

APPENDIX A

APPENDIX A—ACTIONS FOR WATERSHED MANAGEMENT

A list of detailed watershed management actions are 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 appendix 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.

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 7. 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 assigned one or more of the following categories:

- capital—is a capital cost action
- operational—should be integrated into operational work programs
- 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.

Table 9. Criteria for rating actions in the Bowker Creek Blueprint Baseline

CRITERION	CONSIDERATIONS	RATING	RATING DEFINITION	
Environmental	<ul style="list-style-type: none"> ✓ water quality or quantity ✓ retention or infiltration ✓ riparian or creek habitat values ✓ intact upland habitats 	<ul style="list-style-type: none"> ✓ habitat connectivity ✓ biodiversity ✓ creek function ✓ adaptation to climate change ✓ mitigate climate change 	0	No net environmental benefits.
			1	Environmental benefits from this action(s) are limited. Adverse environmental impacts are possible.
			2	Environmental benefits will occur from this action(s). Few adverse environmental impacts are anticipated.
			3	Significant environmental benefits can accrue from this action(s).
Social	<ul style="list-style-type: none"> ✓ linkages among communities ✓ Smart Planning principles ✓ recreational use ✓ public connection to and enjoyment of the creek 	<ul style="list-style-type: none"> ✓ public awareness and education ✓ individual stewardship actions ✓ public health and safety ✓ flood damage ✓ neighbourhood disruption 	0	No net social benefits.
			1	Social benefits from this action(s) are limited. Some adverse social impacts are possible.
			2	Social benefits will occur from this action(s). No adverse social impacts are anticipated.
			3	Significant social benefits can accrue from this action(s).
Capital Cost	<ul style="list-style-type: none"> ✓ capital cost 		0	Costs are negligible
			-1	Less than \$100,000
			-2	\$100,000 to \$1 million
			-3	More than \$1 million
Operating Cost	<ul style="list-style-type: none"> ✓ operating cost 		0	Costs are negligible
			-1	Less than \$25,000 per year
			-2	\$25,000 to \$100,000 per year
			-3	More than \$100,000 per year
Fundability	<ul style="list-style-type: none"> ✓ known funding sources ✓ chance of obtaining funding 		1	Few funding sources. Difficult to obtain funding.
			2	Some funding sources. Reasonable chance of obtaining funding.
			3	Many funding sources or secure funding sources. Good chance of obtaining funding.

