Surrey Bend Regional Park Management Plan

June 2010

metro vancouver

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July X, 2010

Dear Park Supporter:

Re: Surrey Bend Regional Park Management Plan.

The Surrey Bend Regional Park Management Plan was adopted by the Metro Vancouver Board and the City of Surrey Council in July X, 2010 and Y, 2010 respectively. On behalf of our organizations we are pleased to provide you with this document.

The Management Plan outlines the vision that Metro Vancouver and the City of Surrey share for the long term public use and management of Surrey Bend Regional Park over the next decade. The plan promotes passive recreation, education and conservation program within this highly valued Fraser River floodplain landscape.

Crafting a policy document like the Management Plan requires the participation of a large number and diverse range of people. Of particular note is the significant contribution provided by those members of the public who participated in the park planning process as members of the advisory committee. Others provided input at public open houses or written submissions. On behalf of Metro Vancouver and the City of Surrey we thank you for your interest and encourage you to stay engaged.

Metro Vancouver and the City of Surrey operate numerous regional and municipal parks and recreation facilities for the benefit of all residents.

Yours truly,

Cllr. Gayle Martin, Chair

Metro Vancouver Parks Committee

Cllr. Mary Martin, Chair

City of Surrey Parks and Community Services Committee

JC/MD/lk

ACKNOWLEDGEMENTS

This Surrey Bend Regional Park Management Plan is a joint initiative of Metro Vancouver and the City of Surrey, BC. The plan was realized through the leadership, ideas and dedication provided by its many contributors. The project team would like to acknowledge the following Metro Vancouver and City of Surrey staff members for their significant contributions.

Metro Vancouver

- Paul Wilting, Senior Engineer, Civil, Mechanical Design & Construction Division
- Frieda Schade, Central Area Manager Regional Parks
- Craig Sobering, Senior Park System Planner
- Alison Evely, Natural Resource Management Specialist
- Greg Peters, Assistant Superintendent Water Supply and Waste Water Collection System Operations

City of Surrey

- Owen Croy, Manager of Parks
- Tiina Mack, Manager of Parks Planning, Research and Design
- Ted Uhrich, Parks Planner
- Doug Merry, Parks Planning Technician

Advisory Committee Organizations

- Fraser Heights Community Association
- Surrey Environmental Partners
- Vancouver Area Cycling Coalition
- Vancouver Natural History Society
- Unaffiliated Paddling Sports Representative
- Sur-Del Power & Sail Squadron
- Trails BC
- BCIT Fish, Wildlife and Recreation Program

We would also like to offer recognition to community organizations, additional local and regional government staff contributors, agencies and individual members of the public for their input and consideration of this plan. The firm of HB Lanarc Consultants Ltd. was retained as prime consultants to prepare the management plan report and supporting documents. Don Crockett and David Reid are the principals of record, with assistance from Anne-Marie Whittaker and Andrea Tower. Ron Kistritz and Ken Summers were the consulting registered professional biologists responsible for preparing the ecological framework that is the basis for the park management plan.

EXECUTIVE SUMMARY

The City of Surrey and Metro Vancouver, with considerable assistance from the Province, commenced acquisition of land at Surrey Bend in 1995 and have jointly completed this plan. The site will be managed by Metro Vancouver as a Regional Park, but the City will remain involved in an advisory capacity and will participate in any future updates of the plan.

Surrey Bend is a 348 hectare natural area of regional significance. The largest publicly owned natural area in the City of Surrey; it is part of a complex of parks and protected areas along the Fraser River. The Surrey Bend Management Plan outlines a vision for the future of Surrey Bend as a Regional Park with a strong conservation focus.

Prepared with comprehensive public engagement, the plan preserves seventy five percent of Surrey Bend's area in an undisturbed state. In addition to protecting two large blocks of bog, forest and shoreline habitats, the plan will also preserves the important natural hydrologic processes that created and support this special place.

The plan proposes a modest trail network and entrance area with parking and basic facilities to enable people to enjoy the beautiful Fraser River location. Park facilities will be built in stages. There is a commitment to studying and documenting the site's ecology and natural values. The park will offer educational opportunities to people of all ages and interests. Surrey Bend will be managed by Metro Vancouver Parks to ensure that people use the site safely and respectfully.

The Province (Ministry of Agriculture and Lands) has confirmed its support for this plan in a letter which states that the plan is in alignment with the conservation goals for which the lands were acquired.

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INTRODUCTION

Surrey Bend Regional Park (SBRP) contains an undyked mosaic of wetlands and riparian forests that are becoming increasingly uncommon in the lower Fraser River basin. These parklands are a scientific, educational, recreational and cultural resource for the City of Surrey and the region. The Surrey Bend floodplain, characterized by a unique peat bog and wetland complex, is part of the Fraser River delta that formed approximately 7000 years ago after the retreat of glaciers in Southwestern BC.

The area is of exceptional ecological significance due to its diverse range of wetland habitats. The park features the Fraser Valley's greatest diversity of wetland types, third largest and relatively undisturbed bog, largest grass dominated marsh and largest floodplain swamp (Kistritz et al 1992). Surrey Bend is particularly significant because of its large and undivided size. In addition to providing habitat for a diversity of wildlife species, it serves as a valuable genetic reservoir and shelter for plants and wildlife.

SBRP offers a tremendous opportunity to preserve a unique ecosystem and to allow citizens to experience and understand the historic landscape of the Fraser River floodplain. The park will focus on passive recreation, environmental education, nature study, community stewardship, and health and wellness. It will offer visitors multi-use walking and cycling trails through a variety of natural settings, delightful views of the Fraser River, and low-impact facilities in the park's entrance and activity area. Universal access will be a key consideration.

1. PURPOSE OF THE MANAGEMENT PLAN

The purpose of the SBRP Management Plan is to provide a framework for the long term management of and public access to Surrey Bend Regional Park. The Plan will achieve this aim by expressing a long term vision for the park and by providing management strategies for ecological protection and enhancement of the park's natural, cultural and recreational values. The plan will guide management decisions for the park.

2. METRO VANCOUVER AND CITY OF SURREY PARTNERSHIP

Metro Vancouver and the City of Surrey share common goals for protecting and enhancing environmentally significant areas and for providing recreational access to the Fraser River. The tracts of land that form Surrey Bend are owned in part by the City of Surrey and in part by Metro Vancouver. Creation of this major waterfront park on the Fraser River has been made possible by cooperation between the City of Surrey and Metro Vancouver.

Staff from the two organizations initiated joint meetings in 2004, resulting in a Memorandum of Understanding (MOU) in the fall of 2008. This memorandum was adopted by the Metro Vancouver Board and by the City of Surrey Council. Both organizations recognize the high ecological value of Surrey Bend, and acknowledge that conservation is the first priority for the lands. Recreational access and amenities will be compatible with conservation goals. A fundamental agreement between the two parties is that there would be an appropriate level of public recreational access to the site.

The items below derive from the MOU terms and conditions:

Land Tenure and Lease Agreement

The City of Surrey and Metro Vancouver share ownership of the parklands at Surrey Bend. The City will lease its waterfront lands to Metro Vancouver for public park purposes, under the name of Surrey Bend Regional Park. Metro Vancouver will make possessive lands, together with the leased lands, available to the public for park purposes. The lease will be for a period of 99 years. All lands within Surrey Bend have been or will be dedicated as parkland under the Local Government Act. The lease will be signed on completion and adoption of the Management Plan.

