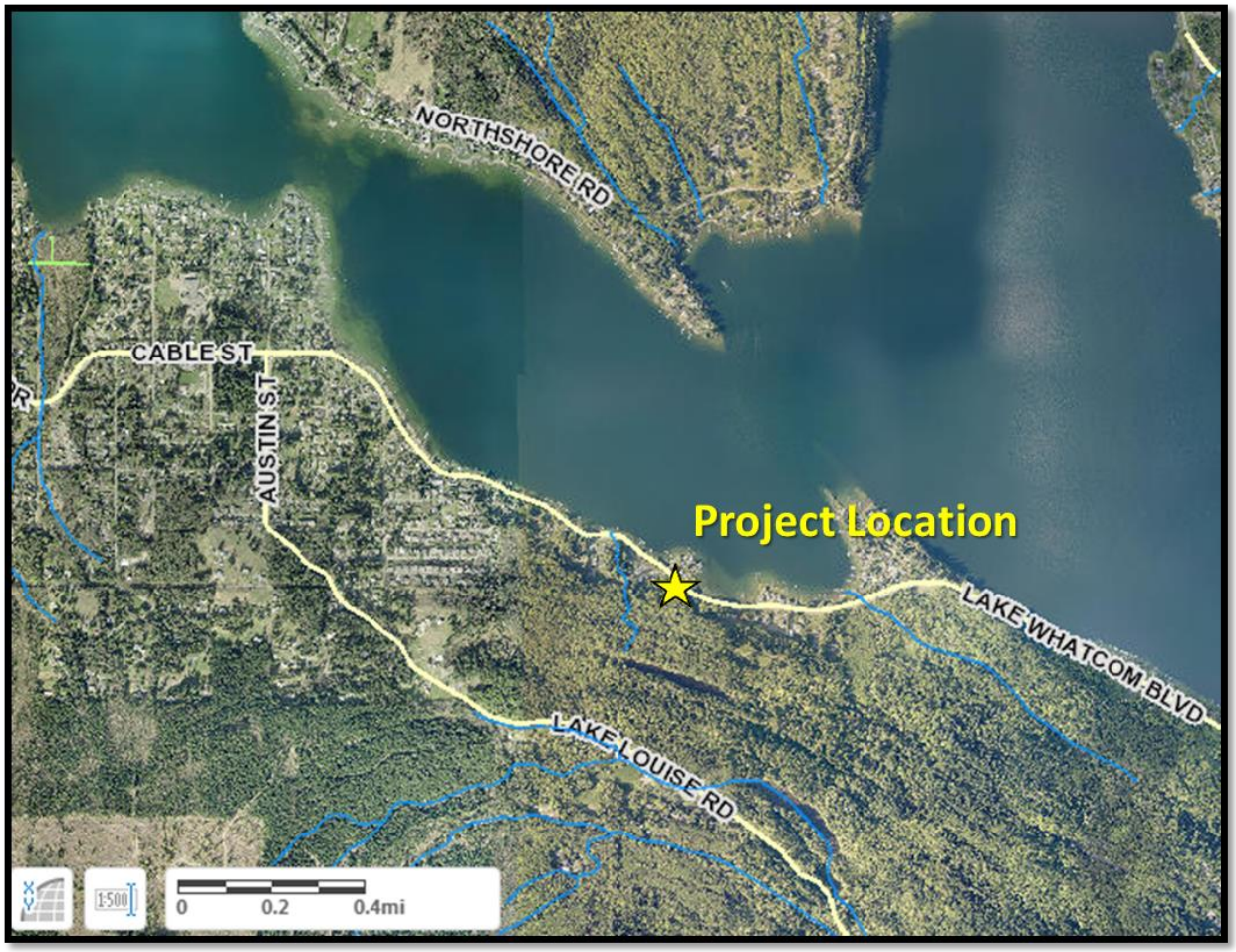
Project Narrative:

This project will improve conveyance and water quality near Viewhaven Lane and Lake Whatcom Blvd intersection. Project will include approximately 100 linear feet of conveyance improvements by replacing two undersized culverts and regrading a ditch. The project will also install approximately 135 linear feet of water quality facility. Project elements may include: bioinfiltration swales, filter vaults, media filter drains, and rain gardens.

Project Status:

Design is anticipated in 2025-2026 and construction scheduled to take place in 2027.

Total Estimated Project Cost: $251,000



Geneva Street & Lake Louise Road Culvert Replacement
Database ID No. 20-010

Construction Funding Year(s): **2028**

Project Narrative:

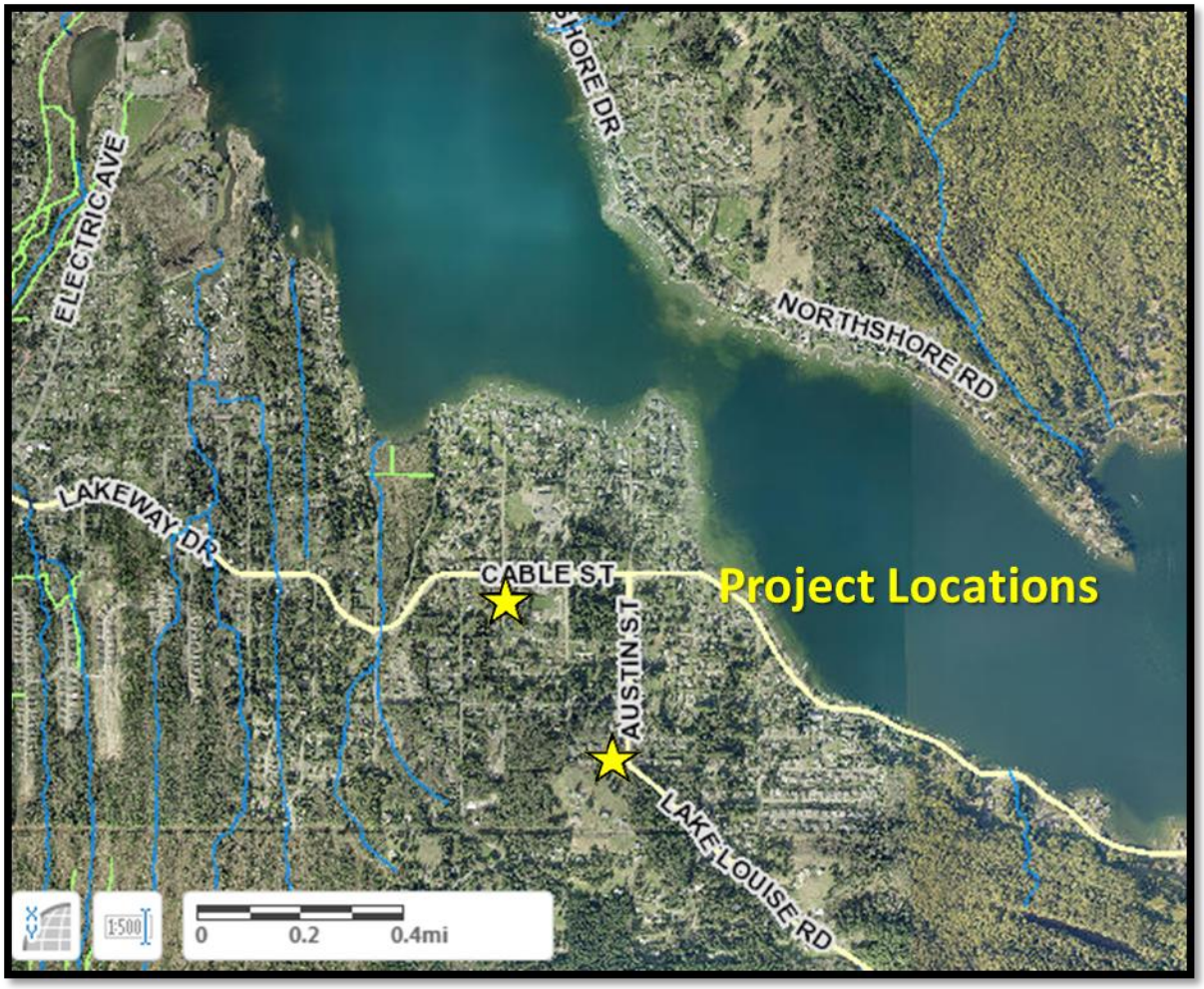
Project will improve conveyance of roadside ditches and culverts along Geneva Street and Lake Louise Road. The project will replaced approximately 200 linear feet of undersized or damaged culverts.

Project Status:

Design is anticipated in 2026-2027 and construction scheduled to take place in 2028.

Total Estimated Project Cost: $265,000*

*$115,000 shown on WRIP for design costs.



Semiahmoo Drive Stormwater Improvements (BP-2, BP-5)
Database ID No. 18-009 & 18-010

Construction Funding Year(s): **2022**

Project Narrative:

This project will improve the conveyance system along the east side of Semiahmoo Drive by upsizing pipes and re-establishing/deepening ditches to reduce flooding and increase traffic safety.

Project Status:

Design is anticipated in 2020, permitting in 2021 and construction scheduled to take place in 2022.

Total Estimated Project Cost: $625,000

Charel Terrace Stormwater Outfall Improvements
Database ID No. 20-011

Construction Funding Year(s): **2023**

Project Narrative:

The December 20, 2018 “Solstice Eve” windstorm caused damage to the stormwater outfall on Birch Point installed as part of the Charel Terrace project in 2011. In March 2019 a “Major Disaster Declaration” that covered Whatcom County for the December storm was granted. In December 2019, the Consolidated Resource Center approved the Washington State Emergency Management Division’s $110,887 request for Architectural & Engineering Services to assess the site and develop conceptual design options. An RFP was advertised by Whatcom County in March 2020 and Herrera Environmental Consultants completed a preliminary study that assessed the outfall stabilization approaches to maintain a functional outfall. From this study, a temporary repair will be constructed in early fall 2021 to secure the catch basin to the bluff and reposition the outfall tee. The permanent repair will be constructed in the summer of 2023, which may consist of hard armoring of the slope to protect cultural resources.

Project Status:

Design is anticipated in 2021-2022 and construction scheduled to take place in 2021 (temporary repair) and 2023 (permanent repair).

