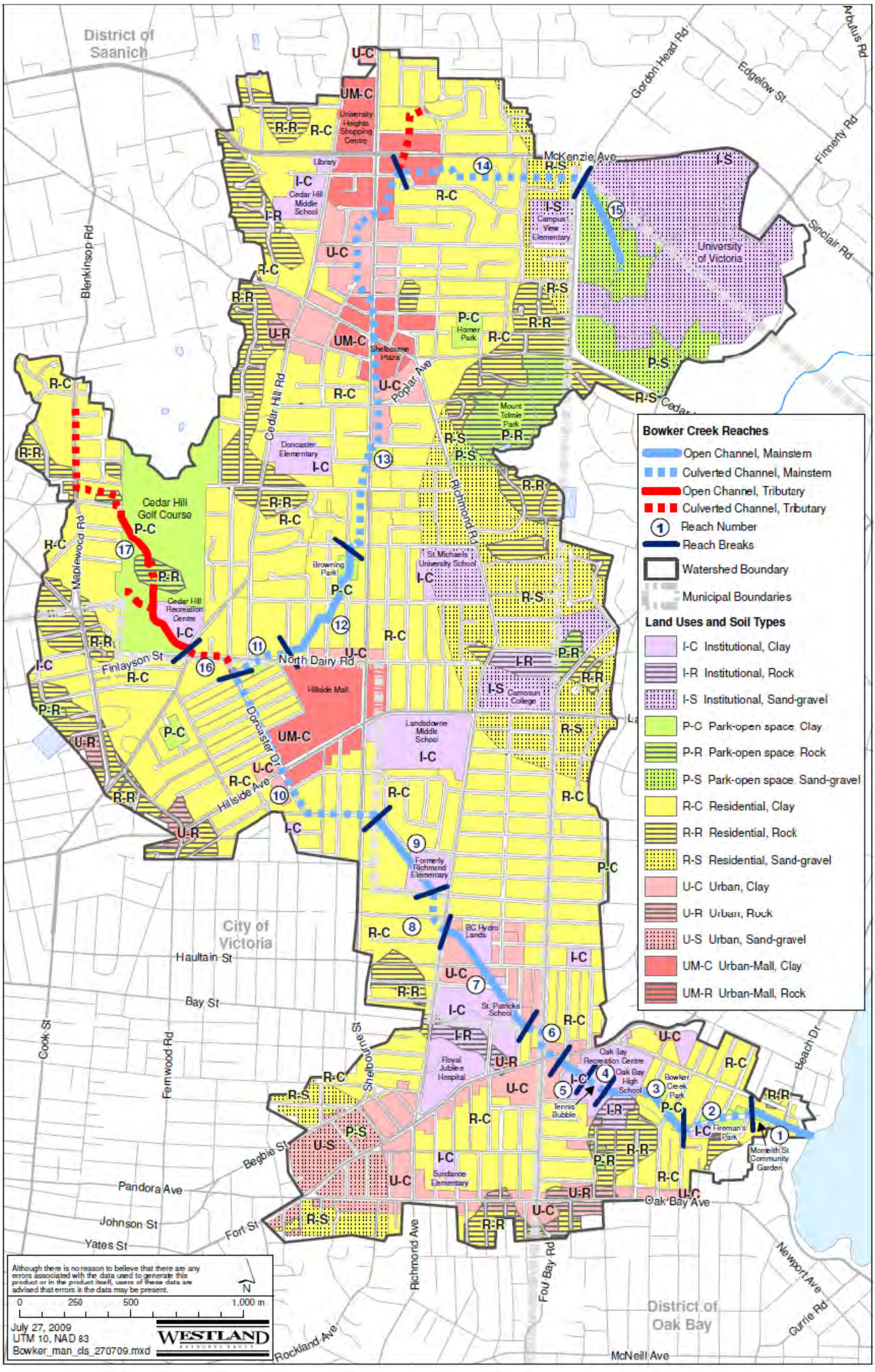
APPENDIX B



BOWKER CREEK REACH MAP FOR APPENDIX B

APPENDIX B—ACTIONS TO IMPROVE THE CREEK CORRIDOR

A list of detailed, reach-specific actions is presented in this appendix. These actions are designed to achieve the vision, goals, and objectives put forward in the Bowker Creek Watershed Implementation Plan (2003). Municipalities, community groups and land owners can use the actions in this plan to incorporate into organizational plans and operating budgets. This plan is a guide to action and cannot mandate any group to carry out the actions.

Reach-specific action items were developed for the 17 Bowker Creek reaches. See Reach Map on the opposite page and the Reach Characteristic Table on the next page. The recommended actions range from small restoration efforts such as invasive species removal, to large projects such as daylighting sections of the creek. The suggested hydraulic upgrades were adopted mainly from the Master Drainage Plan. Actions related to greenways were based on the 2007 Bowker Creek Proposed Greenways map (Map 5 in this document). Creek restoration recommendations were based on the more detailed information found in Appendix C: Bowker Creek Channel Restoration Prescriptions; developed in March 2009 by the Bowker Creek Initiative Coordinator.

REACH NUMBERS

The base maps and information from the *Bowker Creek Watershed Proper Functioning Condition Assessment* (PFCA) (Barraclough, et al., 2007) and the *Bowker Creek Master Drainage Plan* (MDP) (Kerr Wood Leidal, 2007) were used to delineate reaches for the creek and the main tributary that flows through Cedar Hill Golf Course. The MDP defines 103 creek reaches, while the PFCA delineates 16 open sections of the creek. To keep the number of creek reaches to a manageable amount for developing actions and to include both open and closed sections, the creek was sectioned into 17 reaches for the Blueprint (See Reach Map on the opposite page). Integrated, location specific actions were developed for each reach. The location and description of each reach is presented in maps and photographs on the page before the action table.

ACTION NUMBERS

The numbering system for the creek reach actions includes the Blueprint reach number, a hyphen, and then an action number; for example, the first action in reach 1 is numbered 1-1. The numbering system for the watershed-wide actions is assigned sequentially (Appendix A).

RATING CRITERIA

Environmental, social, and economic factors need to be integrated into the implementation plan actions. To ensure that these factors were considered for each action, a set of criteria was developed. Each action or set of actions were rated using the criteria presented in Table 9 (see Appendix A). The ratings were not summed to show a total score as the committee believed that it was difficult to compare actions based on the sum alone.

GOALS ADDRESSED BY THE ACTION

The action tables specify which of the following Bowker Creek Watershed Management Plan goals the actions meet:

Goal 1.	**Individuals, community and special interest groups, institutions, governments, and businesses take responsibility for actions that affect the watershed**
Goal 2.	**Manage flows effectively**
Goal 3.	**Improve and expand public areas, natural areas, and biodiversity in the watershed**
Goal 4.	**Achieve and maintain acceptable water quality in the watershed**

LEAD AGENCY (SUPPORTING ORGANIZATIONS)

The action tables define which organization is responsible for implementing the action and any potential supporting organizations.

TYPE

Each action is categorized as:

- capital—is a capital cost action,
- operational—should be integrated into operational work programs, or
- opportunistic—should be implemented as opportunities come up, such as when funding is available or during redevelopment of the area.

FUNDING SOURCE

Potential funding sources are identified. Some funding sources are more specific than others, and further research into specific funding sources for some of the actions is needed. Funding sources will change with shifting government priorities and this column should be re-evaluated on a regular basis.

PRIORITY

The Bowker Creek Initiative Steering Committee assigned each action a high, medium, or low priority.

CHARACTERISTICS OF BOWKER CREEK REACHES

BLUE-PRINT REACH	LOCATION	DESCRIPTION	RIPARIAN VEGETATION	ISSUES				
				Invasive species	Channelized	Conveyance	Flooding	Erosion
1	Monteith St. to creek mouth	**Open**. Flows in an open channel east and southeast from Monteith Street along the Monteith Street Community gardens, through private property to the ocean. The creek is entirely armoured below Beach Drive and has patches of armouring above Beach Drive.	**Mainly dominated by invasive (yellow willow, English ivy) and non-native vegetation and grass.** Native species: cottonwood, cedar, Garry oak, bigleaf maple, Douglas-fir, poplar, alder, mock orange, rose, red-osier dogwood, oceanspray, snowberry, vine maple, bracken fern, water parsley. Bioengineering stakes of pacific/sitka/scouler's willow are also present. Non-native and invasive species: yellow willow, English ivy, cherry, laburnum, weeping willow, Himalayan blackberry, knotweed, buttercup, daphne, morning glory, laurel, holly, thistle, policeman's helmet, lawn variety grasses	X	X	X	X	X
2	St. Ann St. to Monteith St.	**Enclosed.** Flows eastward through a pipe under Fireman's Park to St. Ann Street.	N/A			X	X	
3	Downstream of Oak Bay Tennis Bubble to St. Ann St.	**Open.** Flows east and southeast in an open armoured channel through part of the Oak Bay Recreation Centre property, Oak Bay High School and Bowker Creek Park.	**Mainly invasive species and grass with isolated pockets of landscaped native and non-native trees and shrubs. Some non-native shrubs overhang the channel and provide cover.** Native species: cedar, cottonwood, Garry oak, birch, , red-osier dogwood, mahonia, alder, bigleaf maple, snowberry, oceanspray Non-native and invasive species: Himalayan blackberry, yellow willow and European nightshade, tulip tree, buddlea, lawn variety grasses, Japanese knotweed in the channel at one location	X	X	X	X	X
4	Oak Bay Tennis Bubble	**Enclosed.** Flows southeast through a pipe beneath the Oak Bay Tennis Bubble.	N/A			X	X	
5	Cadboro Bay Rd. to Oak Bay Recreation Centre	**Open.** Flows in an open channel southeast from Cadboro Bay Road, through the Oak Bay Recreation Centre to the culvert beneath the tennis bubble. The creek is entirely armoured between Bee Street and Cadboro Bay Road and partially armoured downstream.	**Mature trees such as bigleaf maple and cottonwood, no vegetation in armoured sections.** Native Species: Douglas-fir, cottonwood, bigleaf maple, alder, red-osier dogwood, snowberry, rose, water parsley, cattails Non-native and invasive species: laburnum, yellow willow, English hawthorn, Scotch broom, Himalayan blackberry, European bittersweet, English ivy, daphne, grass	X	X	X	X	X
6	Trent St. to Cadboro Bay Rd.	**Enclosed.** Flows east through a pipe from Trent Street, south along Foul Bay Road, and southeast to Cadboro Bay Road.	N/A			X	X	
7	Richmond Rd. to Trent St.	**Open.** Flows in an open armoured channel southeast through the BC Hydro property, St. Patrick's School and the Royal Jubilee Hospital.	**Mainly invasive species (80%+) except for 45 m restored section of native riparian vegetation at St. Pat's school and the large native trees on the BC Hydro lands**. Native species: cottonwood, black hawthorn, pine, Douglas-fir, hemlock, cedar, spruce, native willows, alder, red-osier dogwood, snowberry, rose, mock orange, red-flowering currant, swordfern, scirpus Non-native and invasive species: yellow willow, reed canary grass, Himalayan blackberry, broom, English ivy, buttercup, cherry, holly, daphne, grass, daffodil, fennel	X	X	X	X	X
8	Newton St. to Richmond Rd.	**Enclosed.** Flows south and southeast through a pipe from Newton Street to Richmond Street including under the Spirit Garden right-of-way.	N/A			X	X	
9	Pearl St. to Newton St.	**Open.** Flows southeast in a deep eroding open channel beside the Townley Street right-of-way and through the former Richmond Elementary to Newton Street.	**Mainly invasive (>90%) trees (yellow willow) and shrubs (Himalayan blackberry).** Native species: cottonwood, black hawthorn, red-osier dogwood Non-native and invasive species: yellow willow, Himalayan blackberry, broom, English ivy, holly, laurel	X	X	X	X	X