Management Planning and Future Management Plans

The City of Surrey has taken the lead in the joint management planning effort for SBRP. A continuing public and stakeholder consultation process is integral to the development and implementation of this management plan. To this point, the public has been involved in the planning process through an advisory committee and community meetings. Key government stakeholders include the Greater Vancouver Sewerage and Drainage District (GVS&DD), and the City of Surrey's Engineering Department. The management planning effort will conclude with adoption of the SBRP Management Plan by the Metro Vancouver Board and the City of Surrey Council.

It is common to review park management plans every five to ten years. Future management plans will be undertaken on the same cooperative basis and jointly adopted.

Plan Implementation
Following adoption of the management plan, detailed design for the first phase of public access infrastructure is required. Metro Vancouver will manage construction and development of the site; however, the City will appoint a liaison to the project to act in an advisory capacity and to sign off on the works for completion.

Joint Operations Committee
Park operations and maintenance will be Metro Vancouver's responsibility. A joint Park Operations Committee comprised of two staff members from each organization, will coordinate and advise on site management concerns park programming, special events and any other initiatives, opportunities or issues that may arise. Metro Vancouver will consider the City of Surrey's Natural Areas Management Plan in operating the park.

3. METRO VANCOUVER CONTEXT

Metro Vancouver is a federation of 22 municipalities, one electoral area, and one treaty First Nation (the City of Abbotsford is a member of Metro Vancouver for the provision of regional park services). Four separate legal entities operate under the name Metro Vancouver:

- Greater Vancouver Regional District (GVRD)
- Greater Vancouver Sewerage & Drainage District (GVS&DD)
- Greater Vancouver Water District (GVWD)
- Metro Vancouver Housing Corporation (MVHC)

Metro Vancouver is committed to delivering essential utility services, (e.g. drinking water, sewage treatment, recycling and garbage disposal) economically and effectively on a regional basis; and to maintaining and enhancing the quality of life in our region by managing and planning growth and development and by protecting air quality and green spaces.

Metro Vancouver operates 22 regional parks, 5 greenways, 3 park reserves and 2 ecological conservancy areas. Surrey Bend is presently one of the Park Reserves, not formally open for public use.

3.1 SUSTAINABLE REGION INITIATIVE

The Sustainable Region Initiative (SRI) was first approved by Metro Vancouver's Board in 2002. A summary document was prepared in 2008 titled the "Sustainability Framework" which outlined and consolidated the practices adopted since 2002. Overarching principles to guide corporate decision-making include the following:

- Regard for both local and global consequences and long term impacts;
- Recognition and reflection on the interconnectedness and interdependence of systems; and
- Collaboration in practices and programs.

These principles provide the basis for three sets of operating goals that guide Metro Vancouver in conserving and developing the natural, economic and social capital of the region:

- Protect and enhance the natural environment;
- Provide for ongoing prosperity; and
- Build community capacity and social cohesion.

Completion of the SBRP Management Plan is a priority under the 2009 Sustainability Framework work plan.

3.2 REGIONAL PARKS AND GREENWAYS PLAN

The Regional Parks and Greenways Plan (RPGP) provides overall direction and priorities for parks and greenways programs and services provided by Metro Vancouver. The RPGP addresses the following key goals:

- Protecting natural resources while accommodating visitors;
- Providing outdoor recreation and education programming;
- Fostering stewardship, wellness, and sustainable living values;
- Expanding opportunities to meet the needs of people of varying ages and multi-cultural origins; and
- Funding, new and replacement facilities for residents and visitors.

Surrey Bend parklands provide a unique opportunity to support the outdoor recreation, natural resource protection, and health and wellness goals of the RPGP.

3.3 EXPERIENCE THE FRASER PROJECT

The "Experience the Fraser" (ETF) project is an interregional recreation and cultural heritage system plan for the Lower Fraser River corridor. The plan covers an area extending from Hope, BC to the Strait of Georgia and its goal is to facilitate a "return to and celebration of the river" for communities within the study area. It is anticipated that the ETF Concept Plan and demonstration projects will provide a range of recreational, environmental, cultural, and social benefits.

Surrey Bend parklands are located on the Fraser River near its confluence with the Pitt River. This area is marked by numerous regional parks, greenways and conservation resources on both banks of the river. While these parklands will support a broad range of ETF goals, their main contributions to ETF success are through providing community recreation amenities, protecting and enhancing river related natural resources, and contributing to enhanced community health and wellness.

3.4 ECOLOGICAL HEALTH PLAN

The Ecological Health Plan (EHP) (currently in development) is one of a collection of complementary plans that integrate sustainability principles into Metro Vancouver's operations, outreach and collaborative governance activities. The EHP will identify Metro Vancouver's role in protecting the region's ecosystems and ecosystem services. SBRP supports the EHP initiative through conservation of a large complex of wetland habitats and associated ecosystem functions that occur there.

4. CITY OF SURREY CONTEXT

The City of Surrey is a rapidly growing community with approximately 460,000 residents as of December 2009. Projections by the City's Planning Department have Surrey growing to a population of 545,000 residents by 2021. The City is divided into six town centres: Guildford, Fleetwood, Cloverdale, South Surrey, Newton and Whalley. Identified as a special growth area, the City Centre in Whalley is intended to be one of the Lower Mainland's major metropolitan centres.

Surrey Bend is the largest park site in the town centre of Guildford, and along with Tynehead Regional Park, forms an integral part of the North Surrey open space network. While the park will be operated by Metro Vancouver, the City of Surrey envisions the park as a destination for all Surrey residents to enjoy passive recreation opportunities, nature interpretation, education, and most importantly, for its continuing function as a significant

ecological hub in the City's natural areas network. This vision contributes to the City's mandate as expressed in three documents: the Sustainability Charter; the Parks, Recreation and Culture Strategic Plan; and the Ecosystem Management Study.

4.1 SUSTAINABILITY CHARTER

The City of Surrey's Sustainability Charter is a commitment by the City to prioritize three pillars of sustainability: social, economic, and environmental. By financially supporting and participating in the development of SBRP, Surrey advances several of the priorities in the Sustainability Charter including the following:

- Enhancement and protection of natural areas, fish habitat and wildlife habitat;
- Land, water, and air quality management;
- Enhancement of biodiversity; and
- Enhancement of the public realm.

4.2 PARKS, RECREATION AND CULTURE TEN YEAR STRATEGIC PLAN

In 2008, the City of Surrey updated its ten year strategic plan for the provision of Parks, Recreation and Culture services for the residents of Surrey. The plan identified five strategic directions into which the City will channel investment for the next ten years. Following from these strategic directions are specific recommendations for the respective divisions of the Parks, Recreation and Culture Department. The Parks Division has direction to invest in the planning and development of Surrey Bend to improve amenities available to residents (such as walking paths and access to the Fraser River waterfront), and protect natural areas. Trails and walking opportunities were the park amenities most frequently requested by residents surveyed during the planning process.