Total Estimated Project Cost: $520,000

Holeman Avenue Stormwater Improvements (PW-1)
Database ID No. 07-242

Construction Funding Year(s): **2023**

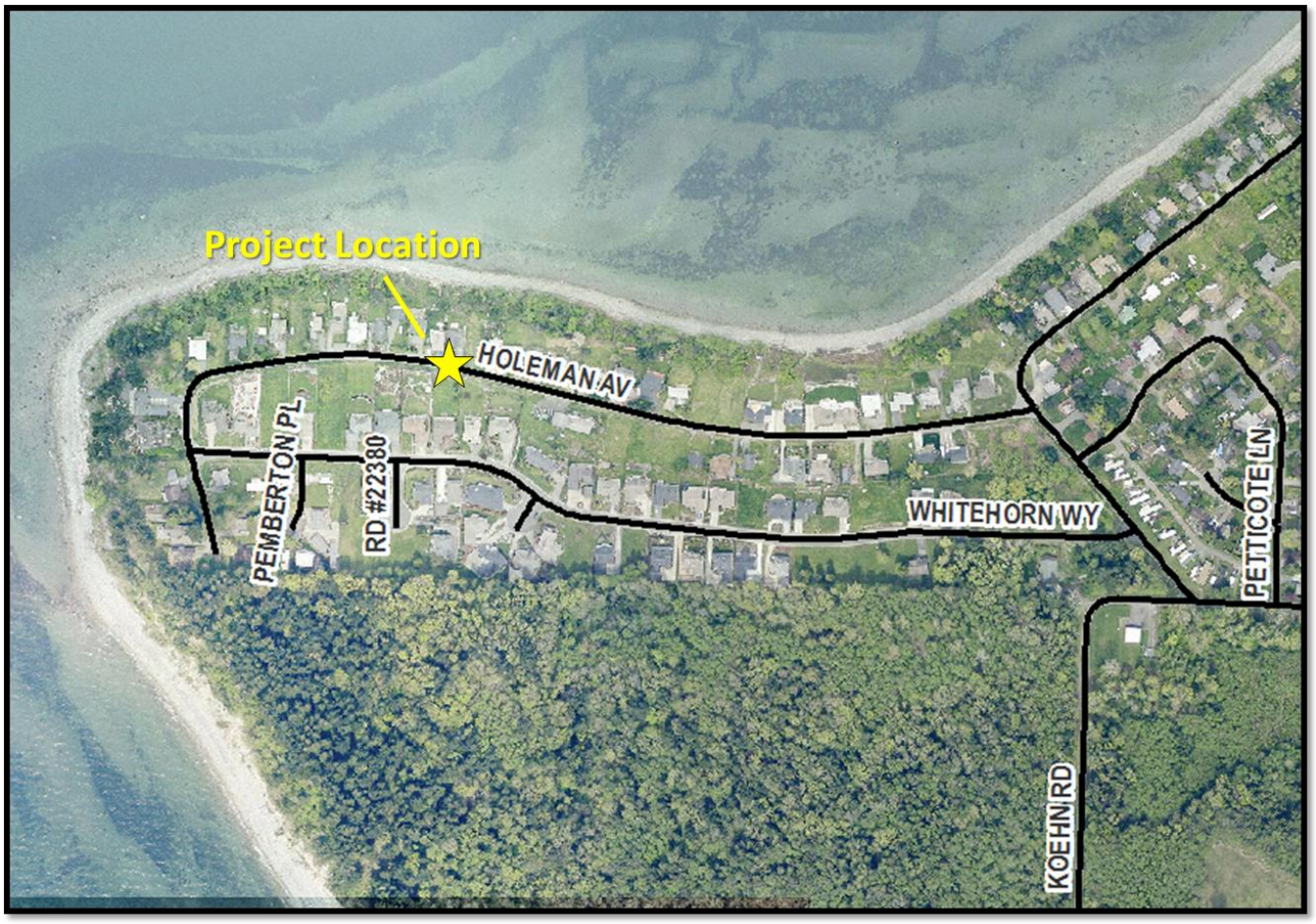
Project Narrative:

The project goal is to reduce roadway flooding on Holeman Avenue by replacing undersized pipe and catch basins and re-establish existing ditch to match pipe invert elevations. This area is particularly sensitive due to the steep, unstable bluff along the shoreline and the concern is that flooding could lead to bluff failure and property damage. This is a critical public safety issue.

Project Status:

Design is anticipated in 2022 and construction scheduled to take place in 2023.

Total Estimated Project Cost: $475,000



Normar Place Stormwater Improvements (BP-1)
Database ID No. 19-004

Construction Funding Year(s): **2024**

Project Narrative:

This project involves upsizing pipes, replacing catch basins and installing an outfall pipe over the bluff with an energy dissipater at Normar Place to reduce roadway flooding, scour and sediment transport.

Project Status:

Design is anticipated in 2022-23 and construction in 2024.

Total Estimated Project Cost: $450,000

Birch Point Road Stormwater & Outfall Improvements (BP-3 & BP-6)
Database ID No. 21-001

Construction Funding Year(s): **2025**

Project Narrative:

A corrugated metal outfall pipe over a steep bluff on Birch Point collapsed due to undermining. The driveway culverts, ditches and upstream storm drain system leading to the outfall are undersized and cause flooding and erosion during storm events. This project will involve upsizing culverts, reestablishing ditches and replacing the halfpipe outfall with an HDPE tightline, anchor and energy dissipater.

