

2.0 DEVELOPMENT OF THE BOWKER CREEK BLUEPRINT

This section presents the methods used in the development of the Bowker Creek Blueprint.

2.1 INTEGRATING FACTORS IN WATERSHED MANAGEMENT

The Bowker Creek Steering Committee felt that it was important to integrate environmental, social, and economic considerations for the recommended actions in the plan. Westland Resource Group met with the Bowker Creek Steering Committee and the Blueprint subcommittee on January 22, 2009, to draft a set of criteria for evaluating and integrating actions in the Blueprint. The criteria were designed to ensure environmental, social, and economic considerations were considered in the recommended actions, and that the engineering information from the Master Drainage Plan (Kerr Wood Leidal, 2007) was incorporated. The criteria make it possible to evaluate actions or sets of actions. The criteria and scoring system are presented in Table 1. Higher environmental and social scores mean a project or activity would be worthwhile, while economic scores and scores for how ‘fundable’ a project is often reflect the ease of implementation.

Table 1. Blueprint action evaluation criteria

CRITERION	CONSIDERATIONS	SCORING SYSTEM
Environmental	<ul style="list-style-type: none"> ➤ water quality or quantity ➤ retention or infiltration ➤ riparian or creek habitat values ➤ intact upland habitats ➤ habitat connectivity ➤ biodiversity ➤ creek function ➤ adaptation to climate change ➤ mitigate climate change ➤ bank stability ➤ flood risk 	0 to +3
Social	<ul style="list-style-type: none"> ➤ linkages among communities ➤ Smart Planning principles ➤ recreational use ➤ public connection to and enjoyment of the creek ➤ public awareness (education) ➤ individual stewardship actions ➤ public health and safety ➤ flood damage ➤ neighbourhood disruption 	0 to +3
Economic	<ul style="list-style-type: none"> ➤ operating cost ➤ capital cost ➤ fundability through grants or synergy with existing programs 	-3 to 0 -3 to 0 0 to +3

2.2 DATA COLLECTION AND ANALYSIS

Data were collected and evaluated from existing Bowker Creek publications, maps and environmental datasets, municipal plans and policies and other relevant publications, including:

- The Bowker Creek Master Drainage Plan (MDP) (Kerr Wood Leidal, 2007) was the first phase of work for the Blueprint and describes engineering requirements to address flooding and erosion issues.
- The Bowker Creek Watershed Assessment (Reid Crowther, 2000) provides useful background data.
- The Bowker Creek Watershed Management Plan (Westland Resource Group, 2003).
- The Bowker Creek Initiative Potential Greenways map (Bowker Creek Initiative Greenways Subcommittee, 2007).
- Bowker Creek Channel Restoration Needs and Prescriptions (Gower, 2009) (see Appendix C.
- Bowker Creek Proper Functioning Condition Assessment (Barraclough, et al., 2007).
- Urban Forest Stewardship Mapping and Analysis (Caslys Consulting, 2008).
- Environmental restoration concept plans for Saanich open channel sections (Harder, 2002).
- Capital Regional District water sediment quality data collected since 1993.
- Benthic invertebrate data and Benthic Index of Biotic Integrity scoring (Fish-Kissing Weasels Environmental, 2009).

Base maps of the Bowker Creek watershed were developed, and include watershed and municipal boundaries, land use, soils, creek channels, and storm drain alignments. 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 define reaches for the creek. The PFCA delineates 16 open sections of the creek based on segments of the creek that share common processes and attributes, while the MDP defines 103 reaches based on storm catchment. To keep the number of reaches to a manageable number for developing actions, and to include both open and closed sections, the entire length of the creek was sectioned into 17 reaches.

The upland areas outside the creek corridor were classified into distinct “upland units”—areas of similar land use—and mapped: see Map 2. A set of actions could then be applied to each of the upland units to improve the overall condition of the watershed. Five main land use units were defined, as follows:

1. **Institutional:** Areas (excluding parks) owned by public institutions such as local government, regional districts, crown corporations, and the provincial government, including Royal Jubilee Hospital, BC Hydro lands, Oak Bay Recreation Centre, and Lansdowne Secondary School
2. **Parks and open space:** Recreational and nature parks and some open space areas including Fireman’s Park, Bowker Creek Park, and Browning Park
3. **Residential:** Areas of predominantly detached housing
4. **Urban:** Areas of mixed commercial, attached and detached residential. These areas are more densely developed than residential areas and include the Shelbourne Street, Fort Street, and Oak Bay Avenue corridors
5. **Urban mall:** Retail malls with large paved parking lots including Hillside Mall, University Heights Shopping Centre, and Shelbourne Plaza. Large impervious areas such as parking lots increase the volume of peak flows in the creek. Increasing infiltration and detention in these areas can improve water quality and reduce flooding