Characteristics of Bowker Creek Reaches

BLUE-PRINT REACH	LOCATION	DESCRIPTION	RIPARIAN VEGETATION	ISSUES				
				Invasive species	Channelized	Conveyance	Flooding	Erosion
10	Clawthorpe Ave. to Pearl St.	**Enclosed.** Flows southeast through a pipe along Doncaster Ave., and east along Pearl St. to just before Townley Street.	N/A			X	X	
11	North Dairy Rd. to Clawthorpe Ave.	**Enclosed.** Flows west through a pipe along North Dairy Rd., and southwest along Clawthorpe Ave. to Doncaster Dr.	N/A				X	
12	Knight Ave. to North Dairy Rd.	**Open.** Flows southwest in an open partially armoured channel through Browning Park, private residences and road right-of-ways to Shelley St. and North Dairy Rd.	**Narrow riparian of mainly invasive species (yellow willow, Himalayan blackberry) and some larger deciduous trees sections, lawns abut creek in many areas** Native species: bigleaf maple, native willows in bioengineering, snowberry, Indian-plum, cottonwood, Douglas-fir, grand fir Non-native and invasive species: Himalayan blackberry, yellow willow, English hawthorn, English ivy, holly, ornamental trees, daphne, lamium, cedar hedge	X	X	X	X	X
13	Garnet Rd. to Knight Ave.	**Enclosed.** Generally flows south through a pipe from Garnet Rd. to Knight Ave. along Shelbourne St., a highly developed, commercial and transportation corridor.	N/A			X	X	
14	Gordon Head Rd. to Garnet Rd.	**Enclosed.** Flows west through a pipe just south of Mackenzie Ave. to Garnet Rd.	N/A			X	X	
15	University Club of Victoria to Gordon Head Rd.	**Open.** Flows in an open channel from the headwaters at the University Club of Victoria through the University of Victoria to Gordon Head Road.	**Variable riparian buffer consisting of mainly native (.75%) deciduous and coniferous trees with mostly native shrub understory.** Native Species: Douglas-fir, alder, trembling aspen, bigleaf maple, cottonwood, grand fir, willow, alder, garry oak, cedar, red-osier dogwood, snowberry, salmonberry, trailing blackberry, salal, Oregon grape, birch, bracken fern, swordfern, piggyback plant, skunk cabbage, cattail, pacific water parsley Non-native and invasive species: rhododendron, English hawthorn, Himalayan blackberry, ivy, holly, buttercup, reed canary grass	X				
16	Cedar Hill Golf Course to Clawthorpe Ave.	**Enclosed.** Flows through a pipe beginning immediately south of the Cedar Hill Recreation Centre east along North Dairy Rd. and southeast along Doncaster Dr. to Clawthorpe Ave.	N/A				X	
17	Cedar Hill Golf Course	**Mainly open.** Flows southeast, mainly in an open channel, through the Cedar Hill Golf Course to Cedar Hill Rd.	**Variable riparian buffer of mainly native trees and shrubs in some areas with golf course grass abutting the creek in other areas. More invasives in the lower section.** Native species: Western red cedar, Douglas-fir, Oregon ash, cottonwood, native willow, alder, grand fir, Indian-plum, Nootka rose, snowberry, thimbleberry, equisetum, red-osier dogwood, red-flowering currant, hardhack, equisetum, skunk cabbage, pacific water parsley, rushes, water-plantain, watercress Non-native and invasive species: Cherry cultivar, Laburnum, holly, Himalayan blackberry, reed canary grass, poison hemlock, purple salsify, curly dock, cleavers, creeping buttercup, thistle, morning glory, lawn variety grasses		X		X	X

REACH 1: MONTEITH STREET TO CREEK MOUTH

Reach 1 flows in an open channel east and southeast from Monteith Street along the Monteith Street Community Gardens, through private property to the ocean. The riparian vegetation includes trees, shrubs, and grass. Invasive species include ivy and yellow willow and policeman's helmet. This reach has issues with invasive species, channelization, conveyance, flooding, and erosion. It has also been identified as having archaeological significance. The creek is entirely armoured below Beach Drive and has patches of armouring above Beach Drive. The uppermost section has one of the more natural creek channels in the watershed.

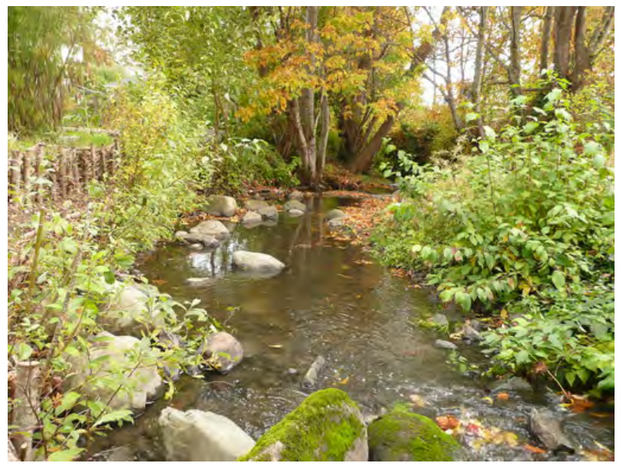
Reach location

The creek mouth where it discharges to the ocean

View of the rock wall showing proximity of the apartment building to the creek

Proposed greenways

South-west corner of the Kachan property. Much of this corner has eroded away in recent years.



Downstream view of Reach 1 showing bioengineering on the left and a relatively new 'bar' in centre, created by an artificially dug channel.

Bowker Greenway Routing Options

Trails Within Watershed

Proposed Trail Route

Proposed Pedestrian Only Trail

Bowker Creek Main Channel

Underground

Open Channel

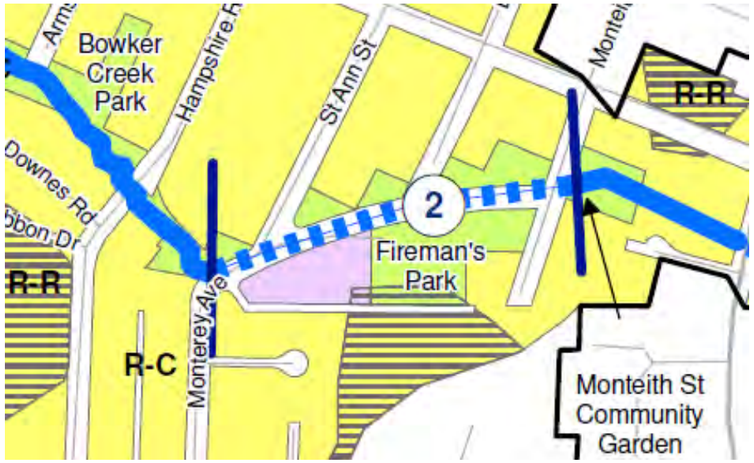
Bowker Creek Watershed Boundary

ACTION LIST FOR REACH 1: MONTEITH STREET TO CREEK MOUTH

REACH-ACTION NO.	LOCATION	ACTIONS	RATINGS					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
1-1	Eastern edge of Monteith community gardens property to above Beach Dr.	If property owners agree, relocate or remove fences and remove fill to re-slope channel banks further back into the private property, on the steep north bank in particular. The south bank is less steep and in better condition but could still use a widened riparian buffer. Remove invasive species and plant native trees and shrubs. If the space available is limited, the north bank could be terraced using willow wattles. If possible, include space for a greenway.	3	2	-1	-1	1	2, 3, 4	Oak Bay (BCI, community groups, property owners)		X	X	Property owners, Oak Bay, grants for buying native vegetation, grants for channel restoration	M
1-2	Monteith Street Community Gardens	Remove policeman's helmet (*Impatiens glandulifera*) from the community gardens on an annual basis until eradicated. Note: this is an archaeological site.	3	2	0	-1	3	3	Oak Bay (BCI, community groups)		X		Oak Bay Parks staff time	H
1-3	Monteith Street Community Gardens	On the south bank, funding is in place to purchase native plants to improve the riparian buffer (10-15 m wide strip) and remove invasive species. Note: this is an archaeological site.	3	3	-1	0	3	2, 3, 4	Oak Bay (BCI, community groups)		X		TD Friend of the Environment Fund	H
1-4	Monteith Street Community Gardens	On the north bank, reclaim riparian area with native plants, re-slope the bank and relocate affected garden plots. Install in-stream structures to improve in-channel conditions if other improvements are completed. Note: this is an archaeological site.	3	1	-1	-1	2	2, 3, 4	Oak Bay (BCI, community groups)			X	Grants, Oak Bay for relocating garden plots	M
1-5	Monteith St. to creek mouth	Create a greenway along this reach that connects to Fireman's Park and Beach Drive greenway (refer to Map 5). Partial or full acquisition of land or a right-of-way would be required from the creek mouth to the community gardens. Complete extensive creek restoration as part of this work, including reducing bank slopes, increasing riparian buffer width, removing invasive species and planting native vegetation.	3	2	-3	-1	1	1, 3	Oak Bay (BCI)			X	Large grant program and municipality, provincial funding	M
1-6 preferred	Beach Drive culvert	Replace undersized Beach Drive culvert with a bridge. The underside of the bridge should be above the 25-year water level and the asphalt creek bottom should be removed and reshaped to eliminate this fish barrier. Maintain existing upstream channel dimensions under roadway.	2	2	-2	-1	1	2	Oak Bay	x			Municipality, grants, provincial funding	M
1-6 alternative	*Beach Drive culvert*	*Replace undersized Beach Drive culvert with a 7.0 x 1.8 m box culvert with the bottom lowered to eliminate fish barrier. See Master Drainage Plan.*	2	2	-2	-1	1	2	Oak Bay	x			Municipal operating budget	L
1-7	Below Beach Drive to creek mouth	Remove invasive knotweed (*Polygonum* spp.) in the channel (and on land if property owners agree).	3	1	0	-1	3	3	Oak Bay (BCI)		X		Small grants, municipal operating budget	H
1-8	Below Beach Drive to creek mouth	Control erosion at 1725 Beach Drive apartment building by installing bioengineering terraces if the property uses allow. With redevelopment or landowner involvement, the concrete and rock walls can be removed or set back and the creek banks sloped back and planted with native vegetation. Changes on the south bank could only occur with redevelopment, while changes on the north bank are possible with landowner involvement. If possible, include space for a greenway.	3	2	-2	-1	2	2, 3, 4	Oak Bay, (property owners, BCI)			X	Property owners, Oak Bay, grants for buying native vegetation, grants for channel restoration	M

REACH 2: ANN STREET TO MONTEITH STREET

Reach 2 flows eastward from St. Ann Street through a pipe under Fireman's Park to Monteith Street. This reach has conveyance and flooding issues.



