

PROPOSED BY: \_\_\_\_\_

INTRODUCED: 9/15/20

RESOLUTION NO. \_\_\_\_\_

(A Resolution of the Whatcom County Flood Control Zone District  
Board of Supervisors)

**WHATCOM COUNTY FLOOD CONTROL ZONE DISTRICT  
SIX-YEAR WATER RESOURCES IMPROVEMENT PROGRAM  
FOR THE YEARS 2021 THROUGH 2026**

**WHEREAS**, pursuant to RCW 86.15.110, flood control or storm water control improvements may be extended, enlarged, acquired, or constructed by a flood control zone pursuant to a resolution adopted by its Board of Supervisors; and

**WHEREAS**, Whatcom County Public Works Department on behalf of the Whatcom County Flood Control Zone District has prepared a Six-Year Water Resources Improvement Program for adoption; and

**WHEREAS**, pursuant to RCW 86.15.120, the Supervisors shall hold a public hearing prior to adopting the resolution; and

**WHEREAS**, the Six-Year Water Resources Improvement Program attached hereto as Exhibit "A" has been reviewed and determined to be consistent with Whatcom County's comprehensive plan and is consistent with the following plans:

- Lower Nooksack River Comprehensive Flood Hazard Management Plan, October 1999
- Jones Creek Debris Flow Study, March 2004
- WRIA 1 Salmon Recovery Plan, October 2005
- Birch Bay Comprehensive Stormwater Plan, July 2006
- Lake Whatcom Comprehensive Stormwater Plan, March 2008
- Lake Samish Basin Comprehensive Stormwater Plan, July 2012
- Birch Bay Central North Subwatershed Master Plan, December 2013
- Birch Bay Central South Subwatershed Master Plan, January 2015
- Nooksack River System-Wide Improvement Framework, June 2016

- Birch Point, Terrell Creek Urban Area, and Point Whitehorn Subwatershed Master Plan, November 2016
- Lake Whatcom Comprehensive Plan: Stormwater Capital Program Update, September 2017
- Lake Whatcom Management Program 2020-2024 Work Plan, July 2020; and

**WHEREAS**, pursuant to RCW 86.15.110, the preliminary engineering studies for constructed improvements are on file with the Whatcom County Public Works Department; and

**WHEREAS**, pursuant to RCW 86.15.110, the estimated cost of the acquisition or construction of the improvement, together with supporting data, is included in the Six-Year Water Resources Improvement Program; and

**WHEREAS**, the improvements will benefit one or more flood control zones, subzones and the county as a whole;

**NOW, THEREFORE, BE IT RESOLVED** by the Whatcom County Flood Control Zone District Board of Supervisors as follows:

That the Whatcom County Flood Control Zone District Six-Year Water Resources Improvement Program for the years 2021 through 2026, which is attached hereto as Exhibit "A", is hereby adopted.

APPROVED this \_\_\_\_ day of \_\_\_\_\_, 2020.

Flood Control Zone District Board of  
Supervisors  
WHATCOM COUNTY, WASHINGTON

ATTEST:

\_\_\_\_\_  
Dana Brown-Davis, Clerk of the Council

\_\_\_\_\_  
Barry Buchanan, Chair

APPROVED AS TO FORM:

Christopher Quinn

Christopher Quinn, Senior Deputy Prosecuting Attorney – Civil Division

Item No.	Project Description	Database ID No.	BES	Previous Expenditure												2025						2026			Total																		
				2021				2022				2023				2024			Phase	Amount	Source																						
				Phase	Amount	Source	Notes	Phase	Amount	Source	Notes	Phase	Amount	Source	Notes	Phase	Amount	Source				Notes																					
<b>LAKE WHATCOM STORMWATER</b>																																											
1	Silver Beach Creek Phase 1: Install water quality system to treat stormwater from the Woodlake development.	07-095	60.5	PE \$ 45,000 REET	PE \$ 100,000 REET	PE \$ 40,000 SW Funds	PE \$ 85,000 LWSU	RW \$ 15,000 REET	CN \$ 535,000 REET	PE \$ 60,000 REET	PE \$ 40,000 LWSU	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 100,000 REET	PE \$ 200,000 LWSU	PE \$ 40,000 LWSU	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	\$ 820,000				
2	Academy Road Stormwater Improvements: Evaluate the water quality performance of the existing Academy stormwater system and provide recommended retrofits.	20-005	63.9	PE \$ 80,000 SW Funds	PE \$ 60,000 REET	PE \$ 40,000 LWSU	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	CN	\$ 480,000		
3	Geneva Bioretention Pilot Project: Install new water quality treatment media, evaluate the effectiveness and constructability of new water quality treatment media	20-006	63.9	PE	PE \$ 25,000 REET	PE \$ 118,000 DOE Grant	PE \$ 15,000 REET	CN	CN	CN	PE \$ 40,000 LWSU	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	PE \$ 2,500 REET	PE \$ 7,500 DOE Grant	\$ 1,001,000			
4	Sudden Valley Stormwater Improvements: Drainage system upgrades, water quality treatment and outfall retrofits in partnership with Sudden Valley HOA	13-004	46.3	PE \$ 10,000 REET	PE \$ 170,000 REET	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 790,000	
5	Silver Beach Creek Phase 2: Main channel restoration below Hillsdale using natural vegetation	07-095	60.5	PE	PE \$ 50,000 REET	PE	PE	PE	PE	PE	PE \$ 80,000 REET	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 750,000	
6	Eagleridge Stormwater Improvements: Install a water quality system to treat stormwater from the Eagleridge development.	20-007	61.4	PE	PE	PE	PE	PE	PE	PE	PE \$ 40,000 REET	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 480,000	
7	Strawberry Point/Lake Whatcom Blvd Stormwater Improvements: System upgrades to improve water quality including vaults, biofiltration swales, and channel restoration	17-001	62.2	PE	PE	PE	PE	PE	PE	PE	PE	PE \$ 70,000 REET	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 910,000
8	Austin Court Stormwater Improvements: Install water quality system on the discharge from Austin Court.	20-008	58.8	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 442,000	
9	Viewhaven Lane Water Quality & Conveyance Improvements: Install water quality systems and improve conveyance near Viewhaven Lane.	20-009	58.8	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 226,000	
10	Geneva Street & Lake Louise Road Culvert Replacement: Replace culverts along Geneva Street and Lake Louise Road to improve water quality and conveyance	20-010	58.8	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 75,000	
<b>BIRCH BAY WATERSHED &amp; AQUATIC RESOURCES MNGT. DIST. (BBWARM)</b>																																											
11	Semiahmoo Drive Stormwater Improvements (BP-2&5): Upsize culverts and re-establish roadside ditch on east side of Semiahmoo Drive	18-009 18-010	50.3	PE \$ 50,000 BBWARM	PE \$ 85,000 BBWARM	PE \$ 50,000 BBWARM	CN	CN	CN	PE \$ 105,000 BBWARM	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 665,000
12	Charel Terrace Stormwater Outfall Improvements: Marine outfall stabilization to protect a bluff slope	20-011	29.8	PE \$ 10,000 BBWARM	PE \$ 100,000 Fed Grant	PE \$ 10,000 BBWARM	PE \$ 100,000 Fed Grant	CN	CN	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 420,000
13	Harborview Rd/Birch Bay Dr Stormwater Improvements (CR-1): Low level system on Birch Bay Dr (CR-2, HL-1); Upsize culverts and high level system on Harborview Rd	07-217	52.0	PE \$ 435,000 BBWARM	PE \$ 60,000 BBWARM	PE \$ 200,000 REET	PE \$ 650,000 BBWARM	PE \$ 25,000 BBWARM	PE \$ 115,000 BBWARM	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 1,505,000
14	Holeman Avenue Stormwater Improvements (PW-1): Replace CBs, upsize culverts, re-establish ditch on Holeman Ave near Birch Bay Dr	07-242	37.8	PE \$ 15,000 BBWARM	PE \$ 25,000 BBWARM	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 475,000
15	Lora Lane Drainage & Tide Gate Modifications (TC1-2): Replace tide gate structure and repair embankment; install Type 2 CB and culvert under Birch Bay Dr	18-008	42.5	PE \$ 20,000 BBWARM	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 1,405,000
16	Wooldridge Ave & Sunset Drive Stormwater Improvements (TC-2): Improve drainage system to reduce local flooding and incorporate water quality treatment	13-007	52.2	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 1,220,000
17	Hillsdale Stormwater Improvements, Phase 1 (HL-C-1): Upsize pipes, replace CBs, new drain line, replace blind tees on Morgan, Cottonwood and Birch Bay Dr	19-002	48.6	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	PE	\$ 750,000	



**Silver Beach Creek Phase 1**  
**Item No. 1 / Database ID No. 07-095**

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

**Project Narrative:**  
This project includes installation of a large stormwater filter vault adjacent to Wood Lake Meadows subdivision in the Hillsdale area of the Lake Whatcom watershed. The new stormwater quality facility will remove the amount sediment and phosphorus entering Silver Beach Creek by filtering approximately 24 acres of contributing area.

**Project Status:**  
Phase 1 design engineering to begin in 2020 with construction to take place in the summer of 2021 during the Lake Whatcom watershed work window.

**Total Estimated Project Cost:** \$820,000



## Academy Road Stormwater Improvements Item No. 2 / 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 of stormwater from the Academy sub-basin of the Lake Whatcom Watershed. This project, 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:**

Preliminary engineering design is anticipated to begin in 2021 with construction to take place in the summer of 2023 during the Lake Whatcom watershed work window.