4.3 ECOSYSTEM MANAGEMENT STUDY (EMS)

The protection of natural areas and habitat connectivity is a priority for the City of Surrey. The City's EMS has identified significant habitat nodes and corridors in Surrey to better understand the functioning of the existing ecosystems. Surrey Bend is identified as the largest habitat node in the City and is therefore a high priority for protection and enhancement. Further, habitat corridors leading to and from Surrey Bend are a high priority for protection and enhancement, as the park provides habitat for a diverse range of wildlife species.

5. PLANNING PROCESS AND FIRST NATIONS

The SBRP Management Plan utilized a collaborative planning process, with Metro Vancouver and the City of Surrey working together closely throughout the development of the Plan. The planning process included background research, public and stakeholder consultation and site visits.

Steering Committee: Metro Vancouver and the City of Surrey formed a Steering Committee to guide the detailed development of the Plan.

Advisory Committee: The Advisory Committee provided valuable input throughout the development of the Plan. The committee was comprised of representatives from the following non-governmental organizations and other stakeholder groups:

- Fraser Heights Community Association
- Surrey Environmental Partners
- Vancouver Area Cycling Coalition
- Nature Vancouver
- Paddling Sports
- Sur-Del Power & Sail Squadron
- Trails BC
- BCIT Fish, Wildlife and Recreation Program

Public Consultation: The planning process included three open houses to discuss the community's vision for Surrey Bend and to measure public sentiment on the progress of the Management Plan. A public open house was held in June of 2009 to receive input on the current uses of Surrey Bend, to understand the community's vision for the park and to identify gaps in site analysis early in the process. A second public open house was held in October 2009 to receive feedback on preliminary concepts for park trails and facilities. A third open house was held in April 2010 to receive feedback on the draft Management Plan. Results of the open houses are included in appendix 9.1.

First Nations: Potential First Nations interest in the lands at Surrey Bend has long been recognized. The planning process included a mechanism for providing First Nations that may have interest in the plan with information and opportunities to provide feedback. The following First Nations have been included in this engagement process:

1. Katzie First Nation
2. Kwikwetlem First Nation
3. Sto:lo Nation, comprised of Aitchelitz, Leq'a:mel, Matsqui, Popkum, Skawahlook, Skowkale, Squiala, Sumas, Tzeachten, Shxwha:y & Yakweakwioose First Nations.

4. Sto:lo Tribal Council comprised of Chawathil, Cheam, Kwantlen, Kwaw-kwaw-Apilt, Scowlitz, Seabird Island, Shxw'ow'hamel and Soowahlie First Nations
5. Tsawwassen First Nation
6. Musquem Indian Band
7. Hwlitsum First Nation
8. Hul'qumi'num Treaty Group comprised of Chemainus, Cowichan, Halalt, Lyackson, Lake Cowichan and Penelakut First Nations.
9. Semiahmoo First Nation
10. Tsawout First Nation
11. Tsartlip First Nation
12. Pauquachin First Nation

At the time of this report, the Katzie First Nation, the Musquem Indian Band, and the Kwikwetlem First Nation have expressed interest in the planning process. Representatives of Metro Vancouver and/or the City of Surrey will make an ongoing effort to obtain feedback from First Nations on planning for Surrey Bend. While Surrey Bend is not part of the Musquem Indian Band traditional territory, they have expressed interest in projects that impact the fish populations of the Lower Fraser River.

Government Agencies: Discussion with the following government agencies on a variety of issues affecting the design and management of the park is in progress:

- Fisheries and Oceans Canada (FOC)
- Fraser River Estuary Management Program (FREMP)
- Port Metro Vancouver
- Ministry of Environment
- Ministry of Transportation and Infrastructure
- Ministry of Agriculture & Lands

Metro Vancouver and City of Surrey Approvals Process: The Surrey Bend Regional Park planning process includes two stages of political approvals by Metro Vancouver and the City of Surrey to ensure the plan meets the objectives of both organizations. In October 2009, the Metro Vancouver Parks Committee reviewed the concept plans and supported the plans proceeding to public consultation. In November 2009, the City of Surrey's Parks and Community Services Committee reviewed the preliminary plans and approved the progress of the plan. In July 2010, the final Surrey Bend Regional Park Management Plan was presented to the Metro Vancouver Parks Committee and Board along with Surrey's Parks and Community Services Committee and City Council for final consideration.

6. PLANNING CONTEXT

6.1 REGIONAL CONTEXT

Surrey Bend Regional Park is a large, rare undyked wetland complex in the lower Fraser River basin. It is located in the Lower Mainland in the northeast corner of the City of Surrey on the floodplain of the Fraser River near the confluence of the Pitt and Fraser Rivers. The Park is bounded by the Canadian National Railway to the west, the Fraser River to the north and east and 104th Avenue to the south. The City of Pitt Meadows lies across the Fraser River to the north of the site.

Figure 1: Regional Context Map

6.2 Local Context and Adjacent Land Uses

Surrey Bend Regional Park consists of 348 hectares of land located in the Fraser River estuary between Douglas and Barnston Islands. The park includes approximately 5 km of Fraser River shoreline. Other natural areas located close to Surrey Bend include the Centre Creek Habitat Restoration Area and the Surrey Escarpment. The Park is adjacent to the Fraser Heights neighbourhood of the Guildford Community and the Barnston Island ferry dock and parking area are located at the south east corner of the park at the terminus of 104th Avenue.

An operating sawmill is located to the south of the park site across 104th Avenue. The western edge of the site is demarcated by the Canadian National Railway line and its Vancouver Intermodal Terminal. This line was established in 1891 by the New Westminster Southern Railway (NWSR) and the terminal was constructed during the 1980s. Air photos from September 3, 1986 show the terminal area being filled (the flight line is 30BCC 534 No. 049 and 047). The railway line and terminal have isolated the park from adjacent residential (Fraser Heights) and natural areas. During the development of the Vancouver Intermodal Terminal, the CNR constructed special culverts beneath their property to transfer upslope drainage into Centre Creek and to permit returning salmon to reach spawning habitat south of the facility.