ACTION LIST FOR WATERSHED MANAGEMENT

ACTION NO.	ACTIONS	TOPIC	RATING					GOALS ADDRESSED	LEAD AGENCY (POSSIBLE SUPPORTING PARTNERS)	TIMING			FUNDING SOURCE	PRIORITY (H, M, L)
			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
1	Review and revise relevant official community plans, and community and local area plans to include goals, objectives, and actions from the Bowker Creek Watershed Management Plan and Bowker Creek Blueprint. Incorporate Blueprint actions into annual municipal operation plans and budgets.	Land use, greenway, and associated plans	2	2	0	-1	3	1	Municipalities		X		Municipal operating budgets	H
2	Incorporate the Bowker Creek greenway plan into municipal greenway plans, parks plans, transportation plans, and other relevant plans.	Land use, greenway, and associated plans	2	2	0	-1	3	1, 3	Municipalities		X		Municipal operating budget	H
3	Designate a creek flood plain or zone on either side of the creek, through zoning bylaws to prevent any new construction of buildings below the 200-year flood elevation. Flood mapping should include climate change assumptions.	Land use, greenway, and associated plans	2	2	0	-1	3	1, 2, 3, 4	Municipalities		X		Municipal operating budgets, grants	H
4	Establish policies that require minimum vegetated greenspace on developments and redevelopments, depending on type of land use. 12% is an average target, based on provincial standards and is within the range recommended by the Urban Forest Stewardship Initiative.	Land use, greenway, and associated plans	2	2	0	-1	3	3	Municipalities		X		Municipal operating budget	H
5	Align watershed efforts with climate change adaptation and mitigation measures and strategies, including tree planting, greenways planning and rain/stormwater infrastructure	Land use, greenway, and associated plans	3	3	0	-1	3	2, 3	Municipalities		X	X	Municipal operating budgets, grants	H
6	With land use changes, use amenity bonusing or other mechanisms to fund or construct greenways, greenspace, or to daylight the creek.	Land use, greenway, and associated plans	3	2	0	-1	3	3	Municipalities		X	X	Developer	M-H
7	Encourage and pursue daylighting and greenways projects as part of changes to land use or when replacing hydraulic structures	Land use, greenway, and associated plans	3	2	0	-1	3	3	Municipalities (BCI)			X	Municipal operating budget	H
8	Develop municipal policies to acquire key streamside parcels for use as flood storage, greenway, parklands, and for creek daylighting.	Land acquisition	3	3	0	-1	3	3	Municipalities (BCI)		X		Municipal operating budget	H
9	Purchase key properties affected by flooding, as appropriate	Land acquisition	3	3	-3	0	2	2, 3	Municipalities	X		X	Grants, acquisition fund	M
10	Revise municipal policies and regulations to permit and encourage low impact development to ensure that developments and redevelopments have an effective impervious area of no more than 30%.	Runoff and water quality (green infrastructure)	3	2	0	-1	3	1, 2, 3, 4	Municipalities		X		Municipal operating budgets, grants	H
11	Establish requirements for rainwater/stormwater management in boulevards. Change municipal policies to use alternate street and sidewalk design and maintenance standards to reduce runoff volumes and improve water quality. For example, use bioswales before catch basins on streets.	Runoff and water quality (green infrastructure)	2	2	-1	-1	3	1, 2, 4	Municipalities		X		Municipal operating budget	H
12	In urban areas, ensure appropriate maintenance of oil interceptors and sediment traps on private property through a municipally-coordinated maintenance program funded by a fee-for-service program.	Runoff and water quality (green infrastructure)	2	2	0	-2	2	4	Municipalities		X		Fee-for-service or utility	M-H
13	Provide appropriate frequency of catch basin cleaning and street sweeping practices	Runoff and water quality (green infrastructure)	2	1	0	-2	2	4	Municipalities		X		Municipal operating budget	M

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			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
14	Develop policies to require commercial and institutional property owners to install oil interceptors and sediment traps in parking lots before stormwater reaches the creek.	Runoff and water quality (green infrastructure)	2	2	-1	-1	2	4	Municipalities (developers, institutions)		X		Municipal operating budget	M-H
15	Create a utility to fund stormwater management projects.	Runoff and water quality (green infrastructure)	2	2	0	-2	3	1	Municipalities		X		Municipal operating budget	H
16	Work on a pilot project to use LIDAR to identify key areas for raingarden or swale installation on public land, and determine if this approach is useful for wider application	Runoff and water quality (green infrastructure)	3	1	0	-1	2	2, 4	BCI			X	Grants	M
17	Identify opportunities and install neighbourhood scale stormwater retention facilities, to reduce flood discharges and to improve water quality.	Runoff and water quality (green infrastructure)	3	2	-2	-2	2	1, 2, 4	Municipalities (BCI, developers)		X		Grants, municipal budgets	H
18	Implement permeable asphalt or concrete in a highly visible area for demonstration purposes; eventually require it for certain types of streets and locations (e.g. low-volume streets immediately adjacent to the creek).	Runoff and water quality (green infrastructure)	3	2	-1	0	2	2, 4	Municipalities (BCI)	X		X	Grants	H
19	Adjust Municipal Development Cost Charges (DCC) to provide incentives for low impact development.	Runoff and water quality (green infrastructure)	3	2	0	-1	3	2, 4	Municipalities		X		Municipal operating budget	H
20	Discourage the sale of invasive exotic plant species at garden centres through education and policy. Encourage landowners to cease using cosmetic herbicides and pesticides through a public education program.	Vegetation management	2	3	0	-1	2	3	BCI (municipalities, public groups)		X		Grants	M
21	If municipalities have not already done so, develop and implement an urban forest strategy that includes the following actions: <ul style="list-style-type: none"> ✓ develop educational materials describing the links between the trees and creeks, ✓ protection of existing trees through the development (as appropriate) of tree protection bylaws, ✓ plant and maintain street trees and boulevards throughout the watershed, including using a diversity of species, ✓ establish municipal policies that require a minimum of 12% vegetated greenspace on developments and redevelopments, ✓ encourage private landowners to plant native trees and vegetation on their properties, and ✓ encourage schools to add tree planting to school yards. 	Vegetation management	3	3	-1	-2	3	1, 2, 3, 4	Municipalities		X	X	Trees for tomorrow, province, CRD, grants, municipality, parks budget	H
22	Develop a strategy and coordinate invasive species eradication for the creek and riparian area, based on eradicating a few key species. May require some research or trials.	Vegetation management	3	2	0	-1	3	3	Municipalities (BCI)		X		Grants	M
23	Where action is needed to control streambank erosion, use bio-engineering measures rather than hard engineering whenever feasible.	Creek corridor and riparian area management	2	2	-1	-1	2	2, 4	Municipalities (streamside property owners)		X	X	Property owners, municipalities	M-H
24	Pursue channel conveyance and stability improvements as possible during development and redevelopment, such as, channel maintenance or restoration, daylighting, and removing invasives and replanting with native vegetation. When replacing hydraulic structures that are inadequate or are nearing the end of their service life, use the opportunity to daylight and naturalize the creek, as possible.	Creek corridor and riparian area management	3	2	-2	-1	2	2, 3, 4	Municipalities		X	X	Developer	M

