

**2023-2027 Cascade’s Maintenance and Repair Activities Work Plan
for Shoreline Designated Areas and Critical Areas of the
White River Lake Tapps Reservoir Project**

	Activity	Location(s)	When Activity Will Occur
1.0	General Maintenance Regular and periodic maintenance is required in and around the White River Lake Tapps Reservoir Project (“Project”) including:		
1.1	<p>Maintenance and repair of the tunnel intake facilities and its associated trash rack facilities (to include gate and fence repairs; vegetation management, such as removal of wind damaged, branches and limbs, and noxious weed removal; trash removal and inspection & cleaning; graffiti cleanup and painting; grading and graveling maintenance roads; routing building and sign maintenance; boat launch maintenance).</p> <ul style="list-style-type: none"> • Vegetation removal along the shoreline shall be the minimum necessary to protect and maintain the listed facilities including removal of noxious, non-native invasive vegetation. • Eurasian Milfoil would be controlled in accordance with 10-year Integrated Aquatic Vegetation Management Plan as permitted by the Department of Ecology. <p>[Not included are major projects such as major building repairs such as crane pad installation; trash rack replacement; installation of new trash rack cleaners, for which Cascade will obtain a Shoreline Substantial Development Permit.]</p>	See Maps 1 to 10	<ul style="list-style-type: none"> • Major repair work to building to occur between 2023-2027 • Inspect integrity of trash rack every 2 years. • Vegetation removal and Eurasian Milfoil control, as needed from April 1 to November 1 each year. • Other listed activities, as needed.
1.2	Debris and trash removal.	See Maps 1 to 10	Periodic maintenance as needed, and past experience is that there

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1.3	<p>Removal of hazardous or dangerous stumps and trees when they block navigation or interfere with the use of adjacent improvements or public safety.</p> <ul style="list-style-type: none"> Vegetation removal along the shoreline shall be the minimum necessary to protect and maintain the listed facilities. For trees, tree removal shall be minimized, and mitigation shall be as required by applicable city or county code. 	See Maps 1 to 10	will be considerably fewer than 5 such removal programs per year.
1.4	<p>Removal of unauthorized improvements and materials, typically items such as fire pits, picnic tables and the like.</p> <ul style="list-style-type: none"> Prior to the removal of any significant permanent structures, Cascade will notify Pierce County Code Enforcement. 		
1.5	<p>Boat launch maintenance and repairs (mainly vegetation management).</p> <ul style="list-style-type: none"> Vegetation removal along the shoreline shall be the minimum necessary to protect and maintain the listed facilities. 	See Maps 5 to 10	<ul style="list-style-type: none"> Periodic maintenance as needed. Vegetation control as needed from April 1 to November 1 each year.
1.6	<p>Various valve, gauge and pipeline facilities around the lake. The only excavation involved in this activity would be as required to address a specific leak or rupture of an underground pipeline. Required vegetation management is primarily mowing the main pipeline right-of-way and clearing around valves and gauges need for monitoring and maintenance activities.</p>	See Maps 1 to 10	Periodic maintenance as needed