Clay, rock, and sand-gravel soil subunits were overlain with the land use units in Map 2, in order to provide the information needed to develop detailed green infrastructure measures. While various green infrastructure measures can be taken irrespective of soil type, infiltration measures will need to be designed to suit the infiltration ability of the native soils.



Figure 4. Bowker Creek volunteers after completing a bank stabilization project

2.3 DEVELOPING RECOMMENDATIONS FOR THE CREEK CORRIDOR AND THE WHOLE WATERSHED

A long list of potential recommendations was drafted based on available information as well as ideas from the steering committee and Blueprint subcommittee. This list of potential actions was refined to develop watershed-wide management and reach-specific recommendations that address the goals and objectives in the Bowker Creek Watershed Management Plan.

The actions were refined and integrated to remove repetition and to ensure that actions worked together, and that any impacts resulting from the actions were considered and minimized. Where appropriate, alternatives and options to the preferred action were developed. The actions were rated using the environmental, social, and economic criteria developed by the BCI Steering Committee and Blueprint subcommittee. It was decided that no summed ratings would be given, due to the difficulty of weighting environmental, social and economic criteria against each other, and also because it was felt that summed scores were overly arbitrary.

Committee feedback to the actions and their rating and relative priority levels was given at a June 18, 2009 joint meeting of the committees. Further committee feedback was given to the actions and other report sections at the August 13 and October 8, 2009 joint committee meetings, and the suggested revisions were incorporated into the final plan. The result of this work is found in Appendices A and B.

2.4 PUBLIC CONSULTATION

Public consultation for the Blueprint has been an inherent part of the development of the document from the beginning of the process, with diverse individuals and groups (i.e. community associations) represented on the BCI Steering Committee, Integrated Stormwater Management Plan sub-committee and Greenways sub-committee. Various approaches to public consultation were taken in order to receive input from a wide group of people and to raise support of the Blueprint. The following is a list of public consultations conducted by BCI Steering committee, Outreach sub-committee, Chair and Coordinator:

- Hosted tour of the watershed for municipal politicians (May 2009)
- Presented a preview of draft Blueprint to municipal politicians, half-day session (November 2009)
- Posted *Bowker Creek Blueprint: a 100-year action plan to restore the Bowker Creek Watershed (Draft January 2010)* on the BCI website for comment (January – August 2010)
- First public open house held at Hillside Mall, day-long drop-in attended by more than 350 people (January 2010)
- Blueprint display at Shelbourne Corridor open house attended by approximately 250 people
- Launched public consultation feedback survey, gathered 46 forms (January 2010)
- Convening for Action on Vancouver Island (CAVI) held a forum on the Blueprint (February 2010)
- Hosted tour for University of Victoria of the Bowker Creek Watershed (March 2010)
- BCI and Blueprint featured as a case study on the “Waterbucket: Sustainable Approaches to Watershed Management” Internet site, www.waterbucket.ca (Spring 2010)
- Held second public open house at World Health Organization (WHO) and Shelbourne Corridor Celebration event, day-long drop-in (May 2010)
- BCI is an attending member of the public consultation/planning committees of the Oak Bay High School renovation and Royal Jubilee Hospital (RJH) regarding integration of the Blueprint into their Master Plan 2010–2030 and the District of Saanich’s Shelbourne Corridor process
- BCI and Blueprint featured as a case study in the Fraser Basin Council (FBC) Water and Watershed Planning Guide, www.fraserbasin.bc.ca, and the upcoming edition of the university textbook *Our Environment: A Canadian Perspective*, 5th edition by Dianne Draper
- BCI and Blueprint featured as a case study with the Environmental Law Clinic, University of Victoria’s report *Re-inventing Rainwater Management: a Strategy to Protect Health and Restore Nature in the Capital Region* (February 2010)
- Display at and discussion with attendees of the following community events: Bowker Creek Pennant Workshops, Shelbourne Corridor History Celebration, 12th annual Duck Race, Bowker Creek Brush-Up
- BCI Annual Reports featured the Blueprint