**Total Estimated Project Cost:** \$480,000



## Geneva Bioretention Pilot Project Item No. 3 / Database ID No. 20-006

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

**Project Narrative:**

This project will utilize a Washington State Department of Ecology grant to install, and monitor the performance of, new high-performance bioretention soil media. The new water quality facility will manage 126 acres of contributing area in the Lake Whatcom water shed, the new media is designed to reduce the amount of phosphorus and other pollutants entering the lake.

**Project Status:**

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

**Total Estimated Project Cost:** \$1,001,000





**Sudden Valley Stormwater Improvements**  
**Item No. 4 / 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:** \$790,000



**Silver Beach Creek Phase 2**  
**Item No. 5 / 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 tributary streams. 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 begin 2022 and construction scheduled to take place in 2024.

**Total Estimated Project Cost:** \$750,000



## Eagleridge Stormwater Improvements Item No. 6 / Database ID No. 20-007

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

**Project Narrative:**

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

**Project Status:**

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

**Total Estimated Project Cost:** \$480,000



**Strawberry Point/ Lake Whatcom Blvd Stormwater Improvements**  
**Item No. 7 / Database ID No. 17-001**

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

**Project Narrative:**

This system upgrade will improve water quality. Project would install a water quality facility to treat approximately 3 acres of residential area. Project elements may include: bioinfiltration swales, filter vaults, media filter drains, and rain gardens.

**Project Status:**

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

**Total Estimated Project Cost:** \$910,000



**Austin Court Stormwater Improvements**  
**Item No. 8 / Database ID No. 20-008**

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

**Project Narrative:**

This project includes the installation of large filter vault, improving the water quality from the existing Austin Court stormwater system. The tributary area is approximately 3 acres and the water quality system will remove sediments and phosphorus form entering into Lake Whatcom.

**Project Status:**

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

**Total Estimated Project Cost:** \$442,000



## Viewhaven Lane Water Quality & Conveyance Improvements Item No. 9 / Database ID No. 20-009

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

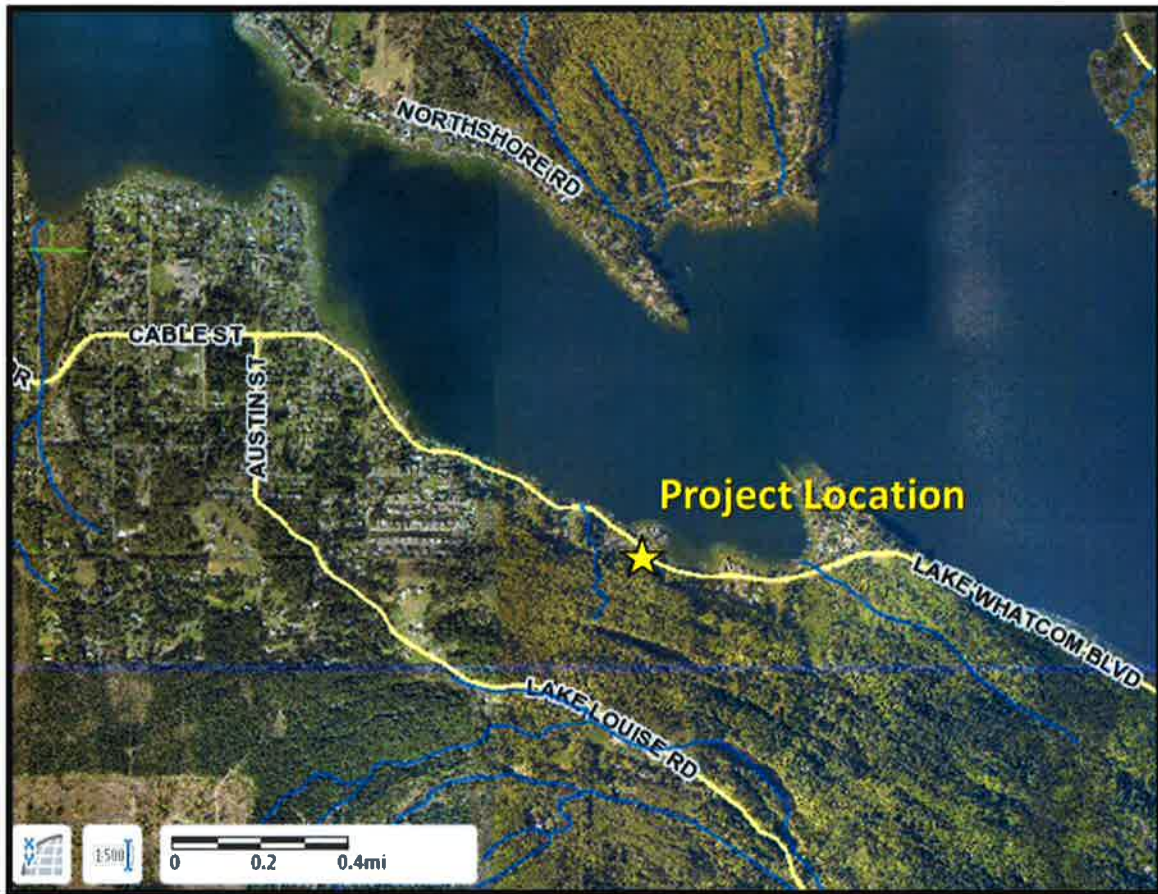
**Project Narrative:**

This project will improve conveyance and water quality near Viewhaven Ln 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 and construction scheduled to take place in 2027.