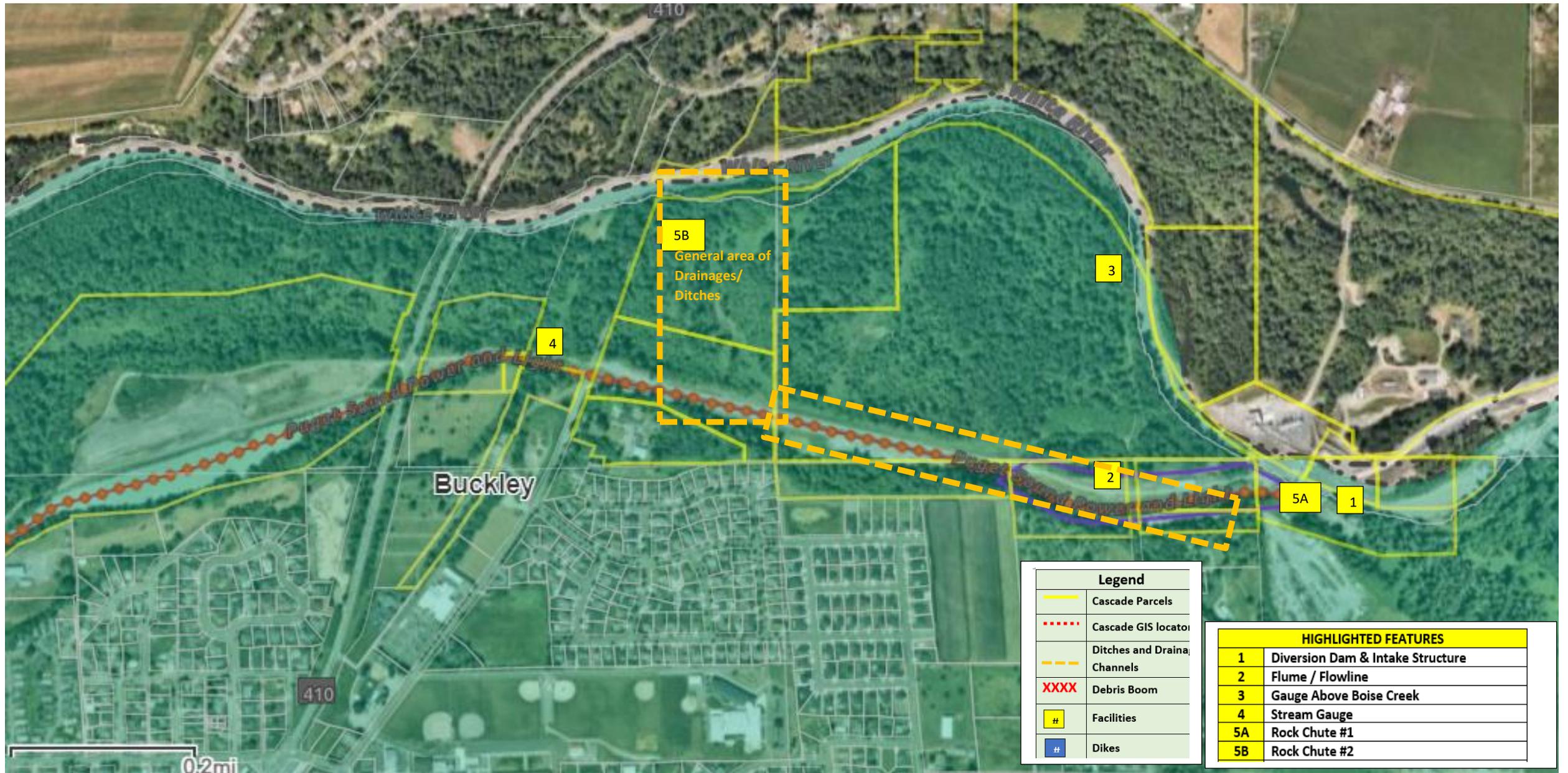
	Activity	Location(s)	When Activity Will Occur
1.7	<p>Backflow preventer maintenance and repair including debris, hazardous or dangerous tree and stump removal, maintenance of gates and other equipment.</p> <ul style="list-style-type: none"> Vegetation removal along the shoreline shall be the minimum necessary to protect and maintain the listed facilities. 	See Map 6	Periodic maintenance as needed
2.0	<p>Dikes</p> <p>Lake Tapps is impounded by a series of dikes ranging in length from a few hundred to a few thousand feet and from a few feet in height to 40 feet. The system of dikes maintains lake levels and prevents flooding when the water is at “full pool”. The goal of maintenance is to prevent structural deficiencies at the dikes and to keep measurement equipment, such as the weir and piezometer in working order, including:</p>	See Maps 2, 7 & 9	
2.1	Inspect, maintain and repair weirs.	See Maps 2, 7& 9	<ul style="list-style-type: none"> Inspections weekly when reservoir level is above 540’; monthly when below. Maintenance and repair as needed
2.2	Inspect, maintain and repair piezometers in and around the Lake Tapps dikes.	See Maps 2, 7 & 9	
2.3	<p>Regular maintenance activities, including removing or preventing growth of large vegetation, maintenance and repairs to dike surfaces, maintaining signage and ecology block identification of dikes. All new signs will be less than 2 square feet in area. Vegetation management is necessary to allow for observation of seepage or other dike condition issues and to prevent large vegetation from damaging the structural integrity of the dikes. Vegetation removal along the shoreline shall be the minimum necessary to protect and maintain the listed facilities. Cascade provides the Washington Department of Ecology Dam Safety</p>	See Maps 2, 7 & 9	As needed – typically 4 times/year starting in April.

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	Office with an Operation and Maintenance Manual for the dikes and an Annual Dike Instrumentation and Monitoring Report copies of which will also be provided to Pierce County Planning.		
3.0	<u>Ditches</u> Cascade is responsible for maintaining several thousand linear feet of artificial drainage ditches necessary to protect its dikes, other facilities and property. The goal of maintenance is to keep water flowing and prevent structural deterioration, including:	See Maps 1 to 10	
3.1	Vegetation control.		April to November, as needed
3.2	Removing debris and sediment to maintain flow.		Twice yearly usually in spring in fall as needed and following significant rainfall events.
3.3	Maintenance of and repairing damage to culverts or the interior of the ditches. Culvert maintenance does not include culvert replacement or any activity that affects the invert elevation of the existing culvert.		Periodic maintenance as needed.
4.0	<u>Roads and Stormwater Facilities</u> Several utility roads provide access to Cascade’s facilities. Storm drainage is collected in adjacent ditches and culverts. It should be noted, although all of the Cascade roads are shown on the attached maps, for the most part, the adjacent ditches and culverts associated with each road are not separately designated or identified. The goal of maintenance is to keep roads safe and passable and to prevent future failure of storm drainage ditches and culverts, including:	See Maps 1 to 10	