Project Status:

Design will be completed in 2023-24. Construction is scheduled to take place in 2025.

Total Estimated Project Cost: $665,000

Lora Lane Drainage & Tide Gate Modifications (TC1-2)
Database ID No. 18-008

Construction Funding Year(s): **2026**

Project Narrative:

The purpose of this project is to replace the existing 48" corrugated metal pipe culvert under Birch Bay Drive with a fish passage culvert that is anticipated to be an 8-ft wide box culvert, remove the existing tide gate on the water side of Birch Bay Drive, install a new side hinge tide gate on the east side of Birch Bay Drive on the new 8-ft wide culvert, and install shoreline armoring at the outfall area.

Project Status:

Preliminary engineering design will begin in 2021 and be completed prior to construction in 2026. Construction is scheduled to take place in 2026, but there is uncertainty if private property owners will be willing to grant easements. If they are willing to sign, this project may be re-scheduled for construction prior to 2026 through next year's WRIP process.

Total Estimated Project Cost: $1,500,000*

*Road Fund contributions are tentative until easements are obtained.

Wooldridge Avenue & Sunset Drive Stormwater Improvements (TC-2)
Database ID No. 13-007

Construction Funding Year(s): **2027**

Project Narrative:

This project will improve the conveyance system along Wooldridge Avenue, Jackson Road and Sunset Drive by upsizing pipes, installing or replacing catch basins and culverts, reestablishing roadside ditches, installing a water quality filter vault and 100 linear feet of water quality treatment swale.

Project Status:

Design is anticipated in 2025-2026 and construction is scheduled to take place in 2027.

Total Estimated Project Cost:

DOE Water Quality Grant:	$750,000*
BBWARM:	**$470,000**
Total:	$1,220,000

*Unsecured grant funding

Hillsdale Stormwater Improvements, Phase 1 (HL-C-1)
Database ID No. 19-002

Construction Funding Year(s): **2028**

Project Narrative:

This project involves upsizing pipes, replacing catch basins, installing new drain line, and replacing blind tee connections on Morgan, Cottonwood and Birch Bay Drives to reduce flooding and allow for maintenance.

Project Status:

Pre-design was completed in 2014, final design will be completed in 2027 and construction of Phase 1 scheduled to take place in 2028.

Total Estimated Project Cost: $750,000*

*$150,000 shown on WRIP for design portion

Shallow Shore Culvert Relocation
Database ID No. 18-007

Construction Funding Year(s): **2022**

Project Narrative:

The existing cross-culvert located at 326 Shallow Shore Drive discharges onto the western edge of the lakefront parcel. During heavy storm events, discharge from the cross-culvert overwhelms an existing private culvert which conveys stormwater to the lake, resulting in regular flooding and inundation throughout the rainy season.

The County currently has an undeveloped right-of-way (Bass Street) to the lake approximately 300 feet north of the existing outfall along Shallow Shore Drive which could serve as an alternate to the existing outfall. The project will evaluate water quality alternatives that may be installed prior to discharging in Lake Samish

Project Status:

Design is anticipated in 2021 and construction scheduled to take place in 2022.

Total Estimated Project Cost: $365,000

Marietta Acquisition
Database ID No. 07-002

Construction Funding Year(s): **2001 - Present**

Project Narrative:

Acquisition of residential properties in the frequently-flooded repetitive flood loss area of Marietta, removal of existing structures and restoration of properties with native vegetation.

Project Status:

Property acquisition began in 2001 and is ongoing. As properties are acquired, structures are removed and native vegetation is planted. All acquisitions are voluntary and the project is ongoing as current property owners decide to sell their properties. Total project cost will need to include funding for cleanup of up to four former gas stations, though the exact nature of the work is still undefined.

Total Estimated Project Cost:	TBD
Expenditures to Date:	$1,851,000

Marine Drive Levee 2020 Damage Repair
Database ID No. 20-001

Construction Funding Year(s): **2022**

Project Narrative:

The Marine Drive Levee provides flood protection during smaller, more frequent floods to the Marietta area and Slater Road. The levee is located on property owned by the Washington Department of Wildlife who is managing the property for wildlife. The levee backslope was damaged in several locations during flooding in 2020. The project involves restoring the levee crest and backslope to the original geometry while trying to minimize the impacts to existing vegetation.

Project Status:

The project is in the design phase. Construction is anticipated for summer of 2022. The FCZD is utilizing FEMA funds to partially fund the project.

Total Estimated Cost:	$393,000
Expenditures to Date:	$43,000

Abbott Levee Protection and Improvement Project
Database ID No. 16-007

Construction Funding Years: **2021 and 2024**

Project Narrative:

The project is located along Abbott Road about 1.7 miles east of Hannegan Road. Recent erosion along the Nooksack River has removed a section of riprap that previously protected the land adjacent to the Abbott Levee and Abbott Road. Phase1 of this project addressed the ongoing erosion in this location. The FCZD is also investigating possible road and levee setback options to improve the upstream tie-in of the levee and address a deficiency identified by the US Army Corps of Engineers to maintain the levee's eligibility in the PL 84-99 Levee Rehabilitation Program. This work will be implemented as a second phase of the project.

