

CHAPTER 7

Green Shores
Using Voluntary Ratings and Certification Programs
to Guide Sustainable Shoreline Development

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7.1 INTRODUCTION

People love to live, work, and play in places where water and land meet. Shorelines provide work, recreation, living space, mild climates, and wonderful views. People are not the only ones drawn to biologically rich and productive places. Unfortunately, many of the natural features that make shorelines so attractive are often the casualties of human activities. Native trees, shrubs, and grasses are cleared to make way for houses, lawns, and views. Bulkheads, docks, and piers displace beaches and alter natural shoreline processes. Loss of shoreline vegetation allows contaminants to flow directly into the water. Prime wildlife habitats disappear, taking with them birds, mammals, fish, and beneficial insects. The good news is that people are finding new strategies for protecting

waterfront properties while also protecting and restoring habitats. Instead of concrete and sheetpile, these practices use a combination of plantings, gravel and sand, logs, stones, setbacks, and slope modification to protect against shoreline erosion and provide access while respecting the ecological attributes of the shoreline (adapted from Green Shorelines, City of Seattle, 2011).

The Green Shores program described in this chapter is one of many initiatives in the Salish Sea region with the broad objective of increasing our capacity to address impacts of shoreline development and climate change on coastal ecology and human well-being.

7.2 REGIONAL CONTEXT—THE SALISH SEA

The Salish Sea is a large inland sea of more than 17,000 km, encompassing Puget Sound in the State of Washington and the Strait of Georgia in British Columbia and the Strait of Juan de Fuca between British Columbia and Canada (see Figure 7.1). Although the Puget Sound/Strait of Georgia portion of the Salish Sea is considerably smaller than Lake Ontario, this area has over 10 times more coastline (14,000 km) because of the complexity of coastal fjords and island groups throughout the inland sea, including the Gulf Islands in British Columbia and San Juan Islands in Washington State. The Salish Sea is home to more than 7 million people, with most residing in the Greater Seattle and Vancouver areas. Beamish and McFarlane (2014) and DeLella Benedict and Gaydos (2015) are two recent books on the Salish Sea region that provide excellent overviews of the area.

The inland nature of the Salish Sea provides protection from large, open ocean wave energy but the complex seabed topography and island groups generate areas of high tidal currents, particularly in the southern Strait of Georgia. Most of the Puget Sound shoreline is formed of unconsolidated sediments, including coastal bluffs, beaches, and sand/gravel spits.* These shore types often occur as drift cells; units of eroding bluffs, shore sections with net directional sediment transport and depositional beaches and spits (see Figure 7.2). The degree of rocky, noneroding shoreline in the Strait of Georgia is greater than that in Puget Sound; however, similar drift cell units occur in the Strait of Georgia, particularly on the more heavily populated east coast of Vancouver Island and the Vancouver area.

The Fraser River, one of the major river drainages on the west coast of North America, flows into the Salish Sea at Vancouver and supports major stocks of all five Pacific salmon species, including chinook salmon, an important prey species for the endangered southern resident killer whale population of the Salish Sea. Salish Sea shorelines provide important rearing and migratory pathways for juvenile salmon, spawning habitat for Pacific herring, sandlance, and surf smelt as well as numerous invertebrate species.

Human settlement—associated coastal development has altered the physical character of Salish Sea shorelines and affected important nearshore habitat functions. More than 27% of the Puget Sound shoreline has been altered by development, with up to 90% armoring in the highly urbanized areas of Seattle and Tacoma.† Over the past several decades, there has been a strong effort on the part of the State of Washington to slow and ultimately reverse the degree of shoreline armoring by supporting bulkhead removal initiatives and alternative (soft shore) protection methods.‡ The degree of shoreline armoring is less in the Strait of Georgia portion of the Salish Sea, in part owing to the greater amount of rocky shoreline and lower population density; however, in highly developed areas such as the southeast coast of Vancouver Island and the Vancouver area, the degree of shoreline armoring approaches levels seen in some areas of Puget Sound.

* Retrieved from <http://www.eopugetsound.org/articles/shoreline-formation-puget-sound>

† Retrieved from <https://sites.google.com/a/uw.edu/shoreline-armoring/background/shoreline-armoring>

‡ Retrieved from http://www.psp.wa.gov/vitalsigns/shoreline_armoring.php

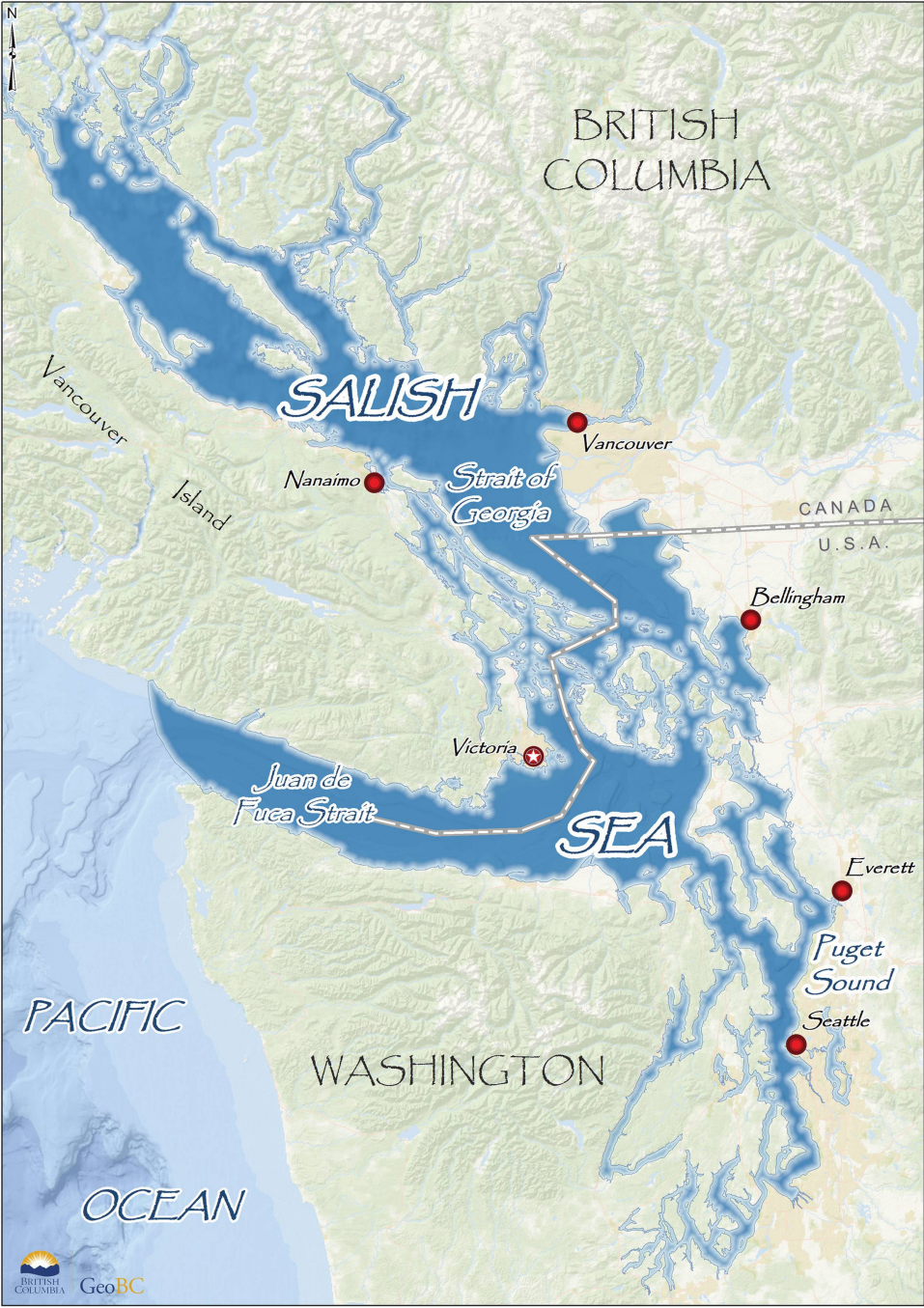


Figure 7.1 Salish Sea.