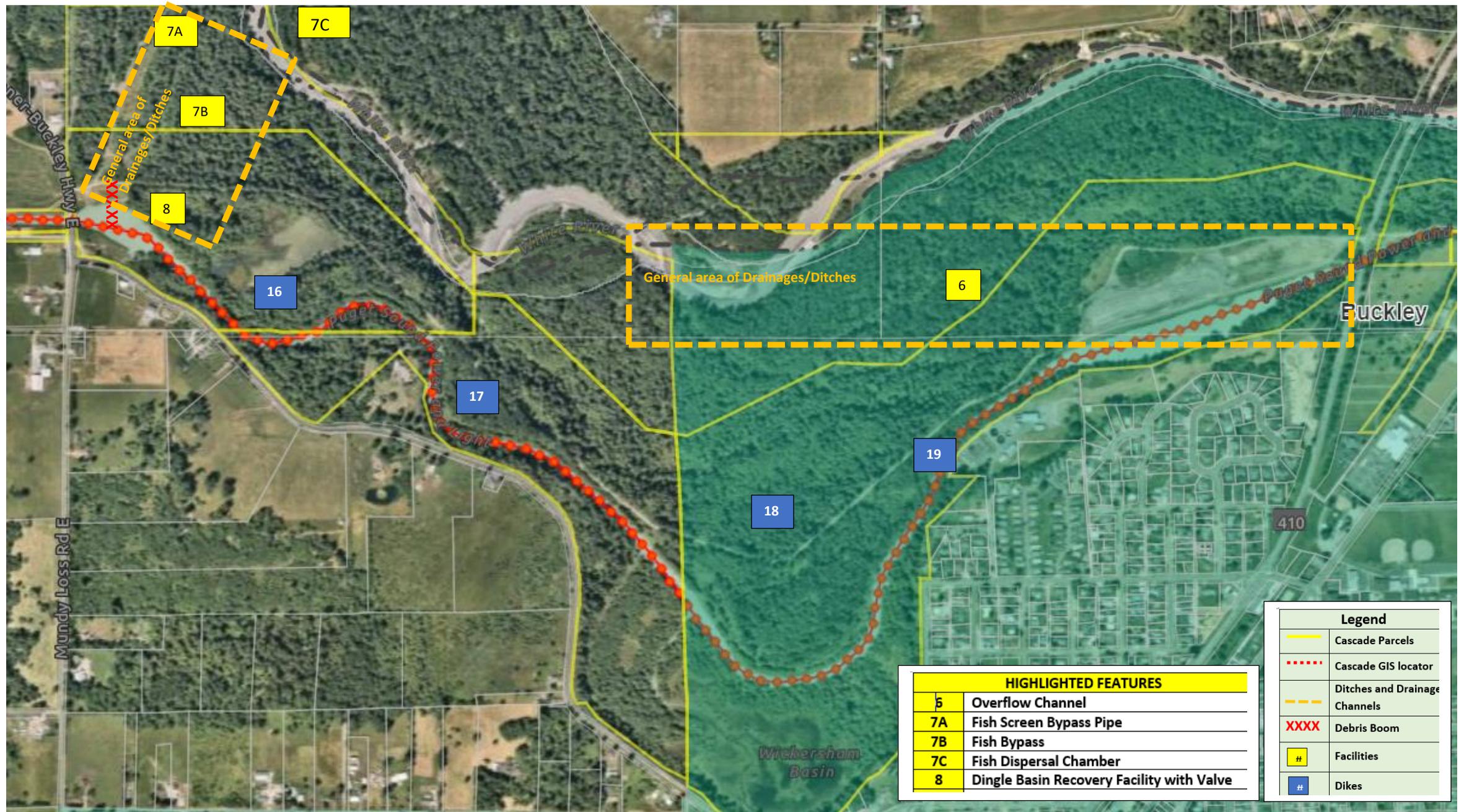
	Activity	Location(s)	When Activity Will Occur
4.1	Vegetation control.		April to November, as needed, Brush maintenance <ul style="list-style-type: none"> • Main roads twice yearly • Minor roads every 3 years
4.2	Repairing or regrading road surfaces.		Generally, every 6 months
4.3	Maintaining ditches and culverts. Culvert maintenance does not include culvert replacement or any activity that affects the invert elevation of the existing culvert.	See §3 above	See §3 above.
5.0	<u>Fish Screen and Fish Return</u> The fish screen traps all downstream migrating fish and shunts them to the fish return bypass so the can reenter the White River. The goal of maintenance is to keep the fish screen equipment functioning properly and to remove blockages to maintain water flow, including:	See Map 2	
5.1	Periodic removal of debris and sediment from debris booms and trash rack.	Fish Screen Log Boom see Map 3; See also 7.0 below	Periodic maintenance as needed – roughly 3 times a year.
5.2	Repair of equipment.		Periodic maintenance as needed.
6.0	<u>Headworks/Diversion Canal/Flowline (Upper Conveyance System)</u> Water is conveyed from the White River to Lake Tapps Reservoir through a diversion canal consisting of a canal, dikes, pipelines, and settling basins. The system is sometimes referred to collectively as the “flowline” or “upper conveyance system”. The goal of maintenance is to maintain flow of water	See Map 1 -4	

	Activity	Location(s)	When Activity Will Occur
	from the Headworks to the Reservoir and to keep the dikes structurally sound, including:		
6.1	Removal of debris.		Periodic maintenance as needed.
6.2	Sediment removal. <ul style="list-style-type: none"> Sediment storage is subject to conditions set by city or county code to control erosion and manage traffic. 		Typically every 5 years.
6.3	Vegetation control and other maintenance and repair to embankments and dikes. Removal of hazardous or dangerous stumps and trees when they block navigation or interfere with the use of adjacent improvements or public safety. <ul style="list-style-type: none"> Vegetation removal along the shoreline shall be the minimum necessary to protect and maintain the listed facilities. For trees, tree removal shall be minimized, and mitigation shall be as required by applicable city or county code. 		Periodic maintenance as needed – typically every 3 years.
7.0	<u>Debris Booms</u> The Lake Tapps Project contains a number of debris booms. Debris booms are located at various places on the Lake and in the flowline to collect floating debris before it reaches critical facilities. Maintenance of debris booms includes replacement and ensuring they remain properly secured.	See Maps 1 to 10	As needed yearly April 1 through November.
8.0	<u>Buoys</u> Cascade has installed several buoys in Lake Tapps to mark hazards or provide other warnings. Buoys may need to be maintained periodically to repair or replace signs or buoy equipment, or to ensure anchoring is secure.	See Maps 6, 7, 8 & 9	As needed yearly April 1 through November.