Project Status:

Construction of Phase 1 was completed during Summer or 2021. The FZCD is developing a scope of work with the project consultant for Phase 2. Phase 2 will include a reach assessment to provide the technical basis for developing alternatives for upstream improvements. The FZCD will utilize this reach scale analysis to develop a capital project for Phase 2. Phase 2 construction is anticipated during 2024.

Total Estimated Cost:	TBD
Expenditures to Date:	$1,030,000

Lynden Levee Improvement
Database ID No. 16-003

Construction Funding Year(s): **2021 - 2022**

Project Narrative:

One 24” culvert and one 48” culvert are located less than 50 feet apart providing interior drainage through the Lynden Levee. One of the pipes drains a channel that flows through the City of Lynden’s wastewater treatment plant. The levee has overtopped where the culverts are located, damaging the levee backslope and the small berm that separates the drainage channel from a water treatment settling pond. The conceptual design developed as part of the System-wide Improvement Framework (SWIF) planning process includes relocating the treatment plant drainage channel through a forested area further away from the pond, connecting the two drainages, and replacing the two culverts with a single larger fish-passable culvert with a side-hinge flood gate.

Project Status:

Primary construction of the project was completed during summer of 2021. This project was implemented collaboratively by the FCZD and the USACE. Construction in 2022 will include planting and stabilization of the new channel. Total project cost includes USACE construction as a direct contribution.

Total Estimated Cost:	$1,766,000
Expenditures to Date:	$1,711,000

Jones Creek Debris Flow Protection
Database ID No. 07-105

Construction Funding Year(s): **2023-2024**

Project Narrative:

This project includes acquisition of residential properties in the high hazard area of the Jones Creek alluvial fan and construction of a setback deflection berm to route debris flows around the town of Acme. The project includes realignment of Turkington Road at the location where it crosses the proposed berm.

Project Status:

Property acquisition began in 2005 and is ongoing. Preliminary design has been performed for the deflection berm and a preferred alternative for Turkington Road has been selected. Detailed design and acquisition of additional lands needed are underway.

Total Estimated Cost:	$6,872,000
Expenditures to Date:	$3,107,000

Cougar Creek Early Action Project / Neevel Levee Bank Stabilization
Database ID No. 16-008

Construction Funding Year(s): **2023**

Project Narrative:

The Neevel Levee provides varying levels of protection to a significant amount of agricultural land. Approximately 250 feet of the levee running along Cougar Creek is over-steepened and experiencing sloughing of the riverward face. A stabilization project incorporating large woody debris at the toe and reducing the slope of the riverward face is proposed in the System-wide Improvement Framework (SWIF) to resolve the deficiency identified by the US Army Corps of Engineers and keep the levee eligible for repair under the Public Law (PL) 84-99 Program. An early action project developed through the Floodplain Integrated Planning (FLIP) process includes replacement of the Cougar Creek flood gate and installation of large woody debris in the channel downstream.

Project Status:

Design of the project has been advanced to an approximate 90% design level. Completion of the design to produce a bid-ready package will be proposed as an early action project under the current Floodplains by Design grant. Construction may occur in 2023 if funding can be secured through NRCS's EQIP program or other grants.

Total Estimated Cost:	$1,660,000
Expenditures to Date:	$175,000

Everson Overflow Pipeline Stabilization
Database ID No. 20-002

Construction Funding Year(s): **2024**

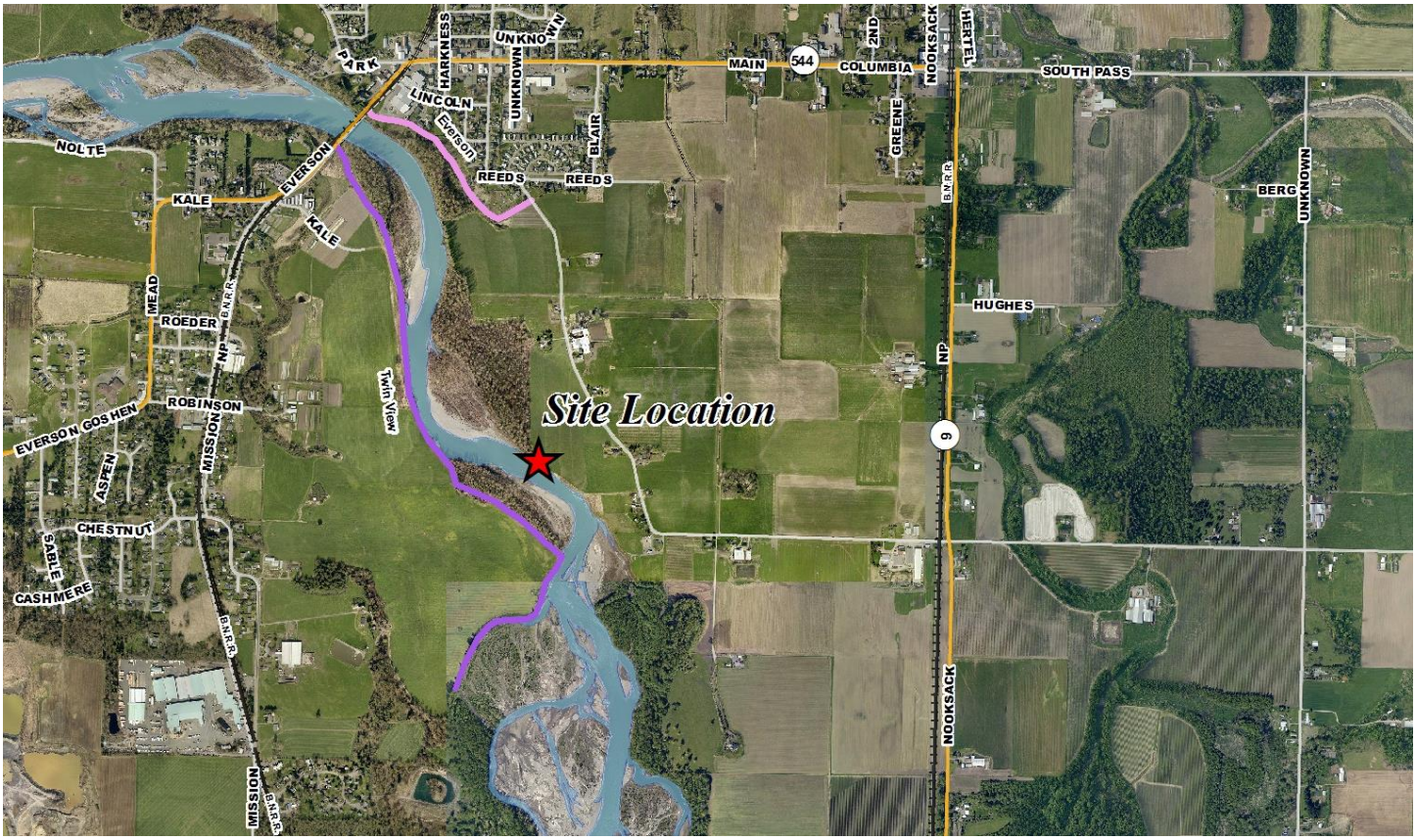
Project Narrative:

A portion of the bank within the Everson overflow corridor was damaged during the 2020 flood season. The damage site is located near a petroleum pipe crossing the Nooksack River. The FCZD is exploring options to stabilize the bank and protect the high ground divide that controls how much overflow occurs at Everson.

Project Status:

The project is in the initial design phase. Construction is anticipated for summer of 2024. The FCZD is planning on utilizing FEMA funds to partially fund the project.

Total Estimated Cost:	TBD
Expenditures to Date:	$139,000



Truck Road 2020 Flood Damage
Database ID No. 20-003

Construction Funding Year(s): **2023**

Project Narrative:

The project is located along Truck Road about 0.3 miles easterly from Mt. Baker Highway (SR 542). During high-water events of the 2017/2018 winter, the North Fork Nooksack River eroded the unprotected bank of Truck Road to within 13 feet of the roadway surface. This prompted an emergency project to construct a passive riprap revetment underneath a section of the roadway to provide immediate protection. Flooding during 2020 eroded the remaining bank exposing the recently constructed riprap revetment and destabilizing a portion of the north bound lane. Jersey barriers were placed by county crews to block off this lane to traffic. The FCZD is evaluating road realignment and bank stabilization alternatives to provide a long-term solution in this area.

Project Status:

The FCZD has hired a consultant to analyze road realignment and bank stabilization alternatives. The consultant will develop a repair project based on the preferred alternative. Construction of the project is anticipated to occur in 2023. The FCZD has secured FEMA funds to partially fund the project.

Total Estimated Cost:	TBD
Expenditures to Date:	$256,000

Bertrand Creek Levee Stabilization
Database ID No. 16-005

Construction Funding Year(s): **2022**

Project Narrative:

The Bertrand Creek right and left bank Levees are designed to overtop during larger floods, but provide protection to agricultural land during the growing season. The left bank levee has a 250 foot long section where erosion is threatening the levee prism. The right bank levee face is sloughing at three locations with a total length of approximately 250 feet. The levees will have to be repaired to remain eligible for rehabilitation through the Public Law (PL) 84-99 program.

Project Status:

A conceptual design has been developed as part of the System-wide Improvement Framework (SWIF) planning process. The project will be designed by the FCZD. Construction is anticipated in the Summer of 2022.

Total Estimated Cost:	$320,000
Expenditures to Date:	$20,000

Devries Levee Improvements
Database ID No. 19-001

Construction Funding Year(s): **2025**

Project Narrative:

This project involves widening the levee crest and backsloping the levee to meet the USACE's levee geometry standards (SWIF project).

Project Status:

A conceptual design has been developed as part of the SWIF planning process. Detailed design has not been initiated yet.

Total Estimated Cost:	$235,000
Expenditures to Date:	$0

Upper Hampton Levee Improvements
Database ID No. 16-006

Construction Funding Year(s): **2024, 2027**

Project Narrative:

Several deficiencies were identified by the US Army Corps of Engineers on the Upper Hampton Levee. Improvements to the levee geometry are proposed in two locations and improvement to address seepage is proposed at a third location.

Project Status:

A conceptual design has been developed as part of the System-wide Improvement Framework (SWIF) planning process. Detailed design has not been initiated yet. However, we were able to complete a portion of the levee backsloping work at one site using excess material generated at the 2021 Abbott and Lynden Levee Improvement projects.