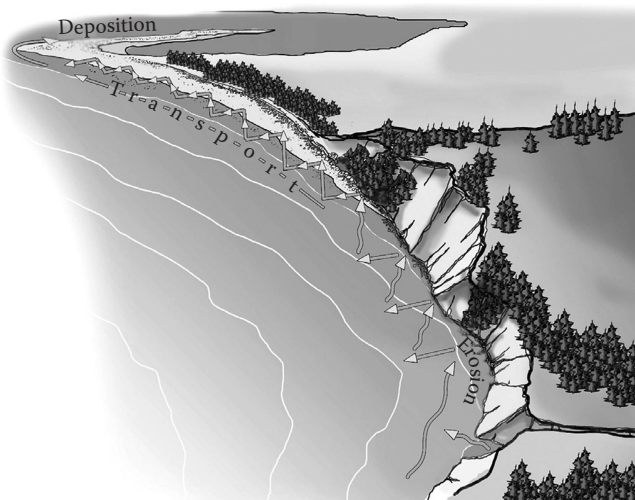


Figure 7.2 Schematic of a drift cell showing area of sediment sources (bluff), zone of transport (beach), and deposition (spit).

Throughout the United States and Canada, there is increasing recognition that shoreline development practices—particularly shoreline armoring—are a significant source of cumulative impacts to nearshore coastal processes and habitat values and that there are also considerable institutional barriers that hinder the development and adoption of sustainable shoreline development practices, including a lack of professional expertise and leadership (Restore America’s Estuaries 2015). In addition, regional sea level rise and increased storm surge are seen as important issues in British Columbia and Washington State that could increase flooding and damage coastal infrastructure, resulting in property loss from erosion, habitat loss, decreasing biodiversity, saltwater intrusion into coastal aquifers, and loss of cultural and historical sites (Climate Action Secretariat [CAS] British Columbia Ministry of the Environment 2013). This is a compelling concern for shoreline property owners and shoreline communities throughout the Salish Sea region. Sea level rise and increased or more frequent storm surge will increase the need to stabilize shorelines and protect development from flooding; however, traditional engineered approaches (predominately hard armoring) to shoreline development may be maladaptive.

7.3 USE OF RATING SYSTEMS AND CERTIFICATION IN THE BUILT ENVIRONMENT

For several decades, development professionals have used credit and rating systems such as Leadership in Energy and Environmental Design (LEED) and Built Green to guide sustainable building practices from both an environmental and human health perspective. These rating and certification programs are tools to reduce the environmental impact of the built environment and transform the development market to a higher level of environmental performance and sustainable design. While providing clear guidance on improved environmental design, these programs also serve as an educational tool for builders and property owners. Reviewing and evaluating the methodology of these programs provide insight as to how rating and certification programs can be used in waterfront construction projects to harmonize the built and natural environment.

An ideal rating system tool includes several key elements (adapted from Cole 2005):

- Simple and practical in application
- Providing value for money
- Credible and transparent
- Challenging to reach higher score levels
- Addressing critical environmental and human well-being issues
- Regionally specific but globally applicable
- Encouraging innovation and education
- Providing useful design guidance
- Capable of evolving to reflect new knowledge

The US Green Building Council established the LEED for Building Design and Construction (LEED) program in 2000 to encourage the development of environmentally responsible buildings that are healthy places to live and work. This program is well established, with more than 16,000 certified projects in the United States and 1800 in Canada in 2015.* LEED also operates related rating and certification programs for single-family residences (LEED for Homes) and neighborhood design (LEED for Neighborhood Development). By 2015, more than 60,000 projects were participating in LEED programs worldwide.†

The Home Builders Association of Metro Denver with a focus on energy efficiency established Built Green in 1995. The program expanded to several US states in 2000 with a broadened goal of promoting and enabling environmentally responsible home construction practices. Built Green programs are operated by local home builders associations, and building credits can vary in different regions depending on regional priorities, such as water conservation, as well as regional programs that incorporate energy efficiencies. Built Green Canada has programs in five provinces and has certified more than 24,000 homes.‡

The American Society of Landscape Architects established the Sustainable Sites Initiative (SSI) in 2006 to “foster a transformation of land development and management practices that will bring the essential importance of ecosystem services to the forefront” (SSI 2009). In part, SSI was initiated to address the environmental aspects of development siting that were not part of LEED green building certification program. Recently, several aspects of the SSI program, including specific credits, have been incorporated into LEED programs.§

Typically, these credit and rating programs share some common elements:

- A series of mandatory requirements (prerequisites) as well as a number of optional credits usually grouped into specific categories such as energy, indoor environmental quality, and so on.
- A credit point system that addresses the relative environmental or human health value of each credit.
- One or more certification thresholds, based on credit points, that establish a rating or certification level; for example, LEED offers four certification levels (Certified, Silver, Gold, and Platinum).
- A structured format for submitting a project for rating or certification.
- A third-party certification or verification process.
- Associated training and professional accreditation programs; for example, more than 20,000 building professionals in Canada have participated in LEED training programs.¶

Although the main objective of these programs is reduced impact on ecosystem services, most also include a number of credits addressing human health and well-being, design innovation, and

* Retrieved from <http://www.usgbc.org/>, and <https://www.cagbc.org/>

† Retrieved from <http://www.usgbc.org/>

‡ Retrieved from <http://www.builtgreencanada.ca/>

§ Retrieved from <http://www.sustainablesites.org/>

¶ Retrieved from <https://www.cagbc.org/>

professional and public education. Some programs provide regionally specific credits and many, including LEED, rely on a continuous evaluation cycle to maintain and improve the program credits and certification standards. Innovation, education, and program audits are key elements of this evaluation process.

Most ratings and credit programs are voluntary but rely on support from the building sector and government for their adoption. Typically, they are also nonprofit and membership based, drawing support from the environmental and building sectors. The voluntary nature of these programs enables participants to distinguish themselves as sustainability leaders in their sectors. Increasingly, these volunteer programs take on mandatory aspects when adopted by local jurisdictions on a regional basis for specific types of buildings (e.g., schools) or as a condition of rezoning or a master development agreement; for example, the University of Victoria in British Columbia now requires all new buildings to meet the LEED Gold standard for building design and construction.* In this way, jurisdictions are promoting and enabling new ways to build and develop within their community.

7.4 THE GREEN SHORES PROGRAM

In 2003, the Stewardship Centre of British Columbia (SCBC) released the guide *Coastal Shore Stewardship: A Guide for Planners, Builders and Developers* as part of its ongoing Stewardship Series of technical guides.† Workshops were conducted throughout coastal British Columbia, and feedback from these workshops indicated that planners, builders, and developers appreciated the information provided by the document but needed more specific planning and development guidance to address coastal management and development issues. The Green Shores program resulted from conversations about how best to address this need.