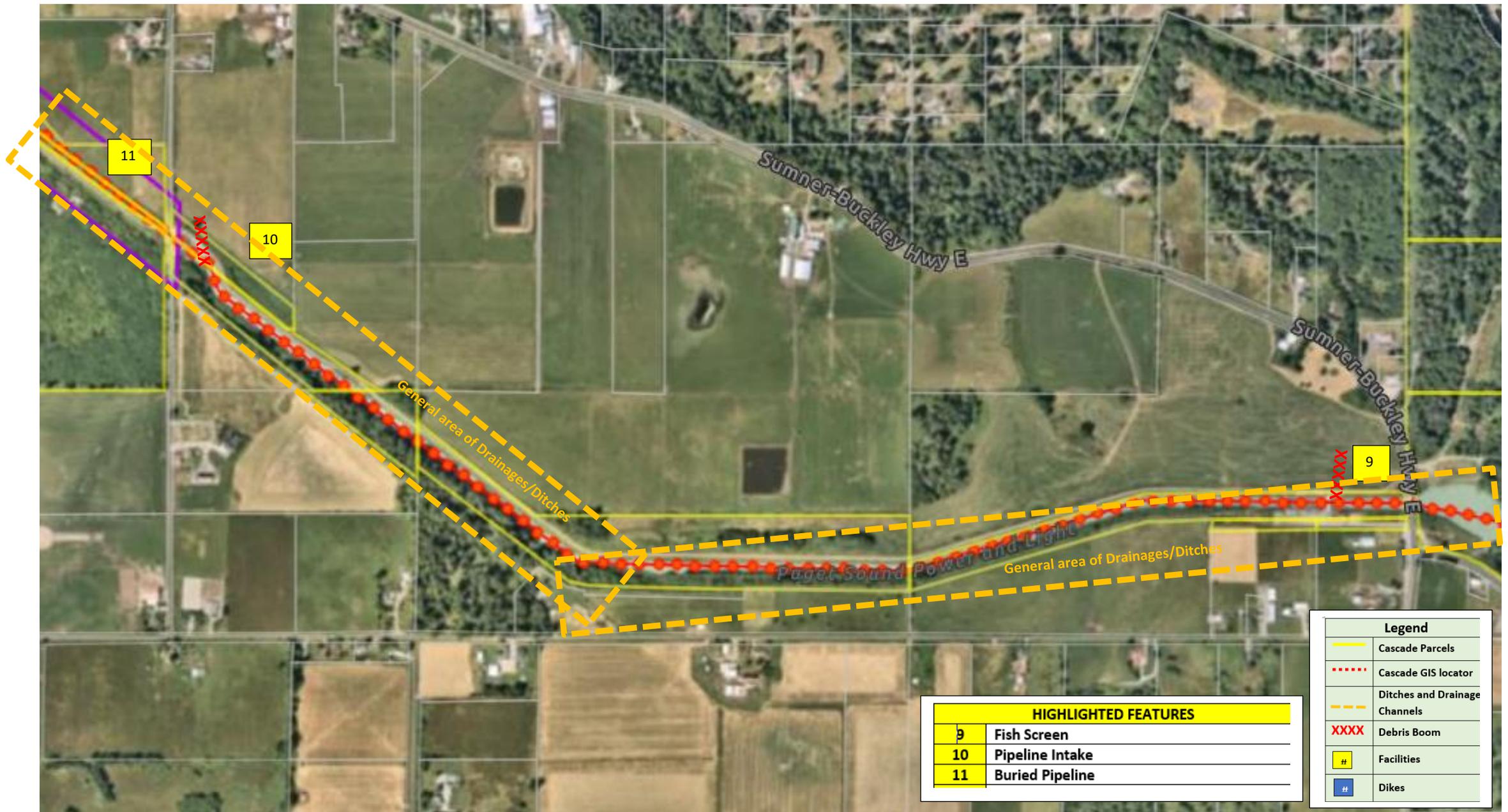
	Activity	Location(s)	When Activity Will Occur
9.0	<u>Trespass Control Measures</u> Cascade uses several types of trespass control measures to secure its facilities, including fences, signs, and barricades. The goal of maintenance on these trespass control measures includes:	See Maps 1-10; Cascade's trespass control measures are located at road entrances and along property lines where necessary.	
9.1	Repairing fence segments or gates or other barriers.		Periodic maintenance as needed.
9.2	Installing, repairing or replacing warning signs and "No Trespassing" signs. All new signs will be less than 2 square feet in area.		Periodic maintenance as needed.
9.3	Vegetation control to maintain sight lines or remove hazardous conditions (it is not anticipated this will involve any significant new areas of clearing beyond what has been done historically by Cascade or PSE during their ownership of the Project).		Periodic maintenance as needed.
9.4	Repairing damaged facilities in cases of vandalism or normal wear and tear.		Periodic maintenance as needed.