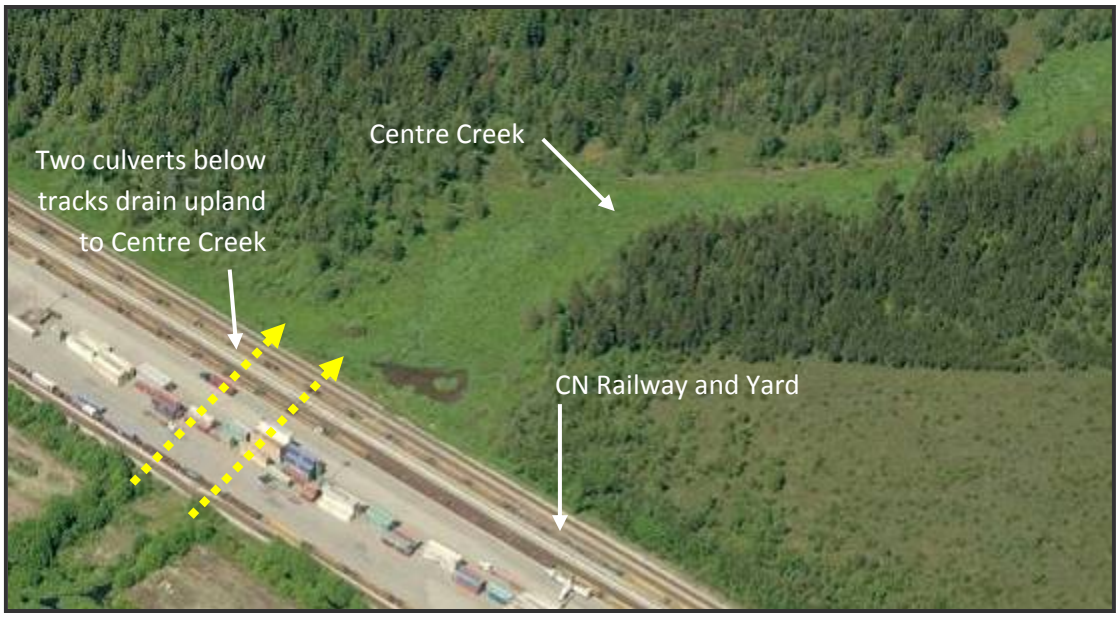


Figure 2: CN Railway Yard

LOCAL CONTEXT MAP

Figure 3: Local Context Map

6.3 TRANSPORTATION, ACCESS AND UTILITIES

Currently, the park is accessed via 104th Avenue with unofficial parking at the Barnston Island ferry parking lot which is owned and operated by the Ministry of Transportation. The parking lot also services walk on traffic to the Barnston Island ferry and sawmill employees. A combination of ferry traffic, semi-trucks, and increasing vehicle traffic from surrounding residential development occasionally creates congestion on 104th Avenue.

South Fraser Perimeter Road

The proposed route for a new 40 km long highway between Surrey and Delta - the South Fraser Perimeter Road (SFPR) - runs adjacent to the CN Railway at the southern boundary of the park site. Although SFPR plans have not been finalized, it is expected that the rail crossing at 104th Avenue will be closed to vehicular traffic (except perhaps emergency vehicles) and that the park will be accessed instead from Triggs Road. Refer to figure 4 for the proposed SFPR alignment in the park access sector.

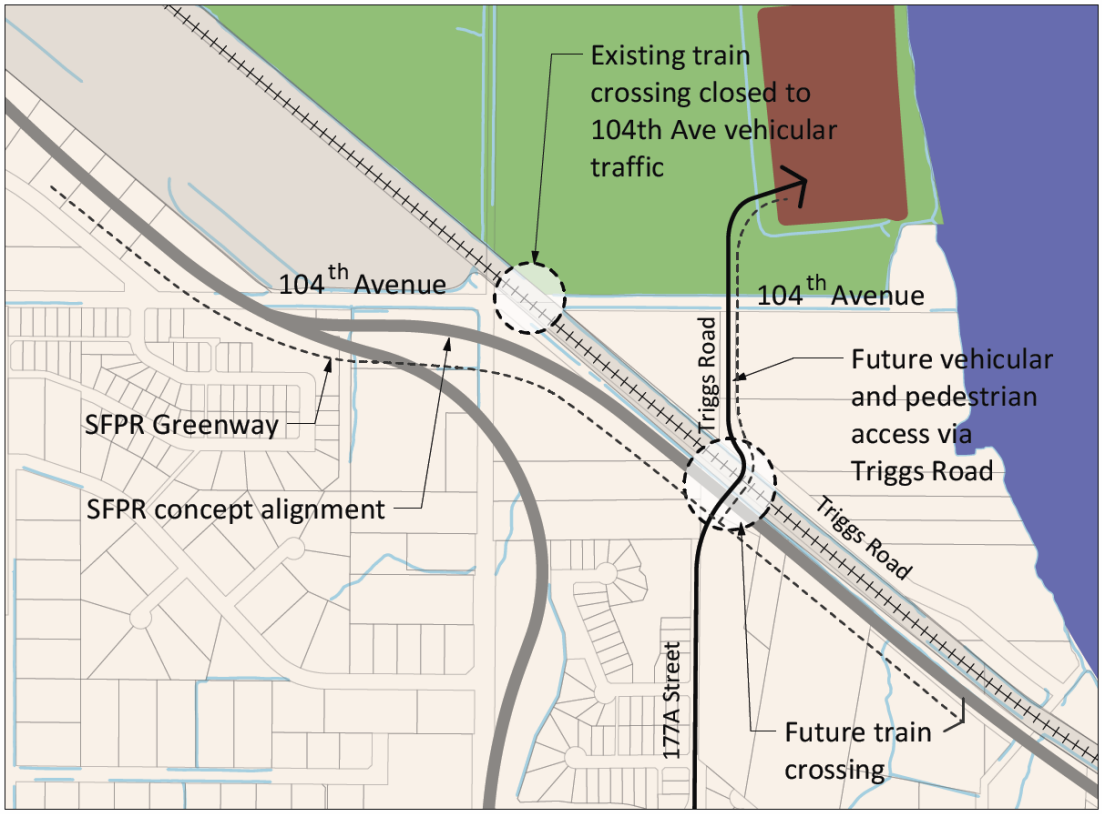


Figure 4: Conceptual Roadway Map

Greenways

The City of Surrey is completing a comprehensive greenway network in the neighbourhoods surrounding the park to facilitate safe and convenient human powered access to SBRP and Barnston Island. Surrey's greenway network will connect to and utilize Metro Vancouver Regional Park trails at Surrey Bend and Tynehead, enhancing the overall connectivity of the greenway system. A key component of the network is a new proposed greenway along the South Fraser Perimeter Road. When completed, this network of greenways will connect SBRP to surrounding natural areas, local neighbourhoods, commercial areas, other municipal and regional parks, and key regional transportation links (i.e. Golden Ears and Port Mann bridges). See figure 5 for a map of the existing and proposed greenways in the Surrey Bend area.

