

**WHATCOM COUNTY
PUBLIC WORKS DEPARTMENT**

JON HUTCHINGS
Director



NATURAL RESOURCES

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MEMORANDUM

TO: The Honorable Satpal Singh Sidhu, Whatcom County Executive, and
Honorable Members of the Whatcom County Council

THROUGH: Jon Hutchings, Director

FROM: Gary S. Stoyka, Natural Resources Program Manager

DATE: September 14, 2021

RE: September 21, 2021 Council Water Work Session

Please refer to the proposed agenda below for the next Water Work Session. Additional supporting documents may be distributed at or before the meeting.

AGENDA

Date:	Tuesday, September 21, 2021		
Time:	10:30 a.m. to 12:00 p.m.		
Place:	Virtual Meeting. For instructions on how to watch or participate in this meeting, please visit us at www.whatcomcounty.us/joinvirtualcouncil or contact the Council Office at 360.778.5010. View meeting schedules, agendas, minutes, videos, and archives at www.whatcom.legistar.com .		
Time	Topic	Council Action Requested	Background Information Attached
10:30 AM – 11:00 AM	Water Resources Update	Informational	None
11:00 AM – 11:45 AM	2022-2027 Water Resources Improvement Plan	Discussion	None
11:45 AM – 12:00 PM	Domestic Water Use Efficiency Project Update – Whatcom Water Alliance	Informational	None

If you have questions, please feel free to call me at (360) 778-6218.

cc:

Dana Brown-Davis
Kristi Felbinger
Jill Nixon
Jennifer Schneider
Karen Frakes

Erika Douglas
John Thompson
Paula Harris
Lonni Cummings
Kraig Olason

Cathy Craver
Beth Bushaw
Jim Karcher
Atina Casas
Doug Ranney

Roland Middleton
Mark Personius
Josh Fleischmann
Tyler Schroeder
Sue Sullivan

Mike McFarlane
Aneka Sweeney
Chris Elder

PROPOSED BY: _____

INTRODUCED: 9/14/21

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 2022 THROUGH 2027**

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
- Lake Whatcom East Geneva Subwatershed Master Plan, January 2021

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 2022 through 2027, which is attached hereto as Exhibit "A", is hereby adopted.

APPROVED this ____ day of _____, 2021.

ATTEST:

Flood Control Zone District Board of
Supervisors
WHATCOM COUNTY, WASHINGTON

Dana Brown-Davis, Clerk of the Council

Barry Buchanan, Chair

APPROVED AS TO FORM:

Christopher Quinn, Senior Deputy Prosecuting Attorney – Civil Division

Item No.	Project Description	Database ID No.	BES	Previous Expenditures			2022			2023			2024			2025			2026			2027			Total
				Phase	Amount	Source	Phase	Amount	Source	Phase	Amount	Source	Phase	Amount	Source	Phase	Amount	Source	Phase	Amount	Source	Phase	Amount	Source	
LAKE WHATCOM STORMWATER																									
1	Sudden Valley Stormwater Improvements: Drainage system upgrades, water quality treatment and outfall retrofits in partnership with Sudden Valley HOA	13-004	46.3	PE	\$ 100,000	REET	PE			PE			PE			PE			PE			PE			\$ 700,000
				PE			PE			PE			PE			PE			PE			PE			
				RW			RW			RW			RW			RW			RW			RW			
				CN			CN	\$ 600,000	REET	CN			CN			CN			CN			CN			
				CN			CN			CN			CN			CN			CN			CN			
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	\$ 50,000	LWSU	PE			PE			PE			PE			PE			\$ 533,000
				PE	\$ 40,000	LWSU	PE			PE			PE			PE			PE			PE			
				PE	\$ 63,000	REET	RW			RW			RW			RW			RW			RW			
				CN			CN			CN	\$ 100,000	REET	CN			CN			CN			CN			
				CN			CN			CN	\$ 200,000	LWSU	CN			CN			CN			CN			
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	\$ 20,000	LWSU	PE	\$ 25,000	REET	PE	\$ 40,000	LWSU	PE	\$ 2,500	REET	PE	\$ 2,500	REET	PE			PE			\$ 1,021,000
				PE			PE	\$ 118,000	DOE Grant	PE			PE	\$ 7,500	DOE Grant	PE	\$ 7,500	DOE Grant	PE			PE			
				RW			RW	\$ 15,000	REET	RW			RW			RW			RW			RW			
				CN			CN			CN	\$ 610,000	DOE Grant	CN			CN			CN			CN			
				CN			CN			CN	\$ 173,000	REET	CN			CN			CN			CN			
4	Silver Beach Creek Phase 2: Main channel restoration below Hillsdale using natural vegetation	07-095	60.5	PE	\$ 50,000	REET	PE	\$ 80,000	REET	PE			PE			PE			PE			PE			\$ 750,000
				PE			PE			PE			PE			PE			PE			PE			
				RW	\$ 20,000	REET	RW			RW			RW			RW			RW			RW			
				CN			CN			CN			CN	\$ 600,000	REET	CN			CN			CN			
				CN			CN			CN			CN			CN			CN			CN			
5	Eagleridge Stormwater Improvements: Install a water quality system to treat stormwater from the Eagleridge development.	20-007	61.4	PE			PE			PE	\$ 40,000	REET	PE	\$ 100,000	REET	PE			PE			PE			\$ 480,000
				PE			PE			PE			PE			PE			PE			PE			
				RW			RW			RW	\$ 15,000	REET	RW			RW			RW			RW			
				CN			CN			CN			CN			CN	\$ 325,000	REET	CN			CN			
				CN			CN			CN			CN			CN			CN			CN			
6	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	\$ 70,000	REET	PE	\$ 140,000	REET	PE			PE			\$ 910,000
				PE			PE			PE			PE			PE			PE			PE			
				RW			RW			RW			RW	\$ 50,000	REET	RW			RW			RW			
				CN			CN			CN			CN	\$ 50,000	REET	CN			CN	\$ 650,000	REET	CN			
				CN			CN			CN			CN			CN			CN			CN			
7	Austin Court Stormwater Improvements: Install water quality system on the discharge from Austin Court.	20-008	58.8	PE			PE			PE			PE			PE	\$ 30,000	REET	PE	\$ 80,000	REET	PE			\$ 442,000
				PE			PE			PE			PE			PE			PE			PE			
				RW			RW			RW			RW			RW	\$ 12,000	REET	RW			RW			
				CN			CN			CN			CN			CN			CN			CN	\$ 320,000	REET	
				CN			CN			CN			CN			CN			CN			CN			
8	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	\$ 10,000	REET	PE	\$ 50,000	REET	PE			\$ 251,000
				PE			PE			PE			PE			PE			PE			PE			
				RW			RW			RW			RW			RW	\$ 16,000	REET	RW			RW			
				CN			CN			CN			CN			CN			CN			CN	\$ 175,000	REET	
				CN			CN			CN			CN			CN			CN			CN			
9	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	\$ 40,000	REET	PE	\$ 40,000	LWSU	\$ 115,000
				PE			PE			PE			PE			PE			PE			PE	\$ 25,000	Road Funds	
				RW			RW			RW			RW			RW			RW			RW	\$ 10,000	Road Funds	
				CN			CN			CN			CN			CN			CN			CN			
				BIRCH BAY WATERSHED & AQUATIC RESOURCES MNGT. DIST. (BBWARM)																					
10	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	\$ 135,000	BBWARM	PE	\$ 105,000	BBWARM	PE			PE			PE			PE			PE			\$ 625,000
				RW	\$ 50,000	BBWARM	RW			RW			RW			RW			RW			RW			
				CN			CN	\$ 135,000	BBWARM	CN			CN			CN			CN			CN			
				CN			CN	\$ 200,000	REET	CN			CN			CN			CN			CN			
11	Charel Terrace Stormwater Outfall Improvements: Marine outfall stabilization to protect a bluff slope	20-011	29.8	PE	\$ 10,000	BBWARM	PE	\$ 11,875	BBWARM	PE	\$ 37,500	BBWARM	PE			PE			PE			PE			\$ 520,000
				PE	\$ 70,000	Fed Grant	PE	\$ 73,125	Fed Grant	RW			RW			RW			RW			RW			
				RW			RW			RW			RW			RW			RW			RW			
				CN	\$ 5,000	BBWARM	CN	\$ 10,000	Fed Grant	CN			CN			CN			CN			CN			
				CN	\$ 40,000	Fed Grant	CN			CN	\$ 262,500	Fed Grant	CN			CN			CN			CN			
12	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	\$ 40,000	BBWARM	PE	\$ 90,000	BBWARM	PE	\$ 45,000	BBWARM	PE			PE			PE			PE			\$ 475,000
				RW			RW			RW			RW			RW			RW			RW			
				CN			CN			CN	\$ 100,000	BBWARM	CN			CN			CN			CN			
				CN			CN			CN	\$ 200,000	REET	CN			CN			CN			CN			
13	Normar Place Stormwater Improvements (BP-1): Upsize pipes, replace CBs and install energy dissipater at pipe outfall on Normar Place	19-004	52.0	PE			PE	\$ 75,000	BBWARM	PE	\$ 75,000	BBWARM	PE			PE			PE			PE			\$ 450,000
				RW			RW			RW			RW			RW			RW			RW			
				CN			CN			CN			CN			CN	\$ 100,000	BBWARM	CN			CN			
				CN			CN			CN			CN	\$ 200,000	REET	CN			CN			CN			
14	Birch Point Road and Outfall Improvements (BP-3 & BP-6): Upsize culverts and replace outfall to the beach to reduce bluff erosion	21-001	33.3	PE			PE			PE	\$ 50,000	BBWARM	PE	150,000	BBWARM	PE			PE			PE			\$ 665,000
				RW			RW			RW			RW			RW			RW			RW			
				CN			CN			CN			CN			CN	\$ 265,000	BBWARM	CN			CN			
				CN			CN			CN			CN	\$ 200,000	REET	CN			CN			CN			
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	\$ 35,000	BBWARM	PE	\$ 50,000	BBWARM	PE			PE			PE	\$ 150,000	BBWARM	PE			PE			\$ 1,500,000
				RW			RW	\$ 30,000	Road Fund	CN			RW			RW			RW	\$ 35,000	Road Funds	RW			
				CN			CN			CN			CN			CN			CN	\$ 400,000	BBWARM	CN			
				CN			CN			CN			CN			CN			CN	\$ 200,000	REET	CN			
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	CN			CN			CN			CN			CN			CN			CN			\$ 1,220,000
				PE			PE			PE			PE			PE	\$ 100,000	BBWARM	PE	\$ 120,000	BBWARM	PE			
				RW			RW			RW			RW			RW			RW			RW			
				CN			CN			CN			CN			CN			CN			CN	\$ 200,000	REET	
				CN			CN			CN			CN			CN			CN			CN	\$ 800,000	DOE Grant	
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	\$ 50,000	BBWARM	PE	\$ 100,000	BBWARM	\$ 150,000