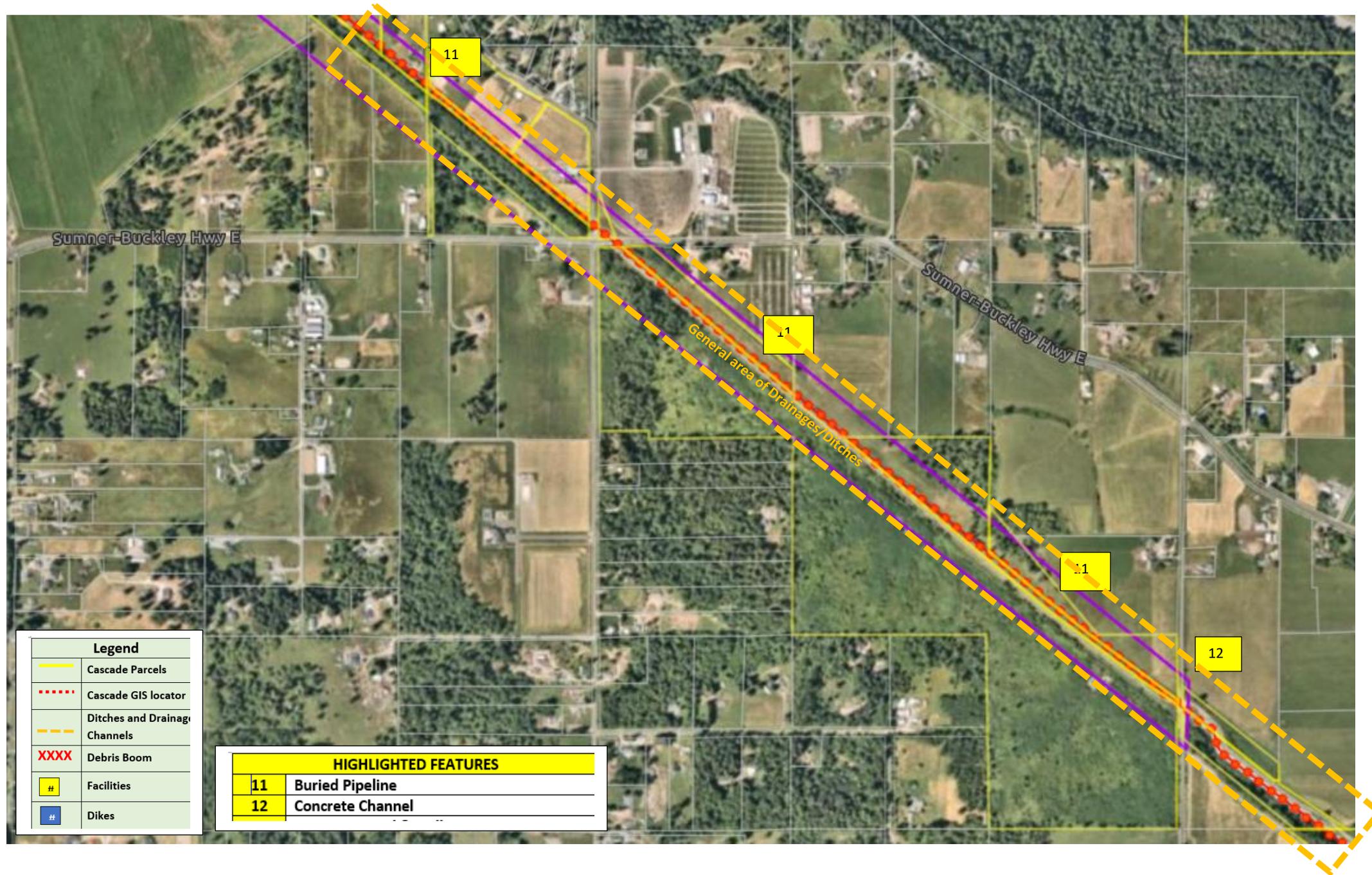
MAP 1



MAP 2



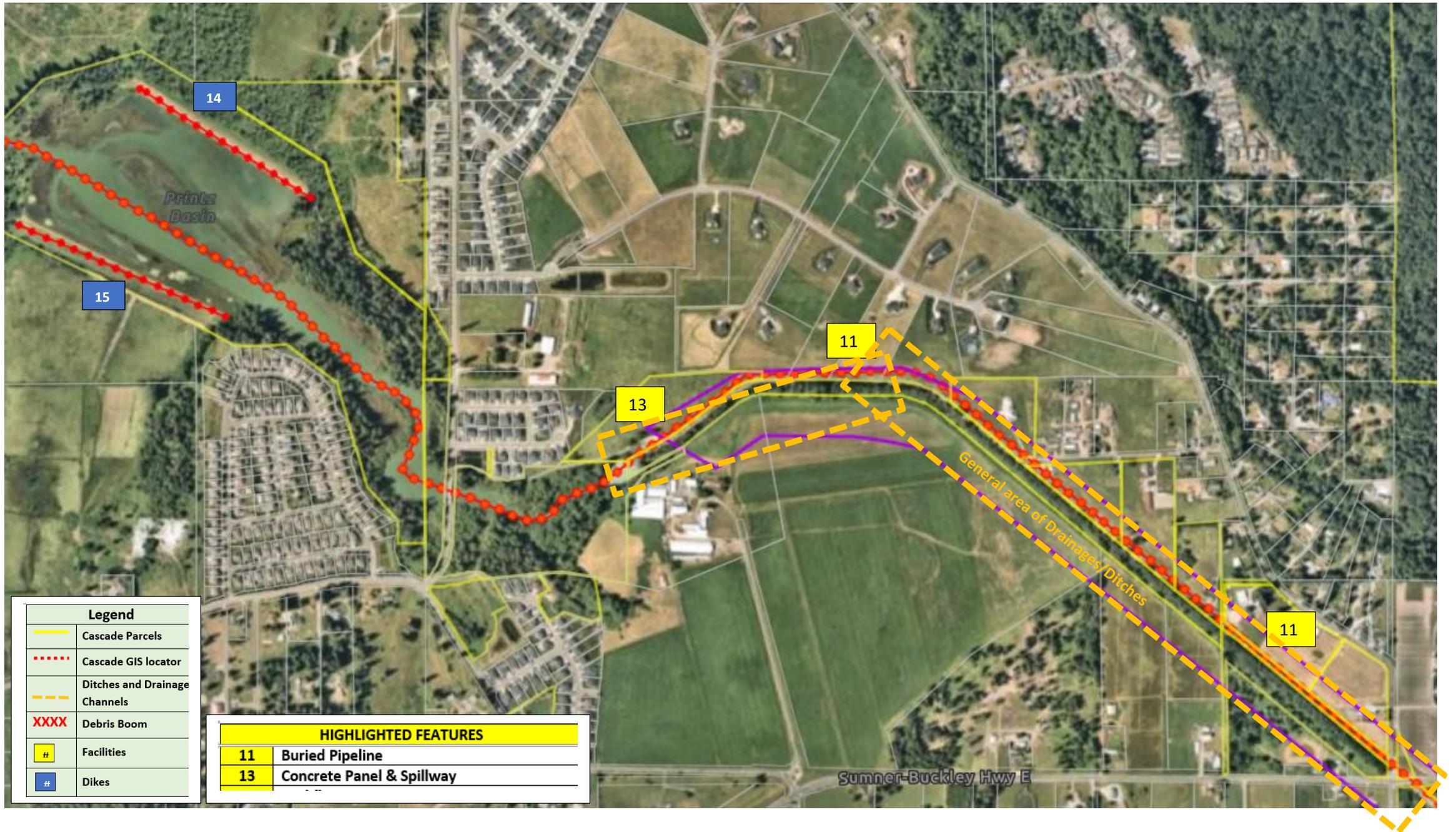
MAP 3



Legend	
	Cascade Parcels
	Cascade GIS locator
	Ditches and Drainage Channels
	Debris Boom
	Facilities
	Dikes

