2012

west vancouver

1 History of the Shoreline Protection Plan (SPP)

Launched in 2006, the SPP represents the District of West Vancouver's commitment to protect and enhance one of its greatest natural assets.

The West Vancouver waterfront has undergone more than a century of development and erosion and is in need of attention. The goal of the SPP is to re-create and foster natural processes to sustain a naturally resilient and healthy shoreline, to address the impacts of development, climate change and sea level rise. The SPP is driven by the principle that the most cost effective and environmentally sound strategy to ensure this outcome is to understand and work to enhance the key restorative features of a natural coastline. These 'key' features of the shoreline include;

- Creeks and streams
- Sediment pathways
- Accretion and erosion processes
- Beach profile/elevations
- Reefs as natural wave defences
- Salt marsh & riparian habitat
- Intertidal and subtidal habitat

In the past decade several severe storms caused considerable flooding and damage to the Seawalk and waterfront infrastructure, gradual ongoing erosion of the foreshore will increase the risks to long term stability of the sewer lines that run along the foreshore. Repairs are costly and take time; following the 2001 storm events the total cost of repair work exceeded $540,000 and the schedule for work ran into 2003. With winter storms escalating in frequency and ferocity, increasingly strong El Niño events, and sea levels predicted to rise up to 60 cm by 2100, protection of the West Vancouver waterfront is an issue of mounting importance. Proactive approaches now will adapt and provide natural, cost-effective protection in the future while at the same time providing all the benefits of a healthy shoreline that can be enjoyed by West Vancouver citizens in the interim.

The benefits and scope of the SPP extend beyond the physical shoreline; it is inextricably linked to urban areas, municipal infrastructure and parkland. As such the SPP fits within the District's wider Official Community Plan, most notably with the policies of Climate Action, development of tourism, incorporating social planning, building neighbourhood character, preserving the natural environment, increasing parks and open spaces and facilitating community recreation.

The Shoreline Protection Plan presents 'SMART' projects (Specific, Measurable, Attainable, Realistic and Timely) that can be implemented in place of recurring shoreline repair works. The projects use 'soft' engineering methods such as reefs, tombolos, berms and natural vegetation, in a cost effective manner, taking advantage of donated materials and resources to supplement or accelerate West Vancouver budgeted projects.

2 Key Successes to Date

The SPP 2008-2011 initiated a series of successful pilot projects along the shoreline. Over half of the concrete sea wall between Ambleside and Navvy Jack has been replaced with reefs and riparian habitat, reducing wave and debris impacts and erosion, while improving public beach access and enhancing the shore's aesthetic value. More than 4,500 m^3 of fine sediments have been trapped on the upper shore, resulting in an increase in elevation across 1/3 of the beach. Following a single heavy rainfall event, Lawson Creek produced more than 600 m^3 worth of sand, gravel and cobble.

More than 6,000 m^2 of low productivity intertidal habitat has been replaced with highly productive shoreline and over 1,000 m^2 of new riparian habitat has been established. Riparian vegetation improves biodiversity and aesthetic value for the public and provides natural drainage, protecting the Seawalk and parks from inundation. Creek enhancements at Lawson and 27th have improved habitat for salmon.

Community benefits resulting from the SPP over the past three years include the protection of multi-million dollar sewer infrastructure, and the enhancement and protection of WV Parks. The SPP also created a win-win mechanism for private landowners to participate in shoreline restoration, increased knowledge and understanding of the importance of upland watercourse and ground water management in shoreline protection, and, created a beneficial use for waste construction sediments normally hauled away to dumpsites.

3 Project Planning

Where possible projects are planned with flexibility, however, there are certain constraints on the timing of specific projects due to tides and environmental agency requirements. As such, the dates provided below are recommended. Having a flexible plan and a range of projects 'ready-to-go' will reduce costs and enhance the scale and efficacy of the projects. The development of a short-term staging area at the foot of 24th St. will allow DWV to act upon any resources that become available and ensure that SPP projects are cost effective.