Green Shores was initiated in 2005, with the support of multiple funding partners, to address coastal shore stewardship. The program provides tools for industry professionals in the planning, design, and construction fields, as well as shoreline property owners interested in minimizing the environmental impacts of their projects in a cost-effective manner. The program is underpinned by four guiding principles:

1. Preserve the integrity and connectivity of shoreline processes
2. Maintain and enhance shoreline habitat diversity and function
3. Minimize and reduce pollutants to the shoreline environment
4. Reduce and reverse cumulative impacts to shoreline systems

The first three principles are easily understood by planners, builders, and the public, while the fourth conveys the concept that impacts to shoreline habitats usually do not result from one project alone but rather from many projects acting in concert, emphasizing that developments need to reduce or eliminate their contribution to cumulative effects.

Recognizing the opportunity for rating and certification programs to influence environmentally sensitive design of shorelines, the Green Shores program and its partners have developed two certification programs for commercial, residential, and park properties, using the Green Shores guiding principles as the backbone of the program. Green Shores for Coastal Development (GSCD) applies to a broad range of types of coastal shoreline properties, while Green Shores for Homes (GSH) focuses on residential properties. Both programs are under development in British Columbia and Washington State.

* Retrieved from <http://www.uvic.ca/campusplanning/about/green-buildings/index.php>

† Retrieved from http://stewardshipcentrebc.ca/PDF_docs/StewardshipSeries/Coastal.pdf

7.4.1 Green Shores for Coastal Development

Using the LEED credit framework, work began to develop GSCD in 2005. With funding from the Real Estate Foundation of British Columbia and others, an interdisciplinary technical team of planners, marine ecologists, coastal geologists, and engineers developed the credit and rating framework. GSCD targets mixed residential and commercial waterfront development projects as well as public spaces (shoreline parks and recreational areas). A pilot version of the GSCD was subject to peer review and tested on a number of shore development projects ranging from a highly urbanized shoreline (South False Creek Olympic Village in Vancouver, BC) to a shoreline park (Tyee Spit on Vancouver Island). Version 1 of the GSCD was released by the SCBC in 2010.* GSCD is voluntary and relies on support from industry, government, nongovernmental organizations, building owners, and the building sector for its adoption. It is intended to be applicable to all coastal systems and ultimately be national or international in scope.

GSCD consists of 5 Green Shores prerequisites and 11 optional Green Shores credits (Figure 7.3). The prerequisites address the most critical issues of sustainable shoreline development, including siting of building structures, conservation of critical and sensitive habitats, coastal riparian values, and shoreline physical processes (sediment supply, transport and deposition). GSCD-certified projects must meet all five prerequisite requirements. Although no points are awarded for these prerequisites, they ensure that the four principles of the Green Shores program outlined above are met; providing a basic “greening goal” for a waterfront development project. Project designs that do not meet all five prerequisites can be quickly screened out of the certification process. By contrast, the 11 optional credits provide a range of opportunities for projects that meet the prerequisites to go beyond basic “green” goals to further reduce the cumulative impacts of waterfront development. The three certification levels—Certified, Silver, and Gold—are intended to incentivize proponents to higher performance levels than initial design might indicate.

GSCD credits address a number of critical aspects of coastal development design, including the following:

1. Climate change adaptation (Credit 4)
2. Habitat conservation and enhancement (Credits 1, 2, 5, and 7)
3. Conservation or renewal of coastal processes (Credits 1 and 6)
4. Pollutant input (Credits 8 and 9)

An innovation credit is included to encourage exceptional performance and sharing of innovative approaches to coastal design. As with LEED, this credit is only available to projects that are willing to make the information publicly available. The Outreach and Public Education Credit is intended to enable a broader uptake of sustainable coastal design and the Green Shores program by coastal property owners, developers, contractors, and local governments.

The prerequisites and credits are structured using a standard format:

1. Intent: a clear statement of the purpose or objective for the credit
2. Context: background information on the rationale for the credit from an ecological and, for certain credits, a human well-being perspective
3. Requirements: conditions that must be met to achieve the credit (and the number of points available for meeting specific requirement levels)
4. Submittals: information that must be provided to the certifier in order to apply for the credit
5. Strategies and technologies: guidance on how to achieve the credit
6. Resources: a list of relevant resources

* The GSCD Rating System Guide is available from SCBC at http://stewardshipcentrebc.ca/PDF_docs/greenshores/GreenShoresCDRS.pdf

Prerequisites	
Prerequisite 1	Siting of permanent structures
Prerequisite 2	Conservation of critical or sensitive habitats
Prerequisite 3	Riparian zone protection
Prerequisite 4	Conservation of coastal sediment processes
Prerequisite 5	On-site environmental management plan

Credits		
Credit 1	Site design with conservation of shore zone	1 to 3 points
Credit 2	Shore friendly public access	1 point
Credit 3	Re-development of contaminated sites	1 point
Credit 4	Climate change adaptation plan	1 to 5 points
Credit 5	Rehabilitation of coastal habitats	0.5 to 4 points
Credit 6	Rehabilitation of coastal sediment processes	2 to 3 points
Credit 7	Enhanced riparian zone protection	0.5 to 4 points
Credit 8	Light pollution reduction	1 point
Credit 9	Integrated stormwater planning and design	1 to 4 points
Credit 10	Innovation	1 to 2 points
Credit 11	Outreach and public education	1 point

Ratings levels	
GSCD bronze	All prerequisites plus 5 points
GSCD silver	All prerequisites plus 10 points
GSCD gold	All prerequisites plus 15 points

Figure 7.3 GSCD: list of prerequisites, credits, and certification levels.

Many of the prerequisites and credits require the project to achieve a certain performance level; for example, Prerequisite 4 requires a project to be designed such that the need to install shore protection works is unlikely over the lifetime of the project. Others have more prescriptive requirements, such as stating a required width and coverage for coastal riparian area (Prerequisite 3 and Credit 7). Most credits (including all credits based on performance criteria) require signoff by a qualified coastal or environmental professional as defined by the GSCD credit guide. As with LEED, application for certification is made using a standard submittal template provided by the certifying organization.

7.4.1.1 GSCD Pilot Project

To encourage use of the GSCD, a pilot project was initiated in 2013, with the following objectives:

- Demonstrate use of GSCD on three shoreline developments
- Provide outreach and professional development
- Promote Green Shores as a preferred standard for shoreline design and certification in British Columbia and beyond

The three properties selected for the pilot project represented different types of shoreline development:

- Commercial/Institutional Development: Deep Bay Marine Research Station, Vancouver Island University
- Public Park: Jericho Beach Park, Vancouver Parks Board
- Multifamily Residential Development: Squamish Oceanfront Phase One, Squamish Oceanfront Development Corporation

Working closely with the proponent, a Green Shores verifier assessed each property. The proponent collected documentation, using the GSCD Guide and Submittal Template, and submitted to the verifier team for assessment. One property achieved a Green Shores Gold rating, one achieved a Silver rating, and one did not have sufficient documentation to complete a rating during the pilot project timeline.