Total Estimated Cost:	TBD
Expenditures to Date:	$7,000

Ferndale Levee Improvement Project
Database ID No. 07-104

Construction Funding Year(s): **2025 - 2027**

Project Narrative:

Two levee segments, one sponsored by the City of Ferndale and one by the FCZD and Diking District #1, provide protection to the three treatment facilities along Ferndale Road. The US Army Corps of Engineers has identified several deficiencies along these two levee segments, including a gap in which super sacks filled with sand have been placed. The 1999 Comprehensive Flood Hazard Management Plan recommended improving these levees to provide 100-year protection to the City and the treatment facilities. The System-wide Improvement Framework (SWIF) also includes this project to address the identified levee deficiencies.

Project Status:

This project is currently in the design phase. An alternative analysis is being conducted by the project consultant. A 60 percent design level plan of the proposed levee configuration is anticipated Fall of 2022. A 100 Percent design level plan is anticipated in 2024. Grant funding through the State's Floodplain's by Design program has been secured to complete the design. Construction is anticipated to be phased with construction beginning in 2025 and lasting through 2027.

Total Estimated Construction Cost: TBD

Expenditures to Date: $372,000

Glacier-Gallup Creeks Alluvial Fan Restoration
Database ID No. 18-006

Construction Funding Year(s): **2026**

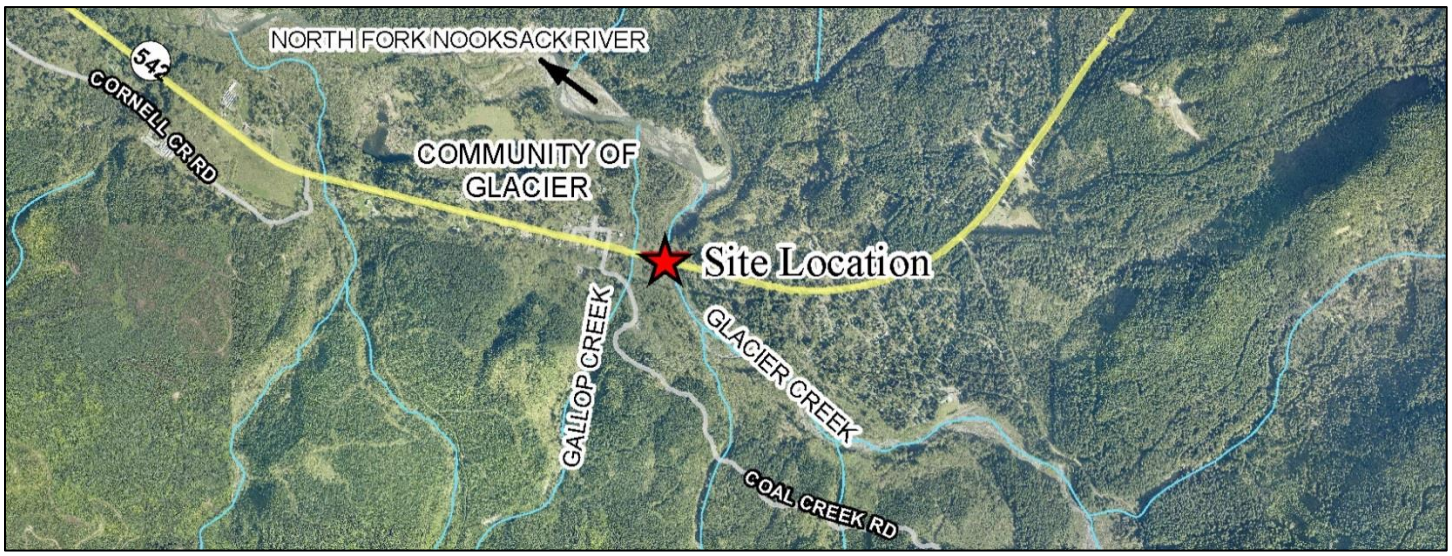
Project Narrative:

The Glacier Creek Levee on the left (west) bank of the creek was constructed in the 1960s to prevent overflows into Gallup Creek and damage to State Route (SR) 542. Since construction, the levee has been subject to ongoing damage. Constriction of the Glacier-Gallup channel migration zone (CMZ) has exacerbated aggradation upstream of SR 542 and severely degraded fish habitat. WSDOT replaced the Gallup Creek bridge and is working to construct a new bridge over Glacier Creek and the alluvial fan between the two creeks. The FCZD is developing a project in coordination with WSDOT and is evaluating the feasibility of full or partial removal of levees blocking natural channel migration on the Glacier and Gallup Creeks alluvial fan and construction of a setback levee on Gallup Creek to protect the Community of Glacier.

Project Status:

A feasibility study and alternatives analysis for evaluating levee removal and setback alternatives was initiated in late 2018. Preliminary design of the preferred alternative will be initiated once the preferred alternative is selected. Construction of the levee removal and setback is anticipated to occur concurrently with the Glacier Creek bridge replacement in 2026.

Total Estimated Project Cost:	TBD
Expenditures to Date:	$317,000



Dahlberg Wetland Mitigation Site
Database ID No. 20-004

Construction Funding Year(s): **2024 - 2027**

Project Narrative:

The FCZD purchased a property northeast of Ferndale as a mitigation site for future projects having wetland or riparian impacts. The property contained a dilapidated farm house.

Project Status:

FCZD purchased the subject property and demolished the farm house in Fall of 2020. The FCZD is installing a monitoring network on the site to support developing a long-term restoration plan for the site.

