



COLWOOD WATERFRONT STEWARDSHIP PLAN

DRAFT



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PART 1

Introduction

1.1 PURPOSE OF THE CWSP

The purpose of the Colwood Waterfront Stewardship Plan (CWSP) is to provide overall direction and guidance for the redevelopment of the Colwood waterfront, with a focus on lands within the public realm including the foreshore, waterfront parks and roadsides.

OCP Goal:

"Colwood's Waterfront is a stewarded, world-class destination for residents and visitors alike".

The Colwood Waterfront is diverse, unique, and treasured, but faces significant pressure from increasing recreational uses, climate change and sea level rise. Colwood's waterfront includes a national migratory bird sanctuary and is rich in ecological, archaeological, and cultural history. At the same time, it is an increasingly popular recreation destination for bird watchers, dog walkers, cyclists, storm watchers, and summer beach picnickers, among other recreational users. Population growth in the West Shore neighbourhoods appears to have led to the discovery of the Colwood Waterfront as a recreational gem. Mitigating the impacts from intensifying recreational use will require planning and management. The CWSP affords the opportunity for Colwood as the leading land use planning authority to proactively establish guiding policy and to design the waterfront open space system to achieve 'active stewardship' of the waterfront.

The Colwood Waterfront Stewardship Plan will establish a planning and management framework that addresses following elements:

- Shoreline sediment processes
- Infrastructure and services
- Ecological protection and enhancement
- Open space amenities
- Other improvements that control access and enhance public safety.

It is hoped that the plan will not only add recreational amenities but will at the same time preserve and enhance the ecological, cultural, and recreational values that attract people to the waterfront in the first place.

Two key guidance reports have been prepared as part of the preliminary planning work for the Colwood Waterfront Stewardship plan.

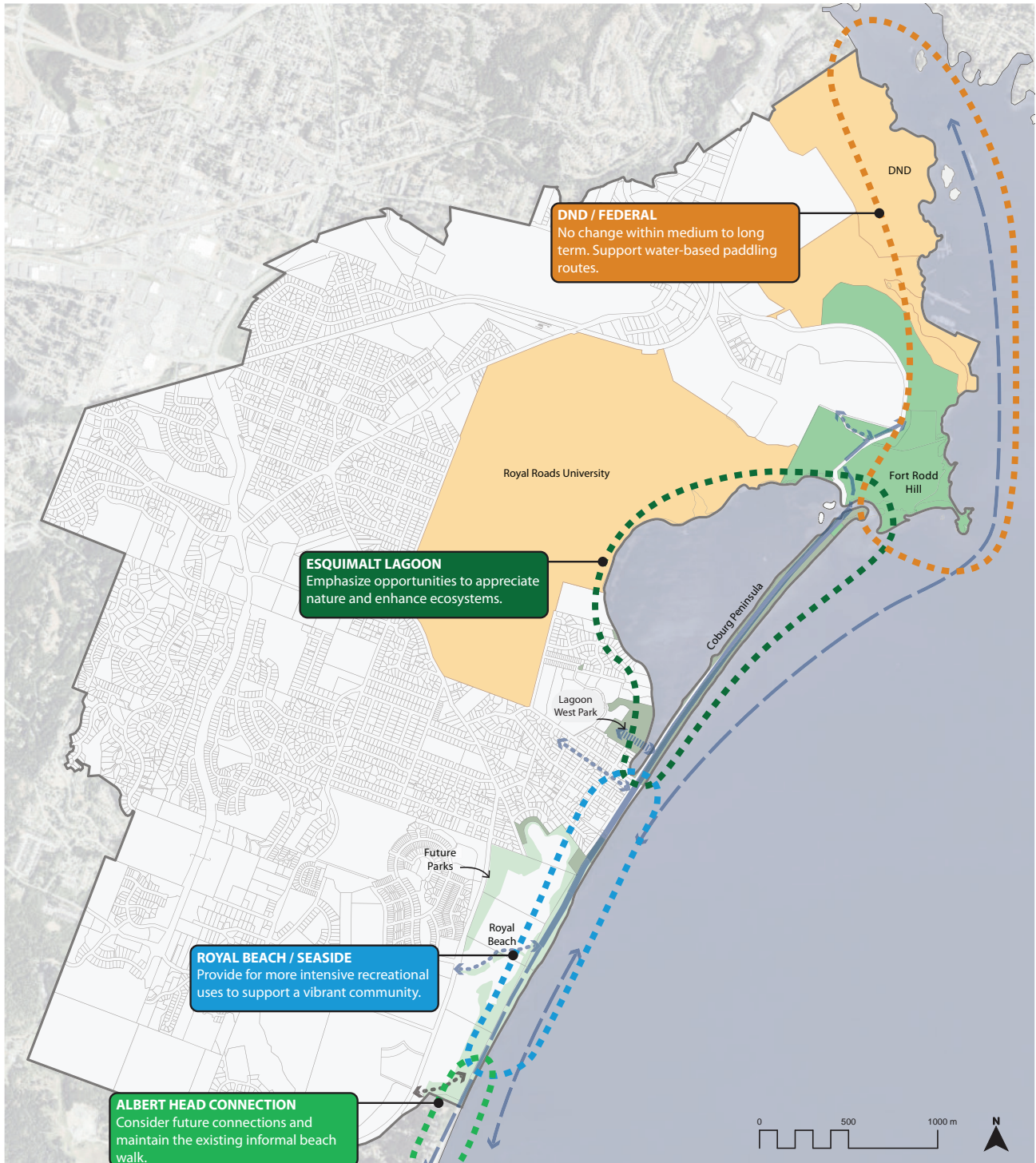
- **Needs Assessment Report** – Summary of community growth projections, and an estimate of programming requirements for the waterfront.

The CWSP establishes a framework for Colwood's waterfront open space system, and will be followed by detailed design and construction of multiple project phases.

- **Multi-Disciplinary Shoreline Assessment Report** – Summary of detailed analyses on ecological, archaeological, infrastructure and planning related elements at the waterfront.

Two additional summary reports inform the CWSP project outcomes, and include the Strategic Directions Report, and the Engagement Summary Report. All these background project reports are summarized in the sections that follow.

Figure 1: General Programming Areas Spanning the City of Colwood Shoreline



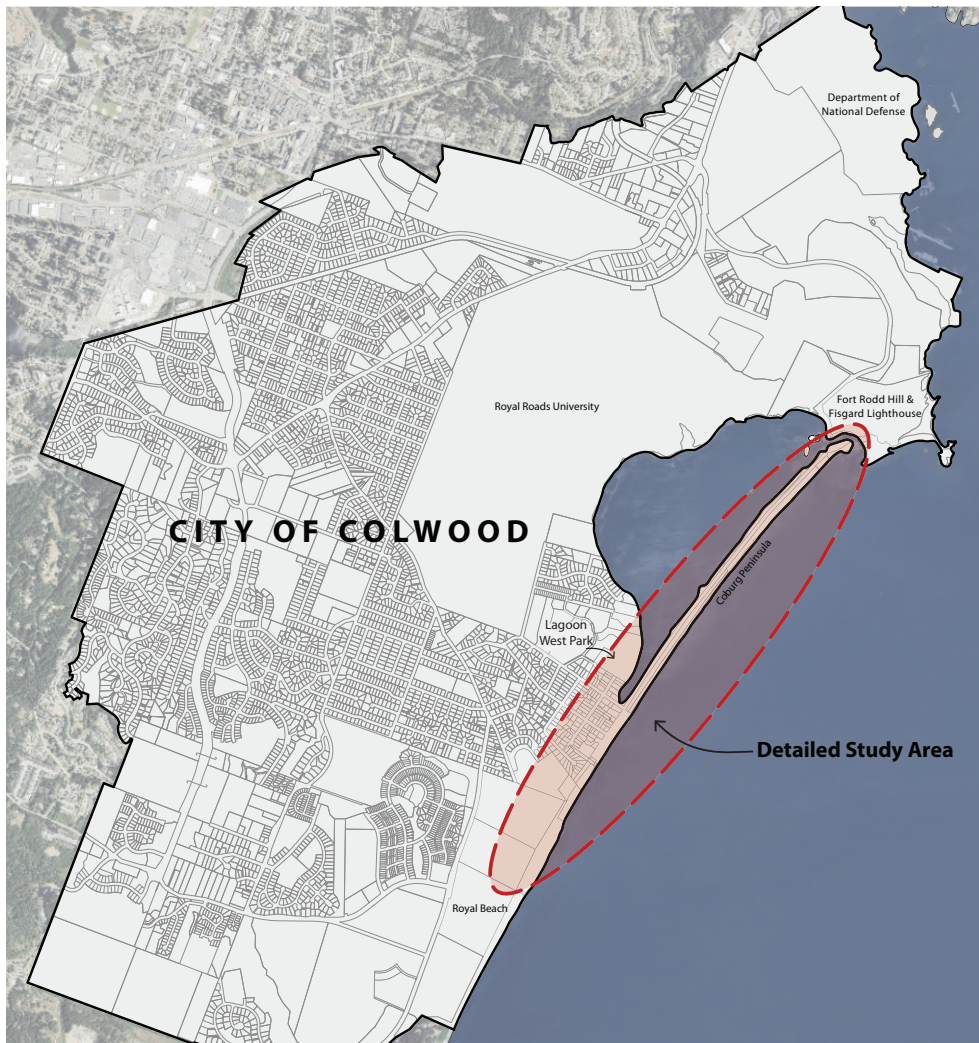


1.2 STUDY AREA OVERVIEW

The City of Colwood is in an area of traditional Coast Salish peoples' land on the southern tip of Vancouver Island. Colwood is one of the communities comprising the 'West Shore' within the Capital Regional District and bordered by Metchosin to the south, View Royal to the north and Langford to the north and west. The entire eastern boundary is oceanfront on the Salish Sea (i.e.: Juan de Fuca Strait). Colwood's waterfront is one of the defining features of the community, and a highly prized community asset.

Colwood's eastern edge is bound by Esquimalt Harbour and Esquimalt Lagoon. The ocean is a formative element of the community that shapes Colwood's identity, and the types of cultural, scenic, and recreational opportunities residents have access to. However, the northern portion

Figure 2: Detailed Study Area



of Colwood's shoreline is home to active industrial Department of National Defense lands which are generally restricted to public access. South of Fort Rodd Hill, Colwood does have a predominantly public shoreline, except for the western and southern margins of Esquimalt lagoon and small portions of the outer shoreline. It is the southern portion of shoreline between the future Royal Beach development and Fort Rodd Hill that is the principal subject area of the CWSP. The Detailed Study Area illustrated in the map below outlines the extent of the majority of planning recommendations and open space conceptual designs presented in this report. The Esquimalt Lagoon area is the

location of a nationally significant Migratory Bird Sanctuary and generally has a more naturalized character. South of the lagoon, the shoreline is constrained by vegetated bluffs on the landward side. However, a modified section of shoreline midway along the bluffs at the future Royal Beach development site provides opportunities for introducing community amenities. Both commercial services and more vibrant park amenities such as plazas and community event spaces are possible within the new park space expected at Royal Beach.

The CWSP will provide designs for specific public realm improvements along the 4 km long shoreline from Fort Rodd Hill to Royal Beach. The 'spine' or central feature of the open space system will be a continuous waterfront walkway, as identified in the Colwood Official Community Plan (OCP) and in the Colwood Parks and Recreation Master Plan (PRMP). Other amenities and open space system improvements will complement the waterfront walkway by adding interest, improving safety, or enhancing environmental quality.

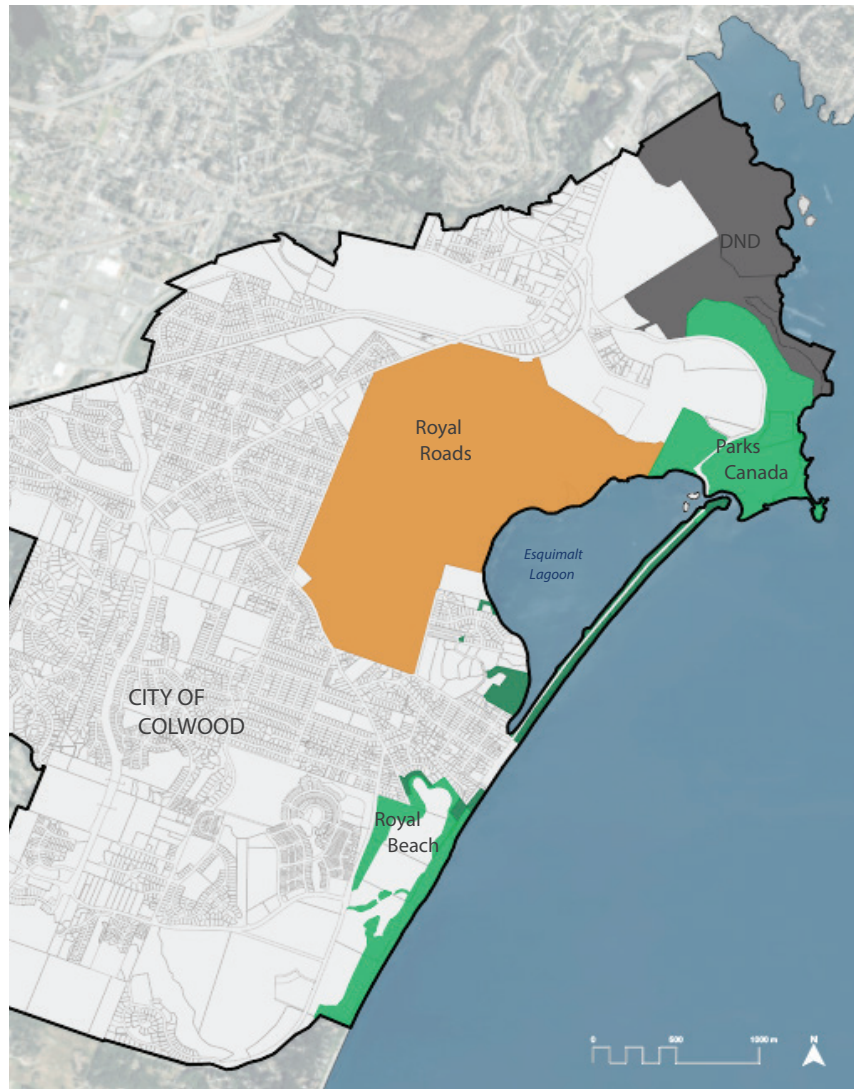


Figure 3: Waterfront Open Space Tenure Map.

There is over 7.5 km of waterfront within Colwood which is predominantly publicly owned, but not necessarily publicly accessible. Lands north of Fort Rodd Hill are part of the Department of National Defense Base and include both institutional lands as well as Undeveloped Lands (currently zoned as Parks and Open Space). The grounds of Royal Roads University have forest ecosystems on the landward side of the Esquimalt Lagoon. Existing Colwood municipal parks within the study area include Coburg Peninsula, Perimeter Park, and Lagoon West Park and there are future parks planned within the Royal Beach development site immediately south of the detailed study area. Parks Canada operates the National Historic Site at Fort Rodd Hill, and much of the surrounding land remains 'park reserve'. This patchwork of largely natural, undeveloped open spaces – the majority of which Colwood manages as park space – affords unique opportunity to plan for a truly special connected, public open space system.

1.3 WATERFRONT PLANNING CONTEXT

The vision and goals of the existing City of Colwood policies will help inform the Waterfront Stewardship Plan including:

- Official Community Plan (2018)
- Strategic Plan (2019-2023)
- Transportation Master Plan (2015)
- Royal Bay Area Plan (Component of 2018 OCP)
- Parks and Recreation Master Plan (2021)
- Sub-Area Plans for Latoria South and Royal Beach

" Colwood is a spectacular seaside community set apart by its outstanding natural setting and exceptional quality of life.

Nature is all around you in Colwood. Within minutes of stepping out your front door, you can be walking along the beach by the ocean, wandering down a shady trail through old growth forest, or enjoying the wide open natural green space of a local park."

-OCP Vision

OFFICIAL COMMUNITY PLAN - WATERFRONT

The value of the waterfront to Colwood is strongly articulated in the OCP's vision statement:

Official Community Plan goals related to the waterfront include:

"The [Colwood] waterfront is a stewarded, world-class destination for residents and visitors alike". Access to the waterfront – with pathways and spaces for public life – will be balanced with measures that protect sensitive ecological areas from human activity.

"People and nature are exceptionally well-connected." Decisions will be made from the perspective of the watershed scale, considering the impact of projects to the overall health, water balance, and habitat of the watershed.

"Colwood is prepared to adapt to a changing world." Colwood puts in place measures to adapt to resource pressures and climate change, building resilience to rising sea levels and other natural disaster.

PARKS AND RECREATION MASTER PLAN

The vision for the waterfront articulated in the Parks and Recreation Master Plan (PRMP) is:

"The treasured public waterfront is iconic and balances resilience to climate change and sea level rise, respect for the environment, and a vibrant destination for activity and cultural events in the region."

The following is a summary of the six key guiding principles within the Parks and Recreation Master Plan:

Celebrate Our Natural Character: Maintain and strengthen the waterfront character and identity of the Colwood community. Promote parks and recreation features and amenities that are unique from other communities. Continue to recognize and celebrate natural features and scenic qualities within parks and public natural areas.

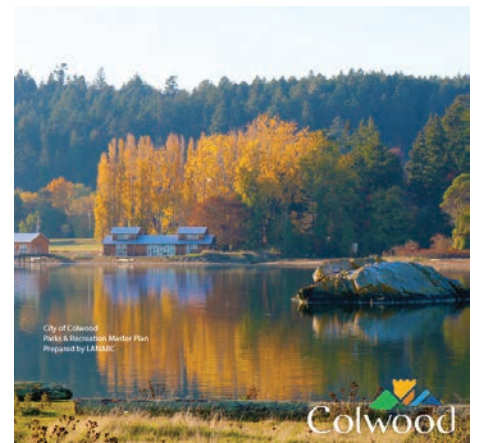
Strengthen Our Connectivity: Improve parks and trails to better function as a collective network for people and for wildlife. Integrate convenient trail connections for pedestrians and cyclists from parks to surrounding neighbourhoods, between neighbourhoods, and to the broader active transportation system. Provide amenities in parks that promote positive social interaction, community building, and gathering.

Protect + Enhance Our Environment: Maintain a naturalized foreshore that is receptive and resilient to coastal processes. Plan park improvements to respond to projected sea level rise. Protect a healthy marine ecosystem.

Encourage Our Community Health + Wellness: Empower residents and visitors of all ages and abilities to be active outdoors. Strengthen access to amenities that are family-friendly and exciting. Integrate flexible, multi-use spaces that encourage a wide range of activities.

Nurture Our Partnerships: Strengthen partnerships with local First Nations for mutual community building. Continue collaboration with the Federal Government National Historic Sites and Esquimalt Lagoon Migratory Bird Sanctuary [Canada Wildlife Service].

Promote Accessibility + Inclusiveness: Incorporate universal design best practices. Design and maintain spaces where people feel safe and comfortable to recreate day or evening.



Colwood Parks & Recreation Master Plan





PART 2

Context



2.1 NEEDS ANALYSIS

CENSUS & LAND YIELD ANALYSIS

At the time of the 2016 Census, Colwood's population was 16,850. The findings of the Demographic and Land Yield Analysis for Colwood (2018) indicate growth up to 22,742 by 2028 and 26,484 by 2038 (35% increase over the next 10 years and 16% increase the following 10 years). While Colwood is currently growing at a slower rate than Langford, the West Shore is the fastest growing sub-area within the Capital Regional District (CRD). By any measure, the growth projections for Colwood are significant.

According to a report prepared by Colliers International (2019) for the City of Colwood, the Capital Region population is projected to increase by upwards of 20% over ten years with the West Shore expected absorb almost half of this increase, growing by over 30,000 people. Colwood's waterfront neighbourhoods are highly desirable locations for new development and will undoubtedly absorb at least some of the projected increases in population for the West Shore.

Much like the region, Colwood has an aging population. Over the past 20 years, the 45-64 age range grew by 12.7%, and the 65+ age range grew by 9.5%, while the proportion of the population in other age categories decreased. At the regional scale, the age group of 65 years and older is expected to see the largest increase and is expected to increase from its current 22% to 28% of the total regional population in 2038. Along with population growth in general, an aging population is expected to further bump demand for passive recreation facilities, such as walking trails and high-quality open space.