**Total Estimated Project Cost:** \$726,000



## Geneva Street & Lake Louise Road Culvert Replacement Item No. 10 / Database ID No. 20-010

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

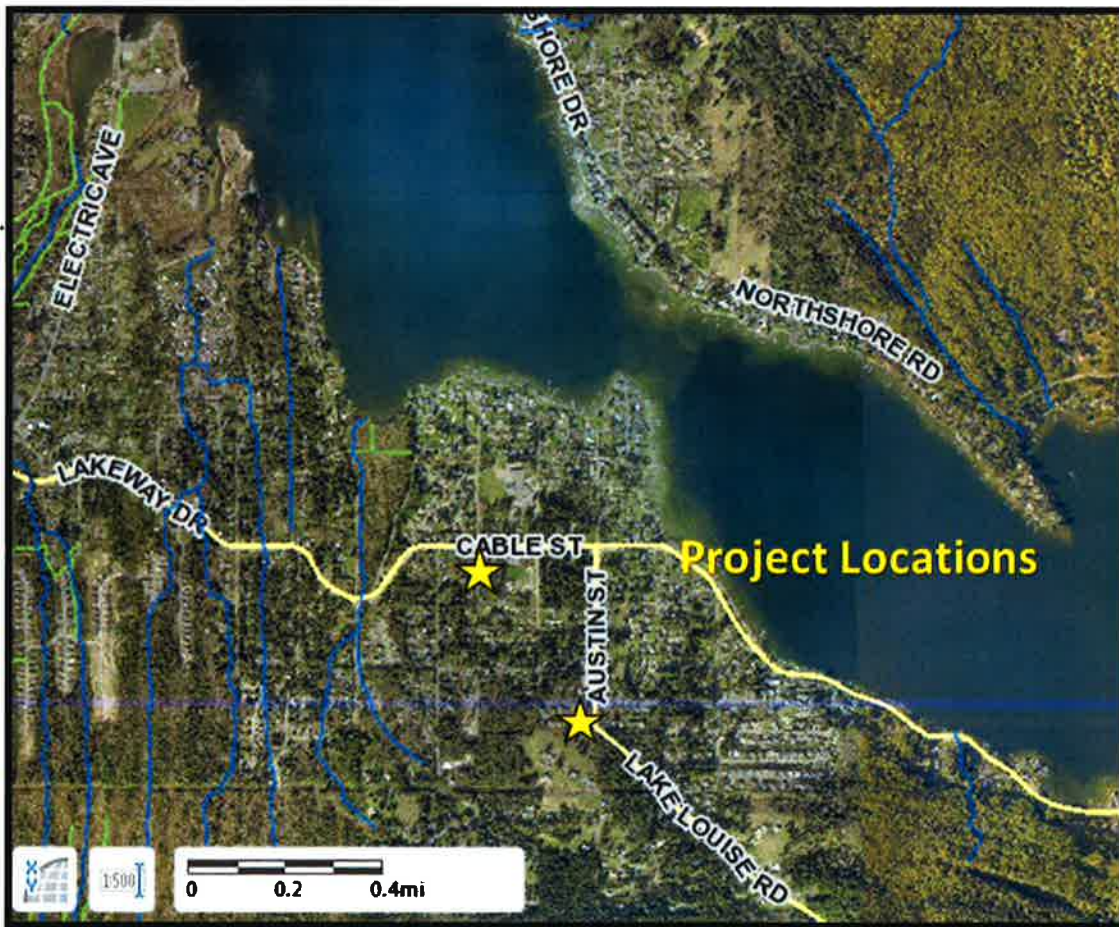
**Project Narrative:**

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 and construction scheduled to take place in 2028

**Total Estimated Project Cost:** \$265,000



**Semiahmoo Drive Stormwater Improvements (BP-2, BP-5)**  
Item No. 11 / 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:** \$665,000





## Charel Terrace Stormwater Outfall Improvements Item No. 12 / Database ID No. 20-011

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

**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 was chosen to complete the study. The study will assess outfall stabilization approaches to protect property and infrastructure while enhancing aquatic habitat.

**Project Status:**

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

**Total Estimated Project Cost:** \$420,000



**Harborview Road/Birch Bay Drive Stormwater Improvements (CR-1)**  
**Item No. 13 / Database ID No. 07-217**

**Construction Funding Year(s):** 2020 & 2021

**Project Narrative:**

This project involves upsizing the upland drainage system along Harborview Road from the intersection of Birch Bay Lynden Road to Birch Bay Drive, improving drainage along a portion of Birch Bay Drive, and connecting the existing drainage system into a new marine outfall into Birch Bay.