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			Environmental	Social	Capital cost	Operating cost	Fundability			Capital	Operational	Opportunistic		
25	In institutional areas, request that schools, hospitals, and other institutions in the watershed develop stormwater management plans and include green infrastructure actions into the plan.	Education and outreach	3	2	-1	0	2	1	BCI (institutions)		X		Institutions	H
26	Identify and contact landowners with streamside properties and provide information on what is happening in the creek and ways they can contribute to creek health.	Education and outreach	3	3	0	-1	3	1	BCI (community groups)		X		Grants	H
27	Encourage voluntary action by developing and delivering workshops and educational materials on various subjects and needs including: <ul style="list-style-type: none"> ✓ best on-site stormwater management practices for builders and developers, ✓ low impact development (stormwater management) for municipal managers and councils and the public ✓ workshops and/or educational materials for residential land owners on topics that include: <ul style="list-style-type: none"> ✓ rain gardens, ✓ installation of rain barrels, ✓ disconnection of roof leaders, ✓ protecting streamside vegetation, ✓ planting native species, ✓ lawn and garden management to maximize infiltration, ✓ installation of pervious areas, ✓ car washing, oil leaks and paint disposal, and ✓ eliminating deposition of deleterious substances into the drainage system. 	Education and outreach	3	3	0	-1	3	1	BCI (public groups)		X	X	Grants	M
28	Identify and contact owners of properties with large impervious surfaces and provide information on pervious surface technology and stormwater detention and infiltration.	Education and outreach	2	2	0	-1	2	2	Municipalities (BCI)		X	X	Grants	M-H
29	Continue to increase awareness and encourage action in the Bowker Creek watershed by: <ul style="list-style-type: none"> ✓ organizing and profiling community events such as walking tours, educational exhibits, the Annual Bowker Creek Rubber Duck Race and Clean-up, and community celebrations. ✓ maintaining good media relations including relationship building with key media contacts, media releases, promotion of special events, and updates on achievements. ✓ providing information on the watershed, the plans, and community efforts to the public and local media through marketing materials, displays, advertisements, the Bowker Creek Initiative website, and television. 	Education and outreach	2	3	0	-1	3	1	BCI		X		Grants, BCI operating budget	M-H
30	Provide regular updates to elected officials and partners through annual reports, staff reports and updates, and presentations.	Education and outreach	0	3	0	-1	3	1	Municipalities		X		Municipal operating budget	M-H
31	Provide regular updates and outreach to residents and other watershed users through websites, Bowker Creek list serve, other list serves, community newsletters, other media, displays at community events, and presentations to community associations and groups.	Education and outreach	0	3	0	-1	3	1	BCI		X		Grants, BCI operating budget	M
32	Incorporate public art in rain-gardens and key locations, to highlight creek and watershed attributes.	Education and outreach	0	3	-1	0	2	1	Municipalities (community groups)			X	Grants, developers	M
33	Establish a list of potential student restoration projects and liaise with UVic, Camosun, and high schools.	Education and outreach	0	3	0	-1	3	1	Community groups		X		Grants	M