The 2019 Colliers report forecasts an increase of 25% region-wide by 2038 in the number of occupied dwelling units, almost a quarter (24%) of this will be within the West Shore – with approximately 4300 units projected to be added in Colwood. At the time of the Demographic and Land Yield Analysis Report, Colwood averaged approximately 116 housing starts per year. In 2020, Colwood posted 300 housing starts as well as the approval of several new developments. It is anticipated that the bulk of the growth

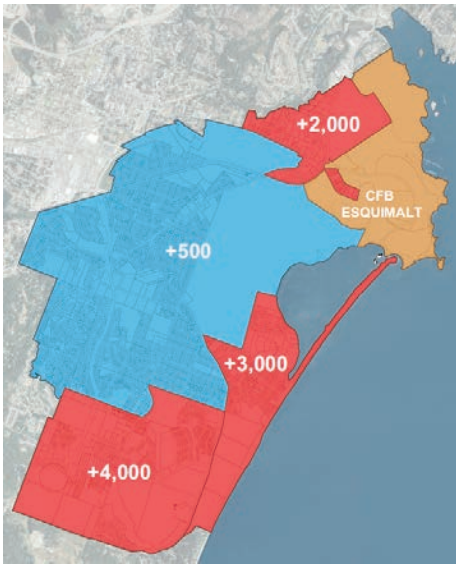


Figure 4: 2038 Population Increase Estimates by Colwood Neighbourhood

Source: City of Colwood 2019 Demographic Study & Land Yield Analysis

Colwood's waterfront neighbourhoods are highly desirable locations to live, and are expected to absorb a significant proportion of West Shore growth over the next decade.

within Colwood will be within the Colwood Corners area (town centre) as well as the Royal Bay/Latoria and Seaside neighbourhoods.

CURRENTLY PROPOSED NEARBY DEVELOPMENTS

Several developments are proposed in the neighbourhoods surrounding the Colwood shoreline, most notably the Royal Bay/Royal Beach development. The Royal Bay Area Plan was adopted in 2014. The plan provides for the phased development of a sustainable mixed-use waterfront community structured to establish walkable neighbourhoods, offering a range of housing forms including detached, ground-oriented attached and apartment homes as well as new parks and trails. Subsequent evolution of the plans are summarized below.

Royal Bay & North Latoria:

There are approximately 300 units constructed along with Royal Bay Secondary School. An additional 450 units, predominantly single-family and townhomes, are anticipated.

Royal Bay & South Latoria:

The South Latoria Sub-Area Plan was approved in July 2020. The plan includes approximately 2,100 new dwelling units of a variety of housing unit types including detached single-family residential, attached residential and mixed-use apartments.

Royal Beach:

The Royal Beach Sub-Area Plan was approved in June 2021. The plan includes 2,850 total allowable housing units, predominantly in multi-family apartments and attached dwelling units. The plan also includes the development of “The Landing” as a mixed-use core of Royal Beach. The height and density will be concentrated at the foot of the Metchosin Road slopes and then generally transition to lower heights towards the waterfront. The Landing is also the site of a potential passenger ferry terminal and waterfront commercial area.

Other Proposed developments of note along the Colwood Waterfront include Pacific Landing, Two Waters, and Seafeld Homes.

New development near the Colwood waterfront will increase pressure on the shoreline, but also provide opportunity for attractive services that compliment the waterfront experience.



Artistic Impression of Waterfront - Royal Beach

Source: Royal Beach Dev. App.

Increasing recreational use of the Colwood waterfront is expected to intensify demand for services like garbage collection, place pressure on parking and transportation infrastructure, and magnify risk to ecosystem values.

COMMUNITY GROWTH SUMMARY

The 2019 Demographics and Land Yield Analysis produced by Colliers International for the City of Colwood projects that the population and land use close to the waterfront in Colwood will grow and change dramatically in the ensuing decade. Significant interest in and activity on current development projects along the waterfront is early evidence of this.

The growing population of Colwood's waterfront neighbourhoods, Colwood proper, the West Shore, and the region, will intensify pressure on the Colwood waterfront as a local recreational destination. New developments, including the Royal Beach commercial centre, will be a regional attraction. As Colwood builds a world-class waterfront, visitors from outside of the region will add a visit to the Colwood waterfront to a typical 'bucket list' of places to visit in the Capital Region. This will further increase pressure on the waterfront.

2.2 COMMUNITY VOICE

Community and stakeholder consultation, including First Nations engagement, has been a key driver in the development of the CWSP. Community engagement has occurred in a multi-phased manner, with Round 1 of engagement followed by concept design development and Round #2 followed by concept design refinement. A third round of engagement will be pursued after the draft CWSP is prepared.

ENGAGEMENT ACTIVITIES

ROUND 1: February to June 2021

The public and key stakeholder groups were invited to provide general comments on desired outcomes and specific design elements. This input was used in the preparation of preliminary design concepts.

134
detailed
online responses



12
meetings
with stakeholders



9
formal
presentations



Figure 5: Engagement Activities - Round 1

ROUND 2: July to October 2021

The public and stakeholders shared their views on preliminary design concepts through online surveys, at a series of pop up events, on sounding boards in local shops, stakeholder meetings and presentations.

207
detailed
online responses



12
meetings
with stakeholders



5
formal
presentations



100+
pop up
participants



314
sounding
board responses



Summer 2021 Pop Up Event - Colwood

Figure 6: Engagement Activities - Round 2

ROUND #1 SUMMARY

Round #1 community consultation resulted in the identification of several key user groups, some general themes in desired outcomes, and helpful design input. This early engagement process involved the completion of:

- 134 online detailed survey responses.
- 9 formal presentations to Council & Committees.
- 12 stakeholder meetings with community and advocacy groups

Some general themes that emerged from the Round #1 Survey Responses included:

- Support for adaptive design and environmental protection & enhancement.
- Advocacy for improved access & accessibility.
- Encouraging celebration of First Nation's culture and heritage.
- Support for a variety of amenity improvements such as washroom facilities at the north end of Coburg Peninsula, sheltered outdoor spaces, benches, and improved garbage and recycling facilities.

Several key interest groups with varying expectations for the waterfront plan were also identified through the initial public and stakeholder engagement process. These groups and their desired outcomes are

Ecological protection and enhancement, First Nation's Engagement, a continuous waterfront walkway and vehicle access continually rank in the top community desired outcomes for the Colwood Waterfront Stewardship Plan.



summarized as follows:

- Local Residents – Adjacent homeowners, dog walkers, beach walkers, sunset strollers, pre-schoolers, youth, cyclists and others with a predominant preference for passive recreation activities at the waterfront, but also a desire to keep things as much as possible as they are.
- First Nations – Celebration, prayer, water-based activity (shellfish harvesting, canoeing, etc.), gathering spaces.
- Universal Accessibility – Handi-dart or van parking, beach access mats, accessible pathways, clearly designated accessible parking stalls in various locations.
- Naturalists – Bird watching, forage-fish monitoring, restoration projects, protection of the Migratory Bird Sanctuary, restriction of boat access to Lagoon.
- Commuters – preservation of northbound and southbound access.
- Regional Visitors – safer pathways and parking, traffic calming, better facilities such as restrooms, interesting activities, maintenance of parking facing waterfront.
- Commercial Operators – food truck space and services, improved garbage and recycling handling, licensing.



Birding at Esquimalt Lagoon
 Source: Goldstream News Gazette

A Colwood staff working group and Parks Maintenance Staff have also provided oversight, review and comments on the CWSP throughout its development. Input from staff has been incorporated throughout the plan.

ROUND #2 SUMMARY

During the Round #2 community engagement activities, the project team received valuable input from well over 300 community members and key stakeholders. Below is a summary of the key planning and design themes expressed by the community in response to the preliminary concepts.

- Ecological Protection and Enhancement Remains Top Desired

Outcome - Throughout the survey, respondents indicated that ecological protection and enhancement as the top planning goal (90% of respondents indicated they definitely or somewhat agree).

- Leave it Alone vs. More Amenities - Respondents indicated competing preferences between leaving the area as it is today with only minor interventions, compared with allowing for more amenities than proposed in the preliminary concepts (e.g. food trucks, washrooms).
- Vehicle vs. Active Mobility Priorities - Respondents indicated competing preferences between increased parking and two-way traffic, compared with support for safe walking and cycling facilities.
- Waterfront as a Local vs. Regional Amenity - Respondents indicated competing ideas that the Colwood waterfront should be envisioned as primarily local-serving (i.e.: Colwood residents) compared with developing the waterfront as something of a destination for the region.
- First Nation Participation - Some survey respondents reinforced the need for meaningful engagement as part of the waterfront planning process. It is important to note that engagement with local First Nations' Chief & Councils was running parallel to the public surveys and this may not have been readily apparent to survey respondents. Colwood acknowledges public project engagement with First Nations as a 'must-do', and will continue to pursue dialogue, understanding and meaningful First Nations engagements throughout implementation of the CWSP.

2.3 SITE ANALYSIS

2.3.1 EXISTING PARKS AND OPEN SPACE

The PRMP defines different types of parks as follows:

- Waterfront parks provide public access to the Esquimalt Lagoon



Paul Lewis Sculpture - Colwood Waterfront
Source: City of Colwood



Existing Colwood Bluffs at Royal Beach

and oceanfront for swimming, sunbathing, picnicking, boat launching, walking and passive recreation.

- Nature parks are dedicated for community access to nature and recreational amenities are typically limited to passive enjoyment and pedestrian trails.

Colwood has 9.3 hectares of parks classified as Waterfront Parks within the Parks and Open Spaces Master Plan (PRMP). This includes Coburg Peninsula and Perimeter Park. Other municipal parks within the general study area include Lagoon West Park (see PA-14 on Page 56) and Matilda Park, both identified as Nature Parks. Through the Royal Beach development, there is expected to be future municipal parkland along the shoreline within the development site. Colwood is fortunate to have other open spaces throughout the municipality, including three national historic sites (Fort Rodd Hill, Fisgard Lighthouse, and Hatley Castle), the Royal Road University Campus, and a Federal Migratory Bird Sanctuary at Esquimalt Lagoon. These areas complement the Colwood waterfront by providing an interconnected open space system for wildlife, and for people.

2.3.2 THE PHYSICAL LANDSCAPE CONDITION

While the waterfront and beach areas are predominantly flat, there are two areas along the Colwood waterfront with steep bluffs, and another with relatively low-lying topography. A section of bluff between Lagoon Road and Royal Beach makes access to the beach difficult from landward neighbourhoods and will dramatically constrain waterfront improvements. The section of bluff south of Royal Beach to the municipal boundary is vegetated and currently in a largely natural condition with no surrounding development. Both bluff areas will require careful planning and management consideration. The portion of the Colwood shoreline that is most vulnerable to sea level rise is the full extent of Coburg Peninsula, rising to only a few meters above current sea level at its highest point. It is expected that the impacts of sea level rise will be most noticeable along Coburg Peninsula, which demands special design consideration for amenities or restorations proposed along the peninsula. Other portions of the Colwood shoreline to the north are rock-dominated with moderate topography and generally

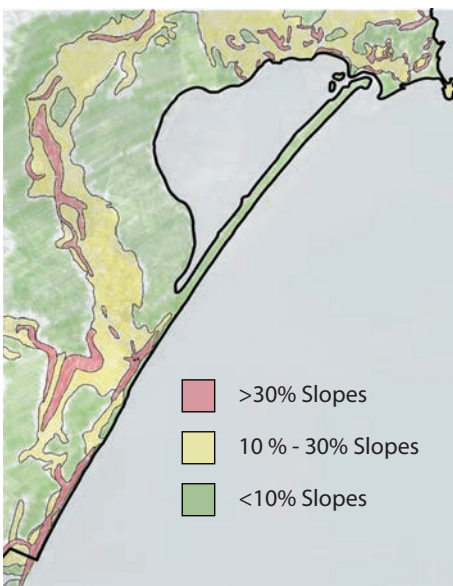


Figure 7: Slope Classification Study

more stable.

SHORELINE ARMORING

There are just a few areas along the Colwood waterfront where beach or shoreline armoring along the backshore has been installed. The photo at right shows the seawall installed in 2017 to protect the pump station from wave damage. There is approximately 780m of Colwood shoreline with some form of armoring. This comprises approximately 19% of the total shoreline within the detailed study area. The absence of shoreline armoring on a sediment shoreline in an urban or suburban area is extremely rare. Generally, sediment shorelines are armored to protect backshore infrastructure or structures. The lack of shoreline armoring on the Colwood shoreline is one of its defining features, and what makes Colwood's shoreline so highly prized.

ACTIVE SCARP AREAS

The adjacent photo shows an example of an active scarp face along the



Beach Armoring at the Pump Station

The absence of a seawall along the Colwood shoreline is unique, and lends to its natural, scenic quality and important habitat value.

However, beaches predominantly comprised of sand and gravel - like Colwood's southern (outer) shoreline - are particularly vulnerable to erosion.

Figure 8: Current Extent of Shoreline Armoring

Sediment shorelines are dynamic and susceptible to changes in sediment supply, sea level rise and storm frequency and intensity.



Figure 9: Current Extent of Active Scarp

Colwood shoreline below Perimeter Park. Active scarp faces are usually identifiable as a low, steep slope devoid of vegetation along the backshore and indicate active wave erosion eating away at the top of the beach. There is approximately 600m of active scarp along the Colwood waterfront as indicated in the map above, mostly concentrated in the Royal Beach area. This accounts for approximately 15% of the total shoreline within the detailed study area.

The current physical condition of the Colwood shoreline is remarkably natural, largely because of past mining activities that artificially nourished the beach. In the past, the typical approach to shoreline protection has been to 'harden' or armor beaches to prevent erosion. Our knowledge of local shoreline ecosystem values has advanced significantly over the past decade, and we now know that seawalls and other armoring techniques cause significant damage to beach habitat quality. Beach armoring also degrades the aesthetic and recreational value of beaches. In order to maintain the current physical condition of the beach and to reduce the likelihood of landward erosion (i.e.: increasing rate and extent of scarp erosion), the artificial addition of sediment or some other mitigating strategy will be required. Ultimately, shoreline processes are expected to continue working on the shoreline, and without some form of intervention, erosion of the



Active Scarp at Perimeter Park

Source: PDLA

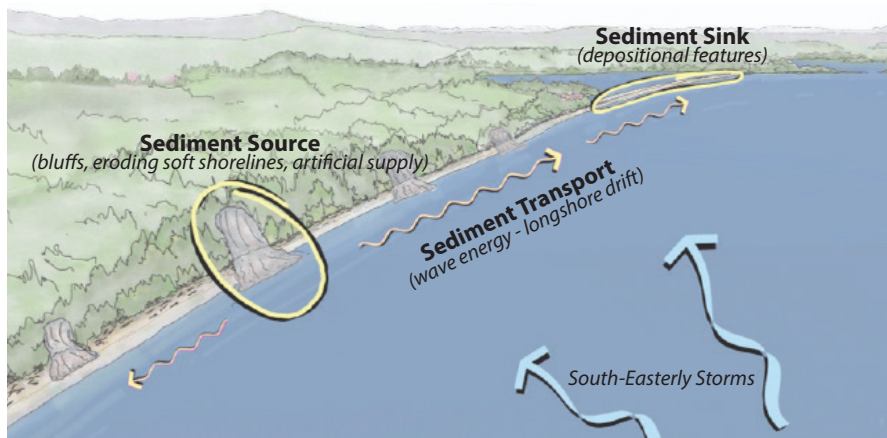
backshore is inevitable.

2.3.3 SHORELINE PROCESSES

Colwood's shoreline represents a classic closed cell longshore drift system. Eroding sediment bluffs (feeder bluffs) historically supplied sediment (sand, gravel, and cobbles) to a longshore sediment transport system that continues to move some material southwest towards Albert Head, but predominantly to the northeast towards Fisgard Lighthouse. A depositional spit (Coburg Peninsula) encloses Esquimalt Lagoon. A depositional spit (Coburg Peninsula) encloses Esquimalt Lagoon.

PRE-DISTURBANCE SHORELINE (PRE-1890s)

Prior to the start of gravel pit operations at Producer's Pit, the sediment system along Colwood's sediment shoreline was fed by active feeder bluffs



Coburg Peninsula is a natural depositional feature formed by wave overwash.

Infrastructure or facilities added to the peninsula should be designed as resilient as possible acknowledging this natural process.

south of the lagoon. Waves from south-easterly storms undermine the toe of bluffs causing them to deposit sediment on the beach. Wave action on the beach then pushed sediment predominantly northward. The historic photo of the Riflery Hut at the north end of Coburg Peninsula shows that:

- The spit was composed of much coarser material – pebbles and cobbles
- The spit was washed over during storm events – erosional channels are visible on the lagoon side of the spit
- There was little vegetation – evidence of a shifting, dynamic landscape.

Figure 10: Pre-Disturbance Shoreline (Pre 1890s)



DND Riflery Hut on the North Tip of Coburg Peninsula
Source: Parks Canada Fort Rodd Hill Archives



Figure 11: Beach Accretion West of Fisgard Lighthouse

POST-DISTURBANCE SHORELINE (1890s - 2007) During gravel pit mining, the sediment system was artificially nourished by an over-abundance of sediment 'leaking' from operations. Vegetation stabilized the bluffs on either side of the pit during this time. Coburg Peninsula remained the

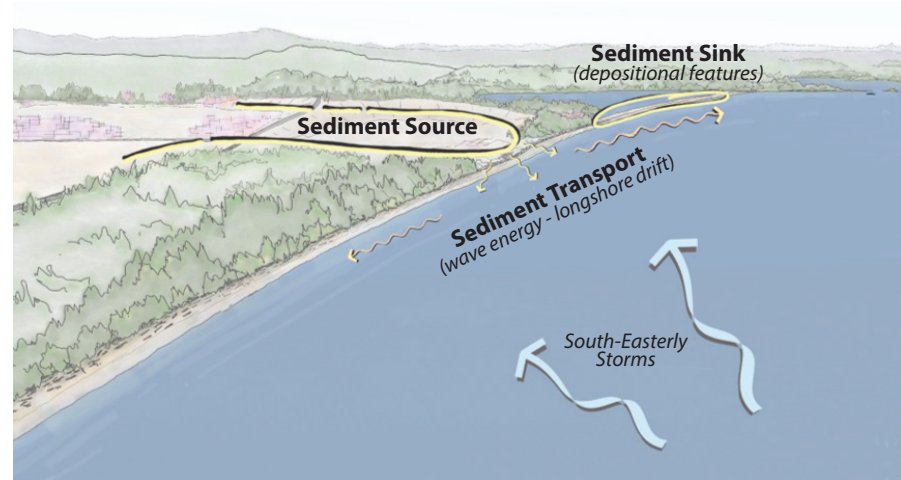


Figure 12: Post-Disturbance Shoreline (1890s-2007)

primary depositional feature, with excess sediment building the width of Coburg peninsula and continuing northward past Fort Rodd Hill.

Since about 1950, when the Fisgard Lighthouse causeway was constructed, sediment was prevented from migrating northward past the lighthouse. A comparison between the 1942 aerial photography and current the high-water mark estimations shows substantial accumulation of sediment southwest of the Fisgard Lighthouse causeway. The estimated volume of sediment accumulated on the two beaches southwest of the lighthouse is approximately +60,000 cubic meters.

Sediment movement along the Colwood shoreline is inevitable. Understanding and carefully responding to the ever changing distribution of sediment is imperative to preserving aesthetic, recreational and ecological values.

EXPECTED FUTURE SHORELINE In 2007, gravel pit operations ceased.

Since then, waves have continued to move sediment predominantly northward. If no management action is taken to supply sediment to the Colwood shoreline, sediment supply to the system is likely to come from beach over-steepening and subsequent re-activation of the feeder bluffs. There are several other similar drift cell systems with feeder bluffs in the Capital Region, including at Sidney Island, at James Island, and at Island View Beach. Another Vancouver Island example of this type of system exists at Goose Spit in the Comox Valley. The latter two examples are cases where feeder bluffs have been stabilized with riprap seawalls placed at the base of the bluffs. The aesthetic quality of the beaches and habitat conditions

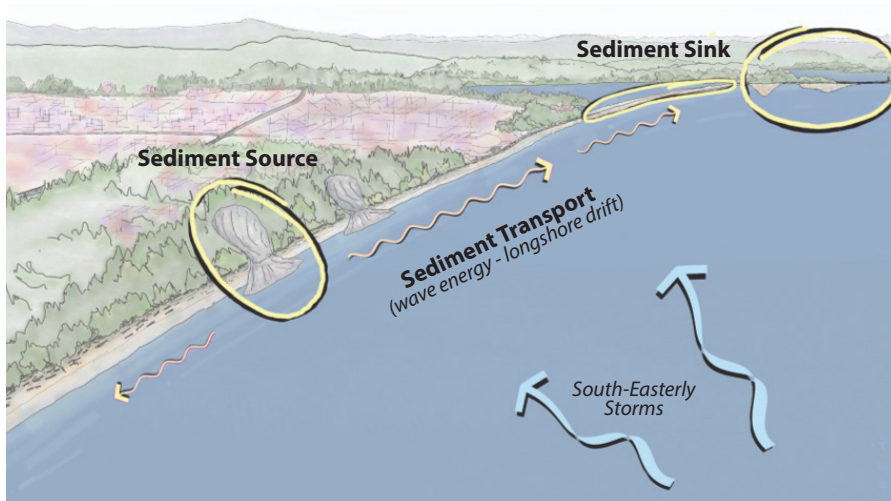


Figure 13: Expected Future Shoreline

have been degraded in both situations. Alternative strategies for sediment management that take into consideration a broad range of community values are preferred, such as beach nourishment solutions or hybrid options. These options can be designed to protect landward property values while also protecting aesthetic and ecological values.