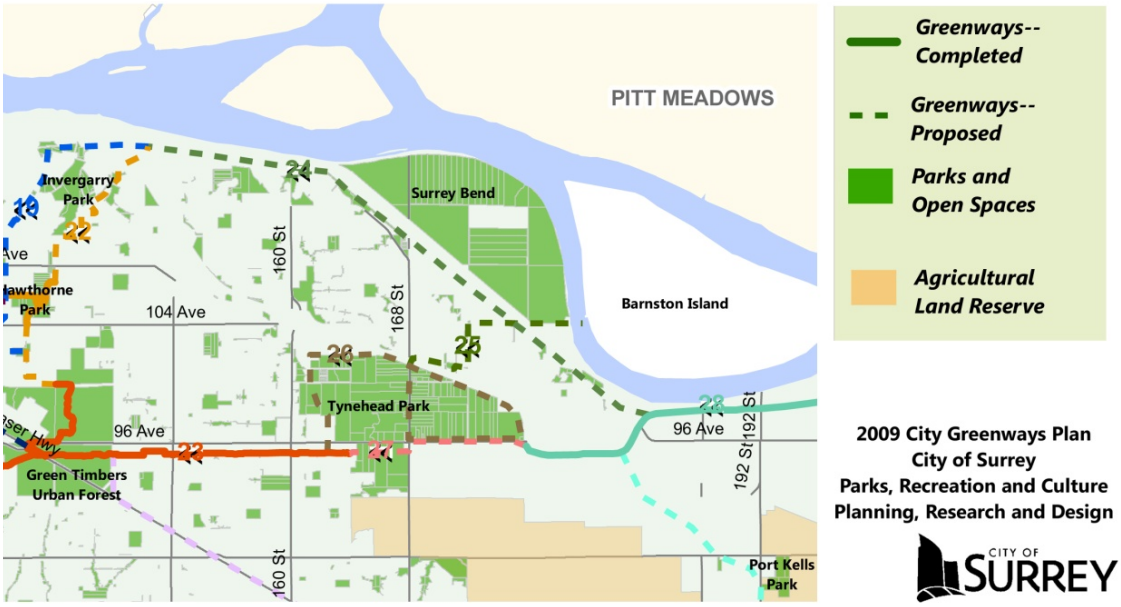


Figure 5: City of Surrey Greenways Plan

Pitt Meadows Airport

The Pitt Meadows Airport is located north of the park on the north bank of the Fraser River. Airports are federally regulated and surrounding areas are subject to zoning regulations limiting the height of natural growths and man-made structures. All but a small portion of the western tip of Surrey Bend Regional Park is located within the "Outer Surface" described within the Pitt Meadows Airport Zoning Regulation. This zoning stipulates that within the

Outer Surface the owner or occupier of the land cannot allow the establishment of a natural growth that is higher than the Outer Surface nor can they erect a structure that exceeds the elevation of the Outer Surface. The Pitt Meadows Airport Outer Surface is 150 feet above the height of the airport reference point which is located in the centre of the airport and 9 feet above sea level.

Maple Ridge Force Main, Surrey Section

Surrey Bend contains one significant segment of regional utility infrastructure – the Surrey section of Metro Vancouver's Maple Ridge Force Main. The Maple Ridge Force Main is a 30 inch diameter Greater Vancouver Sewerage & Drainage District (GVS&DD) force main sewer running through Surrey Bend Regional Park (see figure 3 for location). The steel force main conveys wastewater from the City of Pitt Meadows and City of Maple Ridge to the Annacis Island Treatment Plant. The sewer alignment runs under wet meadow, bog, hard-hack and riparian forest.

Presently sewer maintenance activities are focused on the sewer valve chamber located in the northern portion of the park near the mouth of Centre Creek. Metro Vancouver Wastewater Collection Systems Operations crews access the valve chamber by four wheel drive vehicle via the service road situated near the north end of 176 St. The road currently falls short of the sewer alignment and the valve chamber; there is no access to the sewer from the CN Intermodal yard. From a sewer operations and maintenance perspective, continuous vehicle access along the entire length of the sewer is preferable. This would permit servicing of the mechanical equipment at the north and west end of the park and periodic visual inspection of the alignment to check for the appearance of leaks in this infrastructure. In the absence of continuous vehicle access, operations staff periodically clears the sewer alignment of vegetation to facilitate inspection on foot. GVS&DD have identified a segment of the sewer located within the park for twinning and the need for improved vehicle access to the sewer corridor to facilitate maintenance. The twinning is required to accommodate growth in the catchment area and to provide redundancy for maintenance and management of the system in the event of a sewer failure. The need for this expansion is not expected to materialize for 5 to 10 years.

Figure 6: Force Main Valve Inspection Chamber

6.4 LAND TENURE

Prior to being acquired as park land, most of Surrey Bend was zoned for industrial uses and was mainly privately owned. Due to recommendations arising from a 1990 Habitat Inventory of Eastern Surrey Bend (AIM Ecological Consultants) and a 1992 Ecological Study of Surrey Bend (Kistritz et al), the City of Surrey and Metro Vancouver began the process of acquiring land for a major park at Surrey Bend in 1995.

Land Acquisition & Tenure

In 1995, through a three way cost sharing partnership between Metro Vancouver (i.e. GVRD), the City of Surrey and the Province of British Columbia (as part of the Lower Mainland Nature Legacy (LMNL) program) the process of acquiring land at Surrey Bend commenced. These three parties had a view to manage and protect Surrey Bend for its significant conservation, heritage and habitat values. Forty-four hectares of land which accommodated part of the Maple Ridge Force Main were transferred for the park by the Greater Vancouver Sewage and Drainage District. After the LMNL Program ended, the City of Surrey continued to purchase land until site acquisition was complete.

Parklands making up SBRP are held in fee simple and include 34 land registry parcels totaling 347.7 ha. Parcels are held by the City of Surrey and Metro Vancouver. See figure 7 for a map of parkland ownership and appendix 9.6 for additional property information.

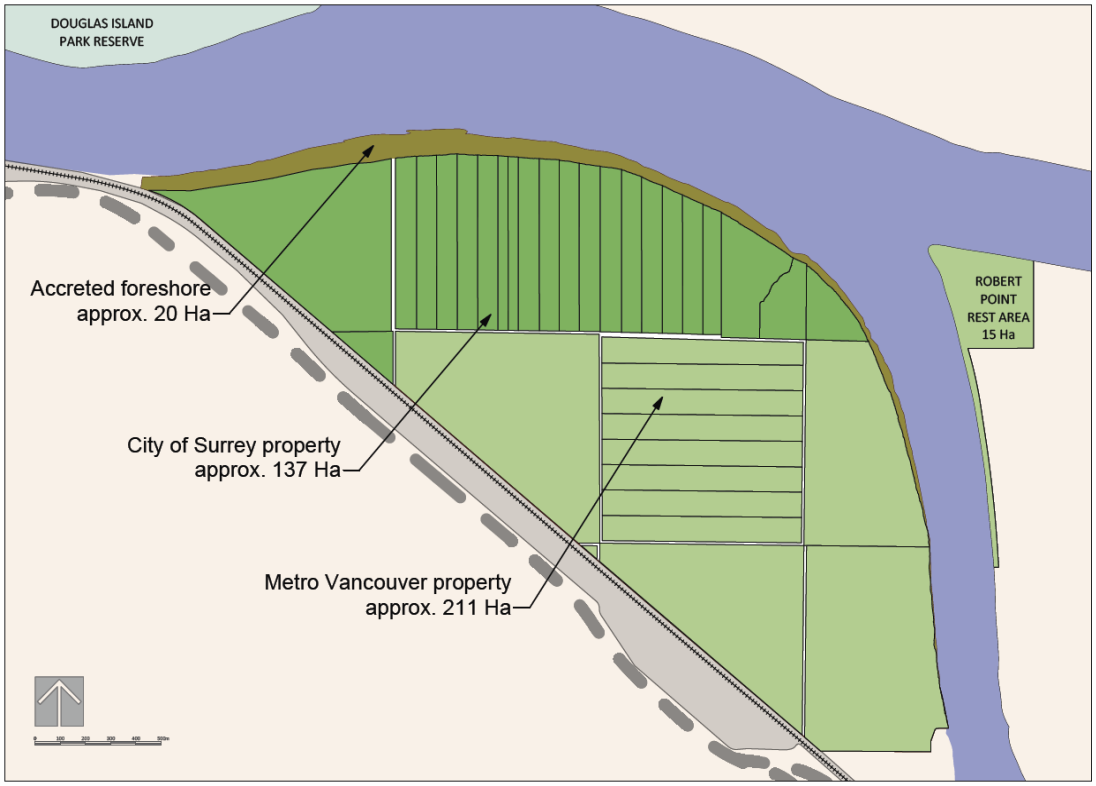


Figure 7: Land Tenure and Ownership

Log Booming & Upland Owner Consent Agreements

The Surrey Bend shoreline is currently a staging area for the log booms that supply local sawmills. Foreshore leases are granted to towing companies by Port Metro Vancouver and the upland owner (City of Surrey and Metro Vancouver in this case). Log booming agreements have time limits, place operation requirements on the towing company, set out financial compensation and describe the cancellation procedure. There are presently 5 active upland owner consent agreements for Surrey Bend. Metro Vancouver has 2 agreements on their holdings and the City of Surrey has 3 on theirs.