Overall, the verifier teams found that the prerequisites and credits detailed in the GSCD guide offered clear, quantifiable assessment criteria for projects. All proponents and verifier teams found the information in the guide useful and easy to understand; however, there were comments by all three proponents that they found the submittal template difficult to use. Suggestions for improving the submittal template included the following:

- Use of simple summary checklists to assist proponent in compiling the required information
- Revise the template and provide for an online submittal system
- List typical documents normally required by a shoreline development and link them to each prerequisite or credit

7.4.2 GSH Program Development

In 2009, the US Environmental Protection Agency (EPA) proposed grant funding for projects to support protection and restoration of highly valued Puget Sound aquatic resources in areas threatened by growth. In response to this call for proposals, the City of Seattle, in partnership with San Juan County and Washington Sea Grant, submitted a application for a project titled “Incentivizing Low Impact Shoreline Development: Developing and Piloting Green Shores for Homes on the City of Seattle’s Lake Washington Shorelines and in San Juan County.” Proposal partners included the SCBC in Canada and a Technical Team consisting of 12 members from Washington State and British Columbia with a broad range of expertise (landscape architects, planners, marine biologists, coastal geomorphologists and engineers, as well as homebuilders). Several members of this group were also the developers of the Green Shores Coastal Development rating system.

The City of Seattle proposed development and testing a program designed to incentivize protection and improvement of ecosystem function and processes along shorelines of single-family waterfront homes. The assessment framework, GSH, was based on the existing GSCD certification system developed in British Columbia and the Green Shorelines guidelines developed by the City of Seattle.* Many of these lessons learned from the development and piloting GSCD were brought forward to the development of GSH.

The City of Seattle proposed piloting GSH credits and locally developed incentives on Lake Washington, a highly developed freshwater urban area, building on the previous Green Shoreline efforts to facilitate alternatives to shoreline hardening such as armor and bulkheads. San Juan County participated to pilot test GSH in rural, marine waterfront locations.

A unique aspect of this program was its transboundary component with the Canadian partners, SCBC as well as the Islands Trust, a federation of local governments serving the Canadian islands of the Salish Sea. These organizations participated in order to expand GSH from Puget Sound to the

* Retrieved from <http://www.govlink.org/watersheds/8/action/greenshorelines/>

Strait of Georgia, in recognition of the interconnected nature of the Salish Sea marine environment. This program called for a single credit and rating system for the Canadian and American portions of the Salish Sea as well as collaborative efforts for sharing of technical expertise across the border. In response to funding opportunities, the American partners focused on the technical aspects of the program as well as identification of appropriate incentives while Canadian partners focused on development of educational materials, outreach, and community engagement.

In 2010, the US EPA awarded a grant to the City of Seattle, funded over 4 years, to develop the GSH program with an overall goal of developing a transboundary rating and credit system for both lake and marine environments. The scope of work for the project included the following components:

- Develop the GSH credit system
- Identify incentives for property owners to participate
- Engage homeowners and builders
- Train GSH Verifiers
- Pilot the GSH program
- Develop a delivery model that can be expanded to other regions

The GSH project team would produce a standard, science-based credit and rating system to be implemented in partnership with local jurisdictions responsible for applying locally appropriate incentives for participating waterfront property owners.

Concurrent with the EPA-funded development in Washington State of the GSH Credit and Rating system, SCBC sought funding to implement the GSH program in British Columbia. In 2014, SCBC began work with four local governments to design and test an implementation model for the GSH in British Columbia with the following project goals:

- Increase the ability of local governments, homeowners, and shoreline professionals to utilize GSH to meet upcoming climate change adaptation challenges
- Reduce the impacts of shore developments on water quality and habitat values
- Create a GSH initiative in BC reaching both freshwater and marine shoreline communities

7.4.2.1 Developing the GSH Credit and Rating System

A Steering Committee team guided the process of creating the GSH Credit and Rating System. Team members included representatives from City of Seattle, San Juan County, SCBC, Islands Trust, and Washington Sea Grant and the technical team coordinator. This team solicited applications and created the technical team that oversaw the technical aspects of credit development. In order to develop the GSH Credit and Rating System, the technical team evaluated other rating and incentive programs to determine their applicability to shoreline homeowners including GSCD along with other programs including LEED for Homes, Built Green, and SSI (Rueggeberg et al. 2012). The review also evaluated homeowner incentive programs and checklists to identify elements appropriate for a GSH program. Each program provided insights about specific credit, rating and certification structures, program delivery, and elements of interest to a GSH Program.

Three common components emerged: (1) each program included a third-party administrative and operational entity, typically a nongovernmental organization; (2) the programs included a checklist or submittal form used by applicants to apply for a rating or certification; and (3) an independent reviewer assessed the merits of the project to determine whether or not certification should be awarded.

Key findings from the review provided the framework for the development of the GSH program. Important elements included flexibility in order to address a wide range of shoreline development

activities and a relatively simple application and evaluation process so that stakeholders can understand the program. The review also noted that certification usually required some form of applicant incentive to be effective, such as grant programs, low-interest loans, or permit fee reductions (Rueggeberg et al. 2012, p. 38). In addition, programs with prescriptive checklists were easier to implement than programs based on performance metrics. Training and education of contractors was recommended, although challenges were acknowledged owing to costs and potentially insufficient demand. While GSH is intended to create a voluntary, nonregulatory program, the review noted the value of municipal, regional, and state or provincial governments adapting aspects of the rating program into regulatory frameworks to advance the capacity of the program.

The GSH technical team met over the course of 2 years to develop and pilot test the GSH credit and rating structure. The team created four credit categories based on the Green Shores four guiding principles encompassing all aspects of shoreline development:

- Shoreline physical processes: Protect or restore natural physical processes that are vital to the health of shoreline environments
- Shoreline habitat: Protect, restore, and enhance aquatic and riparian habitats
- Water quality: Eliminate the amount of sediment, chemical, and organic pollutants discharged to lakes and marine waters in rainwater runoff
- Shoreline stewardship: General best management practices that help support public values of shorelines

During the development of the credit and rating system, a number of common issues emerged for all credit categories.

1. How to address whole site development as compared to renovation or modifications to existing shoreline such as bulkhead removal?
2. What is an appropriate building setback criterion?
3. Should credits differ for freshwater and marine shorelines?
4. How to determine the relative weight (points) of each credit?

To address these issues, for a number of specific credits, the program makes a distinction between the following:

- *Whole site development*, where the proposed project involves the entire waterfront lot, and *riparian or shoreline development*, where the proposed project occurs only in the area from the intertidal zone (in a marine environment) or from the littoral zone (in a freshwater environment) to the upper edge of the riparian zone.
- *Lake* (freshwater) and *marine* (saltwater) shorelines.
- *Greenfield* (not previously developed) and *redevelopment* (previously developed) sites.
- *Urban* and *rural* sites, which are distinguished primarily on the basis of lot size.
- *Rock-* and *sediment-*based shorelines. Although there are several detailed systems for classifying shores according to their physical type in both Washington and British Columbia, for the purpose of the GSH rating system, a simple distinction was made between sediment and rock shores.