SEA LEVEL RISE AND FUTURE STORMS City engaged a team of specialists to undertake a detailed engineering analysis to assess the long-term performance and resilience of coastal infrastructure proposed in the Colwood Waterfront Stewardship Plan (CWSP) from exposure to potential future wave overtopping. The recommendations and cost estimates from the CWSP Detailed Coastal Engineering Analysis Report, such as increasing the size of dune restoration in key areas to limit wave overtopping, were incorporated into the CWSP.

2.3.4 ECOLOGICAL RESOURCES

As part of the background Shoreline Assessment work, Current Environmental Consultants Ltd. prepared an Environmental Overview Assessment (EOA). The information below includes a high-level summary of some of the key information contained in the EOA report.

TERRESTRIAL ECOSYSTEMS The Colwood shoreline is classified as a moist maritime Coastal Douglas-fir (CDFmm) biogeoclimatic (BGC) zone. The area experiences relatively warm, sunny weather in the summer and



Interpretive Signage Example

Source: Colwood OCP

OCP Goal:

"Access to the waterfront – with pathways and spaces for public life – will be balanced with measures that protect sensitive ecological areas from human activity".

Over 250 bird species have been observed at Esquimalt Lagoon - one of the most popular birding sites in Greater Victoria and British Columbia.

The lagoon is protected under the historic Federal Esquimalt Lagoon Migratory Bird Sanctuary Regulation (134 hectares), established on Dec. 12, 1931.

mild, wet winters. The area's location is sheltered in the rain shadow of the Olympic Mountains, and moderated by the Pacific Ocean. It yields drier weather than the exposed surrounding areas of Vancouver Island. Typical forests in the area are dominated by Douglas-Fir, Grand Fir, and Western Redcedar. Drier, rocky outcrop sites are populated by Arbutus, Garry Oaks, and their associated plant communities.

The areas of old growth forest and mature second growth around the Esquimalt Lagoon provide a critical connection between the terrestrial and aquatic realms of the lagoon. These forests provide high value habitat for a wide variety of wildlife. They support lush floral biodiversity, maintain water quality and slope stability, provide food sources for aquatic life and avifauna, and hold more carbon than adjacent younger forest. In particular, the riparian forest provides shade, cover, and nesting opportunities for avifauna.

AVIAN SPECIES

The Esquimalt Lagoon Migratory Bird Sanctuary has been protected for nearly a century. It was initially started to minimize impacts related to over-hunting of waterfowl. Between October and May, thousands of waterfowl frequent the shallow, tidal waters of the lagoon, which provides important foraging and nesting habitat and supports both resident and migrant birds. The entire lagoon and 100m of surrounding land on the backshore of Esquimalt Lagoon, encompasses 134 hectares in total and regulates various activities and uses that are considered disruptive to migratory birds.

Over 250 species of birds have been observed at the lagoon. The Pacific Blue Heron, a provincially blue-listed species is known to frequent the lagoon. In addition, regionally rare species such as the Brant (blue-listed), Eurasian Wigeon, American Golden-Plover (blue-listed), Common Tern, Horned Lark and Western Meadowlark have been observed.

The lagoon is also home to an introduced, non-migratory population of Canada Geese. These resident geese have created significant problems with fecal coliform levels in surrounding waters, impacted crops for local farmers and denuded shoreline and salt marsh vegetation because of grazing. Control of geese (i.e.: egg addling) is recommended as a stewardship activity where feasible.

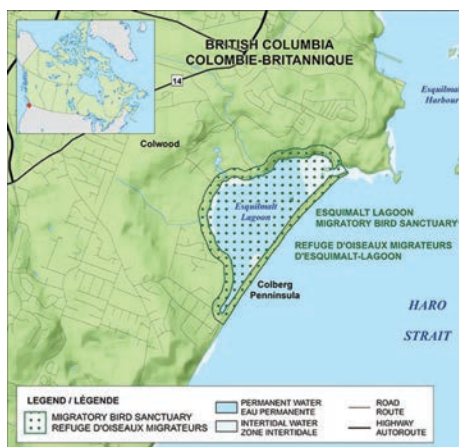
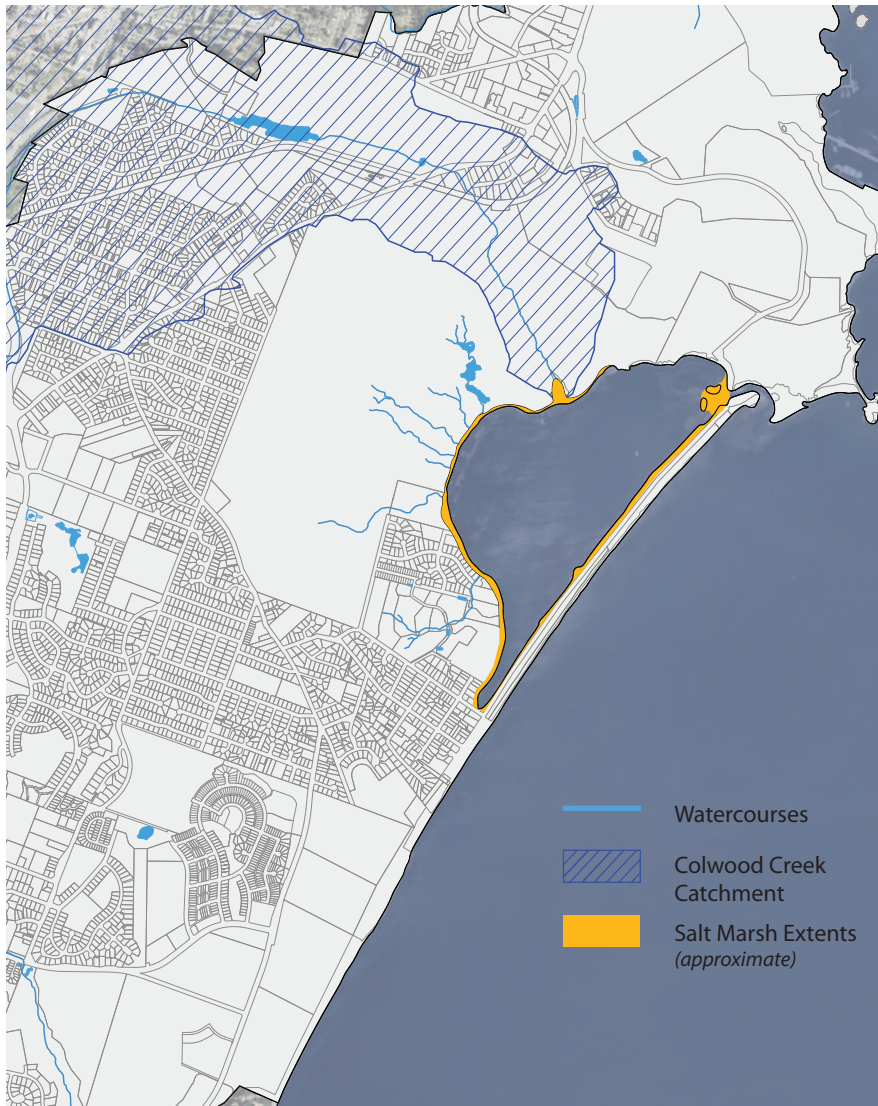


Figure 14: Esquimalt Lagoon Migratory Bird Sanctuary

Source: Environment & Climate Change Canada



OCP Objective 11.2.5:

"Maintain and regenerate the ecological functions of Colwood's diverse shorelines."

Figure 15: Watercourses Entering Esquimalt Lagoon

AQUATIC ECOSYSTEMS

Several watercourses convey both groundwater and storm runoff from surrounding land into Esquimalt Lagoon. The water entering the lagoon provides important habitat for salmonids, forage fish, crustaceans, bivalves, and other vertebrates. The estuarine condition of the lagoon supports both eelgrass and kelp beds which provide spawning habitats for herring as well as foraging habitat for marine mammals, fish, and birds. Finer substrate sediments from the gravel pit operation helped create the sandy beaches along the spit which characteristically support forage fish spawning.

The intertidal salt marsh habitat found along the perimeter of Esquimalt Lagoon is an important element of marine shorelines it provides food sources and cover for wildlife while offering resiliency against many issues related



Esquimalt Lagoon Shoreline



Esquimalt Lagoon saltmarsh trampled by foot traffic and smothered by driftwood - a key restoration opportunity

to sea level rise – including flood protection and carbon sequestration. In the past decades, the lagoon has been known to experience issues with water quality causing both algal blooms and fish kills. The cause of the blooms is unknown, but elevated nutrient input from stormwater discharges are suspected. In addition, the perimeter salt marsh areas are subject to trampling by pedestrian and dog traffic as well as damage from Canada Geese foraging and smothering from driftwood entering the lagoon.

SALT MARSH

Marshes are highly efficient at carbon sequestration and storage. However, the image (left) shows the inner lagoon shoreline, where logs are smothering the productivity of the marsh. Preliminary estimates suggest that carefully removing logs from the backshore area around the lagoon and preventing trampling could result in a 20% to 30% increase in marsh productivity.

SPECIES AT RISK

Data from the BC Conservation Data Centre (CDC) indicates a total of 37 species and ecological communities around the shoreline, north of Lagoon Rd. There were no at-risk elements known in the study area to the south. The CDC designation of ecological communities as “rare” is based on climax community conditions with very low disturbance history. In addition to the terrestrial and avian species and ecosystems at risk, the surrounding marine habitat has been designated as critical habitat for killer whales (Northeast Pacific Southern Resident population).

RESTORATION & ENHANCEMENT - BEACH NOURISHMENT

Beach nourishment involves the carefully engineered introduction of clean, finer substrates (sand and gravels) from outside sources into the littoral drift system to maintain sediment loads on beaches. This practice can help maintain critical ecological processes to support forage fish spawning and can reduce backshore erosion, thereby stabilizing vegetation communities along the shore. With beach nourishment, the resultant wider beach faces dissipate wave energy across the surf zone, helping to protect upland structures and infrastructure from storm surges. Public access onto beaches is also enhanced on flatter beach slopes that result from beach nourishment, with finer rather than coarse (cobble and boulder) substrates. The 'Insects to Orcas' diagram (right) helps to depict the interconnectedness of shoreline

OCP Objective 11.2.2:

"Ensure the long-term health of environmentally sensitive areas."

ecosystems, highlighting the importance of considering terrestrial, riparian, estuarine and marine biodiversity within the CWSP. Of particular interest is the value of riparian vegetation to supporting juvenile salmon, and of sandy beaches to providing spawning habitat for forage fish.

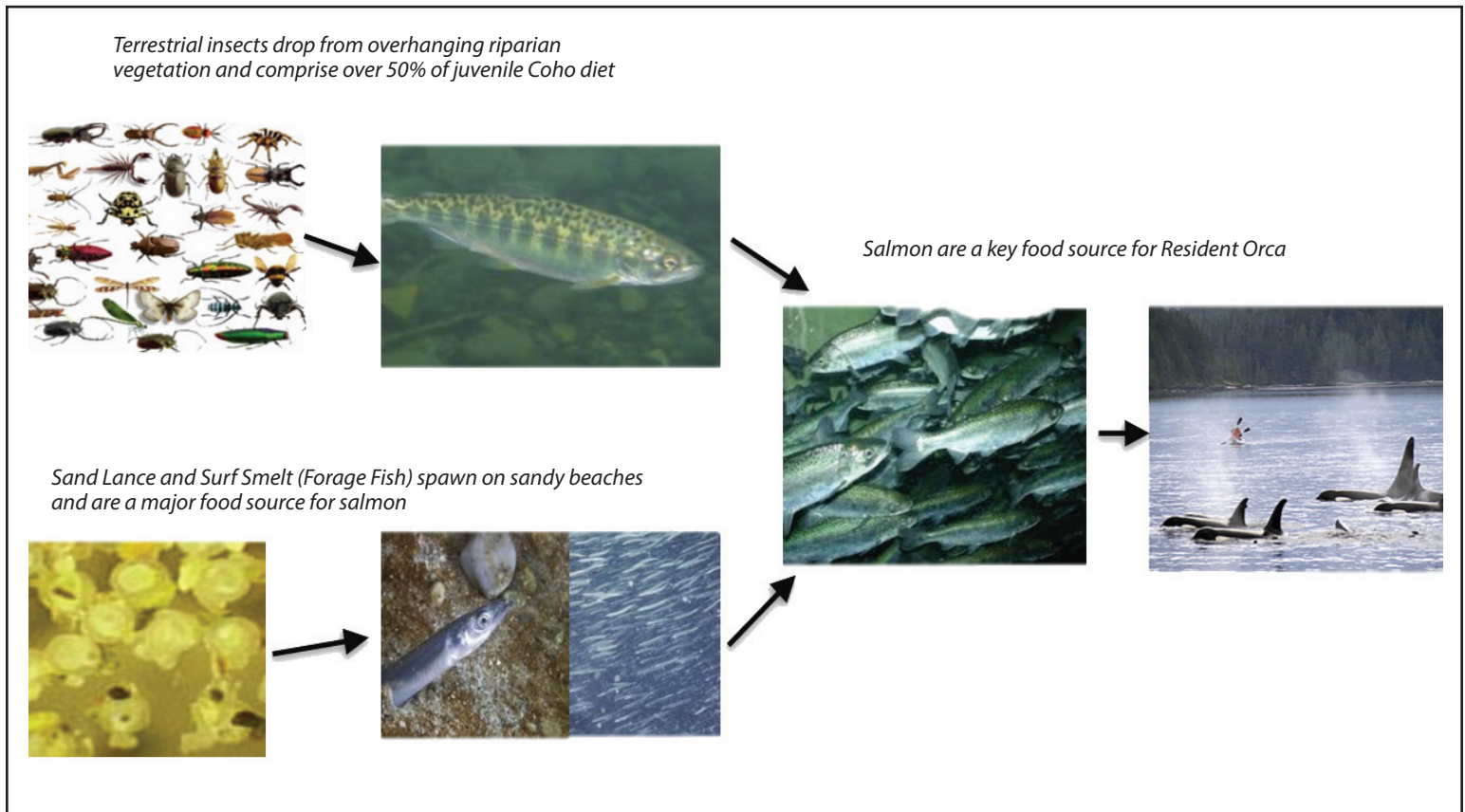


Figure 16: Insects to Orcas Diagram

Courtesy Brian Emmett, Archipelago Marine Research

RESTORATION & ENHANCEMENT - DUNES

Sand dunes are not likely to have been a persistent, pre-settlement landform on the Colwood shoreline. Historical photographic evidence suggests the beaches were comprised of much coarser cobbles and gravels prior to the start of gravel pit operations. However, given the contribution of significant volumes of sand to the shoreline system because of gravel pit operations, the presence of a broad sand shelf on Coburg Peninsula now exists. This area is worthy of consideration for establishment of a 'novel' dune ecosystem. The placement of small dune landforms along with the planting of Dune Grass, Beach Pea, and other associated plant species, could help provide some resilience to storms along Coburg Peninsula and protect the multi use path from impacts.

OCP Policy 10.3.5.1:

"...improve the resilience of shoreline and marine habitats through a "soft shore" restoration approach."



Outstanding Esquimalt Lagoon Saltmarsh & Riparian Habitat.

RESTORATION & ENHANCEMENT - RIPARIAN VEGETATION

The restoration of riparian vegetation yields high ecological, esthetic, and recreational values. Healthy riparian vegetation communities provide habitat for wildlife, improve biodiversity, stabilize soils, filter pollutants, and can help control public access patterns. Typical riparian vegetation enhancements might include the establishment of thickets of Snowberry and Nootka Rose, and planting of native conifer and deciduous trees such as Douglas Fir and Pacific Crabapple. Riparian vegetation plays an important role in restricting both public access and access to undesirable wildlife such as Canada Geese.

RESTORATION & ENHANCEMENT - SALTMARSH

Intertidal salt marsh habitat is an important element of marine shorelines as it provides food sources and cover for wildlife (i.e.: especially migrating juvenile salmonids), and stabilizes very fine substrates in low energy areas. Saltmarsh habitat also provides important resiliency against many issues related to sea level rise, including flood protection and carbon sequestration. Saltmarsh areas along the Colwood waterfront are being trampled by pedestrian and dog traffic, damaged by Canada Geese foraging, and large accumulations of driftwood inside the lagoon are causing damage to saltmarsh areas as well. Restoration and protection of salt marsh habitat can be a cost-effective method to improve ecological function of the lagoon and peninsula. Note that driftwood removed from saltmarsh areas could be put to effective use in riparian restoration areas, especially along the outer (east) Esquimalt Lagoon shore.

2.3.5 CULTURAL RESOURCES

As part of the CWSP project's multi-disciplinary shoreline assessment activities, Millennia Research Limited completed an Archaeological Overview Assessment (AOA), summarized as follows.

The study area for the Colwood Waterfront Plan overlaps with eight known archaeological sites and is within 250m of ten additional sites. The study area is within the core traditional territory of the Songhees and Esquimalt First Nations. Additional First Nations with a stated interest in the study area include Tseycum, Tsawout, Tsartlip, Pauquachin, Lake Cowichan, Penelakut,

OCP Objective 13.2.3:

*"Support and reinforce
cultural inclusivity
and involvement."*

Halalt, Stz'uminus, and Lyackson First Nations, Cowichan Tribes, and the members of the Te'Mexw Treaty Association, including Beecher Bay (SC'IA/NEW) Nation, Malahat Nation, Snaw-Naw-as Nation, Songhees Nation and T-Sou-ke Nation. Colwood's current operating principle is to undertake direct engagement with the three nearby First Nations communities of Esquimalt Nation, Songhees Nation and Beecher Bay Nation.



Black Turnstone
Source: Nicole Beaulac

BIOPHYSICAL SETTING

Paleoenvironmental studies of southern British Columbia indicate that although minor regional changes have continued since the last glaciation over 10,000 years ago, relatively modern environmental conditions were established between 4,500-3,000 BP. Archaeological evidence of indigenous use in and around the Esquimalt Lagoon area dates back to this time range, consistent with paeoenvironmental projections.

ETHNOGRAPHIC BACKGROUND

The Lekwungen people of the Southern Vancouver Island and Salish Sea area occupied numerous villages in the lands between Cowichan Head and Parry Bay. In the 1850's, several autonomous First Nations groups, including the Teechamitsa, signed a treaty with James Douglas, chief factor of the Hudson's Bay Company and later Governor of Vancouver Island. The treaty recognized the land within the CWSP study area.

SUBSISTENCE PRACTICES

The ancestors of Esquimalt and Songhees people intensively used the Esquimalt Harbour, Esquimalt Lagoon, and surrounding land into the early historic period. Plant resources, including raw materials, berries, and roots tubers were collected along the shore and inland of the harbour; bear, deer, elk, game birds, and duck and other waterfowl were hunted and trapped in the area and camps were established in several areas along the north shores of the lagoon. Fishing and shellfish harvesting took place in Esquimalt Lagoon and in Esquimalt Harbour.

SOCIAL ORGANIZATION

Some local groups had their own winter village sites, and likely all local groups had their own seasonal fishing sites. Larger winter villages consisted of several houses representing several local groups and kin groups. Within winter

OCP Policy 14.2.1.3:

"Work with local First Nations to identify areas of traditional food use and harvesting."

villages, members of different households cooperated in some subsistence activities and shared abundance of perishable foods. At their discretion, houses also cooperated in defense strategies and in ceremonial activities. Among the Northern Straits peoples, villages consisted of single houses or clusters of shed-roofed or gabled houses built in a row (or occasionally rows) along the beach. Families in winter villages moved regularly for their annual activity rounds, and Coast Salish families took the wall planks of their houses with them to their seasonal villages.

The Esquimalt and Songhees were marine oriented groups, spending a large portion of their time near the Gulf and San Juan Islands hunting and fishing. Different archaeological sites within the Esquimalt Lagoon area indicate that Esquimalt Lagoon possibly had seasonally distinct occupations.

PREVIOUS ARCHAEOLOGICAL STUDIES

The study area overlaps the boundaries of eight previously recorded archaeological sites. There are an additional 10 sites located within 250m of the study area. These archaeological sites include shell middens, a rock shelter, wet sites (an archaeological site that has a waterlogged component where wood, bark and other organic materials are preserved); lithics (stone tools or flake debris from the making of stone tools); and human remains and burial sites.