HIGHLIGHTED FEATURES	
	Buried Pipeline
	Concrete Channel

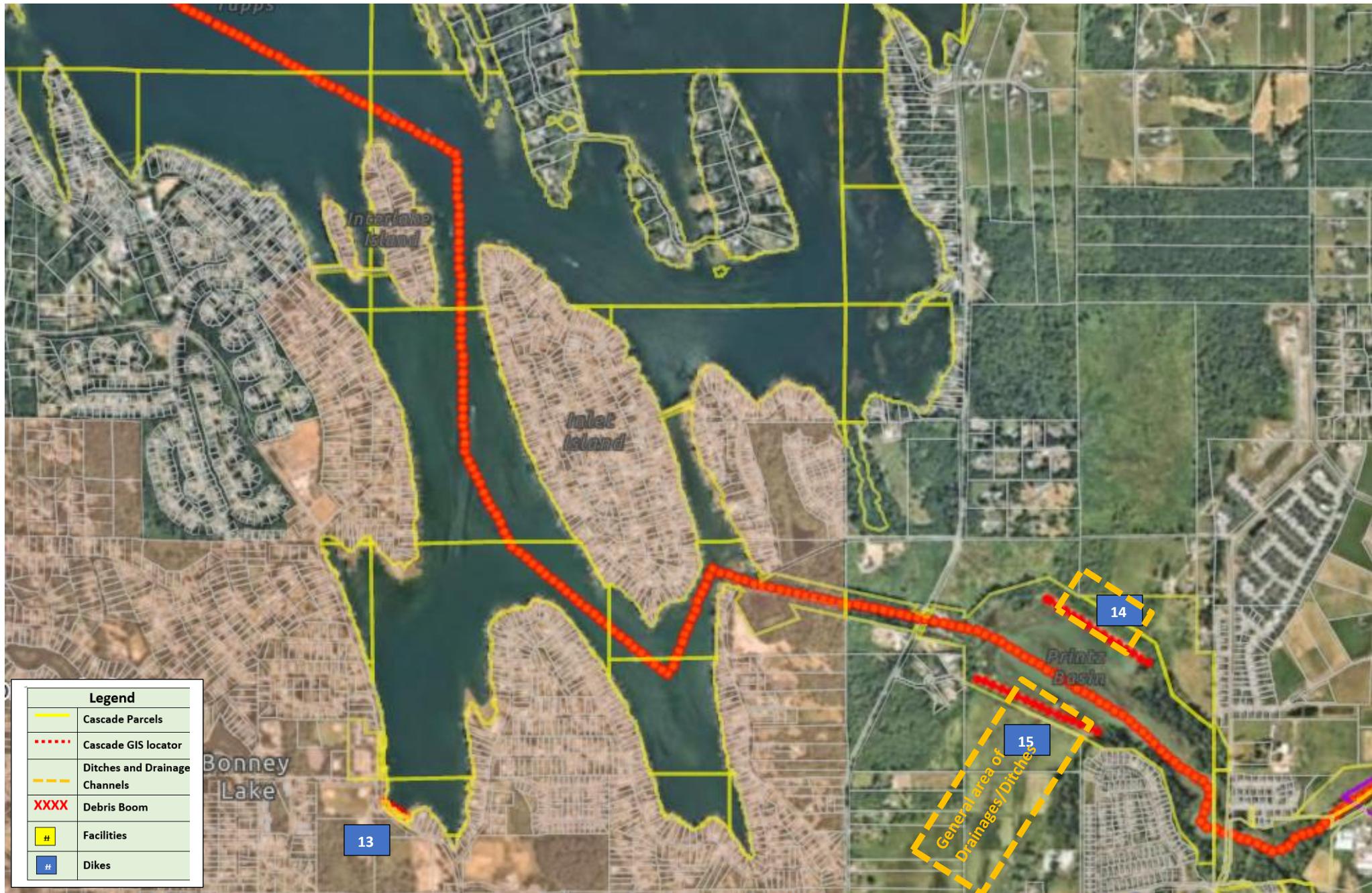
MAP 4



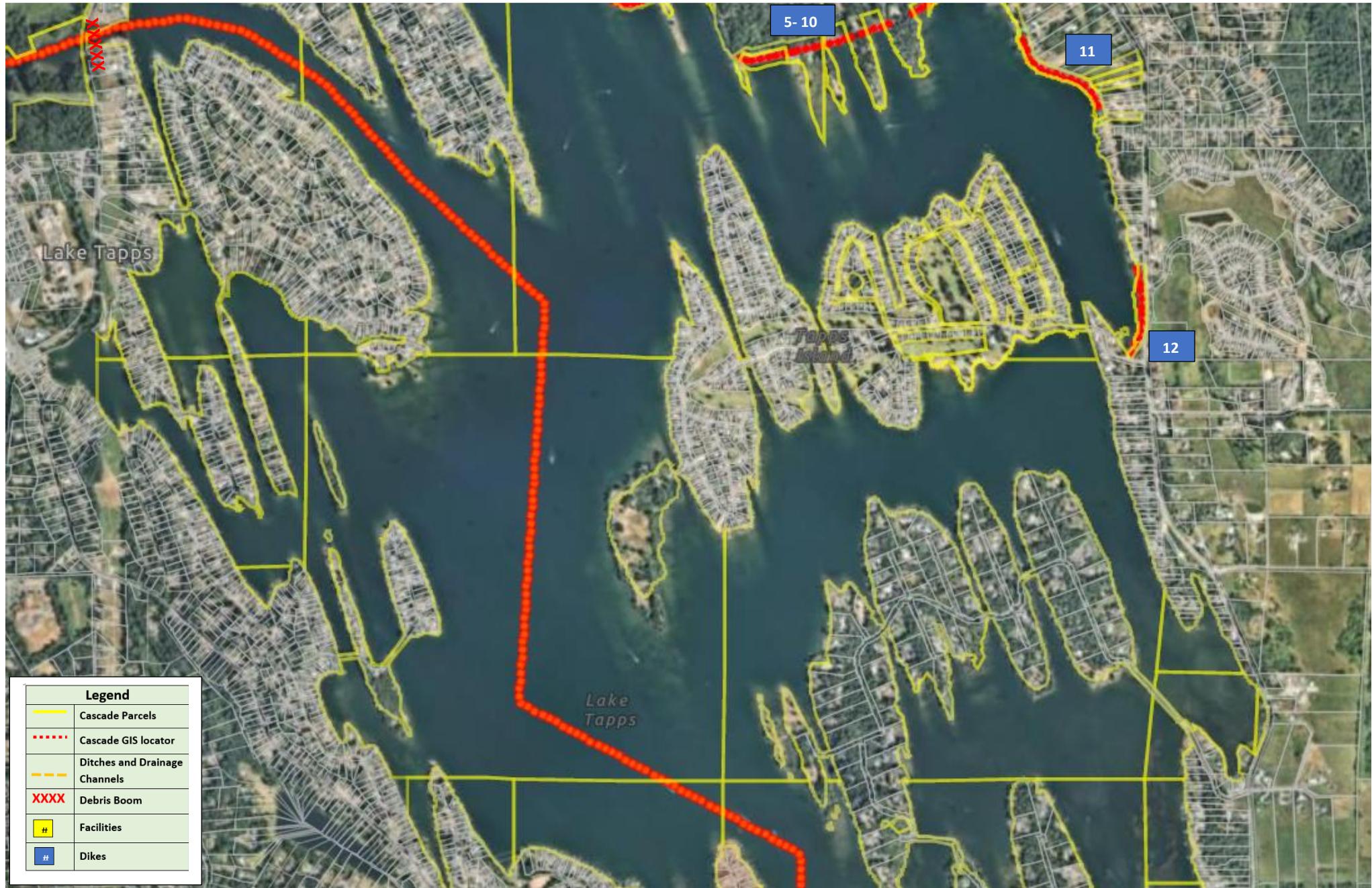