Reach location

Proposed greenways

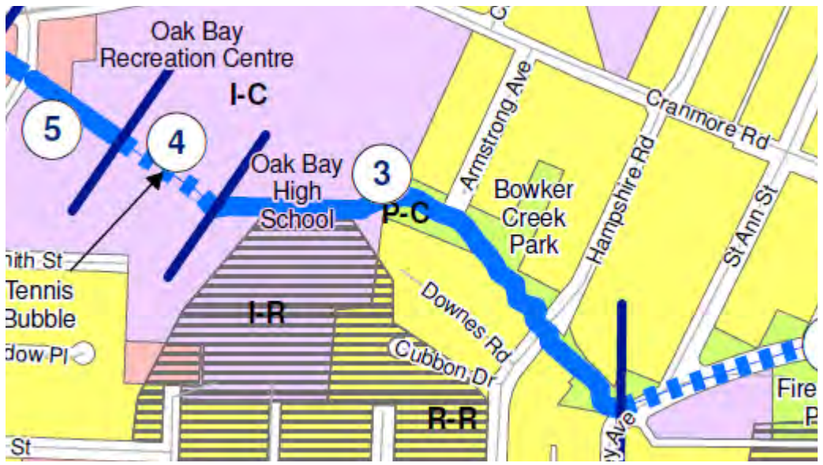
Fireman's Park, during a May 2009 watershed tour for municipal councillors

ACTION LIST FOR REACH 2: ST. ANN STREET TO MONTEITH STREET

REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
2-2	Fireman's Park	Install a berm along the east side of Fireman's Park to protect property on Monteith Street from flooding by directing overland flow back to the creek.	1	2	-1	-1	3	2	Oak Bay		X		Oak Bay	M
2-3 preferred	Fireman's Park	Daylight creek and create a greenway from Monterey Avenue to Monteith Street (parking may need to be reconfigured). Retain existing storm drain as high flow bypass. Detailed design of this action is needed. To reduce impacts to the community, if possible, relocate eastern Fireman's Park baseball field to another location in Oak Bay. See Figure 9 for a restoration concept for this location.	3	2	-3	-1	1	1, 2, 3, 4	Oak Bay		X		Assistance to make changes at Fireman's park - daylighting, greenway, from federal/provincial sources. Cost of new baseball diamond to Oak Bay	H
2-3 alternative	*Fireman's Park*	*To address inadequate hydraulic capacity of existing storm drain, add 3.1 m x 2.44 m box culvert. See Master Drainage Plan for more details.*	0	2	-2	0	1	2	Oak Bay		X		Oak Bay operating budget	L

REACH 3: DOWNSTREAM OF OAK BAY TENNIS BUBBLE TO ST. ANN STREET

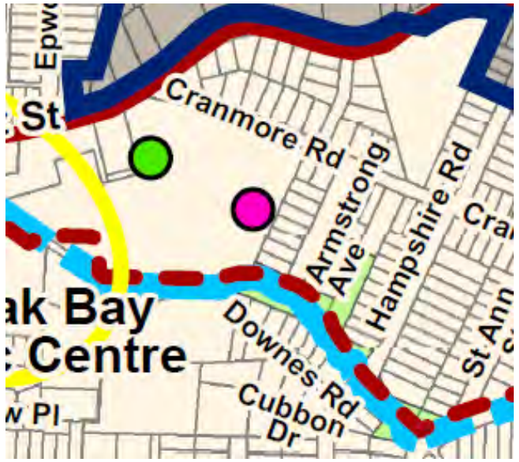
Reach 3 flows east in an open armoured channel through Oak Bay High School and southeast through Bowker Creek Park to St. Ann Street. The riparian vegetation includes young native trees, yellow willow and blackberry in the high school section, and grass with isolated pockets of landscaped native and non-native trees and shrubs through Bowker Creek Park. This reach has issues with invasive species Japanese Knotweed, channelization, conveyance, and flooding.



Reach location

Culvert exiting from under the tennis bubbles at the top of Reach 3

Narrow creek corridor between athletic track (left) and school property (right)



Proposed greenways

Typical concrete channel wall.

Natural sediments accumulate in the lower part of this reach

Bowker Greenway Routing Options
Trails Within Watershed
Proposed Trail Route
Proposed Pedestrian Only Trail

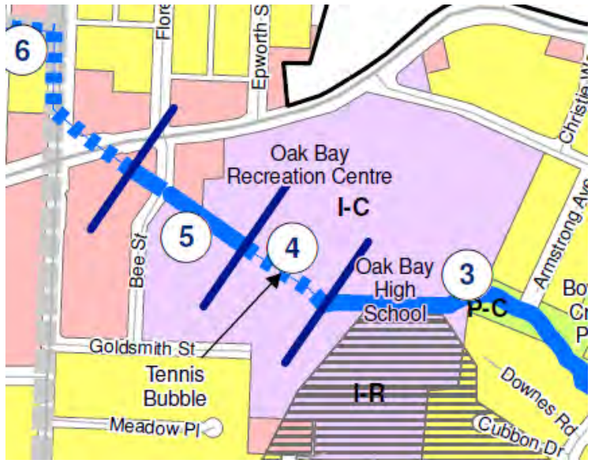
Bowker Creek Main Channel
Underground
Open Channel
Bowker Creek Watershed Boundary

ACTION LIST FOR REACH 3: DOWNSTREAM OF OAK BAY TENNIS BUBBLE TO ST. ANN STREET

REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING AGENCIES)	TYPE			FUNDING SOURCE	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
3-1	Downstream of Oak Bay Tennis Bubble to St. Ann St.	Create a greenway along this reach.	2	3	-1	-1	2	1, 2, 3, 4	Oak Bay		X	X	Provincial funding plus municipal operational budget	H
3-2	Downstream of Oak Bay tennis bubble to Oak Bay High School	Downstream of tennis bubble, remove box culverts and construct a foot bridge above the 25-year high water level between the athletic track and Oak Bay High School. Seek opportunities to reconfigure the channel. Move the north bank further into Oak Bay High School property by at least 10 m. Re-grade the north bank and vegetate with native species. Create earth-filled terraces against the existing concrete wall on the south bank to create a naturally vegetated streambank (leaving the adjacent athletic track intact). Install large rocks in the creek to create structure and to dissipate creek flow energy, and if the bottom is concrete lined, remove to create a naturalized bottom. Install a new greenway along the improved reach. See Figure 10 for a restoration concept for this location.	3	3	-2	-1	1	1, 2, 3, 4	Oak Bay (School District, BCI)		X	X	School District, Provincial, and smaller grants for plants	H
3-3	Oak Bay High School	Become involved in the planning or public input process to redevelop Oak Bay High School, so that improvements to Bowker Creek can be incorporated into the changes. Possible opportunity for an outdoor classroom creekside.	3	3	0	0	3	1, 2, 3, 4	BCI (Oak Bay)			X		H
3-4	Bowker Creek Park	Remove invasive knotweed (*Polygonum* spp.).	3	2	0	-1	3	3	Oak Bay		X		Oak Bay operations budget	H
3-5	Bowker Creek Park	Use more native plants in landscaping along channel edge. Replace grassed areas along channel with overhanging vegetation. Plant more native vegetation such as spirea and cattail in the backwater of the large pond.	2	2	-1	0	2	2, 3, 4	Oak Bay		X		Oak Bay Parks budget	M
3-6	Bowker Creek Park	Recreate a natural-bottomed creek bed using the current channel footprint. Remove the concrete lined bottom and sides, and grade the banks back or use terraces to support native vegetation along the banks. In locations where space is tighter, use the existing concrete walls to create planting benches. Plant native vegetation.	3	2	-1	0	1	3, 4	Oak Bay, BCI		X	X	Provincial and federal	H
3-7	Hampshire Road culvert	Increase hydraulic capacity at Hampshire Road by raising road by approximately 1.2 m and constructing a bridge with an underside above the 25-year water level. Maintain the existing channel dimensions through the road right-of-way.	1	2	-2	-1	1	2	Oak Bay		X	X	Grants, municipal operating budget	M

REACH 4: OAK BAY TENNIS BUBBLE

Reach 4 flows southeast in a pipe beneath the Oak Bay Tennis Bubble. This reach has conveyance issues.



Reach location

Proposed greenways

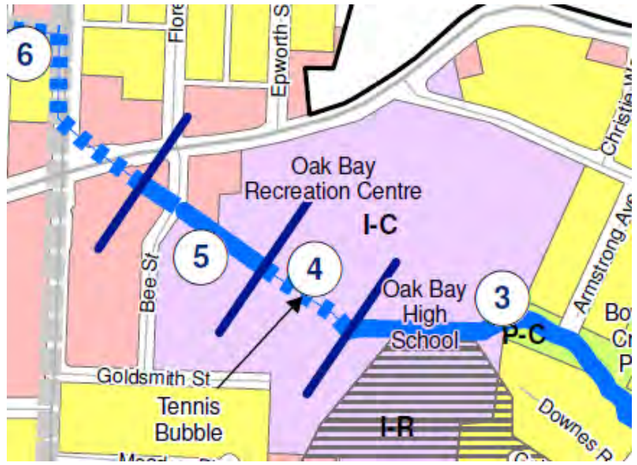
Bowker Creek emerging from under the tennis bubble

ACTION LIST FOR REACH 4: OAK BAY TENNIS BUBBLE

REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING SOURCE	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
4-1	Oak Bay Tennis Bubble	Improve by adding native trees pedestrian and bike access through this area as part of regional greenways planning.	2	3	-1	-1	1	3	Oak Bay		X	X	Municipal budget and provincial grants	H
4-2 preferred	Oak Bay Tennis Bubble	If the tennis bubble is relocated (e.g., in concert with changes at Oak Bay High School), daylight the creek and improve the channel geometry and sinuosity to create more natural conditions and opportunities for a riparian buffer. Create a greenway along this reach. See Figure 10 for a restoration concept for this location.	3	2	-3	-1	1	2, 3, 4	Oak Bay		X	X	Municipal budget and provincial grants	H
4-2 alternative	*Oak Bay Tennis Bubble*	*During redevelopment, to increase hydraulic capacity, lower channel and add 2 – 2.44 m by 3.66 m box culverts.*	0	2	-2	0	1	2	Oak Bay		X	X	Municipal budget and provincial grants	L

REACH 5: CADBORO BAY ROAD TO OAK BAY RECREATION CENTRE

Reach 5 flows in an open channel from Cadboro Bay Road southeast to the Oak Bay Recreation Centre where it enters a pipe under the Oak Bay Tennis Bubble. The riparian vegetation at this reach includes trees, such as big leaf maple and cottonwood, blackberry, and an armoured section with no vegetation. The creek is entirely armoured between Bee Street and Cadboro Bay Road and partially armoured downstream. This reach has issues with invasive species, channelization, conveyance, flooding, and erosion.



Reach location

Proposed greenways

Reach 5 beside the Oak Bay Recreation Centre, looking downstream from Bee Street. Note the steep banks and mix of invasive and native vegetation.