POST CONTACT USE OF THE ESQUIMALT LAGOON

Most of the early historic Euro-Canadian use of the Esquimalt Lagoon area has been associated with Fort Rodd Hill and the Hatley Park estate of James

Paddling Event

Source: Songhees Nation



Dunsmuir, now known as the Royal Roads Campus. Post-contact use of the lagoon is summarized as follows:

- Mid 1800's: Coburg Peninsula was used as a rifle range during the mid-1800's but ceased operation as a rifle range when the area became more populated.
- 1860's-70's: The Royal Roads area was originally owned by David Cameron who established a sawmill at the mouth of the Colwood Creek in 1863 that was later purchased by the Belmont Tannery and Shoe Factory in 1871. Outside of the study area to the northeast of the Coburg Peninsula bridge is the Fisgard Lighthouse, Canada's first lighthouse on the west coast and a National Historic Site. The lighthouse was built in 1860 by the British colonial administration, with an associated red brick house at the entrance to Esquimalt Harbour.
- Late 1800's: Fort Rodd Hill was built between 1894-95 by the Dominion Government as an Army installation (Garrison Artillery). In the late 1800's, the site was developed for military use, which continued through the Second World War. The Royal Marine Artillery was initially in residence but was later replaced by the Canadian reserve troops (the 5th Regiment, under the various permutations of their name over the years) starting in 1906. Today, Fort Rodd Hill is recognized as a National Historic Site.
- Early 1900's: Hatley Castle was constructed in the early 1900's by bringing building materials in through Esquimalt Lagoon. David Cameron, James Douglas' brother-in-law and the first Supreme Court Chief Justice for the colony of Vancouver Island, lived at Belmont Farm, adjacent to the north end of Esquimalt Lagoon. Much of the Belmont Farm, including the location of the dwelling structure, was located on land now occupied by Fort Rodd Hill. Cabins and summer homes were built along the spit but were removed in 1940 when the DND began using the peninsula as a firing range again. A



Cabins on Coburg Peninsula - 1930's
Source: BC Archives

John Muir's Sawmill, Esquimalt Lagoon - 1860's
Source: Library Archives Canada





Producer's Pit, ca. 1940s

Source: City of Colwood Website

pub known to locals as the Dugout Pub was built at the northeast end of the peninsula around 1920 and was in service until the 1940's, when the building was destroyed by fire. DND House (also known as the ranger station) was constructed after the fire and was then decommissioned in 2013 as the building was no longer in use and had suffered considerable water and storm damage. Beginning in 1909, gravel was mined from Producer's Pit. The excess sand from gravel mining was placed on the beach and gravel was loaded onto barges in the bay until the 1990's.

- Mid 1900's: Active military use of Fort Rodd Hill continued until 1956 (past the Second World War) when the site was decommissioned. It's Fortress Plotting Room was a key Cold War communications and aerial traffic monitoring station. Parks Canada took over management of Fort Rodd Hill in the 1960's. The lighthouse was automated in 1929 and continues to remain an active navigational aid to this day.

SIGNIFICANCE OF STUDY AREA

While the study area has been considerably modified for residential, recreational, and public realm improvements, scientifically and culturally significant intact archaeological deposits have been encountered within the study area and human remains have been encountered at several sites across the northern and southern end of Coburg Peninsula.

Previously recorded sites situated within and outside of the project area and 250m study area buffer, indicate the general area was occupied, at least seasonally, for several thousand years. These sites include a semi-subterranean house floor (Locarno Beach Phase – 3,500 +/- 2,400 BP) and Locarno (3,500 +/- 2,400 BP) and Strait of Georgia (1,500 +/- 1,100 BP) age deposits at the southern end of Coburg Peninsula and the western shore of the lagoon at Royal Roads. The potential to further encounter significant intact deposits within the study area is very high along certain sections of the study area (such as at the northern and southern ends of Coburg Peninsula and in areas along the spit), making the area a culturally and archeologically important site.



Newspaper excerpt from the Victoria Daily Colonist from November 24, 1912

POTENTIAL ASSESSMENT AND EXPECTED SITE TYPES

The southernmost kilometer of the study area between Royal Beach and Milburn Road has no known archaeological sites. The level of development and sediment removal within the gravel pit footprint suggests low potential within the area of the pit for archaeological sites, although isolated finds such as lithics may be present, particularly along the foreshore.

The mid-section of Coburg Peninsula does not currently have any recorded archaeological sites, however there is potential to encounter archaeological deposits such as shell midden and wet site deposits along the spit. There is also potential for submerged terrestrial archaeological deposits within the lagoon water body from when the area would have been exposed during the sea level drop. Longshore wave action along the spit may have washed away archaeological evidence of sites, particularly terrestrial sites, in some areas of the spit, but potentially could have capped sections of sites through sedimentary deposition.

Other potential site types, such as intertidal clam gardens in the foreshore areas, are less likely to be encountered as the constant sedimentation in the sheltered shallow lagoon likely did not warrant the construction of rock walls and terracing typical of clam gardens. However, it is known through traditional use knowledge that intertidal clam beds were maintained and harvested until recently, indicating that there is a small possibility that this type of site may be encountered. Duck and fish traps and weirs are evident as waterlogged stakes or rock formations may be submerged within the lagoon as well, particularly near the northern mouth of the lagoon and southern end of the lagoon at Coburg Peninsula.

2.3.6 INFRASTRUCTURE RESOURCES

Herold Engineering Ltd. provided an assessment of infrastructure along the Colwood shoreline as part of the multi-disciplinary shoreline assessment work. Herold identified five key resources requiring special planning consideration within the CWSP study area. The information below includes a summary of some of the key information contained in the report.

OCP Section 13.1: Arts & Culture Overview

"The City of Colwood sits on the ancestral lands of the Coast Salish people, who have stewarded the land and water since time immemorial. Archaeological sites and oral tradition are the vestiges of this rich history."



Winter Storm Debris on Ocean Boulevard
Source: Linda Gower

OCEAN BOULEVARD

Ocean Boulevard currently provides two-way vehicle traffic access to the Coburg Peninsula from both Sooke Road (North) and Lagoon Road/Metchosin Road. It provides easy access to the beach and lagoon, significant parking capacity along Coburg Peninsula, and is an important route for emergency tsunami evacuation. Currently, there are no dedicated and developed pedestrian or cycling facilities provided along Coburg Peninsula.

The portion of Ocean Boulevard along Coburg Peninsula is very low in elevation relative to sea level and is periodically impacted by storms. Storm waves, when combined with high tide and storm surges, can cause overtopping of the road carrying sand, driftwood, and debris onto and across the road. This is expected to become more frequent and more severe over time due to sea level rise and climate change.

Road overwash along Coburg Peninsula will likely cause more rapid degradation of Ocean Boulevard's asphalt surface and will likely require increased maintenance to keep it clear of gravel and debris.

OCP Policy 10.3.5.1:

"Improve the resilience of the shoreline and marine habitats through a 'soft shore' restoration approach that:

- *allows natural movement of wood and gravel*
- *protects and re-establishes habitat*
- *protects the shoreline and foreshore infrastructure from erosion during storms, flooding and sea level rise*

SUMMER 2020 ROAD CLOSURE / COMMUNITY SURVEY

When the global pandemic was declared at the end of March 2020, vehicle access to Ocean Boulevard was limited to discourage large influxes of people with the aim of preventing the spread of COVID-19. All areas remained open to visitors on foot or bicycle. In May 2020, the road was opened from Lagoon Road to approximately mid-point and in June 2020, it was opened at the north end from Ocean Boulevard with a small portion remaining closed in the centre.

From May 14 to June 15, 2020, Colwood conducted a survey on "How we use and enjoy Ocean Boulevard" which garnered over 3,800 responses. The survey was intended to help clarify potential best uses of Ocean Boulevard as part of the community infrastructure ecosystem and Council plans for the waterfront. 46% of survey respondents identified as residents of Colwood, 32% identified as residents of other West Shore communities and 20% identified as being from other areas of the Capital Region.

Maintaining vehicle access and parking along Coburg Peninsula was a high

priority for the respondents who identified as being from Colwood. 61% of respondents favoured allowing through traffic on Ocean Boulevard, while 39% supported some form of closure (full 22%, seasonal 10%, weekend 7%). When respondents are filtered to include only those who identified as Colwood residents, 55% supported through traffic, while 45% supported some form of closure (full 25%, seasonal 11%, weekend 9%).

As recreational use intensifies, safety, road maintenance and multi-modal access are likely to become pressing community concerns.

ESQUIMALT LAGOON BRIDGE

The bridge at the end of Coburg Peninsula consists of two vehicle lanes of approximately 3.55m each, plus a 'sidewalk' 1.12m wide. The vehicle lanes widths are typical for a road such as Ocean Boulevard, but the sidewalk is significantly narrower than the Colwood standard sidewalk width of 1.8m and far narrower than required for a multi-use path.

A comprehensive bridge inspection was done by Stantec in 2013. According to the Stantec report, the bridge was constructed in 1930, the superstructure was replaced in 1968, the bridge was widened in 1984, and the deck was replaced in 2004. Many other relatively minor replacements and repairs have been done over time. It appears that all components other than the main pilings have been replaced at least once over the life of the bridge.

The Stantec report also included a survey of the ground surface seaward from the bridge, under the bridge, and on the Esquimalt Lagoon side of the bridge. The survey was compared to previous historical surveys which confirmed that the Lagoon entrance has changed over time. Of particular concern is the erosion of Gotha Spit which previously protected the bridge from storm waves. The bridge is now more exposed to storm waves and that exposure will likely become more severe due to sea level rise and climate change if the erosion is not managed.

With maintenance and periodic replacement of components, the bridge can continue to function to its current standard. However, the width of the existing structure limits multi-modal options.

Various options exist to make the bridge more suitable for a mix of vehicles,



Esquimalt Lagoon, 2020



Esquimalt Lagoon Bridge

Source: Royal BC Museum



Esquimalt Lagoon Bridge, 1969

Source: City of Victoria Archives

pedestrians, and cyclists including:

- Close the bridge to vehicular traffic and maintain it for pedestrians, cyclists, and emergency vehicles only.
- Widen the bridge by driving an additional row of piles and extending the bridge deck.
- Reconfigure the bridge deck for a wide multi use trail plus one vehicular lane. The vehicular lane could allow alternating one-way traffic controlled by signal lights.

OCEAN BOULEVARD SEWAGE PUMP STATION

The pump station, located at the foot of Lagoon Road on the east side of Ocean Boulevard, was constructed in 2000. Its elevation is just above the high-water mark, and it is splashed by waves during severe storms. Previous reports by Kerr Wood Leidel Ltd. (KWL) (2016) and Northwest Hydraulic Consultants Ltd. (2018) indicate that the pump station will be vulnerable to more severe flooding in the future as sea level continues to rise.



Pump station in a winter storm prior to 2017 berm construction.

Source: City of Colwood

The 2016 KWL report concluded that there is a 37% probability that sea level rise alone (not including further risk due to wave action) could flood the station before the end of its projected service life in 2065. The first stage of berm construction, recommended in the KWL report, was completed in 2017.

In October 2017, Colwood re-engaged KWL to prepare a report on relocation options for the pump station. The proposed relocation has been put on hold pending further study. It is expected that the WCPC will explore options for relocation in the future. For the time being, the pump station building provides a key public amenity as the site of well-maintained public washrooms. The public washrooms are a very important component of the waterfront open space system. Relocation of the pump station in the future should include consideration of also replacing the washrooms.

UNDERGROUND INFRASTRUCTURE

Except for the sewer and water under Ocean Boulevard, there is relatively little underground infrastructure along the waterfront within the study area.

Underground utilities in Ocean Boulevard between Milburn and Lagoon

Road appear secure today but may be vulnerable in the future due to climate change and associated sea level rise.

Increased development along the waterfront will put pressure on Colwood to provide roads and underground infrastructure and associated amenities in proximity to the shoreline. (i.e.: washrooms, water fountains, street lighting, food services, etc.). All facilities should be designed to tolerate marine conditions and to be robust and resilient in the face of sea level rise. Where facilities are added a long distance from infrastructure, these facilities should be designed as 'off-grid' facilities. Ground anchoring systems such as helical piles should be used in place of traditional underground concrete footings to minimize impacts to archaeological resources.

Development of the waterfront will likely require new infrastructure including sewer, water, lighting, and power however, the design and construction could be completed in ways that minimize risk or maintenance issues.

TOP OF BLUFFS

As discussed previously, the sand and gravel bluffs in this area have been stable for the last 100 years or so, due to the high levels of beach nourishment that has been provided by the gravel pit operation. Now that nourishment has stopped, it is probable that bluff erosion will restart in the absence of artificial nourishment or beach armoring. This will put buildings and municipal infrastructure on or above the bluffs in danger. This could affect the eastern end of Aloha Ave and Milburn Drive, as well as Ocean Boulevard.

The beach nourishment options that may be considered to protect and enhance the beach area may also be effective in slowing or preventing bluff erosion and would thus protect any infrastructure located above the bluffs.

TRANSPORTATION

There is high demand for access to the waterfront by all modes of transportation, but currently only personal vehicles are formally accommodated. A continuous multi-use pathway from Lagoon Beach to Royal Beach is one of Colwood's priorities for active transportation. Adding a multi-use pathway will require careful consideration of future beach

OCP Goal:

"Colwood is carbon neutral, energy positive, water smart, and prepared to adapt to a changing world".

OCP Policy 8.2.2.3:

"Extend the multi-use trail along the entire stretch of the waterfront, enabling continuous public access to the southern edge of the city, while adhering to Green Shores Guidelines relating to reduced lighting levels and no net loss of critical and sensitive habitats. Provide public access to the waterfront in such a way that does not threaten the ecological integrity of the foreshore and marine ecosystems.

erosion, bluff re-activation and overwash processes on Coburg Peninsula. Options might include portions of raised boardwalk, significant setbacks or adaptive, easy to maintain design.

Key pedestrian and cycling routes to connect the waterfront identified by the community include connecting the CFB Esquimalt/Belmont neighbourhood and a beach-to-mountain route from Perimeter Park to Havenwood Park and back to the waterfront via Latoria Park.

2.4 CLIMATE CHANGE/SEA LEVEL RISE

The most significant consequence of sea level rise on a largely unprotected sediment shoreline like Colwood's is the risk of accelerated erosion of the backshore that could result in beach armoring. Alternative approaches to

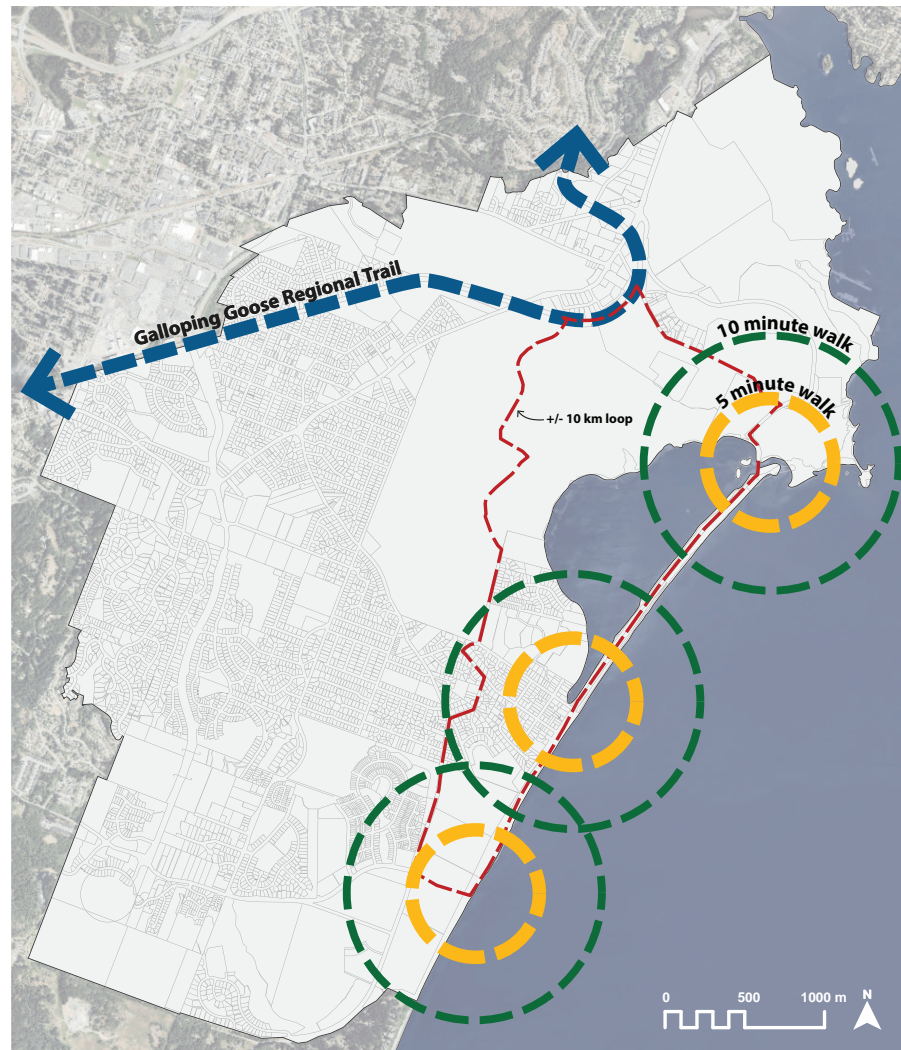


Figure 17: Walking Distances

- 5 minute walk radius
- 10 minute walk radius
- +/- 10 km loop (shown for scale)
- Galloping Goose Regional Trail

shoreline protection - such as those advocated through the Stewardship Centre of BC's Green Shores™ program - can help Colwood introduce facilities and amenities along the shoreline while preserving and enhancing a wider range of values that the Colwood shoreline provides, including scenic value, recreational value and ecological value. Critical to the success of these alternative strategies is careful consideration of the effects of sea level rise on the shoreline sediment transport system, and then careful engineering of proposed amenities to mitigate impacts to shoreline values. These projects are best undertaken by multi-disciplinary design teams weighing a diversity of values against costs. Clearly, implementation of the CWSP will require careful consideration of sea level rise, and the development of detailed design plans that incorporate a meaningful response. The CWSP conceptual designs have been developed with the qualification that Colwood will pursue a soft shoreline management approach

The CWSP conceptual designs have been developed with the qualification that Colwood will apply a soft shoreline management approach consistent with Green Shores - See OCP Policy 11.2.5.1 below.

2.5 GREEN SHORES

Green Shores is an initiative of the Stewardship Centre of BC that provides science-based tools and best practices to help planners and designers minimize the impacts of new developments on shoreline ecosystems, or restore the shoreline ecosystem function of previously developed sites.

The four key Green Shores principles are:

- Preserve or restore physical processes such as the natural actions of water and sediment movement that maintain healthy shorelines.
- Maintain or enhance habitat function and diversity along the shoreline.
- Prevent or reduce pollutants entering the aquatic environment.
- Avoid or reduce cumulative impacts. Small individual effects add up to large impacts on shoreline environments.

Implementing Green Shores principles can help build shoreline resilience in the face of climate change often in a cost effective manner. A 2014 study completed by SNC-Lavalin for the Stewardship Centre of BC (and submitted to Natural Resources Canada) conducted a comparison of three case study

OCP Policy 11.2.5.1

"Protect Natural Shorelines...Adhering to Green Shores for Coastal Development criteria for any works undertaken by the City, including the directions identified in Figure 17: Shoreline Protection Measures..."

sites for both hard infrastructure and soft infrastructure shoreline installations including a cost comparison (see table below). In the three cases, the study found that soft (retreat, accommodate, restore) alternatives provided a significant cost advantage over the hard (protect) alternative.

2.6 SITE-ADAPTIVE DESIGN

The Colwood Waterfront is diverse, unique, and treasured. It includes the

	Case Example	Hard Alternative	Soft Alternative	Comment
1	Qualicum Beach	\$33,000/m	\$10,000 - \$14,000/m	Depending on choice of sand or gravel/pebble/cobble.
2	Marr Creek Inter-tidal	\$35,000/m	\$25,000/m	Assumes cost basis presented above. Does not include cost of maintaining dry high tide access on existing walkway. Does not include the sunk costs of existing rock features already on site.
3	Private Property	\$3000/m	\$4000/m	Does not include sunk cost of existing headland beach system

Figure 18: Cost Comparison - Soft vs. Hard Shoreline Treatments

Source: SNC-Lavalin Study, 2014

national Esquimalt Lagoon Migratory Bird Sanctuary and has a natural foreshore rich in known archaeological sites and wildlife habitats. It is also an increasingly popular recreation destination and a gathering place for community events.