No.	Project Description	Database ID No.	BES	Previous Expenditures			2022			2023			2024			2025			2026			2027			Total
				Phase	Amount	Source	Phase	Amount	Source	Phase	Amount	Source	Phase	Amount	Source	Phase	Amount	Source	Phase	Amount	Source	Phase	Amount	Source	
RIVER & FLOOD																									
19	Marietta Acquisition: Acquire properties in repetitive flood loss area and remove structures	07-002	79.6	RW/CN	\$ 662,000	FCZD	RW			RW			RW			RW			RW			RW		Total through '21	
				RW/CN	\$ 1,044,000	FEMA Fed/State grant	RW	\$50,000		RW	\$100,000		RW	\$100,000		RW	\$100,000		RW	\$100,000		RW	\$100,000	\$ 1,851,000	
				RW/CN	\$ 145,000	ESRP grant	CN	\$25,000		CN	\$25,000		CN	\$25,000		CN	\$25,000		CN	\$25,000		CN	\$25,000	FCZD Total:	
20	Marine Drive Levee 2020 Damage Repair: Repair crest and backslope damage from February 2020 flood	20-001	61.4	PE	\$ 11,000	FCZD	PE	\$ 4,000	FCZD	PE			PE			PE			PE			PE		Project Total:	
				PE	\$ 32,000	FEMA	PE	\$ 11,000	FEMA	PE			PE			PE			PE			PE		\$ 393,000	
				CN			CN	\$ 80,000	FCZD	CN	\$ 4,000	FCZD	CN			CN			CN			CN		FCZD Total:	
21	Abbott Levee Protection and Improvement: Interim erosion protection measures for levee & road (Ph. 1); Extend and realign upstream end of levee (Ph. 2 - SWIF project)	16-007	70.4	CN			CN	\$ 240,000	FEMA	CN	\$ 11,000	FEMA	CN			CN			CN			CN		\$ 99,000	
				PE	\$ 421,000	FCZD/Roads	PE	\$ 310,000	FCZD/Roads (50/50)	PE	\$ 50,000		PE	\$ 50,000	FCZD/Roads (50/50)	PE			PE			PE		Phase 1 Total:	
				CN	\$ 609,000	FCZD/Roads	PE			RW	\$ 75,000	FCZD/Roads	CN	\$ 1,000,000	FCZD	CN			CN			CN		\$ 1,030,000	
22	Lynden Levee Improvement: Combine drainages and replace two culverts through levee with one larger culvert; repair 2 damaged levee sites (USACE and SWIF project)	16-003	64.5	CN			CN						CN	\$ 1,300,000	Roads	CN			CN			CN			
				PE	\$ 55,000	FCZD	PE					PE			PE			PE			PE			Project Total:	
				PE	\$ 218,000	FbD	PE					PE			PE			PE			PE			\$ 1,766,000	
23	Jones Creek Debris Flow Protection: Construct deflection berm and address local access	07-105	70.6	CN	\$ 288,000	FCZD	CN	\$ 19,000	FCZD				CN			CN			CN			CN		(See Note 1)	
				CN	\$ 308,000	FbD grant	CN	\$ 36,000	FbD grant				CN			CN			CN			CN		FCZD Total:	
				CN	\$ 842,000	USACE	CN						CN			CN			CN			CN		\$ 362,000	
24	Cougar Creek Early Action Project/Neevel Levee Bank Stabilization: Stabilize oversteepened section of levee (SWIF project) with new flood gate and restoration (FLIP project)	16-008	59.4	PE	\$ 698,000	FCZD	PE	\$ 126,000	FCZD	PE	\$ 40,000		PE	\$ 40,000		PE			PE			PE		Project Total:	
				RW	\$ 535,000	FCZD	PE	\$ 54,000	Roads	PE			PE			PE			RW			RW		\$ 6,872,000	
				RW	\$ 350,000	FEMA/State grant	RW	\$ 50,000	Roads	RW			RW			RW			RW			RW			
25	Everson Overflow Pipeline Bank Stabilization: Stabilize bank at erosion site from 2020 flood downstream of pipeline crossing	20-002	66.3	RW	\$ 1,485,000	FbD grant	CN	\$ 31,000	FCZD	CN	\$ 1,300,000		CN	\$ 2,000,000		CN			CN			CN			
				CN	\$ 26,000	FCZD	CN	\$ 124,000	FbD grant	CN			CN			CN			CN			CN			
				CN	\$ 13,000	FEMA/State grant	CN			CN			CN			CN			CN			CN			
26	Truck Road 2020 Flood Damage: Evaluate alternatives for road relocation and bank stabilization	20-003	59.4	PE	\$ 70,000	FCZD	PE	\$ 19,000	FCZD	PE	\$ 25,000		PE			PE			PE			PE		Project Total:	
				PE	\$ 105,000	NOAA grant	PE	\$ 76,000	FbD grant	PE			PE			PE			PE			PE		\$ 1,660,000	
				CN			CN			CN	\$ 1,350,000		CN	\$ 15,000		CN			CN			CN			
27	Bertrand Creek Levee Stabilization: Restore right and left levee prisms and install bank protection (SWIF project)	16-005	54.4	CN			CN			CN			CN			CN			CN			CN			
				PE	\$ 35,000	FCZD	PE	\$ 45,000	FCZD	PE	\$ 40,000		PE			PE			PE			PE		Project Total:	
				PE	\$ 104,000	FEMA	PE	\$ 135,000	FEMA	RW			RW			CN			RW			RW		\$ 320,000	
28	Devries Levee Improvements: Widen and establish full crest width and backslope levee (SWIF project)	19-001	49.3	CN			CN			CN			CN	\$ 1,000,000		CN			CN			CN			
				PE	\$ 22,000	FCZD	PE	\$ 36,000	FCZD	PE	\$ 50,000		PE			PE			PE			PE		Project Total:	
				PE	\$ 22,000	Roads	PE	\$ 36,000	Roads	PE			PE			PE			PE			PE		\$ 235,000	
29	Upper Hampton Levee Improvements: Widen levee crest and flatten backslope at two sites and address seepage at a third site (SWIF project)	16-006	70.4	PE	\$ 132,000	FEMA	PE	\$ 218,000	FEMA	PE			PE			PE			PE			PE		Project Total:	
				RW	\$ 40,000	FCZD																		\$ 262,000	
				RW	\$ 40,000	Roads	RW			CN	\$ 3,000,000		CN			CN			CN			CN			
30	Ferndale Levee Improvement: Reconstruct and realign Ferndale and Treatment Plant Levees to improve level of protection and address deficiencies	07-104	68.9	CN			CN			CN			CN			CN			CN			CN			
				PE	\$ 20,000	FCZD	PE	\$ 35,000	FCZD	PE			PE			PE			PE			PE		Project Total:	
				CN			CN	\$ 225,000	FCZD	CN	\$ 15,000		CN			CN			CN			CN		\$ 320,000	
31	Glacier-Gallup Alluvial Fan Restoration: Remove all or part of Glacier Creek levee and construct setback levee along Gallup Creek	18-006	88.9	PE	\$ 116,000	FCZD	PE	\$ 31,000	FCZD	PE	\$ 124,000	FbD grant	PE	\$ 124,000	FbD grant	PE	\$ 255,000		PE	\$ 50,000		PE	\$ 50,000	Construction	
				PE	\$ 298,000	FbD grant	PE	\$ 462,000	FbD grant	PE	\$ 124,000	FbD grant	RW	\$ 100,000		RW			RW			RW		Expected	
				RW			CN									CN			CN	\$ 2,000,000		CN	\$ 5,000,000		in 2025-27
32	Dahlberg Wetland Mitigation Site: Develop advance mitigation site for future impacts from Flood and Road projects	20-004	66.3	PE	\$ 63,000	FCZD	PE	\$ 105,000	FCZD	PE	\$ 100,000		PE	\$ 100,000		PE	\$ 100,000		PE			PE		Construction	
				PE	\$ 254,000	FbD grant	PE	\$ 220,000	FbD grant	PE			PE			PE			PE			PE		Expected	
				RW			RW			RW	\$ 500,000		RW	\$ 100,000		RW			RW			RW		in 2026	
33	Floodplain Acquisition: Acquire key properties for future levee reconfiguration to reduce risk and improve habitat (may include land for Glacier-Gallup depending on timing of purchase)	07-002	79.6	CN			CN			CN			CN			CN			CN			CN			
				PE	\$ 18,000	FCZD	PE	\$ 160,000	FCZD	PE	\$ 100,000		PE			PE	\$ 100,000		PE	\$ 100,000		PE	\$ 100,000		
				RW	\$ 814,000	FCZD	CN			CN			CN	\$ 1,000,000		CN			CN	\$ 500,000		CN			
34	Emergency/New Projects: Typically repair projects that result from new damage, as needed	08-003	Varies	CN	\$ 17,000	FCZD							CN			CN			CN			CN			
				RW	\$ 300,000	FCZD	RW	\$ 212,000	FCZD	RW	\$ 300,000	FCZD	RW			RW	\$ 1,000,000		RW			RW			
				RW	\$ 828,000	FbD grant	RW	\$ 848,000	FbD grant	RW	\$ 1,200,000	FbD grant	RW			RW			RW			RW			
35	Emergency/New Projects: Typically repair projects that result from new damage, as needed	08-003	Varies	PE	\$ 25,000	FCZD	PE	\$ 25,000		PE	\$ 25,000		PE	\$ 25,000		PE	\$ 25,000		PE	\$ 25,000		PE	\$ 25,000		
				RW			RW			RW			RW			RW			RW			RW		Total/year:	
				CN	\$ 50,000	Local sponsor	CN	\$ 50,000		CN	\$ 50,000		CN	\$ 50,000		CN	\$ 50,000		CN	\$ 50,000		CN	\$ 50,000	\$ 425,000	
36	Emergency/New Projects: Typically repair projects that result from new damage, as needed	08-003	Varies	CN	\$ 350,000	FCZD	CN	\$ 350,000		CN	\$ 350,000		CN	\$ 350,000		CN	\$ 350,000		CN	\$ 350,000		CN	\$ 350,000		
				NOTES						KEY															
				Numbers in <i>italics</i> are placeholders for projects still being conceived.						BES = Benefit Evaluation Score (from CWIRP database)															
Previous expenditures includes work contracted in 2020 that will continually appropriate into 2021.						RW = right-of-way or property acquisition																			
Note 1: Estimated total project cost includes work done by U.S. Army Corps of Engineers (USACE) and funded directly by USACE.						PE = engineering design																			
						CN = construction																			