Biophysical surveying of the project sites before and after works is necessary to effectively plan projects and is a common requirement of environmental agency reviews. Post-construction surveys are typically planned immediately after subtidal works and one year after intertidal works. Environmental agency reviews can take time and should be considered early in the planning phase. Establishing and maintaining communication with various agencies is crucial in streamlining the process.

As education and stakeholder engagement is a key goal of the SPP, it is beneficial if signage is in position prior to the commencement of the project, to inform the public of proposed works. Further to this, it is strongly recommended that permanent signage is installed to engage the public with the long term

goals of West Vancouver's Shoreline Protection Plan. When made aware of the projects and the rationale behind the works that are safe guarding this key municipal amenity, the public have shown overwhelming support.

The proposed projects for 2012 are outlined below; costs and project duration are detailed in Table 1 and the project timeline.

Marr Creek Low-Intertidal Reef Construction

- Placement of boulders in the low-intertidal zone as wave protection for the shoreline infrastructure.
- Crescent-shaped reefs trap creek sediments to rebuild the upper shore and provide habitat for kelp, fishes, and seabirds and protection for eelgrass beds.

Lawson Park Riparian Enhancement

- Re-shaping of pathway and expansion of riparian habitat to increase biodiversity and aesthetic value.
- Increase protection of John Lawson Park from high water events and storm waves.
- Tuning of creek enhancement features to improve sediment retention by redirecting creek flow.

Navvy Jack Shoreline Enhancement

- Continuation of 2011 enhancement work including intertidal and subtidal work to the east.
- Improve wave protection for vulnerable upper shore
- Reduce long-shore drift to lessen the impacts of erosion and soften the shoreline over time
- Provide substrate for kelp and habitat for marine life.

Public Communication and Outreach

- Promote awareness of shoreline and SPP work.
- Installation of temporary and permanent communication points and signage.
- Pursuit of external funding sources.
- Bolster working relationships with relevant agencies; promote SPP as a plan for sustainable development.

Lawson Creek to McDonald Enhancement & Tuning

- Placement / relocation of tombolos along the mid shore to improve wave protection and trap sediments.
- Expansion of riparian zone and salt marsh habitat along the upper shoreline.

McDonald Creek Intertidal Reef Extension

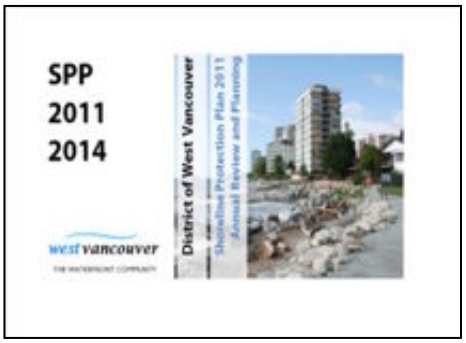
- Extension of existing intertidal reef to provide greater stability for pocket beach west of Creek outlet.
- Provide increased protection for the Seawalk and beach to the east of the site
- Create increased stable intertidal habitat for invertebrates, fish and birds.

Lawson Park and Ambleside Shoreline Enhancement

- Creation of new tombolos to continue step configuration from Lawson Pier to provide wave protection and trap sediments.
- Extend subtidal rock spurs at Ambleside Pier to stabilize upper shore and create subtidal habitat.
- Surveying and authorization required prior to work.

Larson Stream Enhancement

- Enhancement of stream mouth at foreshore for salmon and other wildlife. Use of logs, rocks and sediments to create habitat features.
- Survey and authorization required prior to work.
- Initial survey data is flexible, but work should be planned for spring or if necessary August 2012 in accordance with DFO windows.



Project Management and Agency Interaction

- Build working relationships with relevant agencies (Fisheries and Oceans Canada [DFO], Burrard Inlet Environmental Action Plan [BIEAP], Transport Canada, Environment Canada)
- Formal presentation of SPP to BIEAP and DFO
- Agency pre-approval of SPP Projects
- Preparation of 2013 budget and project proposals.