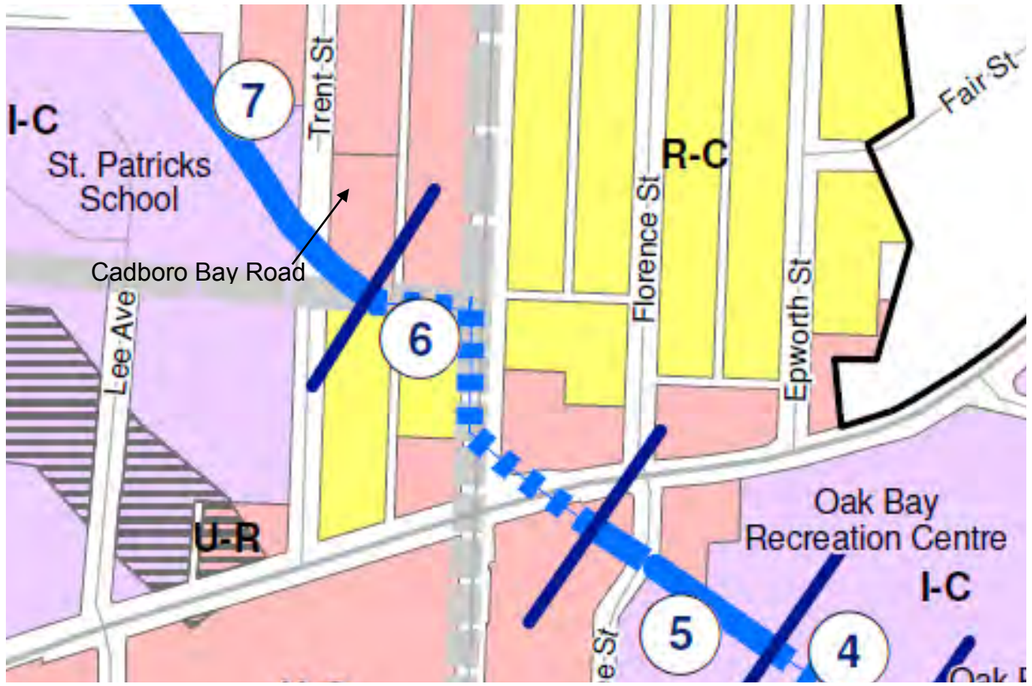
Looking upstream from Be Street. Few options exist to improve this reach. One possibility is installing in-stream baffles for complexity and aeration.

ACTION LIST FOR REACH 5: CADBORO BAY ROAD TO OAK BAY RECREATION CENTRE

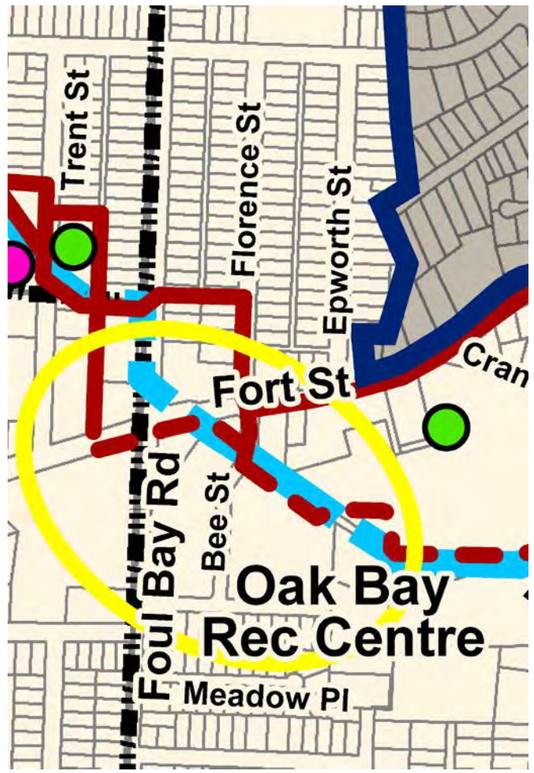
REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
5-1	Cadboro Bay Road to Bee Street	Widen channel and/or install baffle or boulders for in-channel complexity. Review potential for relocating creek to create a more meandering, wider corridor if adjacent land is proposed for redevelopment.	2	2	-2	-1	1	2, 3, 4	Oak Bay (BCI)		X	X	Provincial related to greenways, climate	M
5-2	Bee Street	To increase hydraulic capacity, install a bridge with same width as proposed upstream channel and with underside above 25-year water level which includes the climate change projections.	2	2	-1	-1	1	2	Oak Bay		X		Oak Bay operating budget	M
5-3	Bee Street to Oak Bay Recreation Centre upstream of Tennis Bubble	Changes to Oak Bay High School create opportunities to improve the creek on the north side of the existing channel. Widen channel and create more gradual side slopes (slope will be based on detailed design and site constraints). Plant native vegetation along banks. Create a greenway along the south side of the creek. This action would require at least 10 m of additional space along the creek corridor, and would affect parking at the Oak Bay Recreation Centre A detailed design is needed that could include a strategy to replace the lost parking. See Figure 10 for a restoration concept for this location.	3	3	-2	-1	1	2, 3, 4	Oak Bay (BCI)		X	X	Provincial related to greenways, climate	M-H
5-4	Cadboro Bay Road to Oak Bay Recreation Centre	Create a greenway along the creek and greenways along Bee Street, Florence Street, and Cadboro Bay Road (refer to Map 5 for more details).	2	3	-2	-1	1	3	Oak Bay	X		X	Provincial funding plus municipal operational budget	H

REACH 6: TRENT STREET TO CADBORO BAY ROAD

Reach 6 flows east in a pipe from Trent Street, south along Foul Bay Road, and southeast to Cadboro Bay Road. This reach has conveyance issues.



Reach location



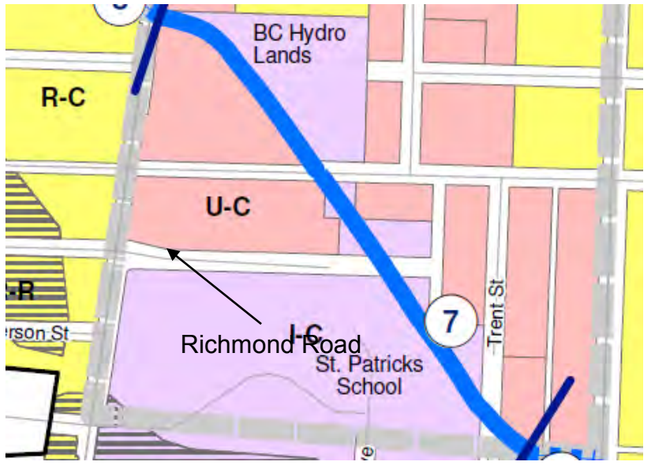
Proposed greenways

ACTION LIST FOR REACH 6: TRENT STREET TO CADBORO BAY ROAD

Reach-Action no.	Location	Actions	Rating					WMP GOALS ADDRESSED	Lead Agency (possible supporting partners)	Type			Funding	Priority (H, M, L)
			Environ-mental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
6-1	Trent St. to Cadboro Bay Rd.	Create greenways in this corridor between Trent Street and Foul Bay Road, Florence Street, and through an unnamed road off Florence Street to the culvert west of Foul Bay Road (refer Map 5 for more details).	2	3	-2	-1	1	3	Oak Bay, Victoria, BCI		X	X	Grants, parks budget	M-H
6-2 preferred	Trent St. to Cadboro Bay Rd.	If major redevelopment occurs, seek opportunity to relocate, meander, and daylight creek, and increase capacity to deal with flooding issues. A detailed design is needed.	3	2	-3	-1	1	2, 3, 4	Oak Bay, Victoria, BCI		X	X	Developer	H
6-2 alternative	*Trent St. to Cadboro Bay Rd.*	*To increase hydraulic capacity, lower and upgrade to 2 - 3.66 x 3.66 box culverts.*	0	2	-2	0	1	2	Oak Bay, Victoria		X	X	Municipal operating budget	L

REACH 7: RICHMOND ROAD TO TRENT STREET

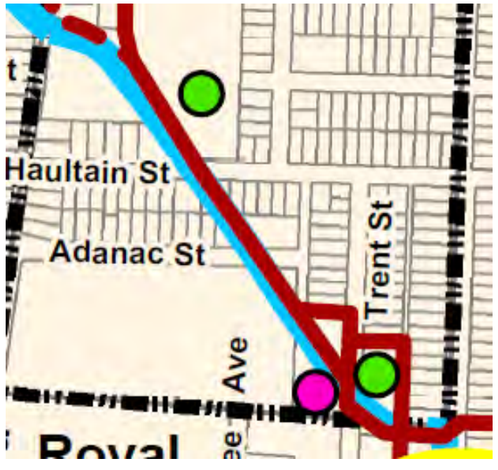
Reach 7 flows in an open partially armoured channel southeast through the BC Hydro property, the Royal Jubilee Hospital and St. Patrick's school. Creekside property is also owned by Saanich and the Bishop of Victoria. The riparian vegetation includes deciduous and coniferous trees, grass, blackberry, yellow willow, and native shrubs. This reach has issues with invasive species, channelization, conveyance, flooding, and erosion.



Reach location

The path along the BC Hydro portion of this reach is popular with neighbours The mature conifer trees that line the path are important to the community.

View across the creek toward the west bank. Bowker Creek is constrained along the west side of the Hydro property and restoration would entail expansion to the east.



Proposed greenways

View from the west bank across the creek to the triangle of land south of Haultain on the east bank. This area provides potential for widening the creek corridor.

The portion of the reach alongside the Royal Jubilee Hospital has some native vegetation and other areas of eroding grassy banks.

Bowker Greenway Routing Options

Trails Within Watershed

Proposed Trail Route

Proposed Pedestrian Only Trail

Bowker Creek Main Channel

Underground

Open Channel

Bowker Creek Watershed Boundary

ACTION LIST FOR REACH 7: RICHMOND ROAD TO TRENT STREET

REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
7-1	BC Hydro property (1837 Kings Rd)	Meet with BC Hydro to discuss the future use and ownership of the BC Hydro land between Kings Road and Haultain Street. Discuss the possibility of turning all or part of the property into a park and greenway through a gift from BC Hydro, or if necessary, a land purchase.	3	3	0	0	3	1,2,3,4	BCI, Saanich		X		Regular operating budget	H
7-2 preferred	BC Hydro property (1837 Kings Rd)	If BC Hydro agrees, move and meander the channel eastward a minimum of 10 m to create a floodplain and riparian area. Re-slope the banks to a gentle grade. Create some slow moving off-channel areas as a public amenity and to improve water quality (some mature conifers would need to be removed and extensive public education and consultation would be needed; retain as many of these trees as possible). Create crayfish habitat and salvage crayfish from current creek location. Plant native riparian species in buffers 5-15 m wide, with key points for public viewing of the creek. As possible, create flood storage by locating the new channel in a floodplain (depression) that would retain some flood flows. Create a greenway path outside the riparian buffer with seating and interpretive signs. See Figure 11 for one possible restoration concept for this location.	3	3	-2	-1	1	1, 2, 3, 4	Saanich (BCI, BC Hydro)			X	BC Hydro provide land. Funding provincial or federal for works	H
7-2 alternative	*BC Hydro property (1837 Kings Rd)*	*In the short-term, re-slope the bank and plant with native vegetation 25 m downstream of Richmond Road culvert to control bank erosion.*	*2*	*1*	*-1*	*-1*	*2*	*4*	*Saanich (property owner)*		*X*		*Saanich operating budget*	*M*
7-3 preferred	Haultain Street Culvert	To increase hydraulic capacity of Haultain Street culvert, install a bridge with an underside above the 25-year water level.	1	2	-2	-1	1	2	Saanich		X	X	Saanich operating budget	H
7-3 alternative	*Haultain Street Culvert*	*To increase hydraulic capacity of Haultain Street culvert, lower and upgrade the Haultain Street culvert to a 4.00 x 3.60 m box culvert.*	0	2	-1	0	1	2	Saanich		X	X	Saanich operating budget	L
7-4	Haultain Street and lots immediately south of Haultain	In concert with changes to the BC Hydro property (Action 7-2), change the location of the creek crossing under Haultain Street to take advantage of the vacant triangle of land immediately south of Haultain Street and the residential lot to the east (if it comes on the market). Remove the gabions, widen the creek corridor, reduce bank slopes, and plant native vegetation. Create a greenway.	3	1	-2	-1	1	2,3	Saanich, BCI			X	Provincial or federal	M
7-5	Haultain Street to Trent Street	In the short-term, conduct ongoing management of yellow willow. Repair willow wattle structure 190 to 201 m downstream of Haultain Street culvert.	2	2	0	-1	3	3	Saanich		X		Saanich operating budget	M
7-6 preferred	Haultain to Trent Street (RJ Hospital and St. Patrick's School, Bishop of Victoria, Adanac Street ROW).	On an opportunistic basis, reshape the channel and create meanders, create a floodplain, gradual side slopes and a healthy riparian area. Build small off-channel wetlands as space permits. VIHA is interested in options that improve the creek running through their property, especially options that include the Adanac Street right-of-way and the Bishop of Victoria property. Include the St. Patrick's School property in this work as possible. Create a greenway (refer to Map 5 for more details). See Map 10 for an illustration of a restoration concept for this location.	3	3	-2	-1	1	2, 3, 4	Saanich (VIHA, Bishop of Victoria, BCI)			X	Provincial, federal	H
7-6 alternative	*St. Patrick's School only*	*If widening, meandering and relocating the creek corridor through St. Patrick's School is not feasible, create retaining walls and a small riparian area within the current bounds, or widen the creek corridor as much as possible to allow for yellow willow removal and bank slopes that will support native vegetation*	*2*	*1*	*-1*	*-2*	*1*	*2, 3, 4*	*Saanich (School Board, BCI)*			*X*	*Property owners, Saanich*	*L*
7-7	Trent to Pearl St.	Work with landowners between Trent and Pearl streets to achieve the long term vision (Blueprint action #9)						9	BCI					

REACH 8: NEWTON STREET TO RICHMOND ROAD

Reach 8 flows south in a pipe from Newton Street to Kings Road under the Spirit Garden right-of-way, and then southeast to Richmond Street. This reach has conveyance issues.