Recreational use of the Colwood's waterfront is increasing dramatically. Enhancement and protection of the natural and cultural resources, including the shoreline processes will be required to maintain the features and attributes that bring people to the waterfront in the first place. The following section of this report - Section 3 - lists the guiding principles for the CWSP that establish a high-level tone or underpinning for design and implementation. Section 4 provides a summary of the CWSP conceptual design, and an implementation strategy. The guiding principles, together with the material that has been presented in this section, provide the foundation for site-adaptive and sensitive design solutions for Colwood's waterfront.

OCP Policy 10.3.1.2

"Implement the policies in Section 11 (Park Areas and Natural Assets) which support a site adaptive planning approach."

SITE ADAPTIVE PLANNING FOR SHORELINES

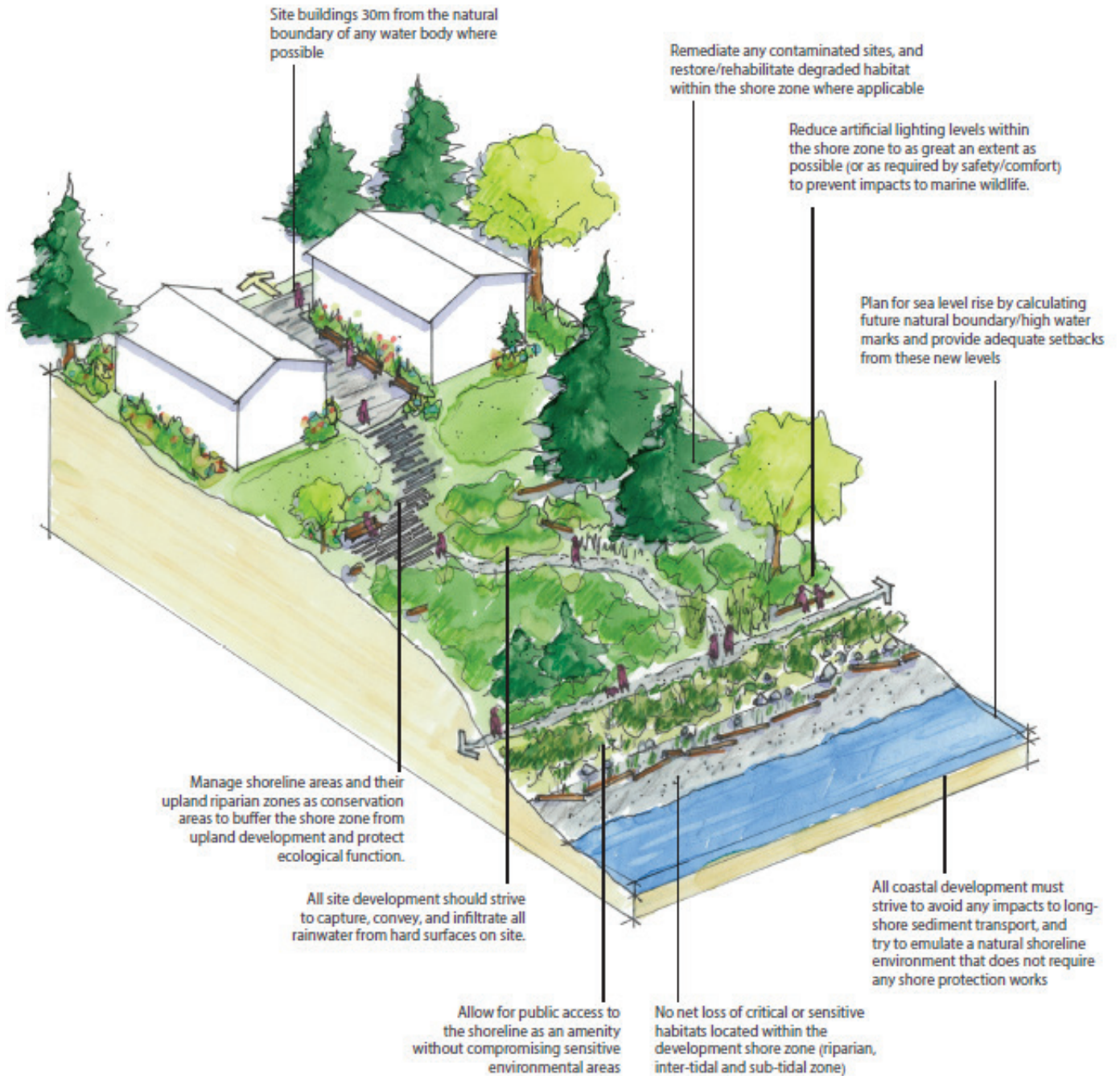


Figure 19: Site Adaptive Planning for Shorelines

Source: Colwood OCP





PART 3

Vision + Guiding Principles

3.1 CWSP VISION STATEMENT

The vision statement for the Colwood Waterfront - paraphrased from the Colwood Official Community Plan and Parks and Recreation Master Plan is as follows:

"Colwood's iconic waterfront is a treasured destination that must hold in balance resilience to climate change, respect for its unique ecology and archaeology, and value as a vibrant regional destination for recreation or cultural activities."

3.2 CWSP GUIDING PRINCIPLES

The Colwood Parks and Recreation Master Plan identifies a number of guiding principles for the park system. These principles are expressed below with specific reference to the waterfront, and with more specific actions that begin to articulate how each guiding principle will be achieved through the development of the waterfront plan.

GP 1 - Build Our Understanding + Connection with First Nations



Indigenous arts and culture play an integral role in creating a sense of place and identity for the waterfront, and will be integrated in partnership with local First Nations as detailed plans are developed.



- Develop cultural and engagement protocols as an initial step
- Continue dialogue with local First Nations and collaborate on plan implementation, future programming, and detailed design
- Encourage First Nations programs and events
- Facilitate ongoing cultural activities and traditional uses of the landscape
- Restore wildlife habitat and where possible re-establish traditional food gathering, ceremonial, and spiritual opportunities
- Protect archaeological sites and coordinate new activities on the waterfront with First Nations

GP 2 - Celebrate Our Natural Character

Connect people to nature by providing diverse opportunities for exploring the landscape, and by providing park amenities that facilitate education and appreciation of the environment.



- Provide experientially rich park amenities that connect people to place
- Preserve and enhance the natural quality of the shoreline and connecting landscapes
- Interpret the ecosystems and history of the waterfront
- Design with natural, durable materials and forms suited to the shoreline environment



GP 3 - Strengthen Our Connectivity

Transportation networks for various modes connect residents and visitors to the Colwood waterfront, while gathering spaces, cultural events, and shared experiences facilitate community building and stewardship.



- Provide multi-modal, accessible routes that safely connect through the site while preserving ecological values
- Provide gathering spaces of various scales to facilitate diverse community use
- Extend accessible greenway links into neighbourhoods
- Connect with public transportation networks
- Program access and use signage to improve wayfinding and appreciation of the natural environment



GP 4 - Protect + Enhance Our Environment



The natural environment of the Colwood waterfront will be protected and enhanced with the acknowledgment that it serves as the foundation for other shoreline values.



- Enhance riparian vegetation and control invasive species consistent with nature-based project best practices and regulatory requirements
- Develop a shoreline sediment management program and protect structures and infrastructure consistent with Green Shores principles
- Use long-lasting, locally sourced, natural, and easy to replace materials
- Control public access around the lagoon and along the outer shore to minimize trampling, pollution and other damage from overuse
- Enhance regulatory and interpretive signage to improve compliance and encourage stewardship

GP 5 - Encourage Our Community Health + Wellness



Public amenities on the Colwood waterfront will emphasize safe, passive recreation in a natural setting, with more vibrant and diverse amenities and activities in new waterfront development areas.



- Integrate community-identified park amenities that promote active, healthy lifestyles
- Formalize parking and calm traffic for safety
- Provide varied user experiences along the shoreline with more active, vibrant spaces and programs in new development areas
- Plan for emergency access to all areas of the waterfront
- Design consistent with CPTED principles, including (limited) lighting and passive surveillance

GP 6 - Promote Accessibility + Inclusiveness

The Colwood Waterfront will provide a range of accessible amenity improvements and programs that are welcoming, that feel safe, and that encourage diverse, positive social interaction for all.



- Provide a continuous accessible, multi-use route along the waterfront
- Plan for universal access improvements as part of all implementation phases
- Accommodate vehicles while prioritizing pedestrians and cyclists
- Program activities & events with project partners and provide facilities that accommodate them



GP 7 - Nurture Our Partnerships

The Colwood Waterfront Stewardship Plan will pursue partnerships with local First Nations, adjacent landowners, government agencies, and land stewards, and will remain adaptable and responsive to emerging opportunities.



- Pursue common interests with First Nations and coordinate waterfront stewardship and design efforts
- Partner with stewardship groups on restoration projects and project permitting
- Share information, ideas and resources with partners and adapt plans to suit new opportunities
- Integrate the waterfront plan with future neighbourhood development plans
- Coordinate regulations and enforcement with partners







PART 4

Implementation

4.1 CWSP ITERATIVE DESIGN PROCESS

The CWSP project planning process has involved a robust community and stakeholder engagement process, as outlined in Section 2 of this report. The Colwood community and engaged stakeholders have been very helpful through the engagement process in providing new ideas, relevant historical context, or more precise site information for example. This feedback has been used to adjust the designs of proposed amenities to fit the site and the community's desired outcomes more accurately and appropriately. The process of design development, community review and comment, and subsequent plan adjustment has been repeated three times through the development of the CWSP. Continued work will be necessary after adoption of the CWSP through the detailed design process for specific phases to consult with the general public and engaged stakeholders again, to ensure that further plan refinements and detailing satisfy community desired outcomes.

During the community consultation process, a preference expressed by some community members was to leave the waterfront alone or to do nothing. Although the landscape setting of the Colwood waterfront is spectacular and much-loved in its current form, there are many areas of the waterfront that are vulnerable to damage from intensifying recreational use, climate change and sea level rise. Indeed, some areas of the waterfront are already being trampled, overgrazed or needing of repair.

The rapid growth expected in Colwood over the next ten years will require active stewardship of the waterfront to prevent further degradation. In contrast, an active stewardship approach is recommended that coordinates restoration efforts with public access controls through integrated design. The synergies possible between restoration efforts and new facility design include using restorations to protect new infrastructure (i.e.: resiliency), designing new facilities to prevent trampling or other unintended damage to the landscape, and using restorations to enhance the aesthetic quality of new facilities. In this way, the CWSP becomes the vehicle for not only improving public recreational amenities, but also results in the wholesale restoration of ecosystems and a more resilient form to the landscape in the face of climate change and sea level rise.

OCP Goal 3.2

"Access to the waterfront – with pathways and spaces for public life – will be balanced with measures that protect sensitive ecological areas from human activity, thereby safeguarding the qualities that make this place special.."

4.2 PROPOSED PLANNING ACTIONS

Within the detailed study area for the Colwood Waterfront Stewardship Plan, there are several key planning or policy recommendations that, when implemented, will help establish the correct environment for achieving outcomes consistent with the project's guiding principles. The planning and policy recommendations are as follows.

PA-1: Sediment System Analysis & Nourishment Pilot

Some form of sediment nourishment and/or erosion protection will be required in the future to preserve values along Colwood's sediment shoreline, and to help build shoreline resiliency in the face of climate change and sea level rise. To jump start this process, Colwood's WCPC and staff will coordinate the following:

- Enlisting an engineering company to assess the entire shoreline sediment system and/or prepare a desktop review and summary report of previous sediment system studies.
- A professionally facilitated workshop to explore sediment management options.
- A sediment nourishment pilot project complete with sediment monitoring and annual beach profile measurements.
- Consultation with adjacent landowners and partners regarding collaborative sediment system management.
- Follow up with subsequent engineering analysis and reporting.

PA-2: Establish a First Nations Engagement Framework

Building on engagement with local First Nations through the CWSP project, Colwood will develop protocols/agreements with local First Nations. The agreements will establish a framework for engagement that provides local First Nations with timely opportunity and the resources necessary to meaningfully contribute to outcomes on a phase-by-phase basis throughout implementation of the CWSP, particularly the detailed design process.

PA-3: Archaeological Monitoring & Coordination

Colwood will engage Archaeological monitors and coordinate with local First Nations during all construction projects along the Colwood shoreline. Archaeological monitoring is to follow applicable provincial and/or federal regulatory requirements and best practices.

PA-4: Esquimalt Lagoon MBSR Review

Colwood will review its existing municipal policy bylaws and practices,



Welcome Totem by Local Coast Salish Artist Tom LaFortune.

Source: Colwood OCP



Great Blue Herons - Esquimalt Lagoon.

Source: CHEK News

and the enforcement approaches, in relation to the spirit and intent of the Canadian Migratory Bird Sanctuary Regulation (MBSR), including:

- Management of pets within the Esquimalt Lagoon Migratory Bird Sanctuary boundary:
 - Recommended alignment of the Colwood Animal Control Bylaw with the federal regulation to expand on-leash areas to include the entire foreshore of Coburg Peninsula. This proposed amendment would clarify community expectations, simplify enforcement, and help to avoid future conflicts.
- Boating on Esquimalt Lagoon.
- Permitting of new buildings and structures within the sanctuary boundary.

PA-5: Application Coordination with Stewards

Colwood will invite stewardship groups and First Nations to participate in the preparation of applications required for shoreline projects under Colwood's leadership, such as the DFO 'Request for Review'. Stewardship groups may have an interest in post project monitoring and other aspects of project delivery that will be viewed favorably by regulatory agencies.

Green Shores Applications - Colwood will apply for Green Shores certification under the Green Shores for Shoreline Development (GSSD) Credit and Rating System.

Nature-based Applications - At the time of writing for this report, the Stewardship Centre of BC (SCBC) is working with the Province of BC to prepare an expedited project authorization process for nature-based shoreline projects. Colwood will consult with SCBC regarding the opportunity to pilot their new process with the first phase of project implementation.

PA-6: WCPC Mandate Extension

The mandate of the Waterfront Coastal Processes Committee (WCPC) will be extended for ten years to reflect the CWSP implementation timeline. The WCPC serves as an important advisory body with partner representatives that can continue to coordinate the implementation and ongoing adaptation of the Colwood Waterfront Stewardship Plan. WCPC involvement in the following initiatives are expected to be of particular importance:

- Shoreline sediment management planning
- Coordination of open space plans with Parks Canada and other interested landowners

- Coordination with environmental stewardship groups
- Preliminary review of phased detailed designs for the waterfront

PA-7: Share with Partners

Colwood recognizes the importance and value of collaboration with adjacent landowners in managing the shoreline sediment system and in planning and designing for an interconnected open space system. Where possible, Colwood will continue to share information, ideas, and resources with adjacent landowners (i.e.: Royal Beach, Parks Canada, Royal Roads, and others) to facilitate coordinated waterfront planning and design.

PA-8: Improve Waterfront Connections to Public Transportation

Colwood will work with BC Transit to explore increasing the frequency of Route 52 bus service to 20-minute service from its current hourly service level. Colwood will work with Parks Canada to explore a greenway link that facilitates improved pedestrian and cycling connections to the Galloping Goose Trail and the Colwood Park and Ride facility at the corner of Ocean Boulevard and Sooke Road. Lastly, Colwood will continue to actively explore the potential for a ferry connection to Victoria with other stakeholders including the CRD and the province.

PA-9: Events Space Transition

Colwood will transition community events away from the Esquimalt Lagoon areas towards new facilities. Colwood will work with the Royal Beach landowner to provide appropriately designed and programmed spaces that can accommodate larger gatherings. Colwood will develop smaller gathering spaces at Lagoon West Park.

PA-10: Public Art

Colwood will allocate a Public Art allowance in the budget for each phase of the CWSP implementation plan.

PA-11: Inclusion of Accessibility Review

As part of the detailed design process for each phase, Colwood will invite IACDI or another recommended accessibility representative to complete an accessibility review of detailed designs.

PA-12: Enhance Waterfront Bylaw Enforcement

During the community consultation process, repeated complaints were voiced regarding feces, broken bottles and garbage on beaches, wildlife being harassed by pets and the perception of dangerous vehicle speeds in



New Waterfront Development Amenities - Concept Sketch
 Source: Colwood OCP



Colwood Beach Events
 Source: Colwood OCP



Enjoying Colwood's Soft Shoreline

Source: Colwood OCP

the area. Some of these concerns can be addressed with improved service levels (i.e.: more garbage and recycling receptacles) or design interventions (i.e.: traffic calming devices). However, Colwood will also work with by-law enforcement, the Canada Wildlife Service, and the RCMP to explore enhanced enforcement of existing regulations related to the following issues:

- Dogs off leash within the migratory bird sanctuary boundary.
- Overnight camping/parking of vehicles.
- Overnight drag-racing along Ocean Boulevard.
- Excessive vehicle speeds on Lagoon Road and on Ocean Boulevard between Milburn Road and Lagoon Road.
- Evening beach parties between Perimeter Park and Milburn Road.

PA-13: Greenway Links

Consistent with recommendations in the Colwood PRMP, greenway links between the waterfront and Colwood neighbourhoods will be planned in the following locations:

- Latoria Road - as surrounding developments and the accompanying roads and open space system is designed, Colwood will work with the developer to integrate a greenway link between the waterfront and Metchosin Road, and westward through the Latoria corridor.
- Perimeter Park - although a steep climb to the adjacent neighbourhood, the greenway connection up the bluff slope from Perimeter Park to the streets above will be improved.
- Lagoon Road - Colwood will explore upgrades to cycling and pedestrian infrastructure on Lagoon Road.
- Ocean Boulevard North - Colwood will explore options with Parks Canada for greenway improvements north of Coburg Peninsula.

PA-14: Place-Name Changes

Local First Nations have expressed a desire for name changes of specific places along the waterfront. This is particularly true for Lagoon West Park (formerly Pithouse Park), where the archaeological story is complex, and place-naming deserves a considered response. Colwood will continue to work with local First Nations to explore place-name adjustments as the CWSP is implemented.

PA-15: Foreshore Lease 135

Colwood will work with the Province of BC and the Royal Beach development proponent to explore the assignment of a new foreshore lease to the municipality for park purposes along the southern portions of the Colwood

Waterfront. This area includes the foreshore contained within the current Foreshore Lease 135 adjacent to the Royal Beach development site.

4.3 PARK IMPROVEMENTS

The CWSP detailed study area extends from Royal Beach to the north end of Esquimalt Lagoon and Coburg Peninsula. The unifying plan elements that spans the entire length of the detailed study area - the continuous waterfront multi-use path - is described in more detail in Section 5.3.1, while sub-areas are described in Section 5.3.2.

4.3.1 CONTINUOUS WATERFRONT MULTI-USE PATH

MULTI-USE PATH PROGRAMMING

The unifying design element for the CWSP is the continuous waterfront multi-use path. The purpose of the multi-use path is to provide a safe, continuous recreational amenity along the waterfront in a manner that is respectful to the sensitive landscape conditions. As such, the pathway is expected to vary in form to respond to site conditions and constraints, but all design variations will accommodate the variety of modes of transport that the multi-use designation invokes, including:

- Pedestrians - The principal use of the multi-use path is expected to be pedestrians. The pathway will be designed wide enough to accommodate current pedestrian traffic as well as anticipated increases in use associated with neighbourhood growth.
- Universal Accessibility Users - The entire length of the pathway is proposed as a universally accessible path. The detailed design for universal accessibility is particularly critical at transition points, crosswalks and parking areas where curbs and other vehicle barriers can also restrict accessibility users. Conceptual designs address universal accessibility as much as possible by providing the framework for accessible use, but much of the universal accessible design performance is determined as the detailed design stage (see Section 5.2, PA-11).
- Bicycles and Other Wheeled Mobility Devices - The proposed design of pathway surfacing and width will accommodate bicycles, wheelchairs, strollers, scooters and other wheeled mobility devices. However, given the constrained and sensitive landscape

PRMP Capital Recommendations C1 & C3:

"Continuous multi-use pathway from Lagoon Beach to Royal Beach."

&

"Provide a continuous pedestrian and cycling route along the waterfront."

conditions, mode-separation (i.e.: the separation of pedestrians from cyclists onto designated pathway sections) is not recommended. In essence, this implies that the multi-use pathway will be a shared mobility environment, similar to the vast majority of the Lochside or Galloping Goose Regional trail system. At times of high pedestrian use on the waterfront, cyclist speeds will inevitably be reduced as 'friction' on the pathways increases. This is considered a reasonable approach, and consistent with best practice for pathway development in sensitive ecological areas.