**Project Status:**

Design will be completed in 2018, permitting in 2019, construction started in 2020 and completed in 2021.

**Total Estimated Project Cost:** \$1,505,000

**Expenditures to Date:** \$585,000



**Holeman Avenue Stormwater Improvements (PW-1)**  
Item No. 14 / 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



**Lora Lane Drainage & Tide Gate Modifications (TC1-2)**  
**Item No. 15 / Database ID No. 18-008**

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

**Project Narrative:**

The project involves replacing the existing flap gate structure with a self-regulating side-hinged tide gate that would aim to improve drainage from the ditch bordering Leisure Park at Lora Lane and improve fish passage. The embankment surrounding the tide gate would be repaired and stabilized and the culvert passing under Birch Bay Drive from the tide gate would be repaired and connected to a Type 2 stormwater vault on the east side of Birch Bay Drive, which would allow access for maintenance.

**Project Status:**

Preliminary engineering design will begin in 2022 and be completed in 2023. Construction is scheduled to take place in 2024.

**Total Estimated Project Cost:** \$1,405,000



**Wooldridge Avenue & Sunset Drive Stormwater Improvements (TC-2)**  
**Item No. 16 / Database ID No. 13-007**

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

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

**Total Estimated Project Cost:**

DOE Water Quality Grant:	\$750,000*
<b>BBWARM:</b>	<b>\$470,000</b>
Total:	\$1,220,000

\*Unsecured grant funding



**Hillsdale Stormwater Improvements, Phase 1 (HL-C-1)**  
**Item No. 17 / Database ID No. 19-002**

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

**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 2025 and construction of Phase 1 scheduled to take place in 2026.

**Total Estimated Project Cost:** \$750,000



**Morrison Ave & Terrill Drive Stormwater Improvements (TC2-1)**  
Item No. 18 / Database ID No. 19-003

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

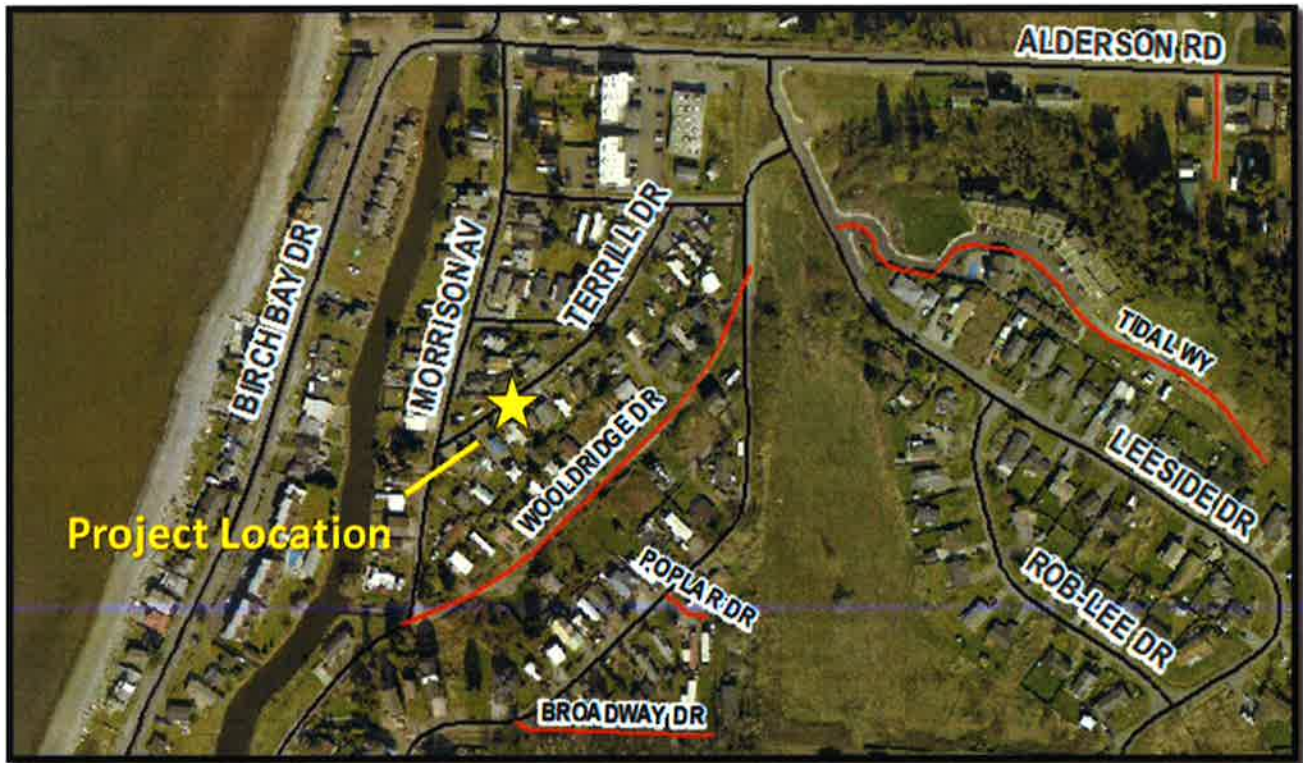
**Project Narrative:**

This project involves installing new storm drain line on Morrison Ave and Willow Drive, replacing and re-grading the storm drain system at Terrill Drive to reduce flooding and issues due to sediment build-up and subsidence.