Reach location

Proposed greenways

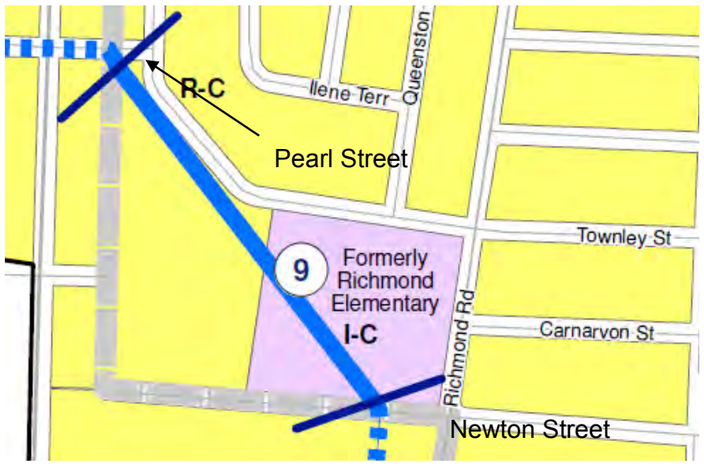
Walking through the Spirit Garden during the 2008 Bowker Creek Celebration

ACTION LIST FOR REACH 8: NEWTON STREET TO RICHMOND ROAD

REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
8-1	Between Trent & Pearl streets	Work with landowners between Trent St. & Pearl St. to achieve the long term vision (Blueprint action #9)						9	BCI					
8-2	Newton Street to Richmond Road (including the Spirit Garden and Victoria right-of-way)	Create a greenway along the creek (refer to Map 5 for more details).	3	2	-2	-1	2		Saanich & Victoria (BCI)		X	X	Provincial or federal. Victoria	M
8-2 preferred	Newton Street to Richmond Road (including the Spirit Garden and Victoria right-of-way)	As possible or feasible, daylight and improve the creek along the greenway to increase its hydraulic capacity and environmental value. This could include property acquisition and the creation of a small park at the corner of Richmond and Newton Streets, extending south to Kings Road.	3	2	-3	-1	1		Saanich & Victoria (BCI)			X	Provincial or federal. Victoria	
8-2 alternative	*Newton Street to Richmond Road*	*To increase hydraulic capacity, upgrade to 2 - 3.10 x 2.44 m box culverts.*	0	1	-3	0	1	2	Victoria & Saanich		X	X	Saanich & Victoria operating budgets	L
8-3	Newton Street to Richmond Road (including the Spirit Garden and Victoria right-of-way)	Consider placing this area into a Development Permit area to enhance the creek when development takes place.	3	2	0	-1	3	3	Victoria & Saanich			X	Victoria policy decision	H

REACH 9: PEARL STREET TO NEWTON STREET

Reach 9 flows southeast in an open channel from Pearl Street, beside the Townley Street right-of-way, and through the former Richmond Elementary to Newton Street. The riparian vegetation includes trees and shrubs, mostly mature yellow willow, blackberry, scotch broom, red osier dogwood, black hawthorne, and snowberry. This reach has issues with invasive species, channelization, conveyance, flooding, and erosion.



Reach location

The right-of-way along Townley Street is relatively narrow, but still allows an opportunity to widen the creek corridor.

The west bank is constrained in the upper two-thirds of the reach by an extensive apartment complex at 1702 Newton Street.

Proposed greenways

Bowker Creek cuts through the former Richmond Elementary school grounds and is surrounded by fencing and fields on both sides

Erosion is an issue through the school grounds. The fence footings have been eroding and public access is worsening the issue.

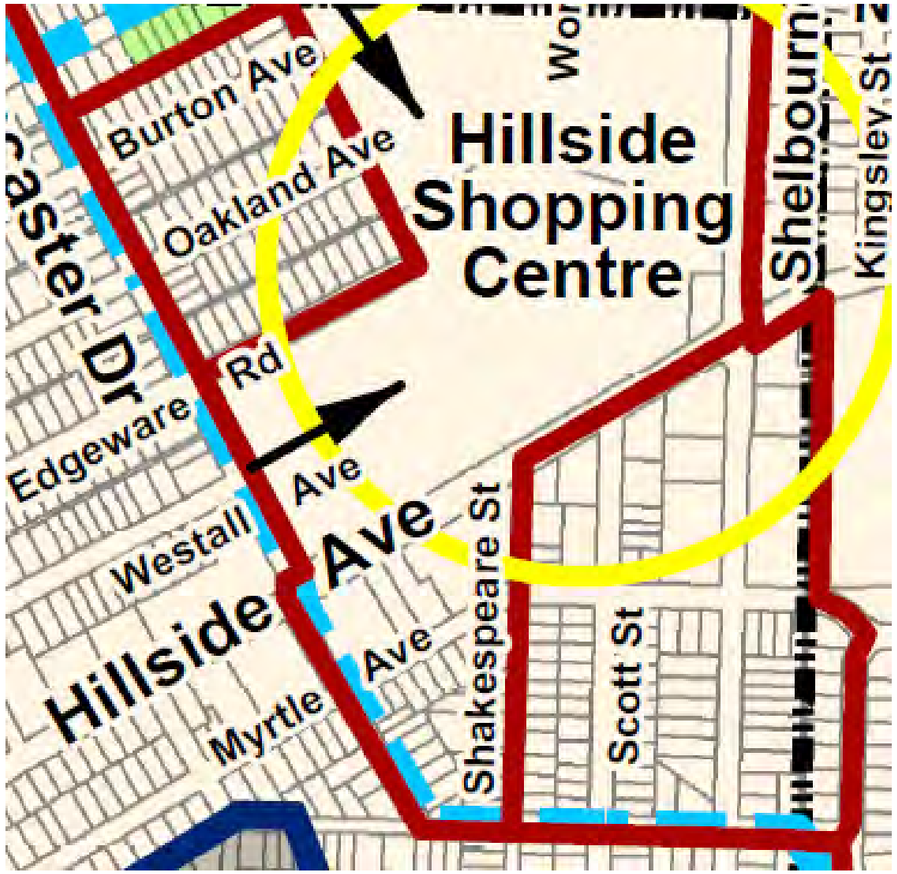
ACTION LIST FOR REACH 9: PEARL STREET TO NEWTON STREET

REACH-ACTION NO.	LOCATION	ACTIONS	RATING						WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TIMING			FUNDING SOURCE	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability	Total			Capital	Operational	Opportunistic		
9-1	Between Trent and Pearl streets	Work with landowners between Trent St. & Pearl St. to achieve the long term vision (Blueprint action #9)							9	BCI					
9-2	Pearl Street to Newton Street	Create a greenway along the creek (refer to Map 5 for more details). Most of this proposed greenway is through the former Richmond Elementary school grounds, which already has a right-of-way for this purpose, and the remainder could be created on the Townley Street right-of-way. If channel relocation occurs (see 9-4), the greenway location could be modified as appropriate.	3	3	-2	-1	1	4	3	Saanich (School District, BCI)			X	Provincial, federal, Saanich	H
9-3	Former Richmond Elementary	Replace and reposition fence that is falling over.	1	2	-1	0	2			School District		X		School District budget	M
9-4 preferred	Former Richmond Elementary School property only	On this site there is an opportunity to create a wider, healthier channel in the triangle to the west of the current alignment. See Figure 12 for a restoration concept in this location. Moving the channel west may accommodate different land uses by removing the channel that currently bisects the property. The new, relocated channel should have gently sloping banks and be planted with native species to create a riparian buffer. Opportunities for an outdoor classroom. The existing channel may provide opportunities to install an overflow pipe to accommodate the peak flows, while having the separate constructed channel providing more habitat and amenity values. The detailed design and site constraints will determine what occurs. A greenway should be created as part of these changes, and can follow the existing right-of-way, or be relocated alongside the new channel location.	3	3	-2	-1	2	5	2, 3, 4	Saanich, School District, (BCI, land developer)			X	Federal, provincial	H
9-4 alternative	*Former Richmond Elementary School property only*	*Widen the creek corridor within the current alignment. If the width is constrained, a retaining wall could be installed on the east bank to create a planting bench. Create a more gently sloping west bank and increase the width of the riparian areas. Remove invasive species and plant native species. Create a greenway along the creek in the current right-of-way alignment.*	2	2	-2	-1	1	0	2, 3, 4	Saanich (School District 61)			X	Saanich, School District 61	M

REACH 10: CLAWTHORPE AVENUE TO PEARL STREET

Reach 10 flows southeast from Clawthorpe Avenue in a pipe along Doncaster Drive, and east along Pearl Street to just before Townley Street. This reach has conveyance issues.