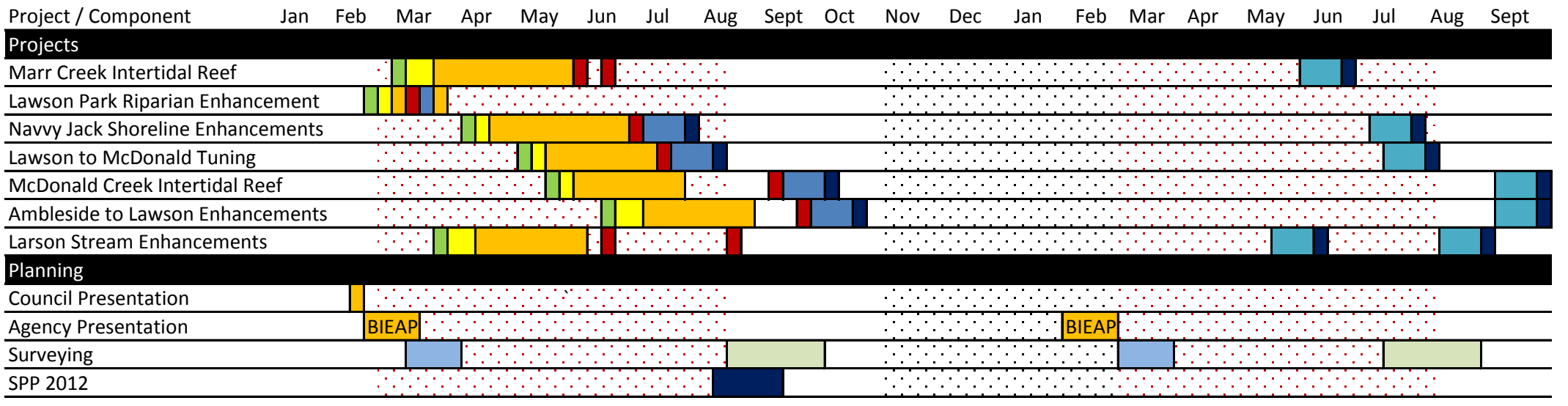
Shoreline Surveying

- Biophysical and topographic surveying to accurately track and monitor changes and benefits.
- Guide future projects, identify successful techniques.
- Meet data requirements of various agencies.
- Annual and project specific surveying and reporting.

#	Task / Goal	Est. Cost	Start	Est. Length
1	Marr Creek Intertidal Reef Construction	$30,000	Biophysical Survey: March 12 Construction: 4 June 2012 or 18 June 2012	5 days
2	Lawson Park Riparian Enhancement	$25,000	ASAP - during construction of Arts building	5 days
3	Navvy Jack Shoreline Enhancement	$25,000	Biophysical Survey: 9 April 2012 Construction: 2 July 2012	5 days
4	Public Communication & Outreach	$10,000	Immediately/ when required	-
5	Lawson Creek to McDonald Riparian Enhancement and Tuning	$25,000	Biophysical Survey: 7 May 2012 Construction: 16 July 2012	5 days
6	McDonald Creek Intertidal Reef Extension	$20,000	Biophysical Survey: 21 May 2012 Construction: 10 September 2012	2-3 days
7	Lawson Park and Ambleside Shoreline Enhancements	$10,000	Biophysical Survey: 18 June 2012 Construction: 23 September 2012	2 days
8	Larson Stream Enhancement	$20,000	Biophysical Survey: 26 March 2012 Construction: June 18, 2012 or Aug 2012	2-3 days
9	Project Management and Agency Interaction	$25,000	Immediately/ when required	-
10	Shoreline Surveying (input to DWV GIS system)	$20,000	Immediately/ when required	-

Table 1. Proposed Projects for 2012; estimated costs, start dates and duration of physical works.

Table 2. Overview of proposed project schedule.*



*This document is intended as a rough guideline of project timing and duration. Project start dates may change according to the availability of resources and materials. Durations are an estimate and may take more or less time than shown. Extended periods, with a duration of more than one week, reflect a window for work rather than the amount of time required on any single task.

Key

Biophyical Survey
Project Planning
Agency Liaison
Construction

Post-construction Survey: Subtidal
Post-construction Survey: Intertidal
Annual Survey: Subtidal
Annual Survey: Intertidal
Reporting

DFO Sensitive Period
Daytime High Tides