Total Estimated Cost:	TBD
Expenditures to Date:	$849,000

Floodplain Acquisition
Database ID No. 07-002

Acquisition Funding Year(s):	**2017- TBD**

Project Narrative:

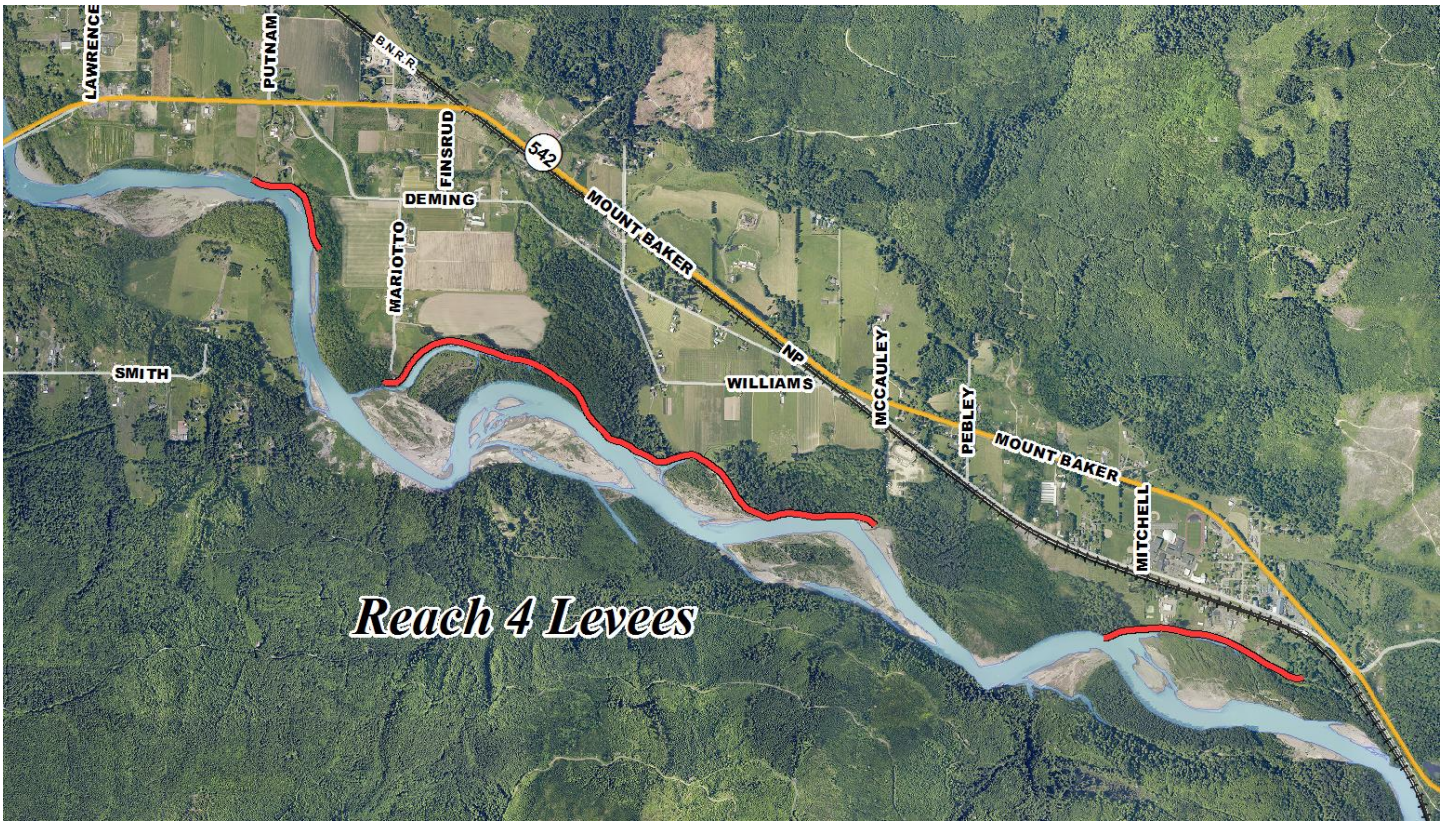
Reach-scale projects to reconfigure flood infrastructure are being evaluated through the integrated planning processes that started with the System-wide Improvement Framework (SWIF) and has transitioned into the Floodplain Integrated Planning (FLIP) process. The goal of this work is to reduce flood risk and expenditures and restore habitat and the processes that form it.

Voluntary acquisition of lands is proposed to enable future levee reconfigurations to reduce flood risk and future levee repairs, while improving habitat.

Project Status:

Acquisition of one property in Reach 4 was completed in 2020. Discussions with additional property owners will occur in 2021 and 2022.

Total Estimated Cost:	TBD
Expenditures to Date:	$1,128,000



Emergency/New Projects
Database ID No. 08-003

Construction Funding Year(s): **2022 - 2027**

Project Narrative:

This item provides funding to address unanticipated projects resulting from new damage to flood control facilities.

Project Status:

Design and construction to occur as necessary.

Total Estimated Project Cost: $425,000/year

Expenditures to Date: $425,000/year

Due to the nature of this item, no map exists. Board of Supervisors review and prioritization will be sought at the appropriate time.