**Project Status:**

Design is anticipated in 2025-2026 and construction in 2027.

**Total Estimated Project Cost:** \$750,000



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

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

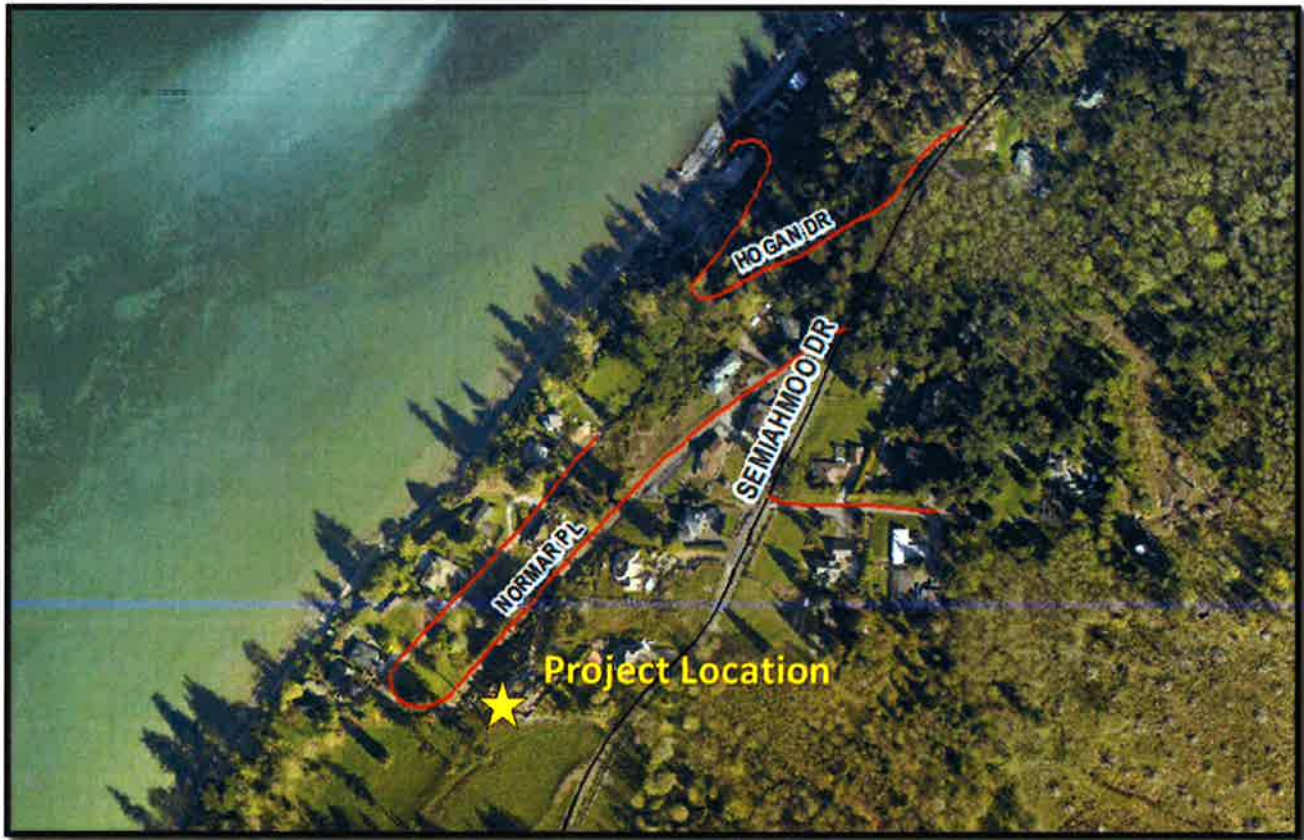
**Project Narrative:**

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 2026-2027 and construction in 2028.

**Total Estimated Project Cost:** \$250,000





## Birch Bay Drive and Pedestrian Facility Item No. 20 / Database ID No: 07-030

**Construction Funding Year(s):** 2019-2021

**Project Narrative:**

This project is located parallel to Birch Bay Drive from Cedar Avenue to the mouth of Terrell Creek. This is an approximate 1.5 mile natural beach berm with pedestrian facility to provide soft-shore erosion protection, habitat enhancement, and encourage pedestrian use along Birch Bay Drive. This multi-beneficial project is included in the Six-Year WRIP to reflect contributions from TAP road funds, STP road funds, WC Road fund, BBWARM, REET, and EDI.