Rights-of-Way

There are no utility Rights of Way located within SBRP at present. The City of Surrey and Metro Vancouver are providing tenure for the Maple Ridge Force Main that meets the needs of the regional utility and the regional park (see figure 3 for location of force main). Unused road allowances for 112th Avenue and 168th Street are located within the park.

Restrictive Covenants

Most of the lands at Surrey Bend acquired with Provincial participation during the Nature Legacy Program are subject to a restrictive covenant held by the Province of British Columbia. The covenant protects the parklands for their high environmental and conservation values and restricts excavation and timber cutting (see appendix 9.6).

6.5 CLIMATE CHANGE

Climate change refers to the long-term changes in average temperature, precipitation, and weather events such as storm frequency and intensity. Although it is impossible to predict the degree of alteration, significant changes in precipitation, temperature, and the frequency and intensity of storms could have profound impacts on the park's hydrological features, process and ecosystems.

In this region, one of the most noticeable effects of global climate change will be rising sea levels. If sea levels rise, groundwater tables and surface waters in low-lying areas will experience salt water incursion. Many plant and animal species may be displaced by higher salinity levels in near-shore habitats and replaced by other plant and animal communities. This may significantly disrupt the existing complex food chain of invertebrates, shellfish, fish (especially salmon), ducks, shorebirds, raptors and marine mammals. As sea levels rise, it is possible that tidal flats, such as brackish marshes, may undergo the largest reductions of biological productivity and habitat or conversion to other wetland types. For further discussion on the potential impacts of climate change on Surrey Bend, refer to appendix 9.4.

6.6 HYDROLOGY OVERVIEW

Surrey Bend is a large undyked floodplain area in the lower Fraser River. No location in the park exceeds 5 meters above sea level and much of the park is subject to periodic flooding from the Fraser River. The park protects a variety of wetland types. Wetland diversity at Surrey Bend is the result of a variety of hydrological processes including daily tidal cycles, seasonal high water levels, past flood events, run off from upland slopes and direct precipitation. An understanding of these processes is crucial to protecting the ecological integrity of Surrey Bend.

Centre Creek as it drains into the Fraser River

Fraser River Floodplain

The site is subject to tidal influences from the Strait of Georgia. Water levels along the Fraser River in Surrey fluctuate by as much as 2.5 meters daily, exposing mud flats at low tides and inundating banks at highest tides. Daily and seasonal variations in water levels create temporary pools and wetted areas that support aquatic vegetation. Kistritz et al (1992) identified four distinct wetland types that are dependent on tidal flows and/or seasonal flooding. These include shallow water, tidal freshwater marsh, flood plain marsh and wet meadow.

In spring, snow melt through the interior and mountainous areas of the province creates high flows on the Fraser River. This phenomenon is called a freshet. During a typical freshet, water levels increase in volume throughout the spring, peaking in late May or early June. Volumes can double or triple over this period; however, the annual freshet is highly variable. Between 1969 and 2009, the highest water level measured at the Mission Gauge during freshet ranged from 3.0 meters to 7.0 meters geodetic. Based on the Fraser River hydraulic model developed in 2008, these levels correspond with a predicted 1 to 2.9 meters range for the downstream end of Barnston Island at high tides. In 2007, water levels peaked at 5.9 meters in Mission and at 2.42 on Barnston Island. During the 2007 freshet, a large portion of

Surrey Bend, including the service road into the park was flooded. The highest flood on record in 1894 had an estimated water level of 7.9 meters measured at the Mission Gauge, an equivalent of 3.28 at Surrey Bend. Although no records exist for Surrey Bend, it is likely that the entire area was flooded during this event.

Centre Creek and Related Watercourses

A large portion of the park is drained by a network of small tidal channels emptying into the Fraser River. The most significant of these is Centre Creek, a relatively shallow and narrow watercourse which flows through the centre of the park. The headwaters for Centre Creek lay south of the park, just north of Highway 1, draining the upland and slopes of the Fraser Heights community. During high tides, cool water from the Fraser River flows into Centre Creek and smaller tidal channels. As the tide recedes, water and nutrients flow from the channels into the Fraser River.

A constructed drainage ditch runs through the park along the alignment of the service road emptying into Centre Creek at the service road bridge crossing. This "ditch" acts as a tributary of Centre Creek. The impact of the ditch on drainage and wetland function is not known. The stream bed is composed of the parent alluvial soils and is likely sandy or muddy.

Surrey Bend Bog

Surrey Bend has a diversity of wetland types and holds the third largest intact bog in the Lower Mainland. Only Burns Bog and the original Richmond Bog are larger. The Surrey Bend bog is relatively undisturbed and located near the centre of the park. Bogs are nutrient-poor wetlands isolated from ground water and surface water flows. They are characterized by an abundance of sphagnum mosses and evergreen woody vegetation adapted to nutrient-poor site conditions. Sphagnum mosses generally dominate these systems, causing the organic soils to acidify and retain moisture, thus slowing the decomposition rate and promoting peat accumulation. The sphagnum moss acts as a sponge, storing water at or near the surface.

Bogs are highly sensitive to hydrological changes. Many bog species are not tolerant of flooding (or land uses that change the soil chemistry), as even a moderate increase in nutrients can change the nature of the bog ecosystem. As primarily closed systems, bogs may undergo change through natural processes, but human modifications to the landscape adjacent to a bog have the potential to accelerate changes to this ecosystem type.

Impacts of Climate Change on Hydrology

As noted in section 6.5, one anticipated effect of climate change is rising sea levels. The impacts of rising sea levels on the hydrology of the Fraser River are uncertain with projections for the Fraser River Delta being highly variable. There is general agreement within the scientific community that climate change related sea level increases will cause a higher degree of flooding along the Fraser River which may result in the gradual conversion of existing wetland habitats in Surrey Bend to other types of wetland.

6.7 GEOPHYSICAL AND SOIL

The geophysical and soil attributes of Surrey Bend are heavily influenced by the park's location within the Fraser River Delta. As with all deltaic deposits, the park is characterized by flat, low-lying floodplain soils between 0-10 meters above sea level. The site's soils are poorly drained and possess high water-holding capacity. Soils on the site are typical of wetlands and include alluvial and organic (peat) deposits. The soils in close proximity to the Fraser River have generally been deposited in bands that run parallel to the course of the river.