The technical team developed specific credits within each of the four categories through an iterative process. In contrast to the GSCD and several of the LEED rating systems, GSH does not include prerequisite actions. Instead, there are four distinct general application requirements:

1. An existing conditions plan that maps site characteristics
2. A proposed site design showing the proposed development in the context of existing site conditions
3. An environmental management plan
4. A critical or sensitive habitat report showing avoidance of defined critical or sensitive habitats

Table 7.1 GSH Credits and Credit Points

Credit Category			Maximum Points Available		Total Points Available
			Base	Bonus	
Shoreline processes	1.1	No shoreline protection structures	15	—	15
	1.2	Setback/impact avoidance	10	4	14
	1.3	Bulkhead removal	15	8	23
	1.4	Groin removal	5	2	7
	1.5	Soft Shore protection or enhancement	12	5	17
	1.6	Managed retreat	10	3	13
Shoreline habitats	2.1	Riparian vegetation	10	5	15
	2.2	Trees and snags	5	1	6
	2.3	Invasive species	4	—	4
	2.4	Woody material	3	—	3
	2.5	Overwater structures	10	—	10
	2.6	Access design	3	—	3
Water quality	3.1	Site disturbance	5	—	5
	3.2	Reduce and treat runoff	6	2	8
	3.3	Environmental friendly building products	4	—	4
	3.4	Creosote material removal	4	0	4
	3.5	Herbicides, pesticides, and fertilizers	2	—	2
	3.6	Onsite sewage treatment	2	1	3
Shore Stewardship	4.1	Shoreline collaboration	8	—	8
	4.2	Public information and education	1	1	2
	4.3	Conservation easement or covenant	6	—	6
	4.4	Shoreline stewardship participation	2	—	2

These application requirements tend to coincide with typical permit application requirements for local jurisdictions, minimizing additional document requirements by the program participants.

These credits and associated rating points are fully documented in the *Green Shores for Homes Credit and Ratings Guide*.^{*} For each credit, the guide describes the situation or conditions to which the credit is applied, the benefits to the homeowner and environment, the points available for the credit, guidance on how to address the credit at the site level, and provides useful references.

A total of 22 specific credits were developed for the four credit categories described in Table 7.1. The Shoreline Process credits address sites with no shoreline protection, building setbacks and actions to reduce or reverse cumulative impacts from existing developments (bulkhead and groin removal). The Soft Shore Protection credit encourages alternative approaches to shoreline hardening but requires the applicant to demonstrate that shoreline protection is needed. A number of these credits (Setback, Managed Retreat) include consideration of projected sea level rise.

The Shoreline Habitat credits provide a variety of ways to incorporate ecological design features and functions into shoreline properties (riparian vegetation, tree retention or planting, invasive species removal and management). The Overwater Structure credit not only delivers the greatest number of credit points for properties with no docks and piers but also provides guidance and credit for best practices with respect to dock design and materials.

The Water Quality credits address potential contamination from site runoff, including sedimentation, removal of existing sources of contaminants (creosote), and minimizing inputs from building materials, landscape maintenance, and septic treatment.

^{*} Available from the Green Shores for Homes website. See <http://www.greenshoresforhomes.org>

Table 7.2 GSH Rating Levels

GSH 1 “ORCA” The project exhibits exceptional design regarding improvement/conservation of the natural features and processes of the shoreline.	Minimum 40 points of which a minimum of 20 points (collectively) is acquired from Shoreline Process and Shoreline Habitat credit categories.
GSH 2 “CHINOOK” The project results in recognizable improvement or conservation of the natural features and processes of the shoreline.	20–39 points of which a minimum of 10 points (collectively) is acquired from Shoreline Processes and Shoreline Habitats credit categories.

The Shore Stewardship credits include recognition of the value of collaboration among waterfront property owners on collective approaches to shoreline protection and enhancement and also include a number of credits that encourage public education and participation in Green Shores approaches to shoreline management. Considerable point recognition is given to projects that establish a conservation easement or covenant to protect the natural features of the property’s shoreline.

Points are provided to meet specific credit conditions. The weighing of credit points is based on relative environmental benefit as determined by the technical team. Many of the credits have multiple point levels depending on the extent of the action; for example, between 2 and 10 points are awarded for bulkhead removal depending on how much of the property shoreline is subject to bulkhead removal. This approach is intentional and meant to encourage incremental improvement in situations where full bulkhead removal may not be possible or supported by the homeowner. Many of the credits include bonus points, awarded in addition to meeting specific credit requirements. Examples include implementing monitoring plans, applying the credit under specific situations, such as bulkhead removal in a documented forage fish spawning area, or providing a plan for managed retreat that considers and accommodates future sea level rise.

Although there are a total of 22 available credits, most shoreline projects will only qualify for 5 to 10 as many of the credits, particularly the higher point Coastal Process credits, are mutually exclusive.* This format allows the credit and rating system to apply to a broad range of project types and situations. Using the findings of pilot testing, two rating levels were defined based on the number of points achieved by an applicant. These are shown in Table 7.2.

In addition to the Credit Guide, an applicant checklist was developed for use by the homeowner or their contractor. The checklist provides a summary of the submittal requirements for each credit and identifies the points available including any bonus points. The applicant uses this form to apply for the credit points applicable to their shoreline project. In addition, there is a section of the form for use by the GSH Verifier to conduct an independent review of the project (see below). An example of the checklist for the Soft Shore Protection Credit is provided in Figure 7.4.

Resource materials found in the appendices of the *Green Shores for Homes Guide* provide additional information to assist in applying the various credits. One of the primary references is the *Marine Shoreline Design Guidelines* developed by the Washington Department of Fish and Wildlife (Johannessen et al. 2014). This document provides a comprehensive framework for determining the need for shore protection and the techniques that best suit the conditions at sites in the Salish Sea region.

7.4.2.2 GSH Pilot Properties

After completing an initial draft of the *Green Shores for Homes Credit and Rating Guide*, the GSH Steering Committee identified pilot properties to test the effectiveness of the credits. The

* For example, a property can only qualify for one of the Bulkhead Removal, Soft Shore Protection, or No Shoreline Protection Structures credits.

Credit 1.5: Soft shore protection				
To qualify for this credit, construct soft shore protection rather than hard shore protection structures anywhere shoreline erosion control is needed. Note that points cannot be earned for both this Credit and Credit 1.3 “bulkhead removal” for the same length of shoreline, except if a bulkhead is removed from a portion of the shoreline (Credit 1.3) and another portion of the shoreline that was previously unprotected is treated with soft shore methods (this credit).				
€	Submission requirements (see Credit 1.5 in guide for details)	Points available		Points applied for
Basic:	a. On the existing conditions plan , show the extent of eroding shoreline and the major structures or improvements that are at risk from shoreline erosion. b. On the site design plan , show: <ul style="list-style-type: none"> • The extent and type of soft shore measures taken (added beach material, LWD, hard elements if needed, etc.), • A cross section of the soft shore protection design showing all soft and hard elements. c. Provide verification by a qualified professional that the soft shore treatment as shown is necessary to address the erosion. d. Provide before and after photos showing the eroding shoreline before and after soft shore treatment. Before and after photos should be taken from same vantage points and sight lines.	Soft shore measures used over 95–100% of shoreline;	12	
		Soft shore measures used over 75–94% of shoreline;	8	
		Soft shore measures used over 50–74% of shoreline;	6	
		Soft shore measures used over 25–49% of shoreline;	4	
		Soft shore measures used over 10–24% of shoreline.	2	
Bonus:	In areas where the beach and nearshore habitat have been degraded, provide documentation from a reliable source (e.g., scientific report, local fisheries authority, marine biologist, reputable stewardship organization) confirming that the soft shore measures recreate, restore or enhance spawning habitat for marine or freshwater fish and/or invertebrate species.		3	
Bonus:	Provide a plan for monitoring the soft shore project that may include (but not limited to) <ul style="list-style-type: none"> • Schedule for taking photos and measurement of key features • site plan showing location of photo and measurement points • The features to be measured or observed; e.g., changes in vegetation line, beach substrate at specific spots (sand, gravel, cobble), log movement • The mid- to long-term maintenance measures required 		2	
Maximum points available/total points applied for:			17	0
Comments:				

Figure 7.4 GSH checklist for the soft shore protection credit.

pilots included two properties in a freshwater environment on Lake Washington and two marine waterfront properties in the San Juan Islands. In each case, completion of the projects occurred at least 1 year before the testing date. See Lake Washington example in Figure 7.5.