Reach location



Proposed greenways

Bowker Greenway Routing Options

Trails Within Watershed

Proposed Trail Route

Proposed Pedestrian Only Trail

Bowker Creek Main Channel

Underground

Open Channel

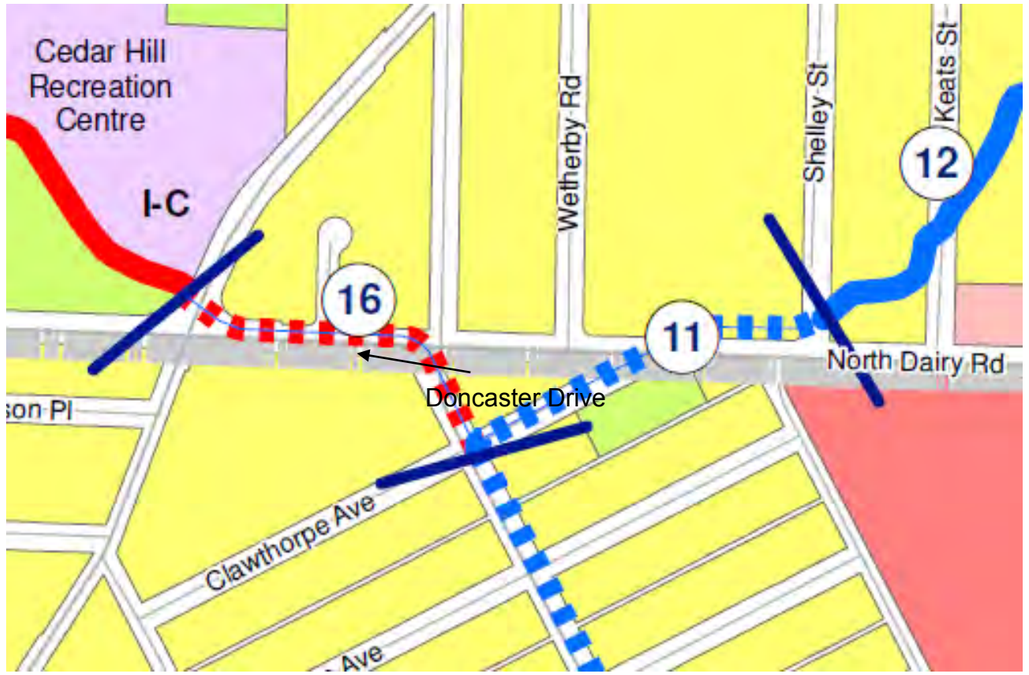
Bowker Creek Watershed Boundary

ACTION LIST FOR REACH 10: CLAWTHORPE AVENUE TO PEARL STREET

REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmen-tal	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunis-tic		
10-1	Between Trent & Pearl St	Work with landowners between Trent St. & Pearl St. to achieve the long term vision (Blueprint action #9)						9	BCI					
10-2	Clawthorpe Ave. to Pearl St..	Create a greenway along Doncaster Drive (refer to Map 5 for more details). Depending on greenway design, this may require partial or full acquisition or right-of-ways along certain properties.	2	2	-2	-1	1	3	Victoria	X			Victoria, Provincial, federal	M
10-3	Clawthorpe Ave. to Pearl St.	During redevelopment, further increase onsite storage and green infrastructure features at Hillside Mall, by working cooperatively with the developer.	3	3	-3	-1	1	1, 2, 3, 4	Victoria (BCI)			X	Provincial, federal, developer	H
10-4 preferred	Clawthorpe Ave. to Pearl St.	During significant redevelopment, determine the feasibility of daylighting Bowker Creek along the periphery of Hillside Mall, or along the Doncaster Dr. ROW.	3	2	-3	-1	1	1, 2, 3, 4	Victoria			X	Victoria operating budget, grants	H
10-4 alternative	*Clawthorpe Ave. to Pearl St.*	*To increase hydraulic capacity on Pearl Street, add 3.66 x 1.83 m box culvert. On Doncaster Drive add 1.52 m round storm drain.*	*0*	*1*	*-2*	*-1*	*1*	*2*	*Victoria*			*X*	*Victoria capital budget*	*M*

REACH 11: NORTH DAIRY ROAD TO CLAWTHORPE AVENUE

Reach 11 flows west in a pipe along North Dairy Road, and southwest along Clawthorpe Avenue to Doncaster Drive.



Reach location

Proposed Greenways

Bowker Greenway Routing Options

Trails Within Watershed

Proposed Trail Route

Proposed Pedestrian Only Trail

Bowker Creek Main Channel

Underground

Open Channel

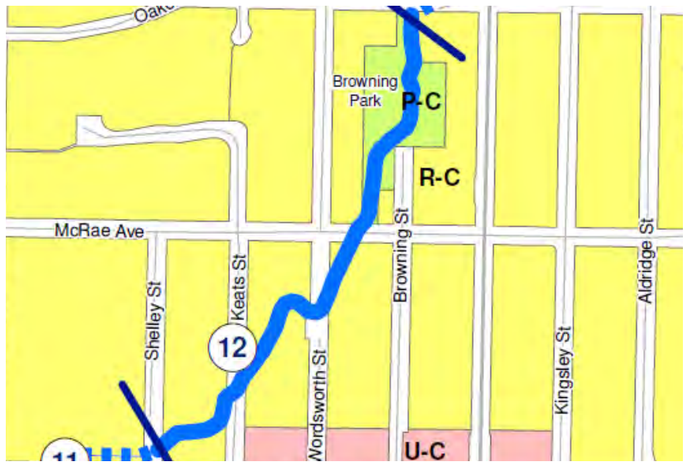
Bowker Creek Watershed Boundary

ACTION LIST FOR REACH 11: NORTH DAIRY ROAD TO CLAWTHORPE AVENUE

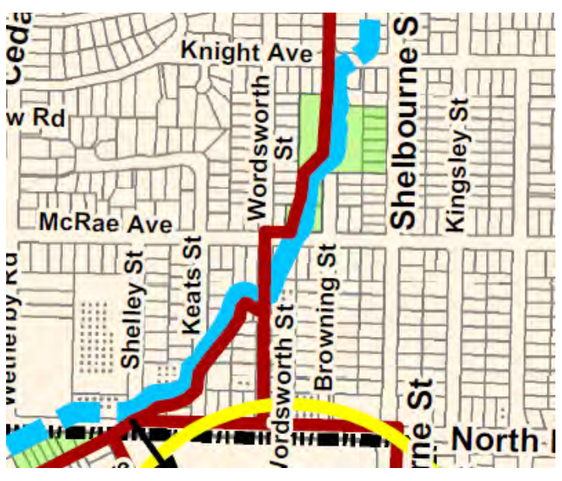
REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
11-1	North Dairy Rd. to Clawthorpe Ave.	Create a greenway near the creek between Clawthorpe Avenue and Burton Avenue through Clawthorpe playlot (refer to Map 5 for more details).	2	3	-2	-1	1	3	Victoria		X	X	Grants, provincial	M
11-2	North Dairy Rd. to Clawthorpe Ave.	Relocate and daylight the creek through the Clawthorpe playlot. Review daylighting options with Victoria Parks department due to concerns over daylighting the creek near a busy traffic corridor. Consider purchasing properties in this area to create more space for the creek and greenways.	2	2	-2	-1	1	2, 3, 4	Victoria	X		X	Provincial, Victoria capital budget	H

REACH 12: KNIGHT AVENUE TO NORTH DAIRY ROAD

Reach 12 flows southwest in an open partially armoured channel from Knight Avenue through Browning Park, private residences, and road rights-of-way to Shelley Street and North Dairy Road. The riparian vegetation is variable and includes Himalayan blackberry, native and introduced deciduous trees and shrubs, and sections that abut lawns. This reach has issues with invasive species, channelization, conveyance, flooding, and erosion.



Reach location



Proposed greenways

Bowker Greenway Routing Options
Trails Within Watershed
Proposed Trail Route
Proposed Pedestrian Only Trail

Bowker Creek Main Channel
Underground
Open Channel
Bowker Creek Watershed Boundary

Looking across to an armoured east bank at the north end of Browning Park. The creek is highly incised at this point.

The section between McRae and North Dairy is constrained between private lots and has erosion issues.

Grassy area in Browning Park along the west bank that is a candidate for riparian planting

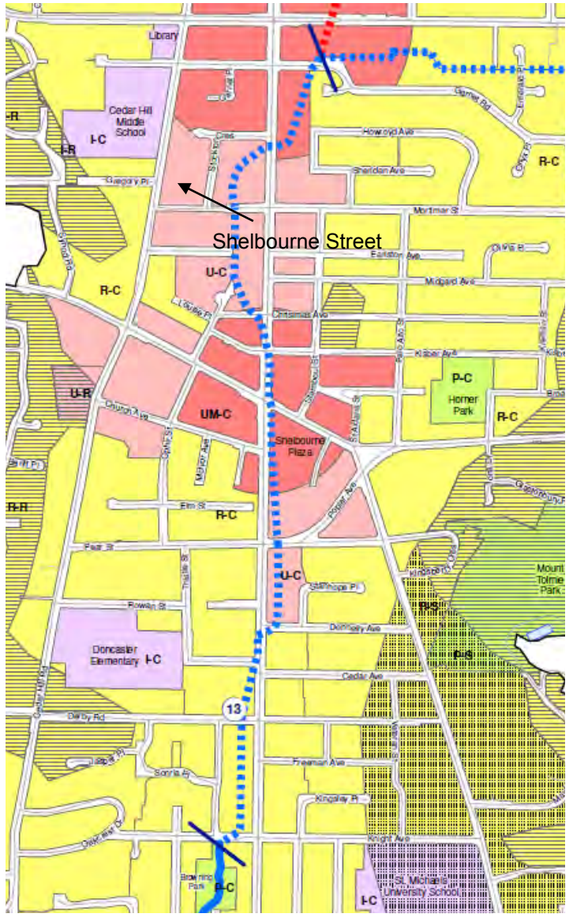
This reach frequently experiences hydrocarbon pollution from upstream sources

ACTION LIST FOR REACH 12: KNIGHT AVENUE TO NORTH DAIRY ROAD

REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TIMING			FUNDING SOURCE	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
12-1	Browning Park only	**Operational actions for Browning Park**—Combine greenway and park improvements with the following Bowker Creek restoration activities: ✓ Move encroaching paths back from the creek and close off informal trails on east bank. ✓ Vegetate grassy areas or areas with a limited riparian fringe, in particular, the west bank between the footbridge and McRae Avenue, and along the east bank where the path encroaches and where housing has been removed. ✓ Re-slope the banks, particularly the west bank alongside 1621 Knight Avenue and 60 m and 265 m downstream of Knight Avenue culvert. ✓ Address house drainage coming through the west side of the park by building a demonstration rain garden for retention. ✓ Determine the source of hydrocarbons and if necessary, create an oil capture device. ✓ Remove invasive species and replant with diverse native species.	3	2	-1	-1	2	2, 3, 4	Saanich, residential property owners		X	X	Trees for Tomorrow, Local Motion, Saanich operational	H
12-2	Browning Park only	**Opportunistic actions for Browning Park—**If the actions listed in 12-1 for park renewal do not fully achieve creek restoration, improve creek conditions on an opportunistic basis. All long-term changes to this reach should consider bank armour removal and bank re-sloping. Ensure that the creek has a diverse riparian buffer throughout the park and maximize public outreach opportunities and public connection with the creek corridor. Consider moving the channel further east (at the south end near McRae Street) to allow space for a greenway and a riparian buffer adjacent to the west bank. Alternatively, re-grade the east bank, remove the rock wall and plant with native trees and shrubs. Remove the asphalt chunks and paving from the entire channel bottom. Create engineered rock groins and riffles. Implement a program to purchase properties to expand the park to the north and south, as they come available.	3	2	-2	-1	2	2, 3, 4	Saanich (BCI), residential property owners			X	Local Motion, Trees for Tomorrow, Saanich Parks	H
12-3	McRae Avenue to Keats Street	To increase hydraulic capacity, add a 1.83 x 1.52 m box high flow bypass along Keats Street and McRae Avenue. See Master Drainage Plan (Kerr Wood Leidal, 2007).	0	1	-1	-1	1	2	Saanich, residential property owners			X	Saanich	L
12-4	Keats Street	Expand the riparian buffer into the existing rights-of-way along Keats Street, remove the gabions, re-slope the banks, remove invasive species, and plant native species.	3	2	-3	-1	1	2,3,4				X	Provincial, federal	
12-5	North Dairy Road to McRae Avenue	Create a greenway along this reach and improve creek conditions, particularly as relates to bank slope, bank erosion, floodplain creation, and planting of native riparian vegetation. This effort would require rights-of-ways or acquisition of creekside properties. Acquisition would be done opportunistically when properties come onto the market: rights-of-way could be created with landowner involvement (refer to Map 5 for details on the greenway portion of this work).	3	2	-3	-1	1	2,3,4	Saanich, residential property owners			X	Provincial, federal	M
12-6	McRae Ave. to North Dairy Rd. (including Wordsworth right-of-way)	In the short-term, improve the riparian buffer (remove invasives and plant native species) and re-slope the bank on the publicly owned land on the Wordsworth right-of-way, as part of greenway improvements. Remove the small patch of invasive lamium along the bank just downstream of the pedestrian bridge.	3	2	-3	-1	1	2, 3, 4	Saanich, residential property owners		X	X	Saanich operational and parks, Local Motion, Trees for tomorrow	M-H

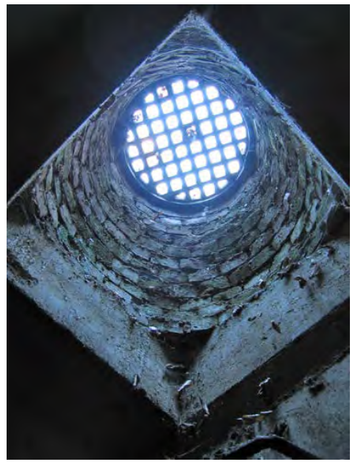
REACH 13: GARNET ROAD TO KNIGHT AVENUE

Reach 13 generally flows south in a pipe from Garnet Road to Knight Avenue along Shelbourne Street, a highly developed commercial and transportation corridor. This reach has conveyance issues.