In addition to the naturally occurring soils, a portion of the site (north of the ferry dock) was preloaded with hog fuel and aggregates in 1973 in preparation for an industrial development. This area is referred to as the fill site throughout this plan. Natural soil forming processes are occurring in this area as evidenced by the growth of a number of herbaceous and woody pioneer plant species. No formal soil survey has been conducted on this area, but a geotechnical study was conducted to determine the suitability of the site for industrial use (Golder Associates). An informal visual survey indicates that the area is marked by coarser soil textures than found on the parent alluvial soils present on site. Because of their coarse texture, the nutrient and water holding capacity of these soils is lower.

6.8 ECOSYSTEMS OVERVIEW

Terrestrial Habitat

Surrey Bend possesses a rare association of foreshore, wetland and transitional habitats including fresh water marsh, wet meadow, sparsely vegetated habitat, shrub thickets, bog, and riparian forest. The variety and juxtaposition of foreshore and upland plant communities provide habitat for a wide variety of species.

No formal wildlife surveys have been completed; however, observations from local naturalists indicate the site is used by a wide variety of aquatic and terrestrial wildlife. For example, beaver, muskrat, mink, and otter have been observed along the river and in adjacent channels. Mammals likely to occur in the upland and transitional habitats include Townsend's Vole, Wandering Shrew, Deer Mouse, Coast Mole, Douglas Squirrel, skunk, raccoon and coyote. In addition, Black Bear and White Tailed Deer are reported to move through the site.

The site also provides excellent habitat for insects, birds, amphibians and reptiles. Mosquitoes breed in shallow marshes and along the foreshore. Shorebirds, such as Greater and Lesser Yellow Legs, Spotted Sandpiper and Killdeer feed along the water's edge. Waders hunt in the meadows and marshes, while numerous migratory and resident birds breed and feed in the upland habitats. Raptors are supported by foraging, nesting and perching opportunities on the site. The wetlands provide exceptional habitat for amphibians; the grassy meadows and sparsely vegetated fill area are used by garter snakes.

Habitat Reservoir

Surrey Bend functions as a habitat reservoir for many species that are able to maintain viable resident or seasonal populations within its confines. For many other species it provides a significant contribution to their annual life requirements. For birds in particular, Surrey Bend functions as a unit with adjacent natural areas (especially the Surrey Escarpment, Barnston Island, Douglas Island, and the riparian fringe and farmlands of Pitt Meadows). Surrey Bend likely serves as a major resource and stopover destination for birds migrating, dispersing along the river or traveling via habitat patches in the upland landscape.

Surrey Bend is large enough to harbor small and medium sized mammals, and potentially larger ones like deer. Medium sized mammals, such as coyotes and raccoons, may regularly cross the up to 200 m wide barrier created by the road and railroad corridor. The smallest

mammals, such as mice and shrews, would be more physically and genetically isolated. The same is true for reptiles and amphibians.

Aquatic Habitat

Tidal fluctuations in Surrey Bend's streams promote conditions that support salmonids. Water from the Fraser River keeps Centre Creek cool, the daily flushing washing detritus out and moving nutrients into the Fraser River. This is especially true in the winter months, when juvenile salmon seek secluded areas to escape the strong currents of the Fraser River. Chinook, Coho, Sockeye, and Cutthroat Trout fry winter in Centre Creek. Coho are thought to spawn beyond the park boundary in the upper reaches of the creek, but this has not been confirmed.

Ten native coarse fish and three non-native fish have also been identified in fish surveys of Surrey Bend. Native fish include Prickly Sculpin, Three-spined Stickleback, Brassy Minnow (blue listed), Leopard Dace, Long Nosed Dace, Northern Pike Minnow, Peamouth Chub, Redside Shiner, and Starry Flounder. Non-native fish include Carp, Brown Catfish, and Black Crappie.

Species at Risk

The following species have been identified in informal surveys or are confirmed for similar habitats near Surrey Bend.

Although relatively common locally, Great Blue Herons are blue-listed (vulnerable) in British Columbia and listed as species of Special Concern (SC) under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Herons nest colonially in riparian forests near shallow water where food is plentiful. No nests have been identified at Surrey Bend; however, the park does contain suitable habitat for nesting and herons are regularly observed hunting in the area. Herons hunt in shallow creeks, in marshes, on mudflats in the intertidal zones, and in wet meadows. A large heronry is located at the mouth of the Coquitlam River, approximately 3.5 km from Surrey Bend.

The Red-legged Frog is blue-listed in British Columbia and is listed as a species of special concern under COSEWIC. Red-legged Frogs breed in shallow ephemeral ponds in forested areas. Populations have declined in British Columbia, most likely as a result of habitat loss and perhaps as a result of competition with and/or predation by introduced Bullfrogs. Red-legged Frogs may also occur at Surrey Bend, although there are no confirmed occurrences at this time.

Pacific Water Shrew is red-listed (endangered) in British Columbia and is listed as endangered under COSEWIC. A semi-aquatic shrew that swims and dives underwater to capture aquatic invertebrates, this shrew is associated with streams and wetlands in coniferous and deciduous forests. An adult specimen was collected from a forested slough in the Fraser Heights subdivision near Surrey Bend (BC Conservation Data Centre). As Surrey Bend has suitable habitat for this shrew, it is likely to occur there.

Vegetation

Surrey Bend's vegetation types were identified through field work, mapping, data collection and classification as part of *An Ecological Study of Surrey Bend* (1992) (see figure 8). Surrey Bend contains a mixture of undyked wetland habitat types scarce in the Fraser Valley lowland. It supports the third largest (80 ha) bog in the Fraser Valley and is one of only two bogs that have remained relatively undisturbed – the other being Burns Bog. It contains what may be the largest (25 ha) remaining natural wet meadow in the Fraser Valley.

The vegetation types are as follows:

- **Shallow Water:** mostly submerged aquatic vegetation
- **Tidal Freshwater Marsh:** a high marsh zone between the intertidal mudflat and river bank, subject to daily flooding and dominated by reed canarygrass
- **Floodplain Marsh:** very wet and nutrient rich marsh, reed canarygrass most abundant vegetation
- **Wet Meadow:** a wet area of dense reed canarygrass
- **Hardhack – Grass Complex:** a mixed shrub zone of hardhack and reed canarygrass
- **Hardhack Thicket:** a very moist to wet shrub zone of almost impenetrable barrier of hardhack vegetation
- **Hardhack – Willow:** a mixed shrub zone of hardhack and willow with slightly moister soils
- **Cottonwood – Alder Forest:** a very moist, densely forested area in ridges along the river bank

- **Coniferous – Hardwood Complex:** a wet lowland forest that meets the floodplain
- **Birch Woodland:** a wet birch forest with an understory shrub layer
- **Bog Complex:** a wet open and treed bog that covers the centre area of the park

Figure 8 displays the original vegetation map from Kistritz et al. (1992) for reference purposes. Mr. Kistritz has adapted the vegetation map and classification as the basis for the Surrey Bend sensitivity mapping and zoning undertaken for the Management Plan (figure 9).