MULTI-USE PATH DESIGN

The form of the multi-use path is proposed to vary in a manner that respond to site constraints. For example, at the south end in the Perimeter Park sub-area, the multi-use path is proposed as a raised walkway that responds to the narrow backshore and steep bluff site constraints in this location. Farther north on Coburg Peninsula, the multi-use path is proposed as a gravel surfaced pathway ranging from four to five meters in width depending on the adjacent land uses. In addition, the alignment of the multi-use path also responds to landscape conditions or constraints. On Coburg Peninsula, for example, the path is positioned on the east side of Ocean Boulevard south of the mid-way point given sufficient peninsula width on the east side of the road in this location. Farther north, the path crosses to the west side of Ocean Boulevard given more sufficient width on the west side of the road in this location. In essence, the multi-use path responds to landscape conditions in form and alignment as an authentic demonstration of site-adaptive design.

MULTI-USE PATH IMPLEMENTATION & PHASING

Implementation of the continuous waterfront multi-use pathway is proposed to be undertaken in segments and at the same time as adjacent landscape restoration efforts. There are three key reasons why this recommended implementation strategy is included in the CWSP as follows:

- First, the entirety of the pathway length is built in the foreshore area and is subject to federal Department of Fisheries and Oceans (DFO) review under the Fisheries Act. The CWSP is generally proposed as a restorative and ecologically sensitive project. However, with respect to implementation of the plan and DFO project review and approvals, it is likely that the pathway segments will require compensatory measures be implemented in conjunction with construction of the pathway. In other words, the pathway construction will be looked upon most favorably if constructed in sections rather than all at once, and at the same time as adjacent riparian, saltmarsh and dune restorations.

- A phased approach to multi-use path construction is also far more likely to engender enthusiasm and trust with stewardship groups that have a keen interest in the ecological restoration of the Esquimalt Lagoon area in particular.
- Lastly, the success and function of ecological restoration efforts is dependent on the construction of the multi-use pathway, and vice-versa. Two of the key causes of ecological degradation along the lagoon foreshore areas are trampling from recreational use and over-grazing from non-migratory (introduced) Canada Geese. The multi-use pathway will provide a safe, intentional pedestrian environment for recreational users of all types, helping to minimize trampling of sensitive riparian and saltmarsh areas where pedestrian traffic is not intended. Similarly, ecological restorations such as the planting of thickets of Snowberry and Nootka Rose, as well as the placement of strategically located signage and fencing, will help to minimize the movement of people off of the multi-use pathway onto adjacent landscape areas, and help to prevent the movement of geese up into the riparian zone where they cause the most damage.

4.3.2 SUB-AREA PLANS

For the purpose of plan phasing, the detailed study area has been divided into six sub-areas. **Sub-areas, organized in order of proposed phasing, are defined as follows:**

- A1. South Beach - Starting at Lagoon Road and spanning northward on Coburg Peninsula to cover 1/3 of the peninsula.
- A2. Riflery Berm Crossing - The central 1/3 of Coburg Peninsula.
- A3. Coburg North - The northern 1/3 of Coburg Peninsula extending to the bridge.
- A4. Milburn - Extending from the south end of Ocean Boulevard to Lagoon Road.
- A5. Lagoon West Park - Covering the Colwood municipal park parcel previously known as Pithouse Park (see PA-14 on Page 56 regarding name change).
- A6. Perimeter Park - Bounded at the south by the north boundary of Royal Beach, and extending northward to the southern terminus of Ocean Boulevard.

CWSP sub-area conceptual plans, proposed programming, and costing are presented on the following pages of this report.

The South Beach area is the portion of Coburg peninsula bounded on the south by Lagoon Road and the Riflery Berm Crossing area to the north. South beach will benefit from the reorganization of roadside parking, the addition of a multi-use trail and the simultaneous implementation of ecological restorations.

BACKGROUND AND RATIONALE:

- The most significant proposed amenity addition for the South Beach area includes the construction of a minimum 5m wide, compacted gravel multi-use trail on the east (ocean) side of Ocean Boulevard.
- Ecological enhancements are proposed along the Esquimalt Lagoon shoreline as riparian plantings, as well as dune restoration east of the proposed multi-use trail. Restoration plantings are proposed to be protected by access control fencing.
- The parking on the east side of Ocean boulevard is proposed to be more clearly demarcated as angle parking, with clearly defined universally accessible parking stalls for handi-dart busses and cars.
- Pedestrian safety along Ocean Boulevard is proposed to be improved through traffic calming devices (speed humps and west-side guard rail) and clearly defined pedestrian crosswalks.
- An open-air shelter is proposed at the former location of the Degaussing hut. This location represents the highest elevation point along Coburg Peninsula, and the only location where a structure is reasonably suited. The accessibility art space in this location is proposed to be enhanced along with the addition of the Degaussing Shelter, ideally with accessibility ramp incorporated into the design of the shelter.
- This collection of amenities will be designed with site-adaptive and low impact design strategies in mind to minimize the disturbance footprint and to ensure a balance between ecology, recreation and resiliency to the expected effects of climate change.

GENERAL LOCATION MAP



Figure 20: South Beach - General Location Map Source: PDLA

CONTEXTUAL SITE PLAN



Figure 21: South Beach - Contextual Site Plan Source: PDLA

PROPOSED DESIGN ELEMENTS

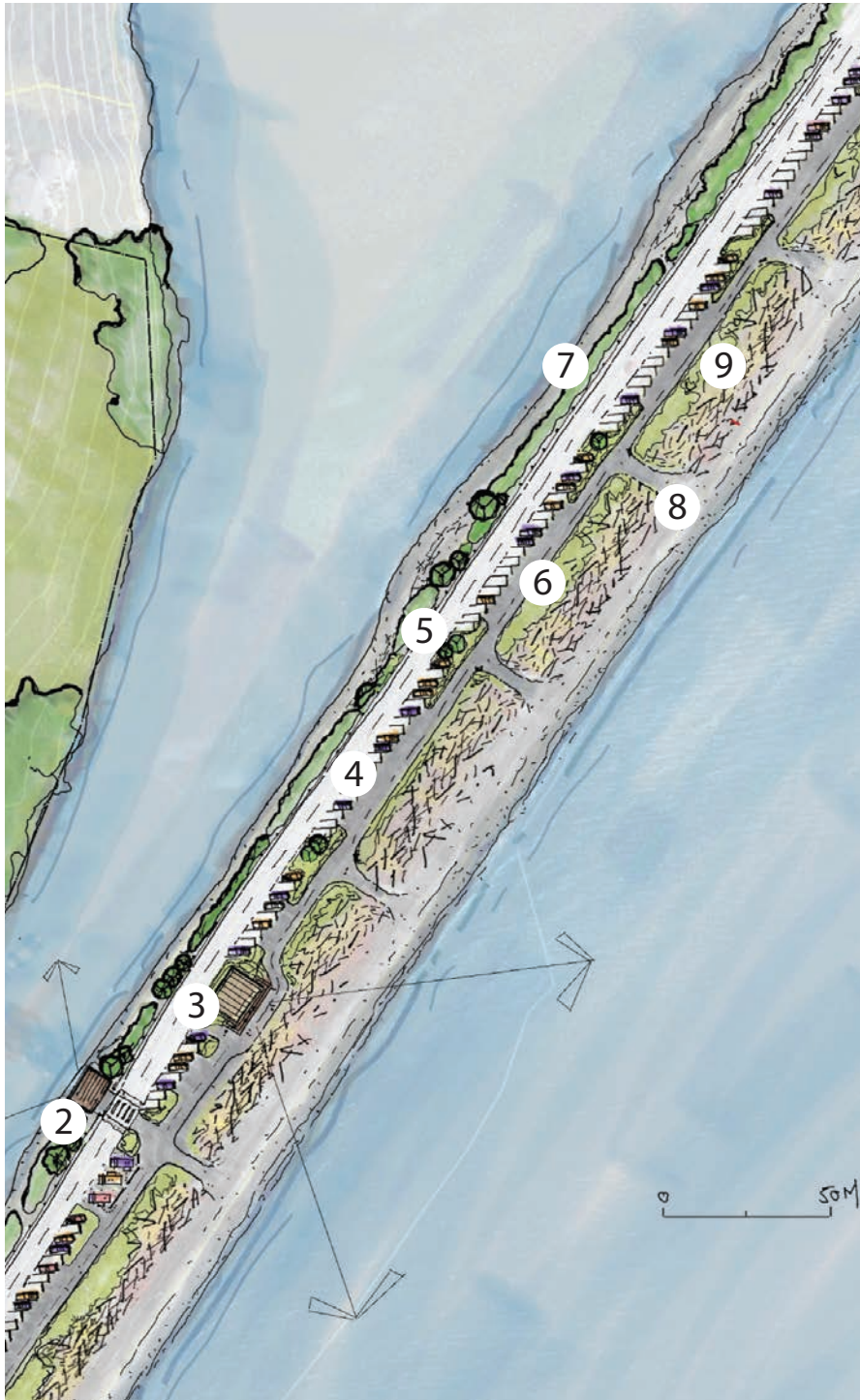


Figure 22: South Beach -Proposed Design Elements Source: PDLA

#7 Riparian Restoration: Revegetation of disturbed areas on the lagoon-side shoreline with indigenous plant species.

#8 Beach Access: Beach access points are spaced approximately 100m apart on average, and constructed with similar materials to the multi-use path. Narrow width is preferred.

#9 Dune Restoration: Dune restoration areas east of the multi-use path and between beach access points help to protect and define the edges of the path and beach access points. Dunes are constructed with sand berms, planted with indigenous species, and protected from trampling with fencing and logs.

PROPOSED PROGRAMMING

#1 First Nations Engagement: Detailed design process to include opportunity and capacity for First Nations contributions.

#2 Wildlife Viewing Platform: With pedestrian access to the west (lagoon) side of Coburg Peninsula restricted south of the Riflery Berm Crossing, one small wildlife viewing platform is proposed at the narrow south end of Esquimalt Lagoon. A raised crosswalk will be provided to facilitate safe crossing from the multi-use path to the viewing platform.

#3 Degaussing Hut: A small open air shelter will be provided at the former site of the Degaussing hut. The open air shelter will be raised from the beach, and will be designed with integrated universal access. Garbage and recycling facilities and universal parking will be included nearby.

#4 Parking Reconfiguration: Roadside parking along Ocean Boulevard will be reconfigured to 30 degree angle parking throughout. Logs will be used at the top end of stalls to guide parking angle and position. Parking stalls will be designed to integrated with clearly demarcated pedestrian environment. One accessible stall c/w compacted screenings surface per 25 stalls (apply to all roadside parking).

#5 Planting Pockets: To improve safety and to break up roadside parking, planting pockets are proposed opposite each beach access path.

#6 Multi-Use Path: The multi use path runs along the east side of Ocean Boulevard between parking stalls and the beach. Path width is slightly wider than other sections of path to accommodate vehicle bumper overhang in parking stalls and the 'jagged' edge created by angle parking.

Implementation of the South Beach area is ideally phased in sequence with the Riflery Berm Crossing and Coburg North areas, from south to north. Design Elements for the South Beach area to be constructed concurrently, with the exception of structures such as the Degaussing Hut and wildlife viewing platform that could be constructed at a later time.

TABLE 1: SOUTH BEACH - GENERAL SPECIFICATIONS & COST

ITEM:	DESIGN ELEMENT:	GENERAL SPECIFICATIONS:	COST:
1	Soft Costs (15%)	<ul style="list-style-type: none"> engagement, design, monitoring contingency 	\$100,427
2	Wildlife Viewing Platform	<ul style="list-style-type: none"> approx. 7m x 4m wood decking with steel base on helical piles raised pedestrian crosswalk 	\$30,000
3	Degaussing Hut	<ul style="list-style-type: none"> raised, accessible open-air shelter approx. 12m x 8m granite block or concrete steps fronting beach designed to withstand log impact 	\$120,000
4	Parking Reconfiguration	<ul style="list-style-type: none"> angle parking, with clearly defined universally accessible parking stalls log stall delineation; surface gravel resloped to improve drainage (high point at east edge) safety railing west side of Ocean Boulevard 	\$113,450
5	Planting Pockets	<ul style="list-style-type: none"> vegetated parking buffers opposite beach access points indigenous species from riparian & dune lists scarify ground, growing medium, plants 	\$63,650
6	Multi-Use Path	<ul style="list-style-type: none"> 5m (min.) width compacted 1/4" minus pathway blend or equivalent gravel surfacing level surface, c/w base gravel where subbase unsuitable. 	\$146,080
7	Riparian Restoration	<ul style="list-style-type: none"> infill restoration of disturbed areas on lagoon-side (west) of Ocean Boulevard growing medium placement with indigenous plantings species selection to include Douglas Fir (<i>Pseudotsuga menziesii</i>), Arbutus (<i>Arbutus menziesii</i>), Shore Pine (<i>Pinus contorta</i> var. <i>Contorta</i>), Nootka Rose (<i>Rosa nutkana</i>), Pacific Crabapple (<i>Malus fusca</i>), Tall Oregon Grape (<i>Mahonia aquifolium</i>), and other minor species as available horticulturally. 	continues

ITEM:	DESIGN ELEMENT:	GENERAL SPECIFICATIONS:	COST:
7	Riparian Restoration	<ul style="list-style-type: none"> includes invasive species control and roadside guard rail or fencing to prevent access 	\$45,585
8	Beach Access Paths	<ul style="list-style-type: none"> beach access paths spaced approx. 100m width 1.5m surfacing 1/4" minus compacted screenings maintained clear of logs (annually after storm season) 	\$2,000
9	Dune Restoration	<ul style="list-style-type: none"> integrated with multi-use trail construction sand berms average 300mm depth (growing medium) indigenous plants to include Dunegrass (<i>Lymus mollis</i>), Dune Sedge (<i>Carex macrocephala</i>), Tufeted Hairgrass (<i>Deschampsia cespitosa</i>), Yarrow (<i>Achillea millefolium</i>), Silver Burweed (<i>Ambrosia chamissonis</i>), American Searocket (<i>Cakile edentula</i>), Puget Sound Gumweed (<i>Grindelia integrifolia</i>), Beach Pea (<i>Lathyrus japonicus var. maritimus</i>), and/or other minor species as available horticulturally. 	\$137,320
10	Saltmarsh Restoration	<ul style="list-style-type: none"> loosen substrate and install <i>Salicornia virginica</i> (American Glasswort), <i>Distichlis spicata</i> (Seashore Saltgrass), and <i>Triglochin maritima</i> (Seaside Arrow-grass) 	\$34,290
Total Cost:		<ul style="list-style-type: none"> cost will vary with detailed design, programming of specific elements, and complexity of site prep. 	+/- \$770,000



Figure 23: South Beach - Degaussing Hut Source: PDLA

Degaussing Hut: Covered picnic or interpretive spaces provide a venue for smaller gatherings such as school classes or even a small wedding. Located on the former site of the Degaussing Hut, this small shelter is elevated above the shoreline and provides dramatic views of the ocean. Structure proposed as a universally accessible facility.

Riflery Berm Crossing is the portion of Coburg Peninsula between the South Beach area and Coburg North just south of the midpoint of the peninsula. Riflery Berm Crossing is the point at which the waterfront multi-use path (MUP) is proposed to cross Ocean Boulevard. A formal at-grade road crossing complete with traffic calming measures, ecological restorations and supporting improvements is proposed for this location.

BACKGROUND AND RATIONALE:

- Riflery Berm Crossing is the point at which the waterfront multi-use path crosses from the east (ocean) side of Ocean Boulevard to the west (lagoon) side. The crossing is proposed as raised crosswalk with a centre pedestrian island (refuge) and pedestrian nodes either side to the road to allow cyclists to dismount before crossing, or to allow pedestrians to pause without blocking the flow of traffic on the trail.
- Ecological enhancements are proposed to continue along the Esquimalt Lagoon shoreline as riparian plantings, as well as dune restoration east of the proposed multi-use trail, in extension of the South Beach area restorations. Restoration plantings are proposed to be protected by access control fencing.
- The parking on the east side of Ocean boulevard is proposed to be more clearly demarcated as angle parking, with clearly defined universally accessible parking stalls for handi-dart busses and cars, again as a continuation of the South Beach treatment.
- Pedestrian safety along Ocean Boulevard is proposed to be improved through traffic calming devices (speed humps and west-side guard rail) and clearly defined pedestrian crosswalks.
- Designated Food Truck stalls and handi-dart bus parking, along with garbage and recycling, benches and wayfinding signage will complement this node.
- A beach access mat is proposed on the west side of the pedestrian crossing.

GENERAL LOCATION MAP



Figure 24: Riflery Berm Crossing - General Location Map Source: PDLA

CONTEXTUAL SITE PLAN



Figure 25: Riflery Berm Crossing - Contextual Site Plan Source: PDLA

PROPOSED DESIGN ELEMENTS



Figure 26: Riflery Berm Crossing - Proposed Design Elements Source: PDLA



Figure 27: Riflery Berm Crossing - Proposed Design Elements Source: PDLA

#9 Designated Food Truck area: Provide enlarged area for food trucks on west side of road adjacent to pedestrian node. Food truck area to be controlled with lockable bollards and serviced with garbage and recycling facilities, benches and signage.

#10 Multi-use Path Crossing: Provide raised crosswalk, centre-of-road pedestrian island, circulation nodes either side of road, benches, wayfinding and interpretive signage, access control fencing and other amenities as appropriate.

#11 Multi-Use Path: The multi use path runs along the east side of Ocean Boulevard between parking stalls and the beach (5m width), then crosses to the lagoon-side (4m width). Alignment on west side to avoid existing vegetation.

PROPOSED PROGRAMMING

#1 First Nations Engagement: Detailed design process to include opportunity and capacity for First Nations contributions.

#2 Saltmarsh Restoration: restore areas of trampled saltmarsh at the site of the riflery berm bulge.

#3 Riparian Restoration: revegetation of disturbed areas on the lagoon-side shoreline with indigenous plant species.

#4 Dune Restoration: Dune restoration areas east of the multi-use path and between beach access points help to protect and define the edges of the path and beach access points. Dunes are constructed with sand berms, planted with indigenous species, and protected from trampling with fencing and logs.

#5 Planting Pockets: To improve safety and to break up roadside parking, planting pockets are proposed opposite each beach access path.

#6 Parking Reconfiguration: Roadside parking along Ocean Boulevard will be reconfigured to 30 degree angle parking throughout. Logs will be used at the top end of stalls to guide parking angle and position. Parking stalls will be designed to integrated with clearly demarcated pedestrian environment.

#7 Beach Access: Beach access points are spaced 50-100m apart, and constructed with similar materials to the multi-use path. Narrow width is preferred.

#8 Accessible Beach Mat: One maintained accessible access point to the beach complete with mat.

Implementation of the Riflery Berm Crossing is ideally phased in sequence with the South Beach and Coburg North areas, from south to north. Design Elements for the Riflery Berm Crossing area to be constructed concurrently. Note that measure to protect the lagoon shoreline should be implemented during the period of time where there is an absence of multi-use path (MUP) continuation to the north.

TABLE 2: RIFLERY BERM CROSSING - GENERAL SPECIFICATIONS & COST

ITEM:	DESIGN ELEMENT:	GENERAL SPECIFICATIONS:	COST:
1	Soft Costs (15%)	<ul style="list-style-type: none"> engagement, design, monitoring contingency 	\$101,440
2	Saltmarsh Restoration	<ul style="list-style-type: none"> loosen substrate and install <i>Salicornia virginica</i> (American Glasswort), <i>Distichlis spicata</i> (Seashore Saltgrass), and <i>Triglochin maritima</i> (Seaside Arrow-grass) 	\$14,130
3	Riparian Restoration	<ul style="list-style-type: none"> infill restoration of disturbed areas on lagoon-side (west of Ocean Boulevard) growing medium placement with indigenous plantings species selection to include Douglas Fir (<i>Pseudotsuga menziesii</i>), Arbutus (<i>Arbutus menziesii</i>), Shore Pine (<i>Pinus contorta</i> var. <i>Contorta</i>), Nootka Rose (<i>Rosa nutkana</i>), Pacific Crabapple (<i>Malus fusca</i>), Tall Oregon Grape (<i>Mahonia aquifolium</i>), and other minor species as available horticulturally. includes invasive species control and roadside guard rail or fencing to prevent access 	\$88,770
4	Dune Restoration	<ul style="list-style-type: none"> integrated with multi-use trail construction sand berms average 300mm depth (growing medium) indigenous plants to include Dunegrass (<i>Lymus mollis</i>), Dune Sedge (<i>Carex macrocephala</i>), Tufted Hairgrass (<i>Deschampsia cespitosa</i>), Yarrow (<i>Achillea millefolium</i>), Silver Burweed (<i>Ambrosia chamissonis</i>), American Searocket (<i>Cakile edentula</i>), Puget Sound Gumweed (<i>Grindelia integrifolia</i>), Beach Pea (<i>Lathyrus japonicus</i> var. <i>maritimus</i>), and/or other minor species as available horticulturally. 	\$116,680
5	Planting Pockets	<ul style="list-style-type: none"> vegetated parking buffers opposite beach access points indigenous species from riparian & dune lists scarify ground, growing medium, plants 	\$72,400

ITEM:	DESIGN ELEMENT:	GENERAL SPECIFICATIONS:	COST:
6	Parking Reconfiguration	<ul style="list-style-type: none"> • angle parking, with clearly defined universally accessible parking stalls • log stall delineation; surface gravel resloped to improve drainage (high point at east edge) • safety railing west side of Ocean Boulevard 	\$124,310
7	Beach Access Paths	<ul style="list-style-type: none"> • log stall delineation; surface gravel resloped to improve drainage (high point at east edge) 	\$37,520
8	Accessible Beach Mat	<ul style="list-style-type: none"> • safety railing west side of Ocean Boulevard 	\$10,000
9	Designated Food Truck Area	<ul style="list-style-type: none"> • 12m x 12m compacted 1/4" minus pathway blend or equivalent gravel surfacing • garbage and recycling, benches, bollards 	\$10,920
10	Multi-use Path Crossing	<ul style="list-style-type: none"> • raised crosswalk, pedestrian island, curb, asphalt • pedestrian node surfacing (concrete unit pavers) • guard rail west side of Ocean Boulevard 	\$72,100
11	Multi-Use Path	<ul style="list-style-type: none"> • 5m (min.) width compacted 1/4" minus pathway blend or equivalent gravel surfacing • level surface, c/w base gravel where subbase unsuitable. 	\$129,440
Total Cost:		<ul style="list-style-type: none"> • cost will vary with detailed design, programming of specific elements, and complexity of site prep. 	+/- \$778,000



Figure 28: Riflery Berm Crossing Sketch Source: PDLA

Riflery Berm Crossing: Perspective view looking southward towards Royal Beach and Albert Head.