Reach location

Proposed greenways



Reach 13 is entirely below ground, beneath a busy transportation corridor

Bowker Greenway Routing Options

Trails Within Watershed

Proposed Trail Route

Proposed Pedestrian Only Trail

Bowker Creek Main Channel

Underground

Open Channel

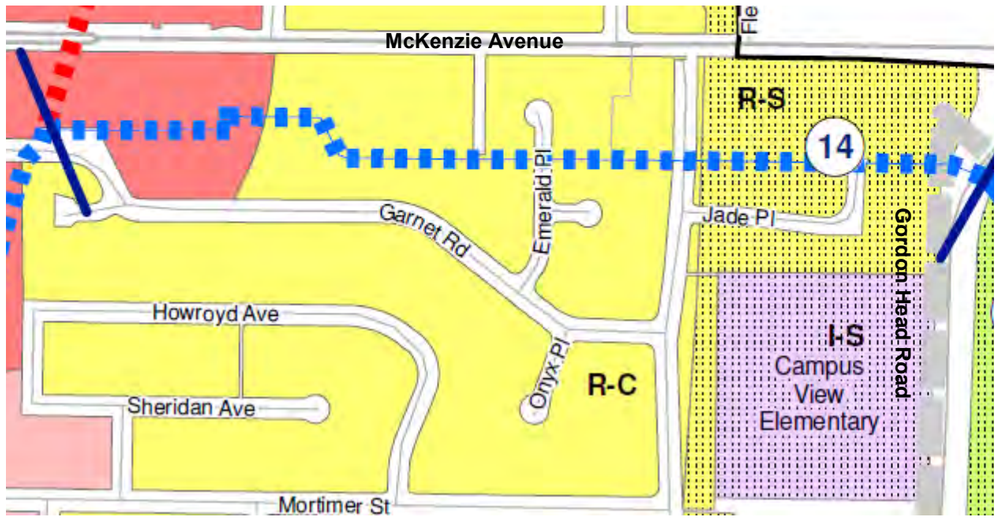
Bowker Creek Watershed Boundary

ACTION LIST FOR REACH 13: GARNET ROAD TO KNIGHT AVENUE

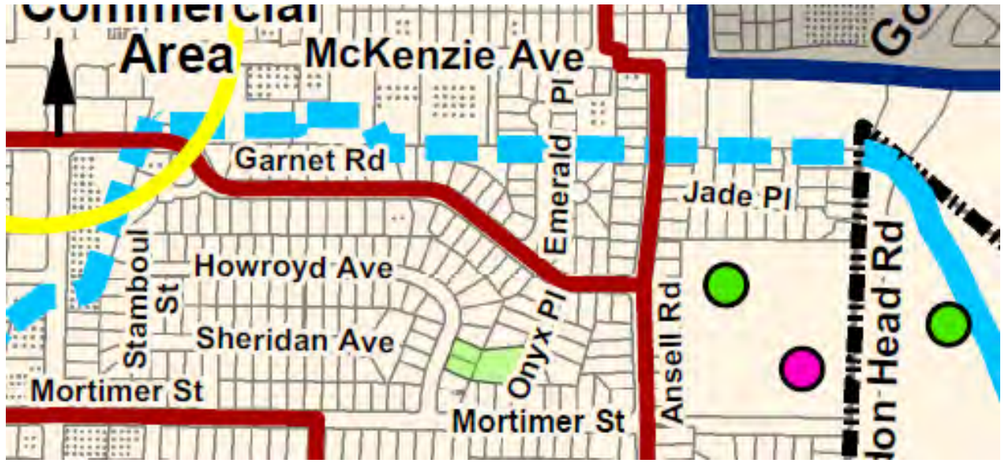
REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
13-1	Garnet Rd. to Knight Ave. (includes the Shelbourne Corridor)	Saanich is currently in the process of creating a Shelbourne corridor plan. The Bowker Creek Initiative will be involved in developing and giving feedback to this plan.	3	3	0	-1	3	1, 3	BCI		X		BCI	H
13-2 preferred	Garnet Rd. to Knight Ave. (includes the Shelbourne Corridor)	Relocate and daylight Bowker Creek and create a greenway corridor generally to the west of Shelbourne Street from Knight Street and Donnelley Street, to the east from Donnelley Street to Christmas Avenue, and to the west from Christmas Avenue to Stockton Avenue. Detailed design of this project would include a list of properties to acquire, greenway alignments (Map 5), and measures to create a healthy creek channel and riparian buffer. The existing pipe could continue to be used during high flow periods.	3	3	-3	-2	1	2, 3, 4	Saanich (BCI)			X	Saanich, developers	H
13-2 alternative	*Garnet Rd. to Knight Ave. (includes the Shelbourne Corridor)*	*To increase hydraulic capacity, upgrade to:* ✓ *a 3.66 x 1.83 m box culvert from Donnelly Avenue to Knight Avenue,* ✓ *a 3.10 x 1.52 m box culvert from Rowan Street to Donnelly Avenue,* ✓ *a 3.66 x 1.52 m box from Cedar Hill Cross Road to Rowan Street,* ✓ *a 3.10 x 1.22 m box from Gamet Road to Cedar Hill Cross Road.*	0	0	-3	-2	1	2	Saanich			X	Saanich	L
13-3	Garnet Rd. to Knight Ave. (includes the Shelbourne Corridor)	Detention and infiltration opportunities should be implemented during redevelopment and as part of the Shelbourne corridor plan. Install rain gardens, encourage property owners to use green infrastructure methods, and install infiltration boulevards planted with native trees and shrubs. These actions will address downstream water quality issues in Browning Park.	3	1	-1	-1	2	1,2,4	Saanich	X	X	X	developers	M

REACH 14: GORDON HEAD ROAD TO GARNET ROAD

Reach 14 flows west in a pipe from Gordon Head Road, just south of Mackenzie Avenue, to Garnet Road. This reach has conveyance issues.



Reach location



Proposed greenways

Bowker Greenway Routing Options

Trails Within Watershed

Proposed Trail Route

Proposed Pedestrian Only Trail

Bowker Creek Main Channel

Underground

Open Channel

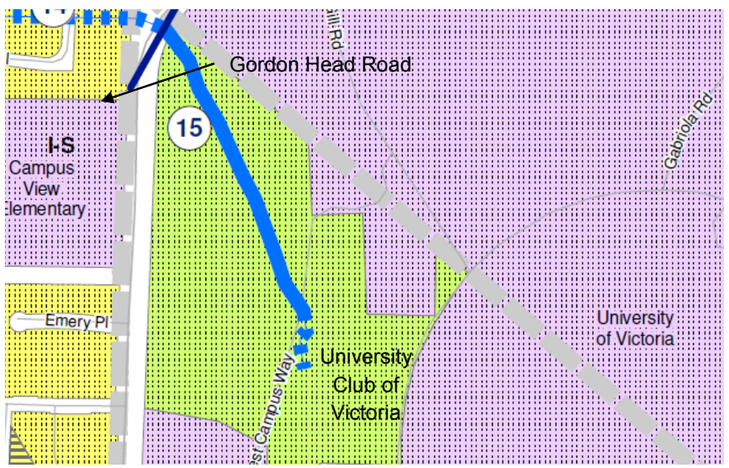
Bowker Creek Watershed Boundary

ACTION LIST FOR REACH 14: GORDON HEAD ROAD TO GARNET ROAD

REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
14-1 preferred	Gordon Head Rd. to Garnet Rd.	During repair of infrastructure or re-development, daylight the creek and use existing storm drain as a high flow bypass. Include pedestrian access and greenways.	3	3	-3	-1	1	2, 3, 4	Saanich (developer)			X	Saanich, developer	M-H
14-1 alternative	*Gordon Head Rd. to Garnet Rd.*	*Increase hydraulic capacity by upgrading to:* ✓ *a 3.1 x 1.22 m box from Cedarwood to Gamet,* ✓ *a 1.83 x 1.22 m box culvert from Gordon Head to Cedar Wood,* ✓ *a 1.37 m round culvert at Gordon Head Road.*	0	0	-3	-1	1	2	Saanich			X	Saanich	L

REACH 15: THE UNIVERSITY CLUB OF VICTORIA (THE HEADWATERS) TO GORDON HEAD ROAD

Reach 15 flows in an open channel from the headwaters at the University Club of Victoria through the University of Victoria to Gordon Head Road. The riparian vegetation includes widely spaced native deciduous and coniferous trees with a shrub understory, and this reach has the only remaining natural floodplain in the watershed. This reach has invasive species issues.



Reach location

The pond at the Faculty Club. The perimeter is landscaped and native plantings could be increased.