**Project Status:**

Construction is scheduled to begin 2019 with completion spring of 2021. To lessen impacts to the tourist economy and aquatic habitat issues, the construction window will begin after Labor Day and suspend prior to Memorial Day.

**Total Estimated Project Cost:**

STP Road	\$2,550,000
TAP Road	\$620,000
WC Road	\$6,785,000
REET	\$745,000
EDI	\$500,000
<b>BBWARM:</b>	<b><u>\$250,000</u></b>
<b>Total:</b>	<b>\$11,450,000</b>



## Shallow Shores Culvert Relocation Item No. 21 / 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 lake front 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**  
**Item No. 22 / 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. Estimated project cost includes some funding for cleanup of up to four former gas stations, though the exact nature of the work is still undefined.

<b>Total Estimated Project Cost:</b>	\$3,500,000
<b>Expenditures to Date:</b>	\$1,924,000



**Marine Drive Levee 2020 Damage Repair**  
**Item No. 23 / Database ID No. 20-001**

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

**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 initial design phase. Construction is anticipated for summer of 2021. The FCZD is planning on utilizing FEMA funds to partially fund the project.

<b>Total Estimated Cost:</b>	\$345,000
<b>Expenditures to Date:</b>	\$0



**Abbott Levee Protection and Improvement Project**  
**Item No. 24 / Database ID No. 16-007**

**Construction Funding Year – 2021 - 2023**

**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. Phase 1 of this project will address 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:**

The project is currently in the preliminary engineering design phase. The FZCD has contracted with an engineering consultant to design measures to help arrest the ongoing erosion with construction planned for summer of 2021. The reach assessment will also provide the technical basis for developing alternatives for upstream improvements as Phase 2.

<b>Total Estimated Cost:</b>	\$3,200,000
<b>Expenditures to Date:</b>	\$310,000



**Lynden Levee Improvement  
Item No. 25 / Database ID No. 16-003**

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

**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:**

This project is being implemented collaboratively by the FCZD and the USACE. The culvert replacement and levee improvement are being designed by the USACE as part of a levee rehabilitation project. The County is currently at a 60% design level for the reconfigured drainage channel behind the levee. Construction for both portions of this job is expected in 2021. Total project cost includes USACE construction direct contribution.

**Total Estimated Cost:** \$1,989,000

**Expenditures to Date:** \$136,000



**Jones Creek Debris Flow Protection**  
**Item No. 26 / Database ID No. 07-105**

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

**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 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:** \$6,657,000

**Expenditures to Date:** \$1,682,000



**Cougar Creek Early Action Project / Neevel Levee Bank Stabilization**  
**Item No. 27 / Database ID No. 16-008**

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

**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. This project includes both of these components.

**Project Status:**

Conceptual designs have been developed as part of the SWIF and FLIP planning processes. Detailed design has not been initiated yet.

<b>Total Estimated Cost:</b>	\$1,360,000
<b>Expenditures to Date:</b>	\$0





**Everson Overflow Pipeline Stabilization**  
**Item No. 28 / Database ID No. 20-002**

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

**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 2023. The FCZD is planning on utilizing FEMA funds to partially fund the project. Initial cost estimate are for design purposed only.

<b>Total Estimated Design Cost:</b>	\$160,000
<b>Expenditures to Date:</b>	\$0



**Truck Road 2020 Flood Damage  
Item No. 29 / 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:**

An analysis of road realignment and bank stabilization alternatives is planned for 2021. Preliminary design of the preferred alternatives will be initiated once the preferred alternative is selected. Construction of the road setback is anticipated to occur in 2023. The FCZD is seeking FEMA funds to partially fund the project. Project cost listed is for design only.

<b>Total Estimated Design Cost:</b>	\$160,000
<b>Expenditures to Date:</b>	\$0



**Bertrand Creek Levee Stabilization  
Item No. 30 / Database ID No. 16-005**

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

**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. Detailed design has not been initiated yet.

<b>Total Estimated Cost:</b>	\$190,000
<b>Expenditures to Date:</b>	\$0



**Devries Levee Improvements**  
**Item No. 31 / Database ID No. 16-008**

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

**Project Narrative:**  
This project involved 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.

<b>Total Estimated Cost:</b>	\$250,000
<b>Expenditures to Date:</b>	\$0



## Upper Hampton Levee Improvements Item No. 32 / Database ID No. 16-006

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

**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.

**Total Estimated Cost:** \$700,000

**Expenditures to Date:** \$0



## Ferndale Levee Improvement Project Item No. 33 / Database ID No. 07-104

**Construction Funding Year(s):** 2025 - 2026

**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. Alternative analysis is being conducted by an engineering consultant. A 60 percent design level plan of the proposed levee configuration is anticipated Fall of 2022. Grant funding has been secured to complete this design. Construction of the project is anticipated in 2025 or 2026.

<b>Total Estimated Design Cost:</b>	\$1,200,000
<b>Expenditures to Date:</b>	\$550,000



## Glacier-Gallup Creeks Alluvial Fan Restoration

Item No. 34 / 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.