Coburg North, as the name implies, is the northernmost project area that falls within the CWSP detailed study area boundary. Coburg North provides pedestrian access to the north end of the spit by way of the multi-use pathway (MUP) on the west side of Coburg Peninsula, and reorganized parking on the east side. Extensive ecological restorations are integrated throughout, as are traffic calming measures. Siting of a public washroom building is proposed near the north end of the spit on the west side of Ocean Boulevard.

BACKGROUND AND RATIONALE:

- Coburg North sees the extension of the waterfront multi-use pathway on the west or lagoon side of Ocean Boulevard from the Riflery Berm Crossing. Pedestrian access to the beach is facilitated by crosswalks across Ocean Boulevard and formalized beach access paths.
- Ecological enhancements are proposed to continue along the Esquimalt Lagoon shoreline as riparian plantings, and as dune restoration east of improved roadside parking. Restoration plantings are proposed to be protected by access control fencing.
- The parking on the east side of Ocean boulevard is proposed to be more clearly demarcated as angle parking, with clearly defined universally accessible parking stalls for handi-dart busses and cars.
- Pedestrian safety along Ocean Boulevard is proposed to be improved through traffic calming devices (speed humps and west-side guard rail) and clearly defined pedestrian crosswalks.
- Designated Food Truck stalls and handi-dart bus parking, along with garbage and recycling, benches and wayfinding signage will complement crosswalk locations.
- A proposed washroom building is sited just south of the bridge on the west side of Ocean Boulevard. The washroom building is accessible to pedestrians from the multi-use path, and has a service truck pullout on the east side.

GENERAL LOCATION MAP

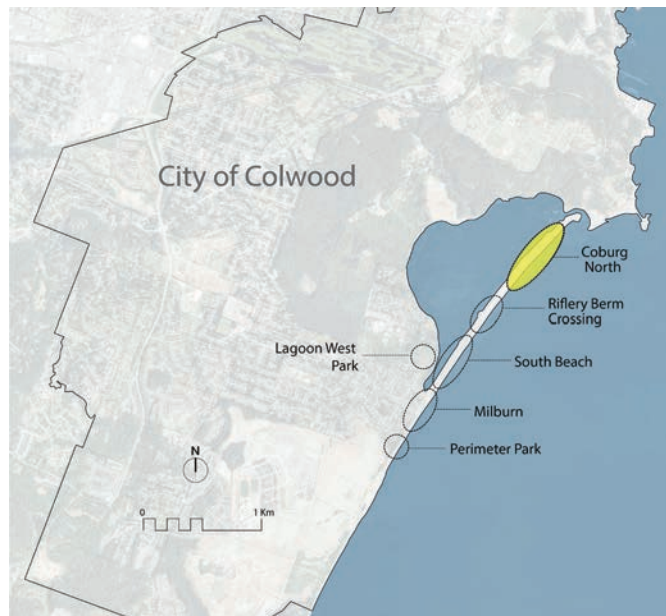


Figure 29: Coburg North - General Location Map Source: PDLA

CONTEXTUAL SITE PLAN



Figure 30: Coburg North - Contextual Site Plan Source: PDLA

PROPOSED DESIGN ELEMENTS

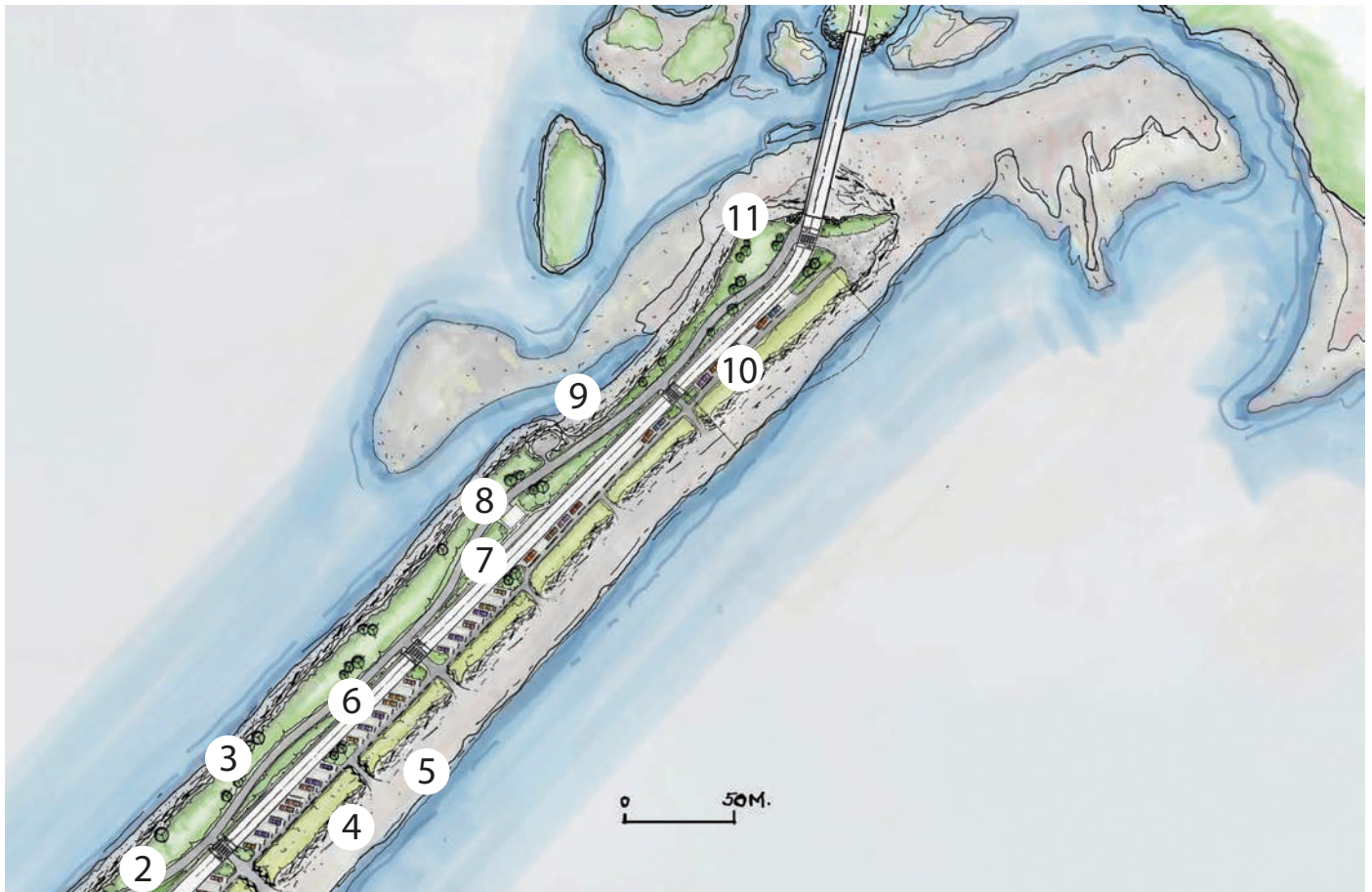


Figure 31: Coburg North - Proposed Design Elements Source: PDLA

PROPOSED PROGRAMMING

- #1 **First Nations Engagement:** Detailed design process to include opportunity and capacity for First Nations contributions.
- #2 **Multi-Use Path:** The multi-use path runs along the west side of Ocean Boulevard from the Riflery Berm Crossing north to the bridge (4m width). Alignment on west side to avoid existing vegetation.
- #3 **Riparian Restoration:** Revegetation of disturbed areas on the lagoon-side shoreline with indigenous plant species.
- #4 **Dune Restoration:** Dune restoration areas east of parking and east of a narrow pedestrian path, and between beach access points. Dune form helps to protect and define the edges of the path and beach access points.
- #5 **Beach Access Paths:** Beach access paths are spaced 50-100m apart, and constructed with similar materials to the multi-use path. Narrow width is preferred.
- #6 **Planting Pockets:** To improve pedestrian safety and to break up roadside parking, planting pockets are proposed opposite each beach access path between Ocean Boulevard and the beach.
- #7 **Parking Reconfiguration:** Roadside parking along Ocean Boulevard will be reconfigured to 30 degree angle parking throughout. Logs will be used at the top end of stalls to guide parking angle and position. Parking stalls will be designed to integrated with clearly demarcated pedestrian environment.
- #8 **Washroom Building:** 'Off-grid' washroom building positioned between Ocean Boulevard and the multi-use path.
- #9 **Interpretive Point:** Outside classroom space or gathering area on the point - gravel surfacing and fencing.
- #10 **Raised Crosswalks:** Provide raised crosswalks from multi-use path across Ocean Boulevard to the beach. Space 100-150m apart and connect to beach access paths on east side.

Implementation of the Coburg North area is ideally phased in sequence with the South Beach and Riflery Berm Crossing areas, from south to north. Design Elements for Coburg North to be constructed concurrently, with the exception of the washroom building which could be constructed separately. Note that measure to protect the lagoon shoreline should be implemented during the period of time where there is an absence of multi-use path (MUP) continuation to the north.

TABLE 3: COBURG NORTH - GENERAL SPECIFICATIONS & COST

ITEM:	DESIGN ELEMENT:	GENERAL SPECIFICATIONS:	COST:
1	Soft Costs (15%)	<ul style="list-style-type: none"> engagement, design, monitoring contingency 	\$154,469
2	Multi-Use Path	<ul style="list-style-type: none"> 5m (min.) width compacted 1/4" minus pathway blend or equivalent gravel surfacing level surface, and place base gravel where subbase unsuitable. 	\$121,960
3	Riparian Restoration	<ul style="list-style-type: none"> infill restoration of disturbed areas on lagoon-side (west) of Ocean Boulevard growing medium placement with indigenous plantings species selection to include Douglas Fir (<i>Pseudotsuga menziesii</i>), Arbutus (<i>Arbutus menziesii</i>), Shore Pine (<i>Pinus contorta</i> var. <i>Contorta</i>), Nootka Rose (<i>Rosa nutkana</i>), Pacific Crabapple (<i>Malus fusca</i>), Tall Oregon Grape (<i>Mahonia aquifolium</i>), and other minor species as available horticulturally. includes invasive species control and roadside guard rail or fencing to prevent access 	\$128,400
4	Dune Restoration	<ul style="list-style-type: none"> integrated with multi-use trail construction sand berms average 300mm depth (growing medium) indigenous plants to include Dunegrass (<i>Lymus mollis</i>), Dune Sedge (<i>Carex macrocephala</i>), Tufeted Hairgrass (<i>Deschampsia cespitosa</i>), Yarrow (<i>Achillea millefolium</i>), Silver Burweed (<i>Ambrosia chamissonis</i>), American Searocket (<i>Cakile edentula</i>), Puget Sound Gumweed (<i>Grindelia integrifolia</i>), Beach Pea (<i>Lathyrus japonicus</i> var. <i>maritimus</i>), and/or other minor species as available horticulturally. 	\$180,000
5	Beach Access Paths	<ul style="list-style-type: none"> beach access paths spaced approx. 100m width 1.5m surfacing 1/4" minus compacted screenings maintained clear of logs (annually) after storm season) 	\$66,480

ITEM:	DESIGN ELEMENT:	GENERAL SPECIFICATIONS:	COST:
6	Planting Pockets	<ul style="list-style-type: none"> • vegetated parking buffers opposite beach access points • indigenous species from riparian & dune lists • scarify ground, growing medium, plants 	\$47,400
7	Parking Reconfiguration	<ul style="list-style-type: none"> • angle parking, with clearly defined universally accessible parking stalls • log stall delineation; surface gravel resloped to improve drainage (high point at east edge) 	\$104,680
8	Washroom Building	<ul style="list-style-type: none"> • approx. 10m x 7m off-grid amenity building • footing to be helical pile or floating slab. 	\$300,000
9	Interpretive Point	<ul style="list-style-type: none"> • approx. 8m x 12m compacted 1/4" minus pathway blend or equivalent gravel surfacing • interpretive signage, garbage and recycling, benches, split-rail fencing 	\$6,420
10	Raised Crosswalks	<ul style="list-style-type: none"> • raised crosswalk, asphalt (approx. 6) • pedestrian link to multi-use path and beach access points • guard rail west side of Ocean Boulevard 	\$27,400
11	Saltmarsh Restoration	<ul style="list-style-type: none"> • loosen substrate and install <i>Salicornia virginica</i> (American Glasswort), <i>Distichlis spicata</i> (Seashore Saltgrass), and <i>Triglochin maritima</i> (Seaside Arrow-grass) 	\$47,055
Total Cost:		<ul style="list-style-type: none"> • cost will vary with detailed design, programming of specific elements, and complexity of site prep. 	+/- \$1,184,000

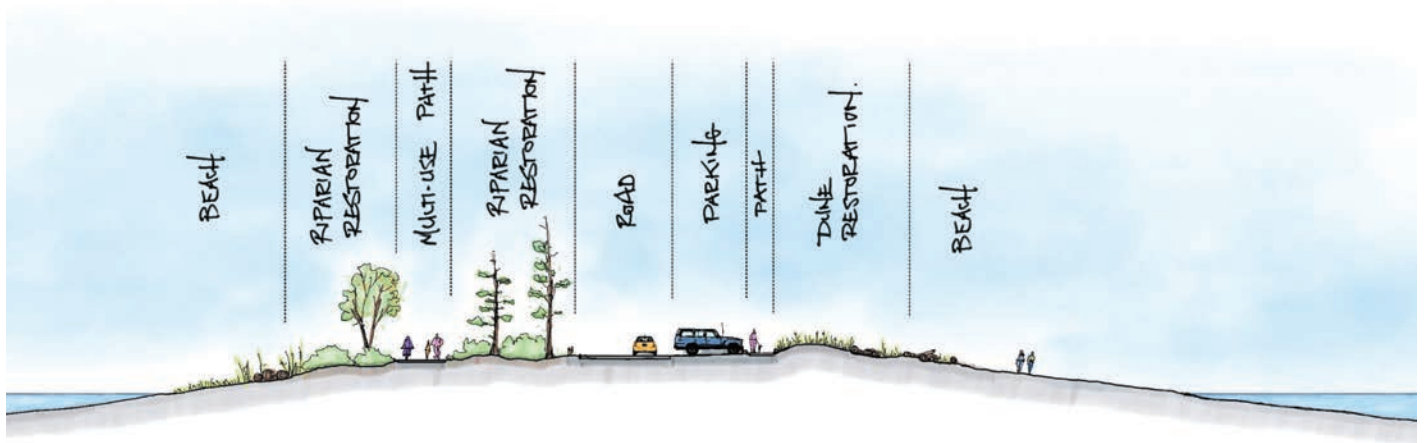


Figure 32: Coburg North Cross Section Sketch Source: PDLA

Coburg North Cross Section: Multi-use pathway separated from roadway by riparian vegetation enhancement and guard rail. Roadside parking protected from outer shore waves by dune formation and planting.

The Milburn section of waterfront stretches from the southern terminus of Ocean Boulevard northward to Lagoon Road. The principle feature through Milburn is the newly proposed multi use path (MUP). Some complexity in the design is expected to integrate the waterfront trail with parking, traffic circulation and ecological restoration works.

BACKGROUND AND RATIONALE:

- The area is occupied by the southern leg of Ocean Boulevard that serves as an access road to a duplex lot adjacent to Perimeter Park, and an informal beach access and parking lot. The portion of waterfront between Milburn Road and Lagoon Road consists of a low, sparsely vegetated berm and small creek draining to the beach.
- Improvements proposed for this section of shoreline consist of reconfiguring the south leg of Ocean Boulevard to a 'Woonerf', which will improve pedestrian access and downgrade vehicle access. Also, a clearly defined multi-use path (MUP) will be added between Milburn and Lagoon Road.
- Ecological enhancements will be a key component of improvements to these areas and ideally installed simultaneously with improvements.
- Trail side amenities such as benches, garbage cans and beach access points are integrated into designs and designated accessible parking stalls will be added and clearly demarcated.
- The reorganization of parking is intended to help improve pedestrian safety on Ocean Boulevard. The design will eliminate cars backing out of parking stalls into the flow of pedestrian traffic - an important consideration with expected increases in pedestrian use.

GENERAL LOCATION MAP



Figure 33: Milburn - General Location Map Source: PDLA

CONTEXTUAL SITE PLAN



Figure 34: Milburn - Contextual Site Plan Source: PDLA

PROPOSED DESIGN ELEMENTS



Figure 35: Milburn - Proposed Design Elements Source: PDLA



Figure 36: Milburn - Proposed Design Elements Source: PDLA



Figure 37: Milburn - Proposed Design Elements Source: PDLA

PROPOSED PROGRAMMING

WOONERF (Ocean Blvd. - South Leg):

#1 **First Nations Engagement:** Detailed design to include opportunity and capacity for contributions.

#2 **Woonerf Entrance:** Traffic calming and appropriate signage to blend vehicle and multi-use trail traffic.

#3 **Woonerf:** Curving 6m wide road surface with no parking either side; vegetation allowed to encroach both sides with dunegrass planted on ocean-side; accommodate emergency vehicle turning at south end.

#4 **Beach Scallops:** Rock steps or shelves down to beach scalloped landward. Beach enhancements below high tide level. Apply Green Shores principles. Mitigate driftwood throw.

#5 **Transition to Raised Walkway:** Interim ramp to beach prior to raised walkway construction; small plaza transition to raised walkway.

PARKING AREA:

#6 **Accessible Parking:** include high proportion of accessible parking stalls (mimum 4).

#7 **Curbing:** Formalize parking and restrict vehicle movements with concrete curbing in parking area and up to Ocean Boulevard intersection.

#8 **Raised MUP Crosswalk:** At T-intersection.

#9 **MUP Seating Wall & Slope Plantings:** Moderate grade with seating wall along west side of multi-use trail (see cross section A-A' following pages) & revegetate slope with native plants. Multi-use path to be concrete this section.

BERM AREA:

#10 **MUP Resurfacing:** This section of multi-use path to be concrete with sawcut joints (no tool marks).

#11 **Traffic Calming:** Add concrete curb, raised speed humps and boulevard plantings on Ocean Boulevard between Milburn Road and Lagoon Road.

#12 **Dune Restoration:** Complete dune restoration and fencing integral with multi-use trail.

#13 **Riparian Restoration:** Complete riparian restoration and fencing integral with multi-use path.

#14 **Rain Garden:** Install demonstration rain garden at corner to treat road runoff prior to discharging to adjacent creek.



Figure 38: Milburn - Proposed Design Elements Source: PDLA

WAVE PLAZA:

#15 **Handi-Dart Bus Parking:** Provide 1 accessible bus parking stall with integrated loading space.

#16 **Designated Food Truck Stalls:** Two designated Food Truck stalls in plaza area controlled with removable bollards.

#17 **Wave Plaza:** Hard surfacing, bollards along Ocean Boulevard and granite block seating wall along beach.

#18 **Accessible Beach Mat:** One maintained accessible access point to the beach complete with mat.