Blackberry patches within the forested area are an obvious target for invasive species removal efforts

Proposed greenways

Much of Reach 15 is inaccessible within a forested floodplain

This feeder channel coming from the stadium is a good candidate for riparian restoration and for widening the riparian buffer

Bowker Greenway Routing Options

Trails Within Watershed

Proposed Trail Route

Proposed Pedestrian Only Trail

Bowker Creek Main Channel

Underground

Open Channel

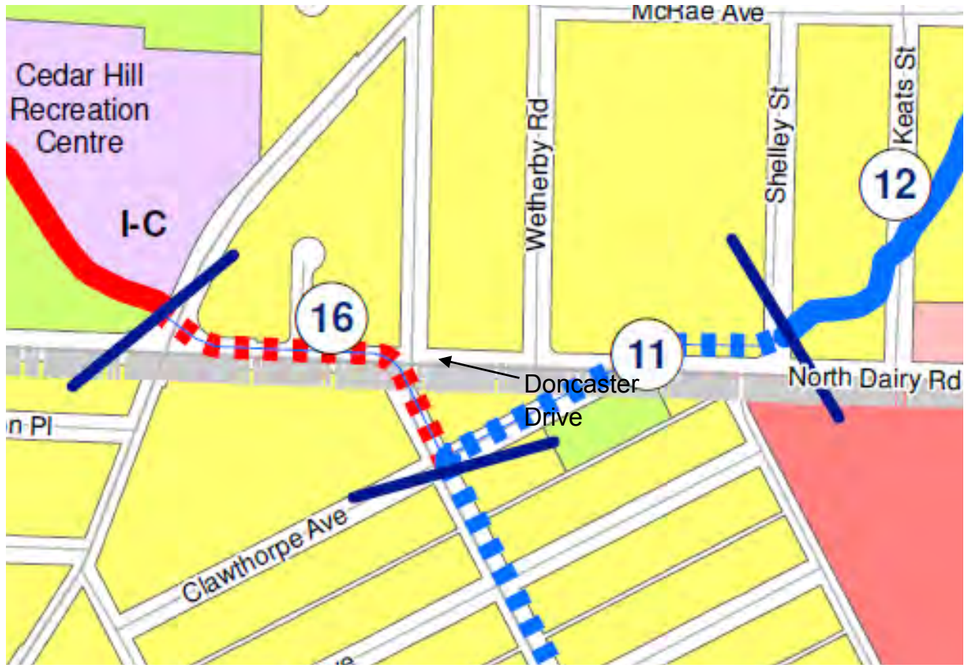
Bowker Creek Watershed Boundary

ACTION LIST FOR REACH 15: THE UNIVERSITY CLUB OF VICTORIA (THE HEADWATERS) TO GORDON HEAD ROAD

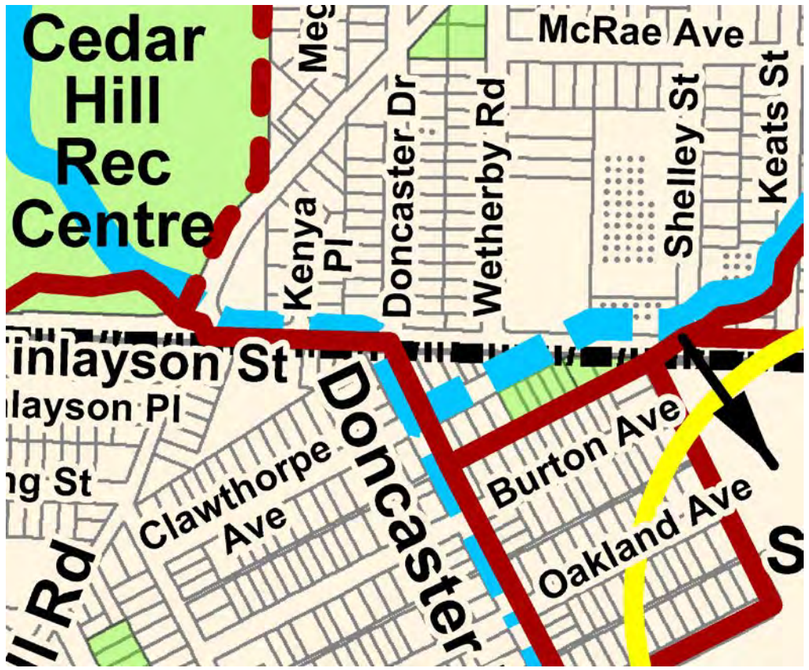
REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
15-1	University Club of Victoria to Gordon Head Road	Remove invasive species. Install interpretive signs about Bowker Creek and stormwater management in the parking lot to the south. Extend riparian buffer into blackberry and grass lined swale beside the parking lot to the south. Plant more native species around Faculty Club pond edge and outlet channel, including dispersed willow stakes. In the creek section east of the Fraser Building parking lot, widen the riparian buffer into the grassy and blackberry-covered areas.	3	3	-1	0	2	1, 2, 3, 4	UVic Facilities Management (BCI)			X	UVic, student projects, small grants for plant purchase and signage	M-H
15-2	University Club of Victoria to Gordon Head Road	Approach the University to obtain the perpetual protection of this reach beyond 2011.	3	3	0	0	3	1, 2, 3, 4	UVic Facilities Management (BCI)		X		Not applicable	H
15-3	University Club of Victoria to Gordon Head Road	Continue to implement campus-wide stormwater management as per the University of Victoria Integrated Stormwater Management Plan (2004).	3	3	-2	-1	3	1,2,3,4	UVic Facilities Management	X	X		UVic	H

REACH 16: CEDAR HILL RECREATION CENTRE TO CLAWTHORPE AVENUE

Reach 16 is a main tributary to Bowker Creek. It flows in a pipe beginning immediately south of the Cedar Hill Recreation Centre, east along North Dairy Road, and southeast along Doncaster Drive to Clawthorpe Avenue.



Reach location



Proposed greenways

Bowker Greenway Routing Options

Trails Within Watershed

Proposed Trail Route

Proposed Pedestrian Only Trail

Bowker Creek Main Channel

Underground

Open Channel

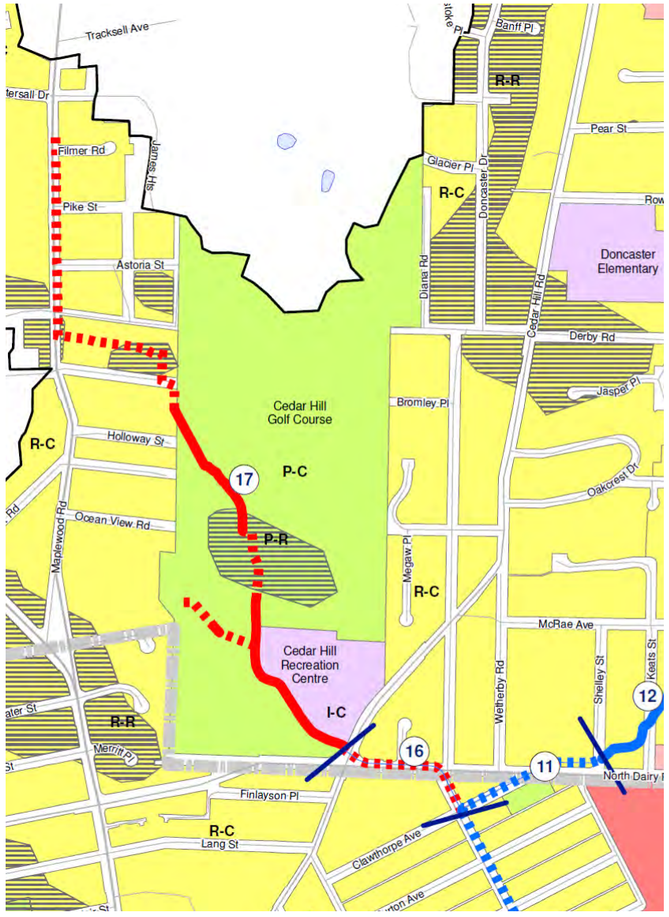
Bowker Creek Watershed Boundary

ACTION LIST FOR REACH 16: CEDAR HILL RECREATION CENTRE TO CLAWTHORPE AVENUE (TRIBUTARY)

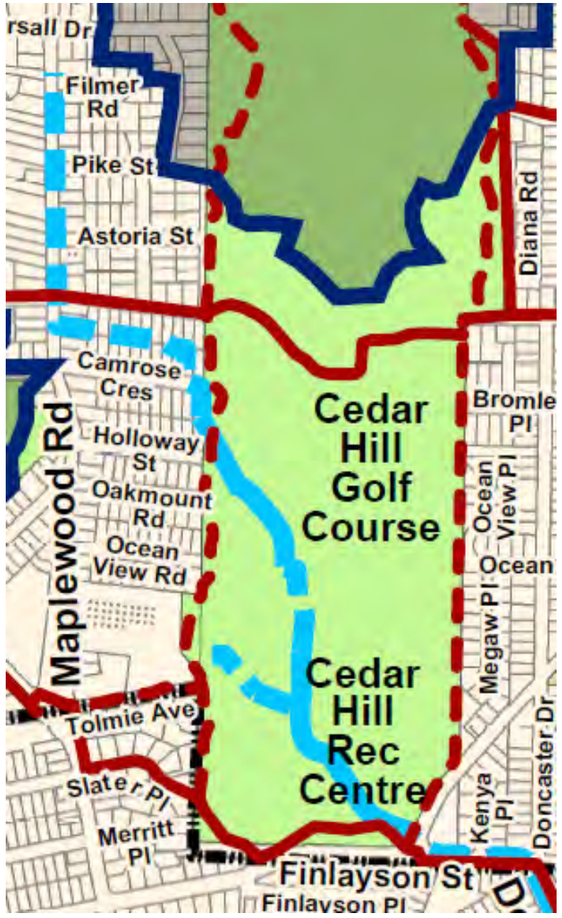
REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
16-1	Cedar Hill Golf Course to Clawthorpe Ave.	Create a greenway along North Dairy Road (refer to Map 5 for more details).	2	3	-1	-1	2	2, 3, 4	Saanich	X			Provincial, municipal operational & capital budgets	M-H
16-2	Cedar Hill Golf Course to Clawthorpe Ave.	During redevelopment, consider daylight the creek and create a greenway along the creek.	3	2	-3	-1	1	2,3,4	Victoria, Saanich			X	Provincial, developer	M-H
16-3	Cedar Hill Golf Course and Cedar Hill Recreation Centre	Removal of invasives (see Appendix C, reach #15 &16 for identified invasives) Plant native trees along riparian												

REACH 17: CEDAR HILL RECREATION CENTRE AND CEDAR HILL GOLF COURSE (TRIBUTARY)

Reach 17 is a main tributary to Bowker Creek, it flows southeast, mainly in an open channel, through the Cedar Hill Golf Course and Cedar Hill Recreation Centre to Cedar Hill Road. The riparian vegetation includes grass, coniferous trees, and red osier dogwood. This reach has issues with channelization and erosion.



Reach location



Proposed greenways

Downstream view from footbridge showing conifers, blackberry, and red osier dogwood

Planted conifers need ongoing care to thrive among reed canary grass and blackberry

Bowker Greenway Routing Options

Trails Within Watershed

Proposed Trail Route

Proposed Pedestrian Only Trail

Bowker Creek Main Channel

Underground

Open Channel

Bowker Creek Watershed Boundary

ACTION LIST FOR REACH 17: CEDAR HILL RECREATION CENTRE AND CEDAR HILL GOLF COURSE (TRIBUTARY)

REACH-ACTION NO.	LOCATION	ACTIONS	RATING					WMP GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TYPE			FUNDING SOURCE	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
17-1 preferred	Cedar Hill Golf Course and Cedar Hill Recreation Centre	Install a detention basin to the southwest of Cedar Hill recreation centre and naturalize the creek as much as feasible (the greens and fairways may need to be reoriented). Remove invasive species and care for planted conifers. Re-slope banks to a gentler angle and re-vegetate with native species. Ban the use of pesticides and herbicides on the golf course and at the recreation centre or take the pesticide-free pledge	3	2	-2	-1	2	2, 3, 4	Saanich		X	X	Saanich parks, volunteers, Quadra Cedar Hill Neighbourhood Assn.	M
17-1 alternative	*Cedar Hill Golf Course and Cedar Hill Recreation Centre*	*Downstream of 600 mm culvert on Cedar Hill Golf Course, immediately west of the baseball diamond, reduce erosion at outlet caused by high velocity by protecting banks with rock.*	1	0	-1	-1	2	2	Saanich		X	X	Saanich	M
17-2	Maplewood Road to Cedar Hill Golf Course	Examine the feasibility of creek daylighting when infrastructure needs upgrading or when the area is being redeveloped.	3	2	-3	-1	2	2,3	Saanich		X	X	Saanich, developer	M
17-3	Cedar Hill Golf Course and Cedar Hill Recreation Centre	Removal of invasives (see Appendix C reach# 15& 16 for identified invasives) Plant native trees along riparian												