<b>Total Estimated Project Cost:</b>	TBD
<b>Expenditures to Date:</b>	\$185,000



**Dahlberg Wetland Mitigation Site**  
**Item No. 35 / Database ID No. 20-004**

**Construction Funding Year(s):** 2020 - 21

**Project Narrative:**  
The FCZD is working to restore a recently purchased property northeast of Ferndale. The property has a dilapidated farm house. The site will be utilized for wetland mitigation on future project.

**Project Status:**  
FCZD has purchased the subject property and is working on demolishing the existing structure on site. Planting and restoring will follow.

<b>Total Estimated Cost:</b>	\$100,000
<b>Expenditures to Date:</b>	\$0





**Floodplain Acquisition**  
**Item No. 36 / Database ID No. 07-002**

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

**Project Narrative:**

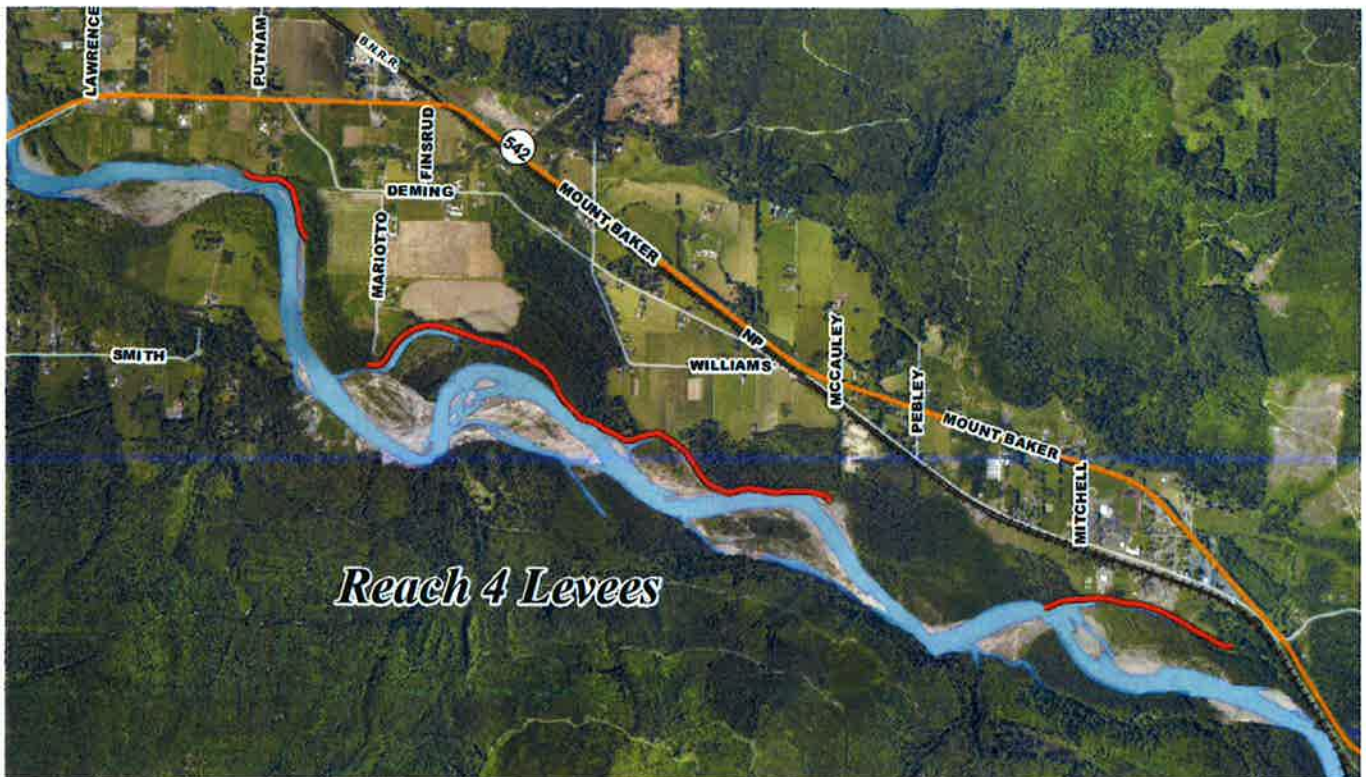
Reach-scale projects to reconfigure flood infrastructure are being evaluated through the integrated planning processes that started with the System-wide Improvement Framework (SWIF) and has transitioned into the Floodplain Integrated Planning (FLIP) process. The goal of this work is to reduce flood risk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

<b>Total Estimated Cost:</b>	TBD
<b>Expenditures to Date:</b>	\$1,035,000



**Emergency/New Projects**  
**Item No. 37 Database ID No. 08-003**

**Construction Funding Year(s):** 2021 - 2026

**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:** \$125,000 to \$425,000/year

**Expenditures to Date:** N/A

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