The purpose of the pilot was to test (a) whether the credits could be interpreted and applied at a site level, (b) whether the credits could lead to improved waterfront development design, and



(a)



(b)

Figure 7.5 Lake Washington pilot property (a) before and (b) after.

(c) whether the relative weighing of the credit points was allocated accurately. In addition, the pilot tests would help determine whether the credit checklist provided easily understood information for both applicants and reviewers, and whether it requested the necessary information to meet the credit requirement.

Technical team members conducted the pilot testing, first by receiving background information on the pilot properties, and then conducting site visits to evaluate each project. During the site visit, team members used the GSH checklist to determine an overall point “score” for each property. Afterward, they provided feedback on how the credits had applied to the properties, and reviewed whether the documentation provided had allowed for an adequate review.

The pilot testing program revealed a number of areas for improvement with both the credits and credit checklist, including a need to provide more freshwater-oriented credit points, better distinction between small urban and larger rural properties for certain credits, and a need to provide credit recognition for taking no shore protection action on a site.

Each of the four pilot properties achieved a score high enough to qualify as a GSH property, with three of the four achieving a Level 1 (Chinook) rating and one property achieving a Level 2 (Orca) rating. The Level 2 property was built on a high rocky bank where every effort had been made to minimize site disturbance during construction. The house on the Level 2 property had also achieved Platinum status under LEED for Homes; this provided extra points for the GSH assessment.

7.4.2.3 Role of Verifiers

As with other certification programs, independent, third-party review of an application is an important aspect of the GSH program. The GSH verifier conducts this review and may also act as a resource for the applicant during the application process. The homeowner (or contractor or engineer working with the homeowner) is responsible for the actual design of a project. It is not the role of a verifier to provide design or permitting advice to the homeowner; rather, the verifier is trained to help the homeowner understand the GSH program, including the credits and submittal process.

Verifiers should be locally based with a basic knowledge of the property development process, shore processes, and ecology, as well as an in-depth knowledge of the GSH credit and rating system. Verifiers are not required to be experienced coastal professionals. The prescriptive nature of the credits, with clearly defined, measurable outcomes, limits the amount of professional interpretation required of a verifier.

The technical team designed a 2-day program to train verifiers for the GSH program. Before the training course, each participant completed a pre-course assignment to familiarize themselves with the GSH Credit Guide and Checklist. Using the pilot properties, participants applied the GSH credits in both classroom and field exercises. Learning outcomes from the training session included the following:

- A working knowledge of the credit system
- The ability to conduct a screening of GSH credits applicable to a specific waterfront plan or design
- An understanding of the resources available to advise homeowners and their contractors to prepare necessary documentation for a GSH project
- The ability to verify credit submittals through review of application materials and site inspections

Participants were required to pass an examination based on an application submittal in order to demonstrate the above learning outcomes. Ten participants completed the 2-day training program and subsequent examination to become the first GSH verifiers.

7.4.2.4 Use of Incentives

As identified in the review of certification programs, offering a certification is typically insufficient to motivate a homeowner to take action (Rueggeberg et al. 2012, p. 38). Incentives can be provided in a number of different ways by government or nongovernmental entities. The GSH credit and rating program concept has always included some form of incentive for homeowner participation and achievement of specific rating levels, most likely delivered by the local jurisdiction participating in GSH.

Barriers to taking action and incentives to encourage property owners to change were the topic of a series of community meetings in Washington State (San Juan County and the City of Seattle)

and British Columbia. These meetings included governmental regulators, professionals, and homeowners interested in the GSH program. Barriers identified at these meetings include permitting processes, lack of understanding of the ability to employ alternative shoreline protection designs, the perceived cost of these designs over traditional bulkheads or riprap, impacts on property value, and perceptions of what might be effective alternative techniques to address erosion on the shoreline.*

Incentives recommended for the GSH fell into four categories:

1. Technical Assistance: assistance with alternative protection design and riparian planting plans
2. Financial Incentives: grants and tax incentives
3. Education and Outreach: property owner demonstrations, technical training for consultants, architects, and landscape designers
4. Permitting Facilitation: permit exemptions, mitigation banks, streamlined, and consolidated permitting processes

Incentives explored in Washington during the pilot phase of the GSH program focused on education, outreach, and permit exemptions; however, in order to offer any permit-related incentives, each individual jurisdiction would need to agree to participate in the program. In BC, the four pilot communities focused their initial efforts on voluntary adoption through education and promotion of the positive benefits of GSH.

At the time of writing, no participating jurisdictions in Canada or the United States have implemented incentives programs. One BC local government included GSH as a policy in their Official Community Plan and others are considering its adoption at the planning level. Other jurisdictions have started processes to improve permitting efficiency for soft shoreline projects, and efforts are underway to coordinate these efforts with the GSH program.

7.4.2.5 Relationship to Regulatory Programs

GSH was conceived to be voluntary and incentive driven, rather than regulatory based or operated as a governmental program; however, many of the actions addressed by the GSH credits, such as bulkhead removal or soft shore protection, are highly regulated activities that require a permit in both the United States and Canada. Agencies at local, state/provincial, and federal levels review shoreline projects to ensure that they are safe, protect aquatic habitats and species, maintain water quality, and preserve public lands and interests.

In developing the GSH credits, attention was given to consistency and compliance with many of these key regulatory programs, particularly those in Washington State. Review of the credits by regulatory authorities provided a level of confidence that actions taken to meet credit requirements would not run contrary to permit authority. Since the two primary recipients of the EPA grant were local jurisdictions (Seattle and San Juan County), the GSH program was developed to coordinate with their local permit process.

7.4.2.6 GSH Program Delivery

The GSH Credit and Rating Guide and Checklist form the technical backbone for the GSH program. The long-term goal is to deliver the program through a third-party administrator similar to the LEED, Built Green, and Sustainable Sites models. Key aspects of program delivery include registration in the program, preparation of the GSH submittal, and postconstruction verification of the submittal.

* These findings are consistent with information from the B.C. meeting documented in a report by Modus (2015). Green Shores for Homes Pilot Project Summary Report, prepared for Stewardship Centre for B.C. Retrieved on September 22, 2015 from <http://www.stewardshipcentrebc.ca/green-shores-for-homes-pilot-project-summary-report/>