#19 **Art Wall:** Screen or wall separating plaza and washroom doubles as an art wall, sign or notice board.

A4

Milburn - IMPLEMENTATION

Implementation of the proposed Milburn area improvements is possible as a step-wise process, with the exception of ecological enhancements that are best completed as an integrated design with multi-use path (MUP) improvements. The implementation plan is divided into four (4) sub-phases. The woonerf and parking area sub-phases are ideally constructed together, but could be phased pending available funding.

TABLE 4: SOUTH BEACH - GENERAL SPECIFICATIONS & COST

ITEM:	DESIGN ELEMENT:	GENERAL SPECIFICATIONS:	COST:
WOONERF (Ocean Blvd. - South Leg):			
1	Soft Costs (15%)	<ul style="list-style-type: none"> engagement, design, monitoring contingency 	\$154,469
2	Woonerf Entrance	<ul style="list-style-type: none"> signage, raised speed hump, plantings entrance control is key element of woonerf 	\$16,000
3	Woonerf	<ul style="list-style-type: none"> concrete flatwork, repaving, plantings physically constrain parking both sides 	\$117,000
4	Beach Scallop	<ul style="list-style-type: none"> machine work, granite blocks, beach sand, edge plantings & 'driftwood throw' mitigation 	\$64,200
5	Transition to Raised Walkway	<ul style="list-style-type: none"> short term ramp long term transition plaza 	see A6
PARKING AREA:			
6	Accessible Parking	<ul style="list-style-type: none"> see parking area specs. (includes lot) 	\$75,960
7	Curbing	<ul style="list-style-type: none"> concrete curb and gutter throughout integrate with asphalt surface 	\$13,000

ITEM:	DESIGN ELEMENT:	GENERAL SPECIFICATIONS:	COST:
8	Raise MUP Crosswalk	<ul style="list-style-type: none"> raised crosswalk for multi-use path asphalt with painted zebra/elephant markings 	\$1,625
9	MUP Seating Wall & Slope Plantings	<ul style="list-style-type: none"> trailside retaining/seating wall slope regrading, growing medium, plantings 	\$61,500
BERM AREA:			
10	MUP Resurfacing	<ul style="list-style-type: none"> 4m wide concrete surfacing - broom finish with sawcut control joints - crosswalk to Wave Plaza 	\$45,000
11	Traffic Calming	<ul style="list-style-type: none"> raised asphalt speed humps (4) integrated concrete curb and gutter east side 	\$29,600
12	Dune + Riparian Restoration	<ul style="list-style-type: none"> integrated with multi-use trail construction beach sand (as growing medium), plantings 	\$28,800
13	Riparian Restoration	<ul style="list-style-type: none"> integrated with multi-use path construction invasive species control, replanting 	\$22,600
14	Rain Garden	<ul style="list-style-type: none"> approx. 30m² rain garden 	\$6,000
WAVE PLAZA:			
15	Handi-dart Bus Parking	<ul style="list-style-type: none"> 1/4" minus crushed screenings scaled to fit 	\$1,600
16	Food Truck Stalls	<ul style="list-style-type: none"> 1/4" minus crushed screenings for two trucks 	\$2,800
17	Wave Plaza	<ul style="list-style-type: none"> resurfacing, art wall, seating walls, bollards 	\$120,000
18	Accessible Beach Mat	<ul style="list-style-type: none"> 20m length accessible mat 	\$10,000
Total Cost:		<ul style="list-style-type: none"> costs will vary with detailed design, programming of specific elements, and inclusion of optional items 	+/- \$708,000



Figure 39: Milburn - Beach Scallops Section Sketch Source: PDLA

Beach Scallops: Seating steps constructed with robust materials and pulled back to allow an improved beach condition. Significant driftwood throw in this location requires careful consideration of shoreline modifications. To be designed using Green Shores principles.

Lagoon West Park is a largely undeveloped, spectacular, oceanfront property that Colwood is fortunate to have as part of its park system. Lagoon West Park is ideally situated on the Esquimalt Lagoon waterfront, and the primary purpose of the park will be the preservation and enhancement of riparian habitat, especially that portion within the Esquimalt Lagoon Migratory Bird Sanctuary. The upland portions of the site are proposed to house modest community amenities.

BACKGROUND AND RATIONALE:

- Most of Lagoon West Park will remain as an ecological preserve. Previously disturbed portions will house new facilities or will undergo ecological restoration.
- Proposed park amenities are sited to protect known archaeological resources and an orchard of historical significance. These resources will be protected and enhanced.
- The design of new facilities in Lagoon West Park will be pursued in collaboration with local First Nations and include facilities for cultural expressions, consistent with First Nations' ideals.
- The proposed concept plan for Lagoon West Park includes setting aside over 60% of the park area as an ecological enhancement area and preserve.
- The westerly corner of the park is drier, higher in elevation, located outside of the migratory bird sanctuary, and more suitable for the addition of facilities.
- Proposed upgrades for this park include re-purposing the existing one storey building to a museum or park visitor/interpretive centre, then adding a parking lot, natural playground, open-air shelter and bandshell.
- Proposed facilities to be scaled to accommodate smaller sized community events and gatherings, such as small music-in-the-park events, a paint-in-the-park event, or an elementary class visit.

GENERAL LOCATION MAP

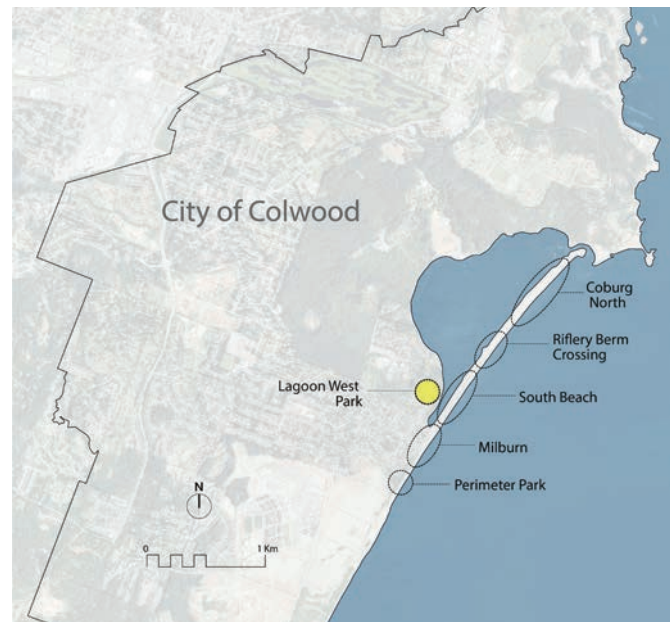


Figure 40: Lagoon West Park - General Location Map

CONTEXTUAL SITE PLAN



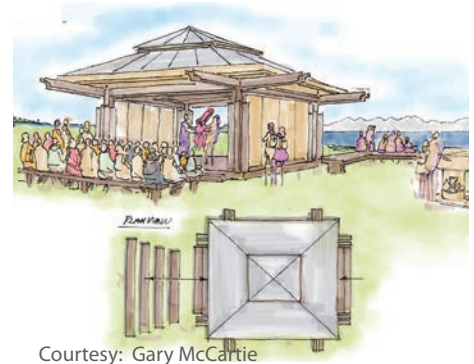
Figure 41: Lagoon West Park - Contextual Site Plan



Bandshells can establish identity in a park and offer a memorable, open-air space for small community events.



Natural playscapes provide a valuable play experience for children aged 2-12 and will introduce a welcome passive-surveillance presence in the park.



Covered picnic or interpretive spaces provide a venue for smaller gatherings such as school classes or even a small wedding.

PROPOSED DESIGN ELEMENTS

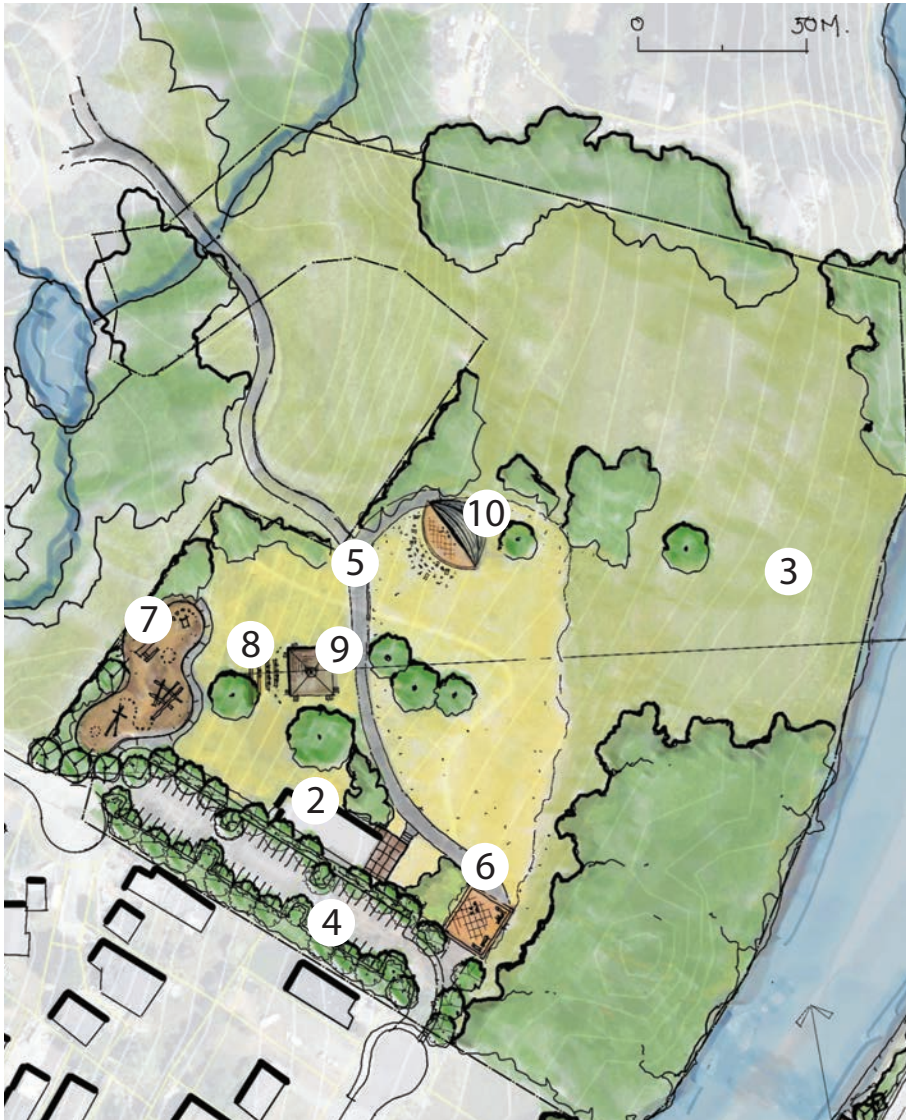


Figure 42: Lagoon West Park - Proposed Design Elements

PROPOSED PROGRAMMING

- #1 **First Nations Engagement:** Detailed design process to include opportunity and capacity for First Nations contributions.
- #2 **Repurposed Building:** Existing building to be repurposed for a museum, welcome centre, community resource building or other amenity.
- #3 **Ecological Preserve:** Protect and enhance existing riparian habitat and orchard.
- #4 **Parking Lot:** Scaled to serve facilities for Lagoon West Park. Including screening for adjacent properties.
- #5 **Pathways:** Compacted gravel pathways for looped trails and destination pathways.
- #6 **Signage Program:** To include entrance, interpretive and wayfinding signs.
- #7 **Natural Playground:** To provide play areas for a variety of ages.
- #8 **Site Furnishings:** To provide benches, picnic tables and litter/recycling receptacles.
- #9 **Interpretive Shelter:** A covered space with seating for approx. 20-30 people (expandable outdoor seating).
- #10 **Band Shell:** For small string quartet/folk band. Spectator capacity on lawn to be 75-100 people.

Implementation of the proposed Lagoon West Park improvements is possible as a step-wise process, depending on available annual funding. A Partnership centred on specific programming is ideal for repurposing the existing building. Funding sources are identified in the Colwood PRMP, but could include commercial or memorial naming rights for the optional interpretive shelter and/or bandshell.

TABLE 5: LAGOON WEST PARK - GENERAL SPECIFICATIONS & COST

ITEM:	DESIGN ELEMENT:	GENERAL SPECIFICATIONS:	COST:
1	Soft Costs (15%)	<ul style="list-style-type: none"> engagement, design, monitoring contingency 	\$188,036
2	Repurposed Building	<ul style="list-style-type: none"> scope and cost are purpose dependent include public washroom & water fountain visitor centre (low cost); museum (high cost) 	\$50,000
3	Ecological Preserve	<ul style="list-style-type: none"> allowance for orchard & riparian restorations invasive species removal + new plantings 	\$67,550
4	Parking Lot	<ul style="list-style-type: none"> 50-60 parking stalls includes curb & gutter, asphalt, drainage and landscaped islands & res. buffer 	\$254,225
5	Pathways	<ul style="list-style-type: none"> 1/4" minus crushed screenings pathways min. 2m width 3m width for service access paths. 	\$76,800
6	Signage Program	<ul style="list-style-type: none"> 1 entrance sign 2 interpretive signs wayfinding & rules signage as required 	\$20,000
7	Natural Playground	<ul style="list-style-type: none"> approx. 1100 m² playground area natural play features fibar safety surfacing w/ concrete curb 	\$70,000
8	Site Furnishings	<ul style="list-style-type: none"> aluminum bench frame w/ durable inset matching garbage/recycling receptacles memorial bench program applies 	\$15,000
9	Interpretive Shelter	<ul style="list-style-type: none"> optional - funding dependent 20-30 person capacity expandable seating budget-controlled design 	\$200,000
10	Bandshell	<ul style="list-style-type: none"> optional - funding dependent 10m wide x 5m deep stage area 	\$500,000
Total Cost:		<ul style="list-style-type: none"> cost will vary with detailed design, programming of specific elements, and inclusion of optional items 	+/- \$1,442,000

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Perimeter Park is constrained to the west by steep bluffs. A relatively narrow stretch of flat land between the bottom of the bluffs and the beach is available for the creation of an important multi-use path connection between Royal Beach and Esquimalt Lagoon, but this narrow landscape is characterized by water seepages, wetlands and large trees and is not well suited for construction of a conventional trail surface. A raised walkway is proposed for this section of the waterfront multi-use path, combined with riparian vegetation restoration and other minor improvements described in detail below.

BACKGROUND AND RATIONALE:

- The Perimeter Park section of the waterfront multi-use pathway is proposed as an elevated walkway. The elevated walkway will become an important, heavily trafficked portion of the waterfront trail by connecting the future Royal Beach neighbourhood to the Seaside and Lagoon neighbourhoods. The elevated walkway will be universally accessible, and of sufficient width to accommodate significant pedestrian traffic. It will also be designed to minimize impacts to the landscape in the short term and to remain resilient to sea level rise in the long term. Note that the accommodation of bikes is recommended as part of a 'shared use' pathway rather than providing dedicated bike lanes through this corridor.
- Proposed steps from the elevated walkway down to the beach at intervals will facilitate controlled beach access.
- A proposed trail intersection plaza at the south end of the boardwalk will provide opportunity for wayfinding signage, benches, garbage and recycling receptacles and sitting steps down to the beach.
- Pathway improvements and vegetation enhancements from the south pedestrian node up the slope through Perimeter Park are also recommended to facilitate improved access to the waterfront.

GENERAL LOCATION MAP

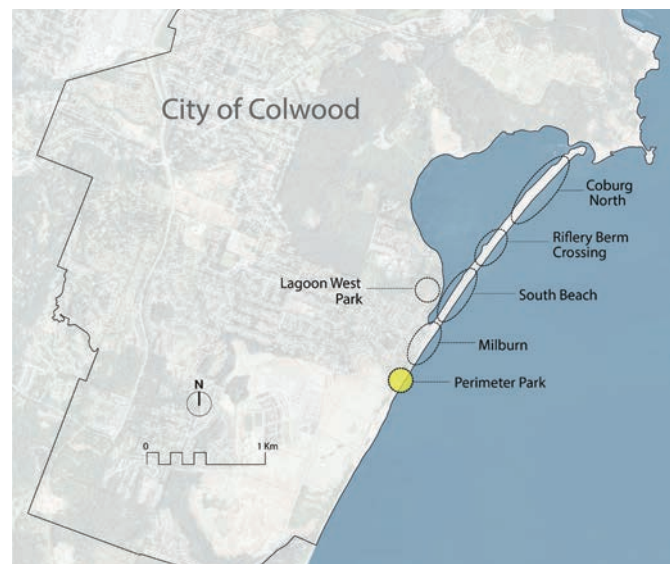


Figure 43: Perimeter Park- General Location Map Source: PDLA

CONTEXTUAL SITE PLAN



Figure 44: Perimeter Park - Contextual Site Plan Source: PDLA

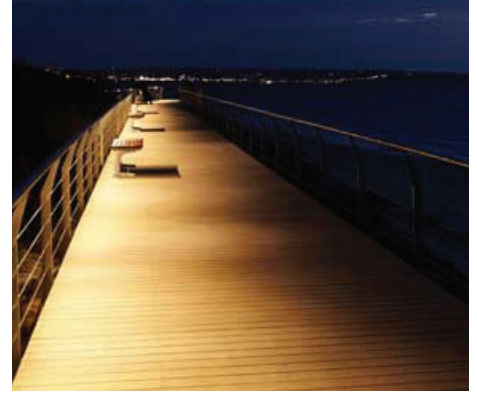


Olympic Village, Vancouver BC

Large granite steps down to the water double as seating and a fun and adventurous destination for all ages.



Raised pathways are beloved destinations that offer opportunity for scenic views while getting close to nature.



Elevated walkway surfacing is to be durable and provide universal access.

PROPOSED DESIGN ELEMENTS



Figure 45: Perimeter Park - Proposed Design Elements Source: PDLA

PROPOSED PROGRAMMING

#1 First Nations Engagement: Detailed design process to include opportunity and capacity for First Nations contributions.

#2 Perimeter Park Enhancements: Reduce pathway grade up slope through park by adding switchbacks, and use fencing to prevent foot traffic on slopes. Revegetate ravelling gravel slopes.

#3 Trail Intersection Plaza: Small pathway node at south end of raised walkway to include wayfinding signage, benches, garbage and recycling receptacles and steps to beach.

#4 Raised Walkway: Connect Royal Beach to Ocean Blvd. with raised walkway c/w railings, steel pilings and fibre-reinforced decking. Align with toe of bluff and minimize impacts to existing trees.

#5 Beach Access Steps: Provide at least two access locations from raised walkway to beach. Steps to be designed to withstand impacts from driftwood.

#6 Riparian Vegetation Enhancements: Remove invasive species and plant area with native species. Where raised walkway construction disturbance occurs, ensure full restoration of vegetation.

#7 Transition to Woonerf: Small plaza transition to raised walkway.

Implementation of the Perimeter Park improvements can occur independent of other interventions. All other improvements should be implemented concurrently. The construction method for the raised walkway should minimize impact to existing riparian vegetation, either through the use of a single narrow service path under the proposed raise walkway alignment, or by building incrementally from completed portions.

TABLE 6: PERIMETER PARK - GENERAL SPECIFICATIONS & COST

ITEM:	DESIGN ELEMENT:	GENERAL SPECIFICATIONS:	COST:
1	Soft Costs (15%)	<ul style="list-style-type: none"> engagement, design, monitoring contingency 	\$247,035
2	Perimeter Park Enhancement	<ul style="list-style-type: none"> 1.5m compacted gravel path, max. grade 10% split rail or page-wire fencing. vegetation enhancement and invasive species removal 	\$39,400
3	Trail Intersection Plaza	<ul style="list-style-type: none"> 2 benches; hardscape surfacing; granite block steps to beach wayfinding, location (Perimeter Park) and interpretive signage (gravel pit history) 	\$48,500
4	Raised Walkway	<ul style="list-style-type: none"> 4m width, steel construction on pilings; fiber-reinforced/slip resistant plastic decking (see conceptual cross section). Construction method to minimize site impact 	\$1,538,315
5	Beach Access Steps	<ul style="list-style-type: none"> 1.5m width slip resistant treads. Ensure robust construction to resist impact from driftwood 	\$100,000
6	Riparian Vegetation Enhancement	<ul style="list-style-type: none"> invasive species removal (ivy, blackberry, daphne, holly, etc.) and native species plantings. Where raised walkway construction disturbance occurs ensure full vegetation cover with native species. 	\$20,000
7	Transition to Woonerf	<ul style="list-style-type: none"> long term transition plaza 	\$9,000
Total Cost:		<ul style="list-style-type: none"> cost will vary with detailed design, programming of specific elements, and inclusion of optional items, particularly raised walkway 	+/- \$2,002,000

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