MAP 5



MAP 6

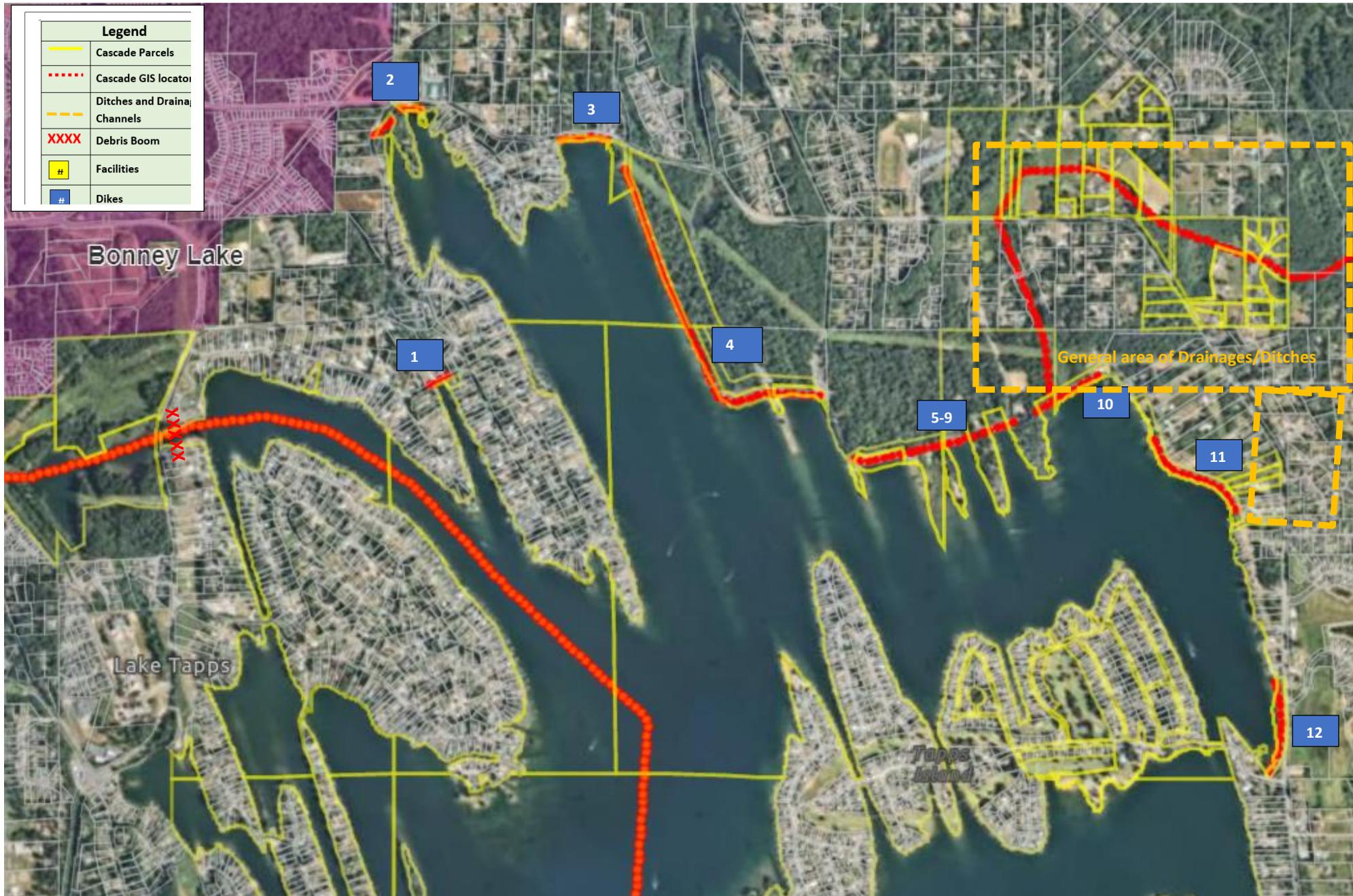


MAP 7

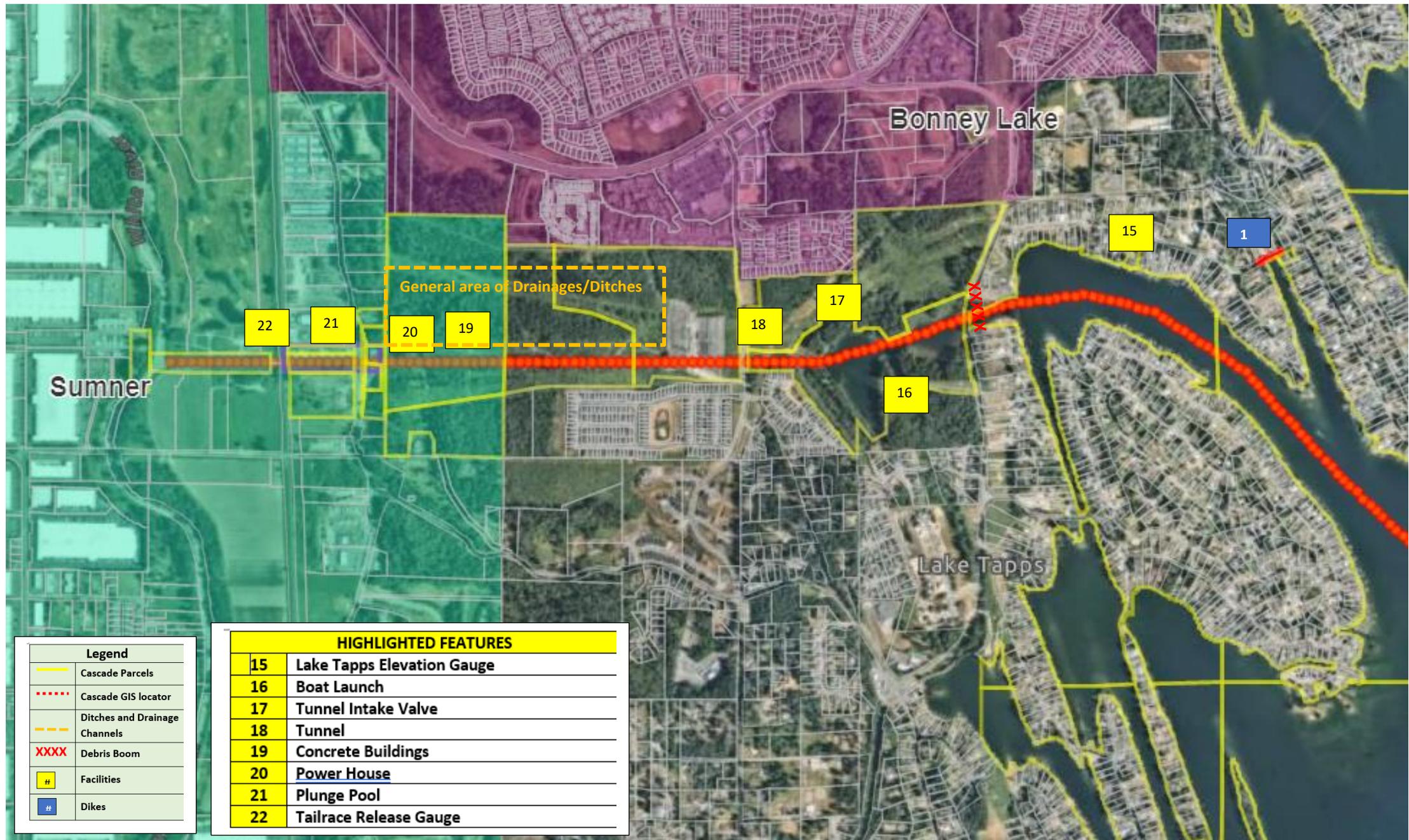


Legend	
	Cascade Parcels
	Cascade GIS locator
	Ditches and Drainage Channels
	Debris Boom
	Facilities
	Dikes

MAP 8



MAP 9



MAP 10