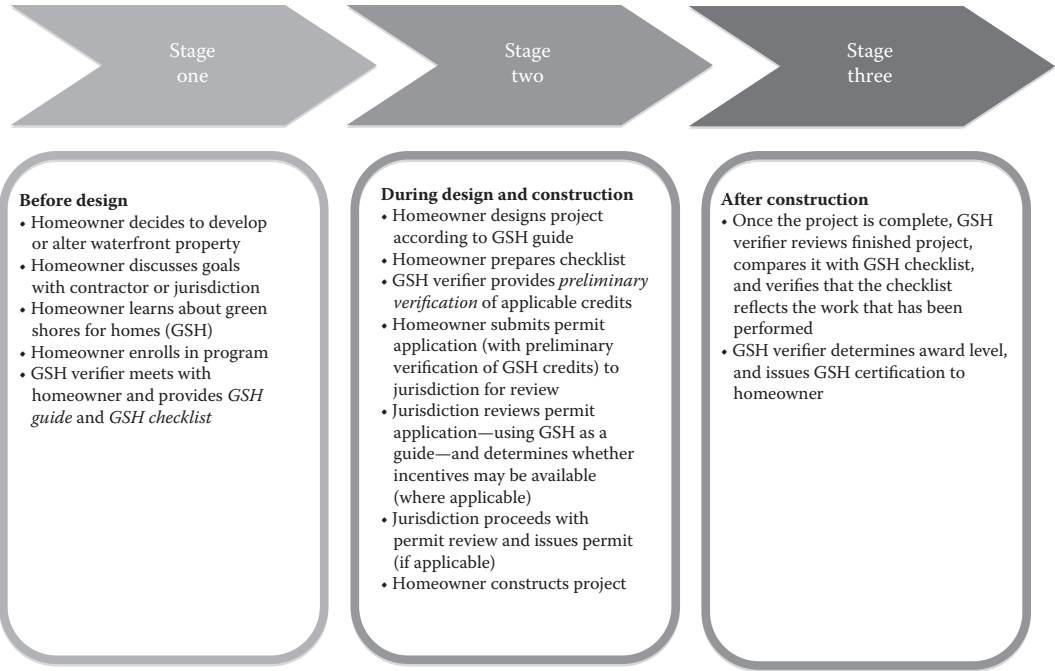


Figure 7.6 GSH design and rating process.

Homeowners will be able to register in the GSH program either through an online process available on the GSH website or by filling out the application form and e-mailing it to the GSH administrators.* Once an application has been received, a verifier is assigned to work with the homeowner to support their GSH application. The homeowner is responsible for compiling all documentation required for any credit for which they will apply. The verifier may meet with the homeowner to screen available credits; however, the verifier does not provide design advice or permitting assistance. This allows the verifier to retain an independent relationship with the design and regulatory aspects of the project as well as their subsequent verification of the project submittal. Figure 7.6 outlines the three stages of program delivery and describes how the GSH program intersects with a typical local permitting process.

7.5 GREEN SHORES AS A TOOL FOR CLIMATE CHANGE ADAPTATION

While the initial impetus for the Green Shores program focused on reducing impacts on near-shore habitat and coastal processes, adaptation to climate change is another reason for reducing hardscape such as bulkheads and armoring as hardscape solutions may not be as effective at preventing catastrophic storm damage as the softer approaches promoted by the Green Shores program.† In addition, Green Shores provides a number of credit points for climate change adaptation actions under the GSH building setback and managed retreat credits. The GSCD rating system has a dedicated credit for the production of a climate change adaptation plan that addresses one or more of the four approaches to adaptation (avoid, protect, accommodate, and retreat), with higher point allocations given to avoidance or retreat strategies.

* Retrieved from [http:// www.greenshoresforhomes.org](http://www.greenshoresforhomes.org)
† These are the general conclusions found in the report Living Shorelines: From Barriers to Opportunities, Restore, America’s Estuaries 2015.

In order to better understand the implications for the use of the Green Shores program for climate change adaption, SCBC—with funding from Natural Resources Canada—commissioned an engineering study to test several case examples and evaluate the effectiveness of soft shore armoring alternatives compared to an equally appropriate hard alternative, based on the following criteria (Lamont et al. 2014):

- Adaptability to climate change and related sea level rise
- Effectiveness in protecting the shoreline against flooding
- Effectiveness in providing ecological resilience
- Relative cost, considering initial capital cost, maintenance cost, and long-term replacement cost

The study evaluated three soft shore alternatives described as follows:

- Case Study #1: Use of beach nourishment, consisting of supply and placement of typical beach intertidal materials, ranging from sand to gravel/cobble mixture
- Case Study #2: Use of nearshore rock features, including boulder clusters and intertidal and subtidal rock habitat reefs
- Case Study #3: Use of a typical headland-beach system to maintain a conventional beach intertidal substrate in an area exposed to waves from more than one primary direction

The evaluations outlined in the report demonstrate that soft shore approaches can provide effective flood protection against climate change–related sea level rise and related issues. The three case examples demonstrated that soft alternatives for flood protection provide significant cost advantages over hardscape alternatives. The margin of cost saving varies, ranging from 30% to 70% of the cost of a comparable hardscape alternative. Moreover, an ecological services evaluation framework developed for this study demonstrated that soft alternatives provided similar or improved assessment scores for shoreline ecological resilience.

This study provided compelling reasons to consider design alternatives as put forward by the Green Shores program in the context of climate change and sea level rise adaptation. As a result of this study, there is ongoing work with multiple levels of governments, conservation organizations, and professional associations* to raise awareness of the use of Green Shores as a tool when addressing climate change adaptation.

7.5.1 The Need for Multidisciplinary Approaches to Shore Development

Development design and construction in the shoreline environment requires a multidisciplinary approach to address a range of complex issues. In order to develop a meaningful Green Shores rating system, credit development required the expertise of marine biologists, coastal geomorphologists, landscape architects, coastal engineers, shoreline planners, and ecologists.

This approach ensured that the broad range of issues associated with shoreline development could be addressed. Marine and freshwater biologists are critical for understanding the impacts of shoreline development on marine and riparian habitat. Coastal engineers and geologists provide structural design and physical process considerations unique to the shoreline environment. Landscape architects understand the design principles inherent in the integration of land and water and also bring knowledge of the role vegetation has on a healthy shoreline environment.

* For example, Green Shores is referenced in the British Columbia Sea Level Rise Primer and the BC Ministry of Environment's Climate Action Secretariat regularly participates on Green Shores Advisory Committees. SCBC is also working with the Professional Association Climate Change Adaptation Working Group—a group of professionals from the engineering, planning, biology, nongovernmental, and forestry sectors—to link these professionals to Green Shores training opportunities.

Land use planners understand the interplay between regulatory requirements and development standards.

It is not always feasible to assemble a full multidisciplinary team for a shoreline development project, particularly for single resident waterfront development. For this reason, the GSH guide and credit descriptions focus on design outputs (e.g., percentage of riparian zone conserved or restored) and provide design guidance to help achieve the required outputs. The credit guide identifies key areas or situations where professional advisement is recommended.

For larger shoreline development projects, such as those addressed by the GSCD, there are requirements for professional signoff on specific coastal process and habitat credits. This approach recognizes the sustainability benefit of forming multidisciplinary team in the early project design phase. The Green Shore program encourages the use of an integrated design process, which involves inclusive, collaborative, and holistic elements at all aspects of the design process.* The application of this approach and the guidance offered by the GSCD and GSH credit systems at the project level ultimately leads to positive human and ecological outcomes.

7.5.2 Professional Development Training and Outreach

Outreach and education efforts based on GSCD and later GSH have been ongoing in British Columbia over the program development period. Four workshops held in 2013 involved more than 150 participants including government agencies, developers, shoreline professionals, conservation organizations, and shoreline property owners. Workshop participants had the opportunity to learn about the GSCD credit and rating system and its application, receive updates on GSH, and share shoreline experiences. Some workshops included field trips to projects that had used Green Shores approaches. Participants recognized the multidisciplinary nature of the program and discussed the challenges to implementation. Workshop attendees noted the need for education and outreach to increase understanding of the issues in the community and secure greater buy-in on the value of the program. In 2014, SCBC initiated a multijurisdictional study to develop strategies for implementation of GSH programs in British Columbia. The study, *Green Shores for Homes; BC Pilot (2015)*, identified two key implementation strategies focused on education and outreach:†

1. A Green Shores educational and promotional initiative
2. A Green Shores professional training and certification program

After completion of this study, SCBC began work to develop training courses for Green Shores in British Columbia. The target audience will include landowners, local government staff, elected officials, conservation organizations, and coastal professionals. SCBC received funding for this new initiative to work with the University of Victoria and British Columbia Institute of Technology to develop and deliver Green Shores training in three regions of British Columbia. In addition, accessible, creative, and highly visual training materials will be developed, including videos, posters, FAQs, info graphics, and other community-based social marketing materials. All materials will be linked to the Green Shores‡ and GSH§ websites. In this way, the educational materials and learning outcomes will be directly transferrable to the Washington State Green Shores partners.