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

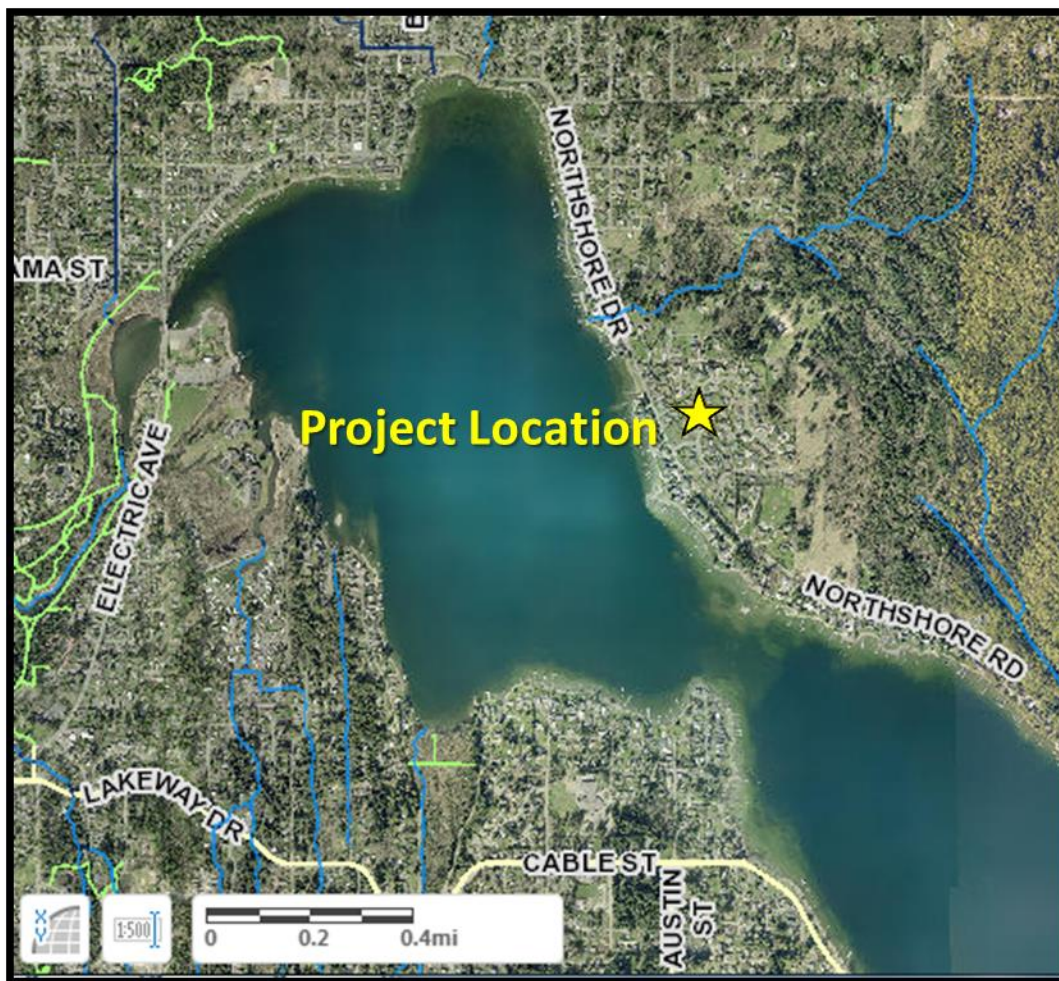
Project Narrative:

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

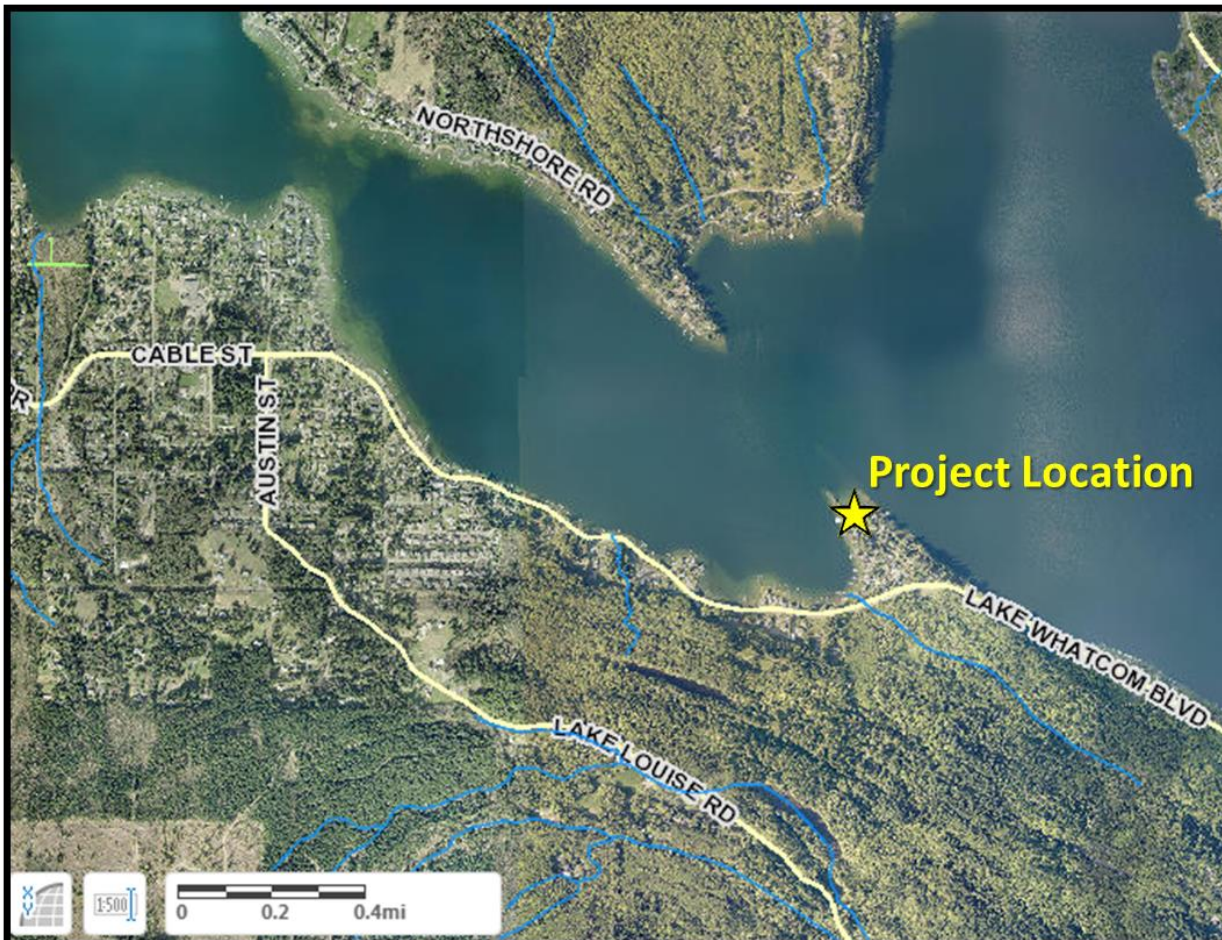
Project Narrative:

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.

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

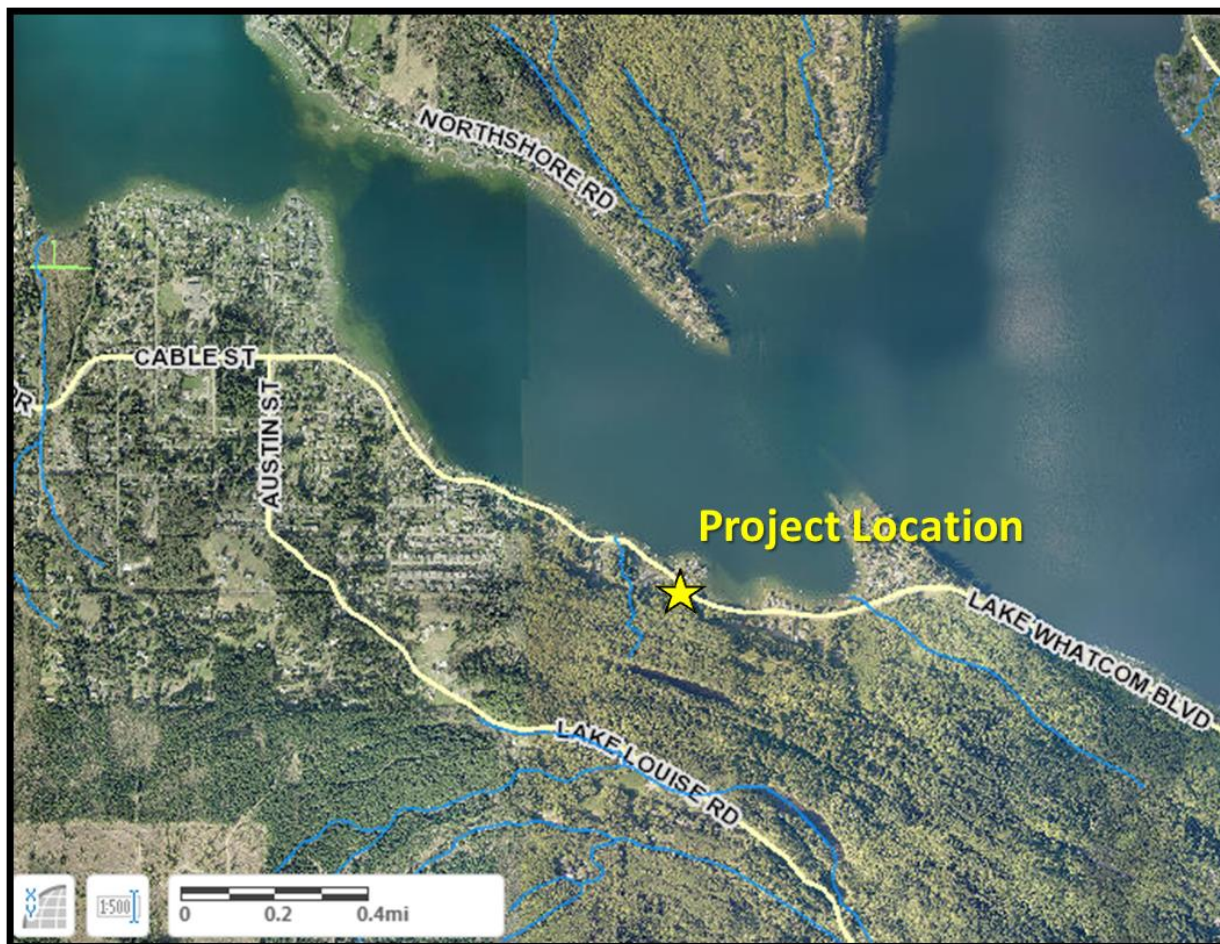
Project Narrative:

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:

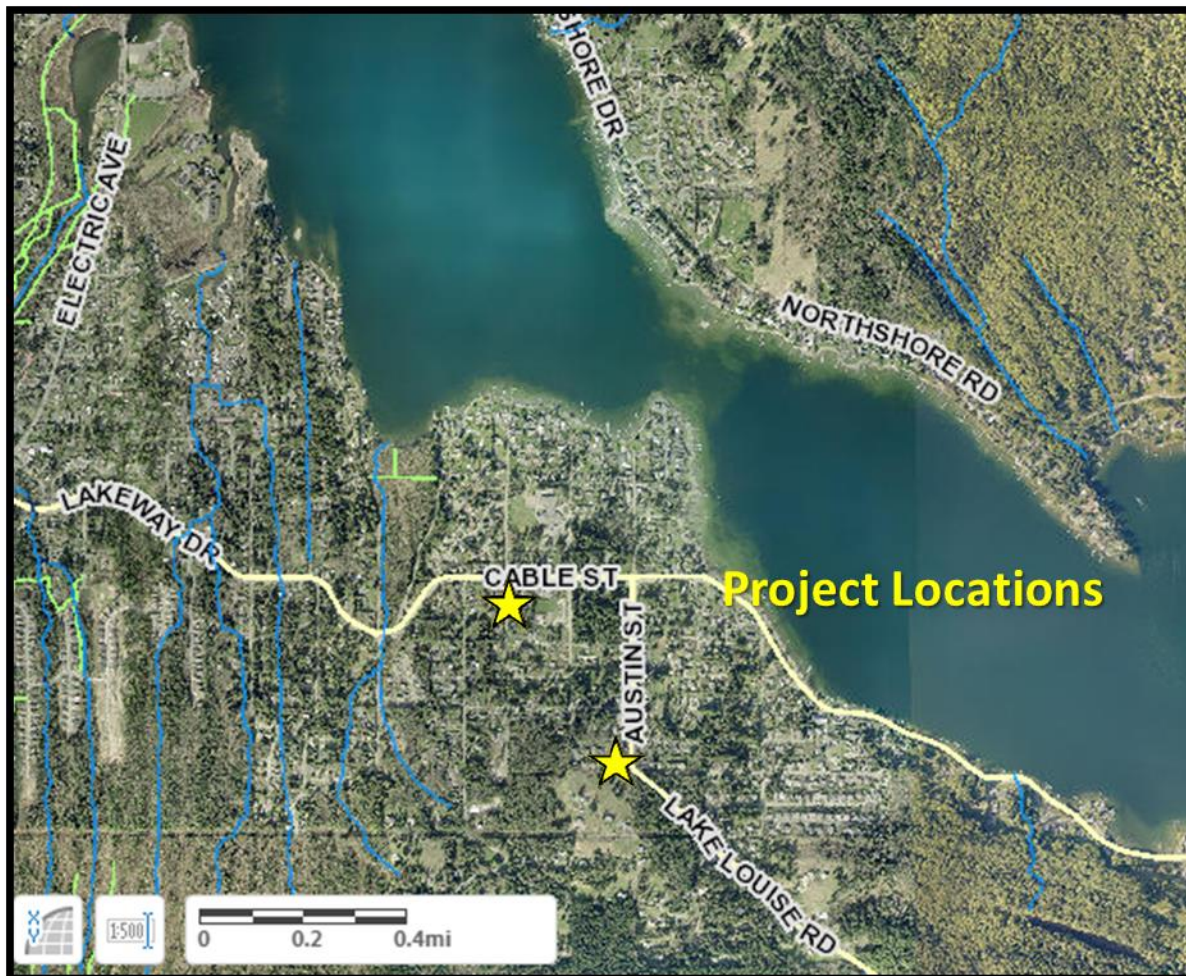
Project will improve conveyance of roadside ditches and culverts along Geneva Street and Lake Louise Road. The project will replaced approximately 200 linear feet of undersized or damaged culverts.

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

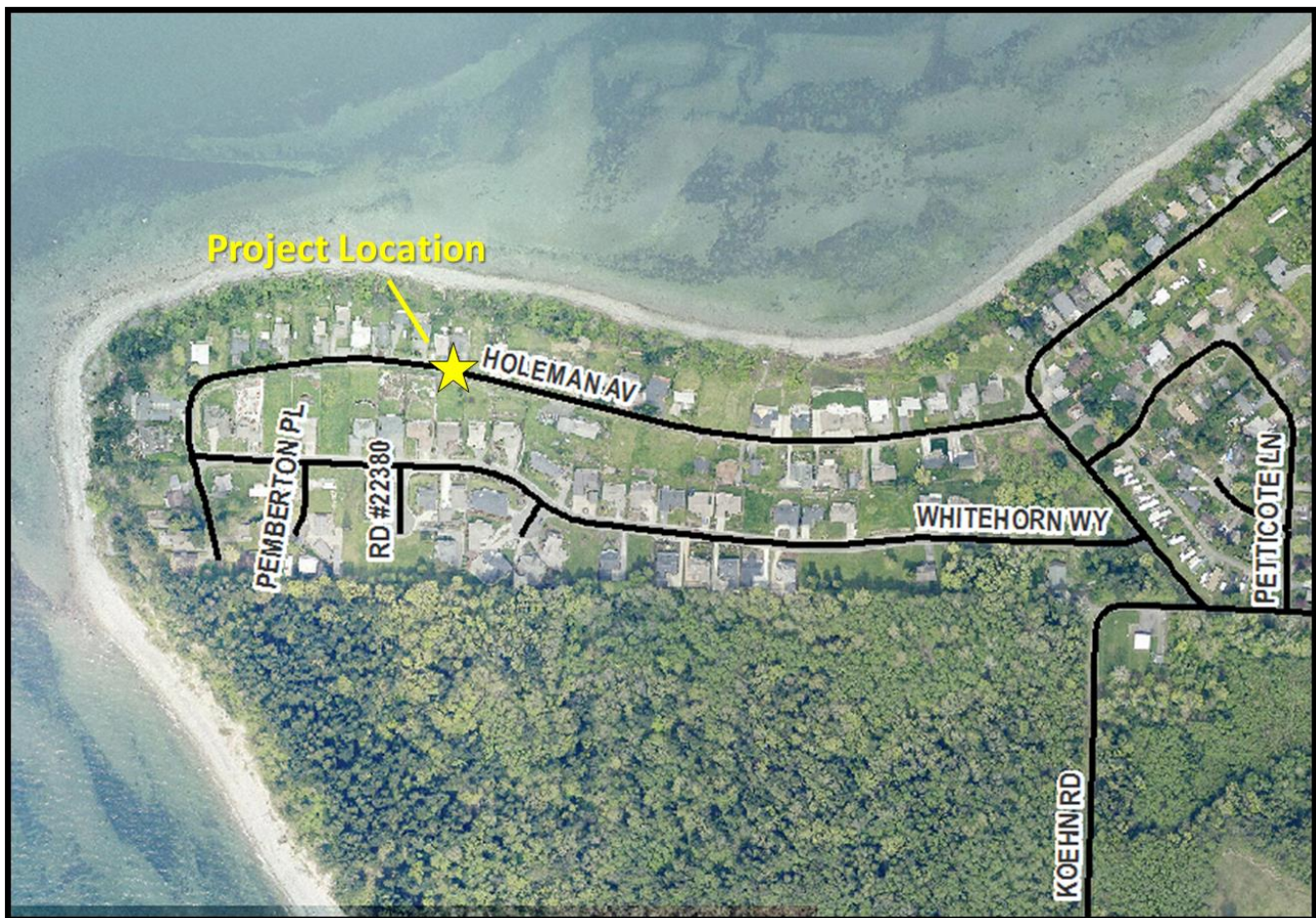
Project Narrative:

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

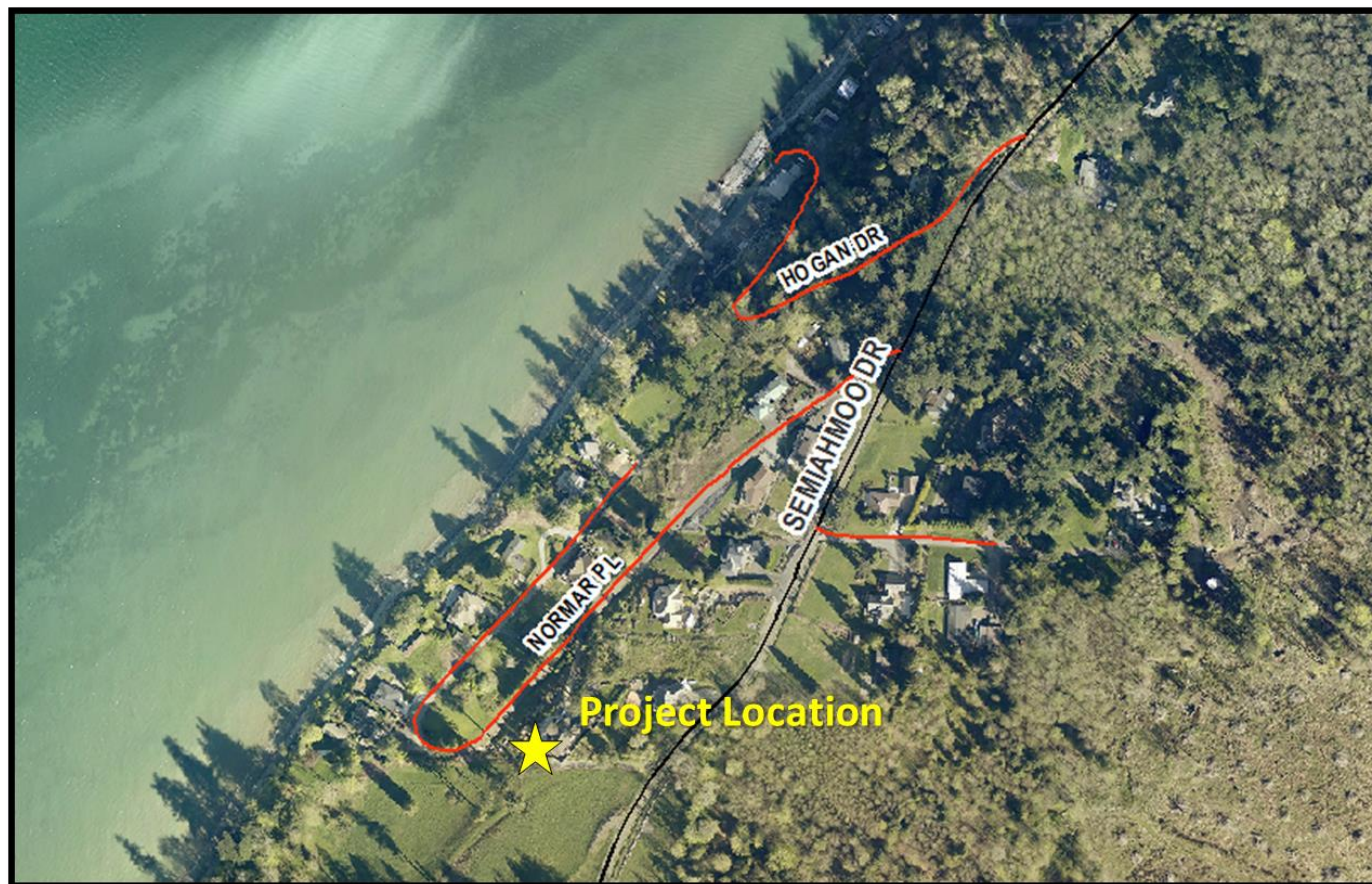
Project Narrative:

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

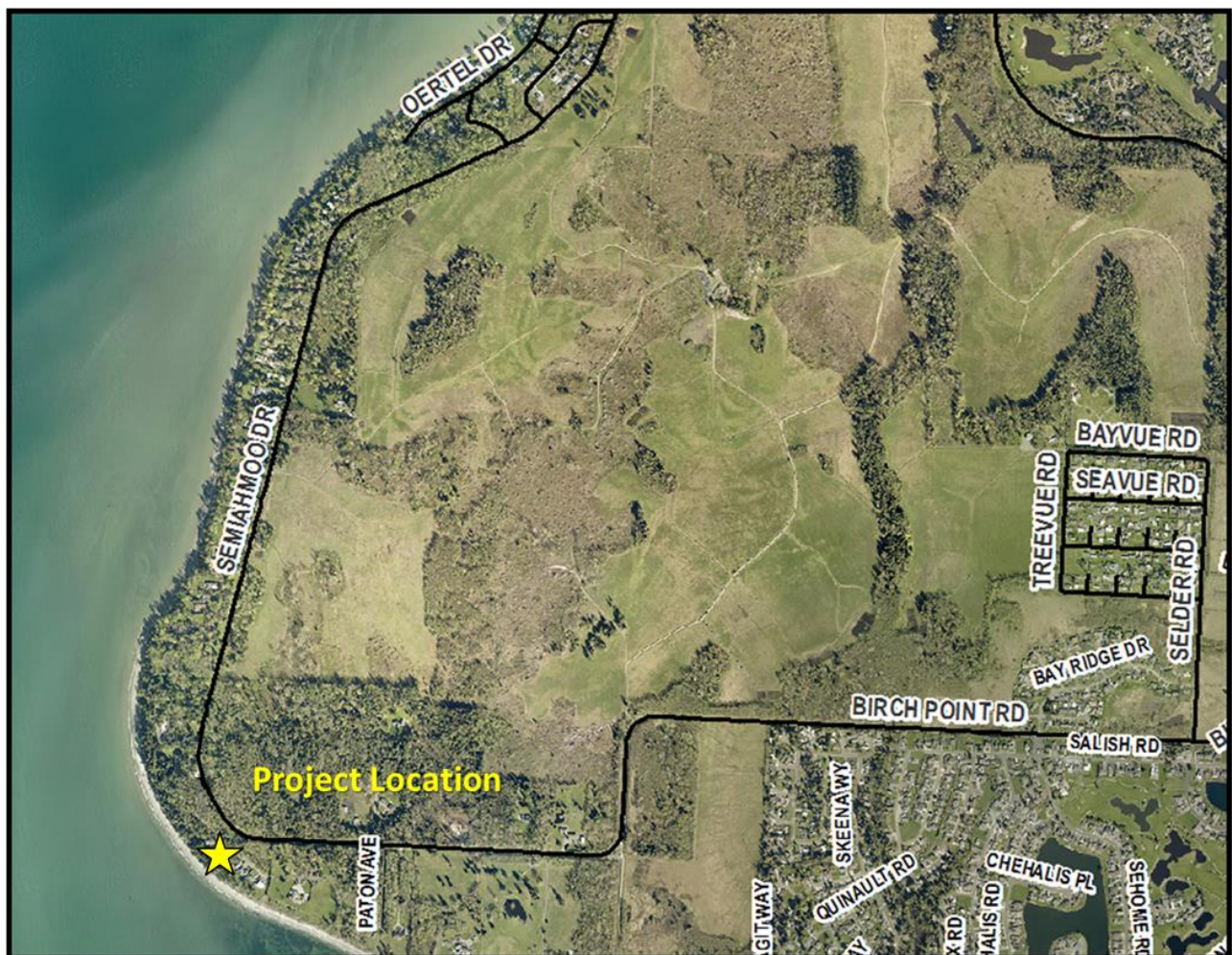
Project Narrative:

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:

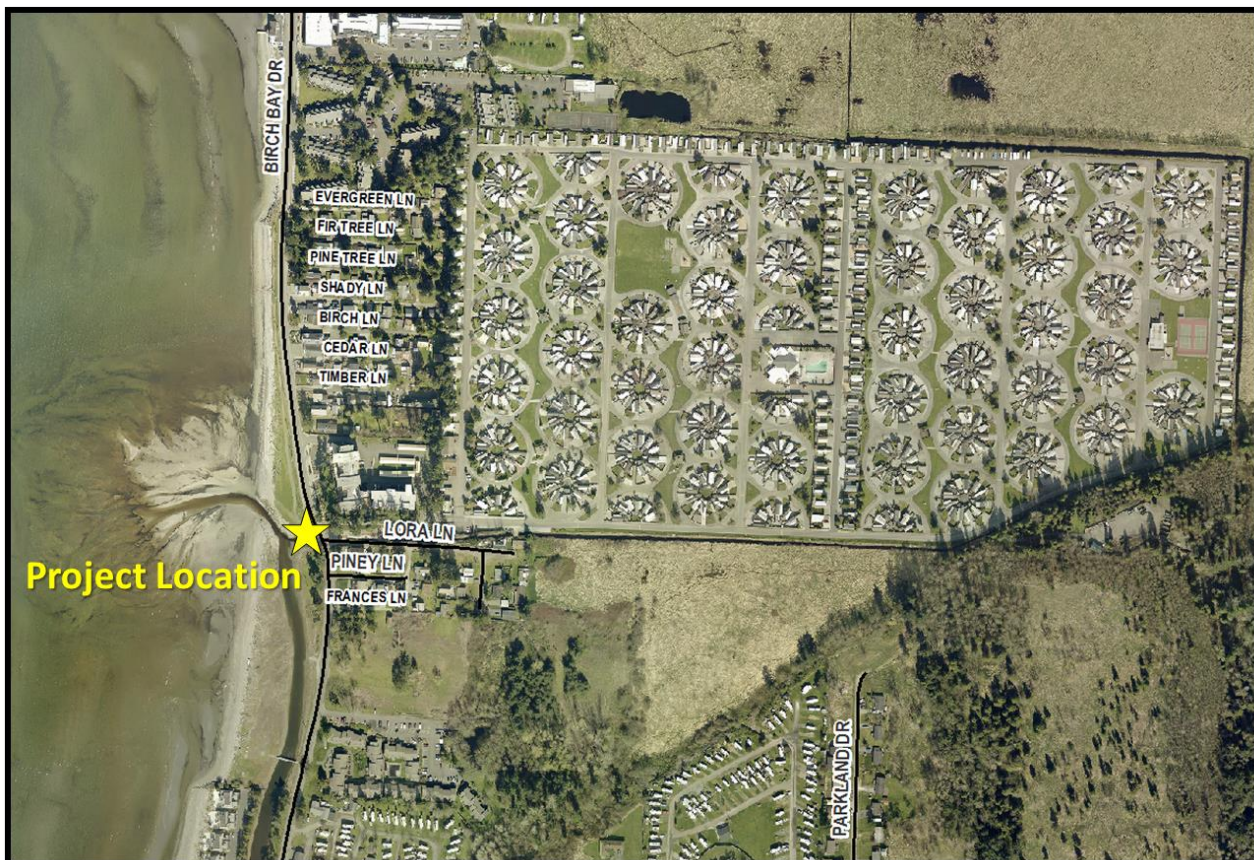
The purpose of this project is to replace the existing 48" corrugated metal pipe culvert under Birch Bay Drive with a fish passage culvert that is anticipated to be an 8-ft wide box culvert, remove the existing tide gate on the water side of Birch Bay Drive, install a new side hinge tide gate on the 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. Phase 1 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

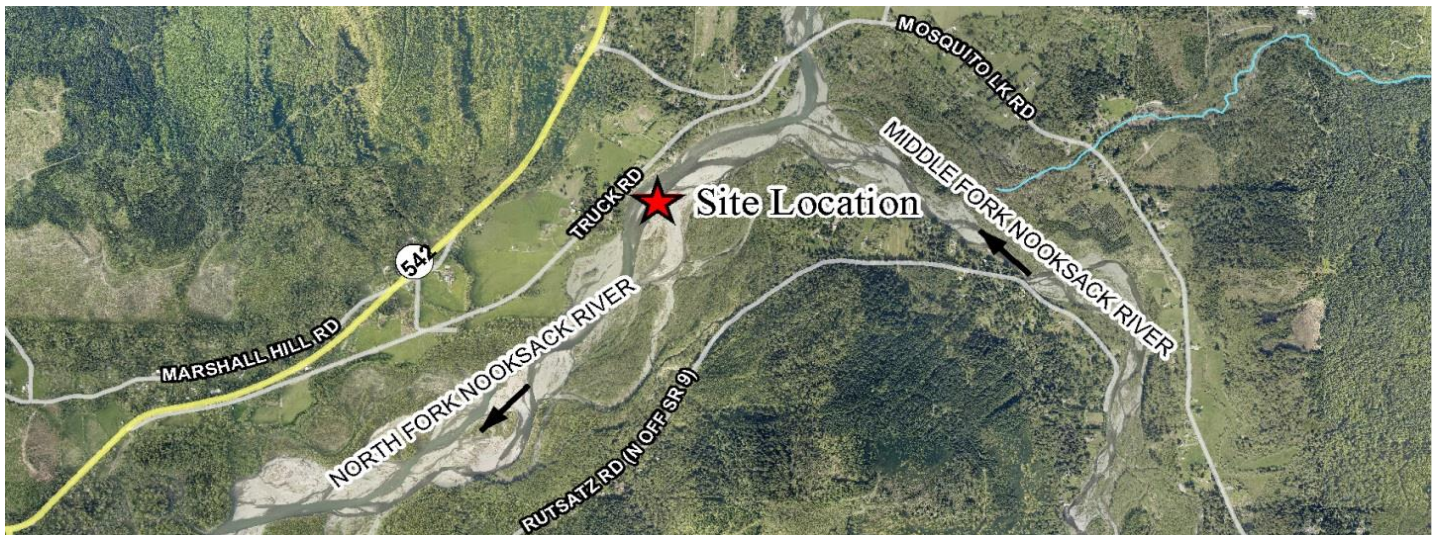
Project Narrative:

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:

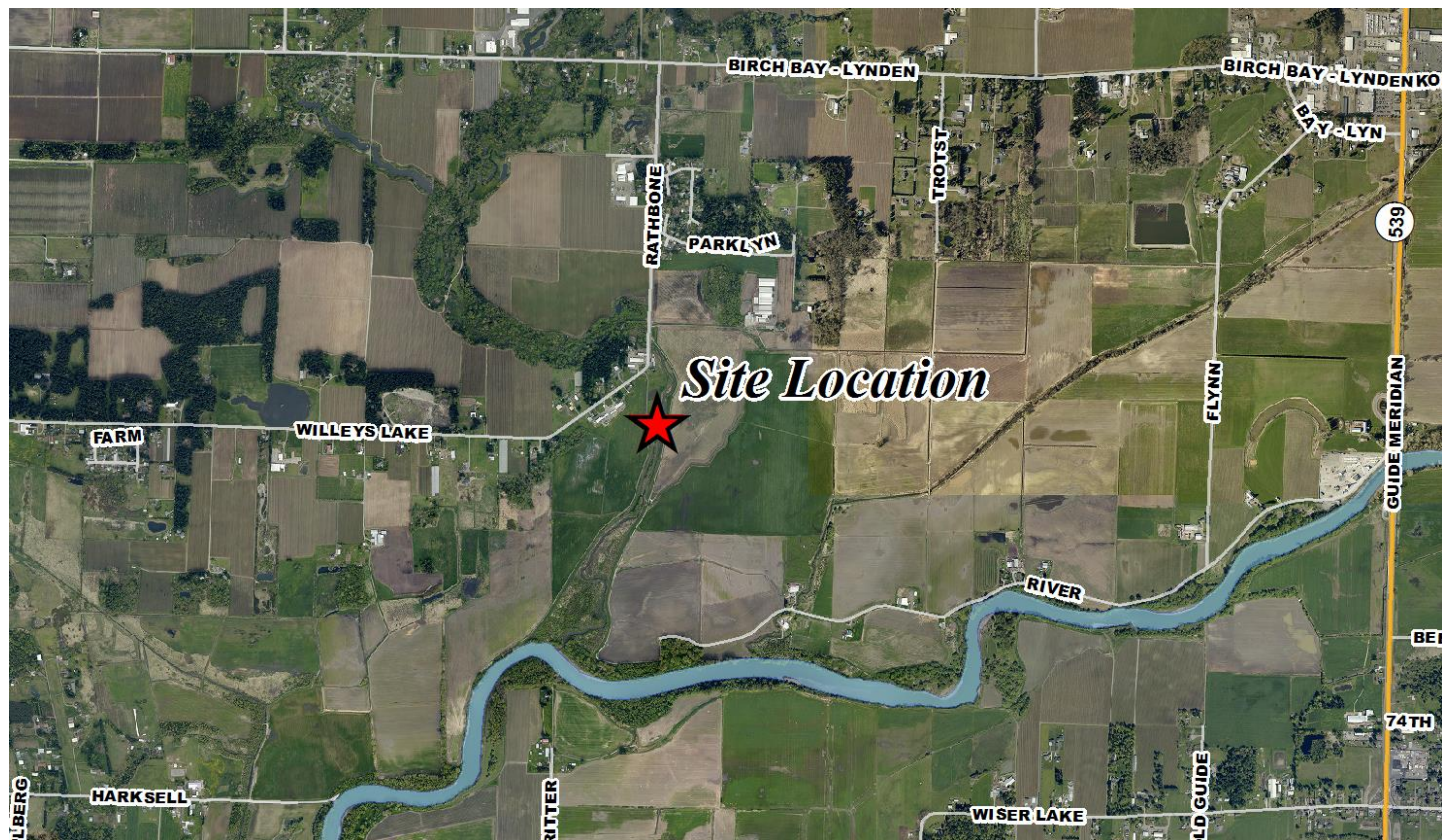
The Bertrand Creek right and left bank Levees are designed to overtop during larger floods, but provide protection to agricultural land during the growing season. The left bank levee has a 250 foot long section where erosion is threatening the levee prism. The right bank levee face is sloughing at three 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:

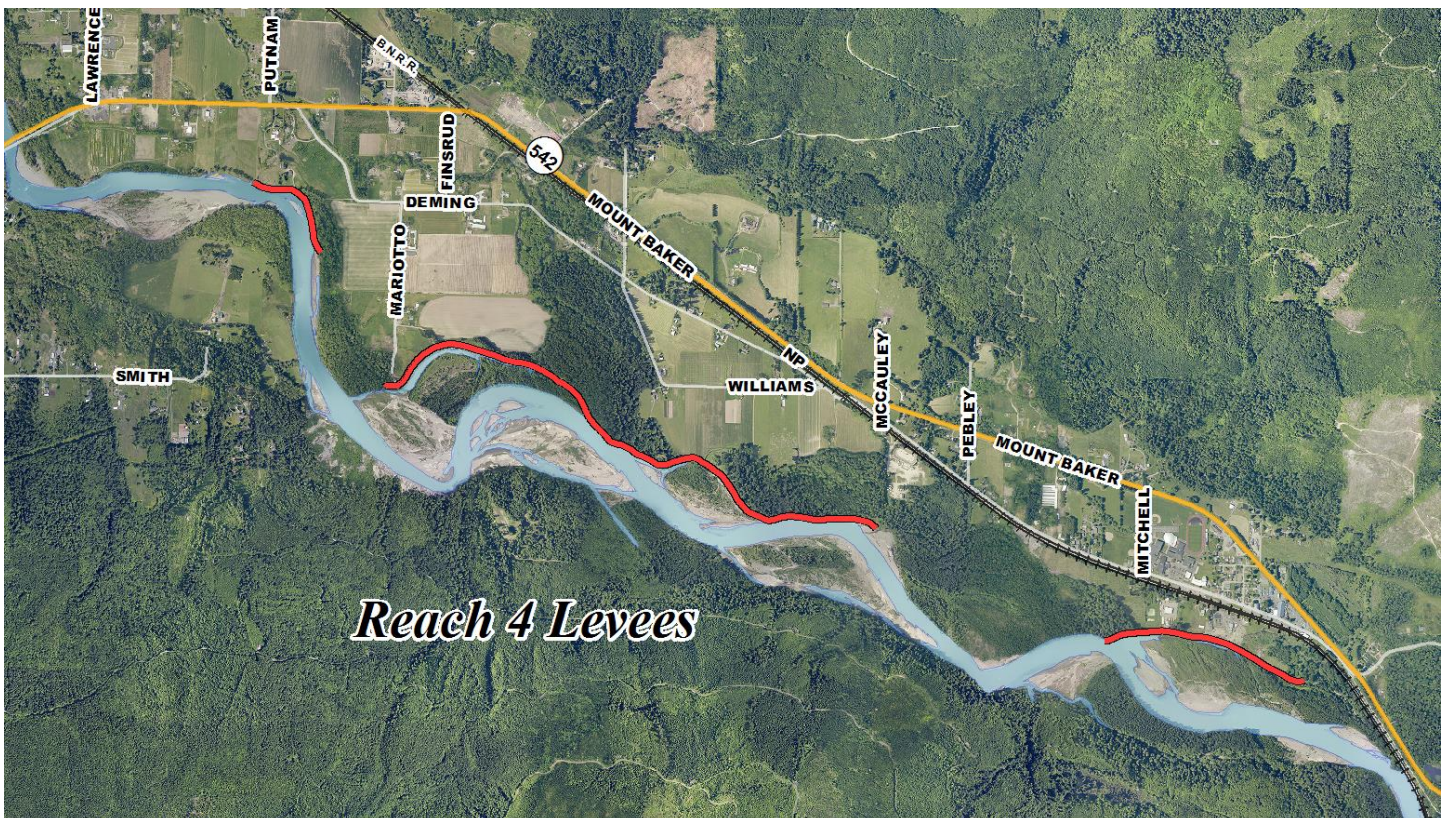
Reach-scale projects to reconfigure flood infrastructure are being evaluated through the integrated planning processes that started with the System-wide Improvement Framework (SWIF) and has transitioned into the Floodplain Integrated Planning (FLIP) process. The goal of this work is to reduce flood risk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