Two levels of training will be developed and delivered: Introduction to Green Shores (Level I) and Advanced Green Shores (Level II). The courses will introduce participants to the purpose

* For a full description of the IDP, see the *Integrated Design Process Guide*, Canadian Mortgage and Housing Corp. https://www.cmhc-schl.gc.ca/en/inpr/bude/himu/coedar/upload/Integrated_Design_GuideENG.pdf

† Other key strategies include working with local government and others to streamline approvals and developing targeted financial incentives.

‡ Retrieved from <http://www.greenshores.ca>

§ Retrieved from <http://www.greenshoresforhomes.org>

and application of Green Shores practices, how these practices can aid in climate change adaptation, and the roles and responsibilities of government, landowners, and professionals in shoreline development. Professionals completing the Level II training will form the initial registry of trained professionals available on the Green Shores websites.

Outreach and education in Washington on the use of soft shoreline alternatives began before the initiation of the GSH program. These efforts, spearheaded by local and state agencies, have begun to incorporate GSH into training and outreach efforts. During the initial phase of program development, Washington participants in GSH focused on development of the credit document and the website. Later phases for the program in both Washington and BC will include outreach and education to jurisdictions to encourage wider support and willingness to offer incentives such as reduced permit fees or streamlined permitting processes. In addition, later stages of program development will include outreach to homeowners to encourage their participation. These efforts will be coordinated with other outreach efforts to reduce the amount of armoring in the region.*

7.6 CONCLUSION

Green Shores provides a flexible program that encourages homeowners to protect or restore their shorelines, and address coastal impacts associated with climate change through the use of natural or “soft” solutions. Although voluntary, the Green Shores program provides options for regulatory authorities to adopt the credit criteria within their jurisdictional regulations or requirements. As a voluntary program, the development and coastal professional community rather than regulators can drive it. Unlike LEED, Green Shores has yet to establish widespread brand recognition in order to deliver a marketing advantage. As a technique to promote alternative shoreline stabilization, property owners, developers, and coastal professionals need a demonstration of the value-added component of Green Shores to justify the extra effort required to obtain certification; however, the benefit of a rigorous and transparent certification process provides credibility and will increase market demand and brand recognition over time.

The GSCD and GSH program development and pilot phase testing is largely completed and has been well received by land use professionals, governments, academia, and the public in both Washington State and British Columbia† and there is strong interest in continued growth of the program by local governments. The key challenge for the next phase of Green Shores is moving from the development and piloting phase to a fully operational program providing all the elements of the rating and verification process outlined in Figure 7.6. Key issues to be addressed to achieve a fully operational program include the following:

- Greater recognition of Green Shores approaches to ecological and human well-being values. This can be achieved by continued outreach to the existing Green Shores network as well as to real estate markets, the green building community, and other professional networks.
- Specific incentives offered to property owners for achieving specific GSH rating levels (Chinook or Orca). To date, partner jurisdictions have considered use of incentives but none have implemented a dedicated GSH incentive program.
- Development of organizational leadership and capacity for coordinating and delivering Green Shores programs in British Columbia and Washington State. The Stewardship Centre for British Columbia and Washington Sea Grant are leading program delivery on each side of the border;

* Two significant programs in place that have partnered with the GSH program include the “Shore Friendly” effort initiated by the Washington Department of Fish and Wildlife and the Green Shorelines effort promoted by the Lake Washington, Cedar River, and Sammamish Watershed.

† Green Shores was recognized as a finalist in the Land Awards by the Real Estate Foundation of British Columbia in 2010 and also won Best Environmental Idea at Simon Fraser University’s RISE competition in 2014 for ways to address sea level rise in coastal British Columbia.

however, development of a sustained operation and business model along with funding mechanisms remains to be completed and implemented.

- Need for local government champions. Successful implementation of the GSH programs requires a close partnership with a coastal community or region. The GSH program needs to be perceived within coastal communities as being supported by their municipal or regional (county) government in terms of both incentive delivery and harmonization, to the degree possible, with local regulations.

A recent report by Restore America's Estuaries (2015, p. 6) lists three major barriers to the implementation and broader use of Living Shoreline approaches to shoreline development and management:

1. Institutional Inertia: both regulators and coastal professionals being more locked into traditional approaches
2. Lack of a Holistic Context: regulators, planners, and designers do not consider system-wide or cumulative impacts when considering shoreline development on a project-by-project basis
3. Lack of an Advocate: there is no single agency or jurisdiction committed to promoting and facilitating Living Shoreline approaches to shoreline management

Recommended strategies to address these barriers include education and outreach, regulatory reform, improved institutional capacity, and public agencies leading by example.

The Green Shores program offers opportunities to address these barriers, including the following:

1. A sound technical framework focused on holistic (integrated) design approaches with a clear emphasis on cumulative impacts
2. Guidance and a process for Living Shoreline approaches that agencies and local jurisdictions can adopt to overcome "institutional inertia," which is caused in great part by lack of a clearly articulated alternative
3. A focus on a diverse outreach and education program at several levels to meet the needs of homeowners, the real estate industry, planners, and regulators, as well as coastal professionals

There is a growing awareness in the Salish Sea region by local, state, and provincial governments about the impacts of hardscape shore protection on the natural environment and the need to address adaptation to climate change. Washington State has implemented regulations at several agency levels to restrict bulkhead installation and encourage bulkhead removal.* In British Columbia, the recognition of the need to respond to climate change impacts has motivated local governments to seriously consider alternative approaches to traditional shoreline hardening. The Green Shores program offers these jurisdictions with guidance, a process, and potentially incentives to achieve these goals.

The Green Shores program chose to adopt the ratings and certification model as a method of facilitating change in shore development and management practices—an approach modeled on successful Green Building initiatives such as LEED. However, this approach presents implementation challenges including demonstration of the market advantage of certification, ability for local governments to provide viable incentives for homeowners to participate in GSH certification, and the need for a financially viable and sustainable organization to operate the program.

* The State of Washington Shoreline Management Act directs local governments to adopt shoreline master programs (SMPs) that "protect and restore the ecological functions of shoreline natural resources." SMPs should allow structural shoreline modifications only where they are demonstrated to be necessary to protect a primary structure [WAC 173-26-176 (3)(c)]. In 2014, the Washington Department of Fish and Wildlife revised their Hydraulic Project Approval to require more stringent review of proposed bulkhead proposals. The new guidelines require single-family homeowners to "use the least impacting technically feasible alternative" to address bank protection [WAC 220-660-370 (3)(b)].

Soft shore alternatives are an important and critical way for property owners to address erosion in an ecological manner while also mitigating the impacts of increased coastal inundation attributed to climate change. The Green Shores program provides an important pathway for property owners, with the support of local jurisdictions, to protect and restore their shorelines, conserving and enhancing coastal ecology and human well-being for future generations.

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