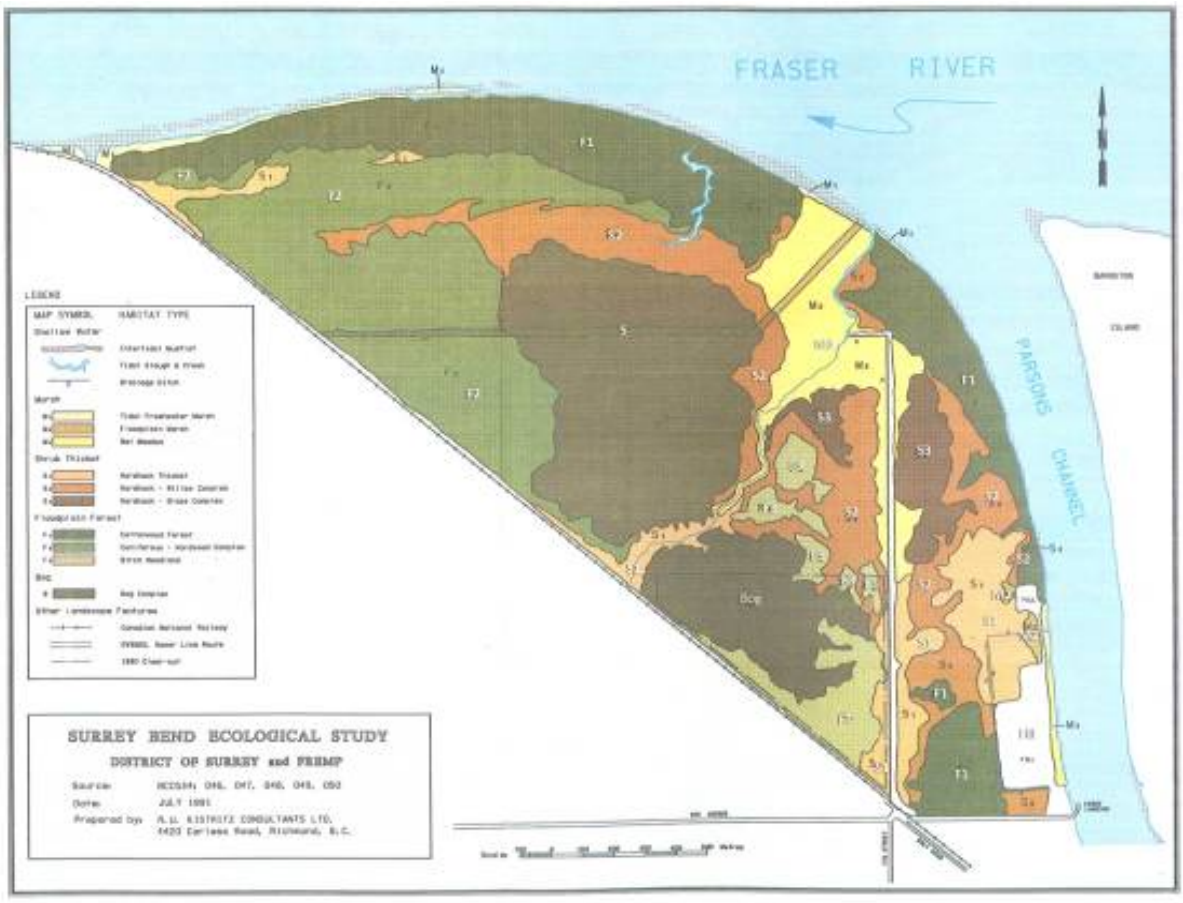


Figure 8: Original Vegetation Analysis Map from Kistritz et al. (1992). A readable map of vegetation types is shown in figure 9.

Habitat Connectivity

Surrey Bend has been identified as the largest "habitat node" within the City of Surrey through the City's Ecosystem Management Study. Surrey Bend is part of a larger complex of parks and protected areas connected by the Fraser and Pitt Rivers. Many of these sites support wetland components similar to those found at Surrey Bend; together they contribute to regional diversity and protect many hectares of valuable vegetation and wildlife habitat. Protected sites found within five to ten kilometers of Surrey Bend include the Coquitlam River Wildlife Management Area, Douglas Island, Colony Farm, Tynehead Regional Park, and Derby Reach Regional Parks. Protected sites within twenty kilometers of Surrey Bend include Pitt-Addington Wildlife Management Area, Widgeon Marsh Regional Park reserve, Purfleet Point Reserve, Brae Island and Don and Lion Islands.

Protected natural areas adjacent to Surrey Bend located south of the CN railway include the Centre Creek Habitat Restoration Area and the Surrey Escarpment. However, habitat connectivity between the park and protected upland areas is limited by the CN intermodal yard, railway tracks and 104th Avenue. The Center Creek Habitat Restoration Area, managed by The Land Conservancy, is connected to Surrey Bend via twin culverts that pass under the CN property and 104 Ave. The area was identified as an important spawning area for Coho; however, no recent fish surveys have been conducted and continued use by salmonids is unconfirmed. Similarly, the road and railway limit wildlife movement and habitat connectivity between Surrey Bend and the Surrey Escarpment. The South Fraser Perimeter Road will further accentuate the separation between Surrey Bend and natural areas to the south.

6.9 Heritage and Archaeological Resources

Coast Salish First Nations settlement of the Fraser River estuary dates back approximately 8000 years. First Nations have historically used the estuary for its highly productive natural resources and as an area of settlement.

Archaeological Resources

An archeological site at the mouth of Centre Creek was identified in an archeological survey in 1979. Site DbRq4 was listed and classified as a site of occupation based on the presence of fire broken rock. Since that time the site was determined to have been destroyed and

consequently declassified. However, it is possible that more archaeological sites are present in the park.

The Coast Meridian

In 1859, J.W. Trutch contracted with the Chief Commissioner of Lands and Works for the Colony of British Columbia to survey the area which later became known as the City of Surrey. To facilitate his survey, Trutch established a survey reference line called the Coast Meridian. The reference line started at the intersection of the international boundary and the shore of Semiahmoo Bay and proceeded due north to its end on the south shore of the Fraser River. Trutch and his crew slashed the survey line for its entire length and established a trail. In wet areas the trail was lined with logs in corduroy fashion to limit sinking into wet alluvial soils. The trail was a very important asset to early settlers. Local settlers improved sections of it to provide better access to their holdings. The trail was improved into a road and named the Coast Meridian Road. Eventually the road was renamed 168th Street.

Coast Meridian Corduroy Road, 1970s

The northern portion of the Coast Meridian is located in the western section of Surrey Bend Regional Park. A GVRD landfill suitability report prepared in the 1970's contained reference to the presence of the Coast Meridian on site and a photograph of a remnant of the corduroy road. Due to the challenging access to the western portion of the park it is difficult to ascertain if any vestiges of the Coast Meridian or its trail remain. The 168th Street alignment may have been the access point for a hermit that was documented to live in the northwest corner of the park in the 70's and 80's.There is no longer any trace of the hermit's home which was reportedly built with a boat as a roof.

Hermit's Dwelling: **Photo Credit - Western Canadian Wilderness Committee**

6.10 Current Use and Trends

Public use of Surrey Bend is currently limited to the central and eastern portions of the park. This use is informal and largely unmanaged. Primarily, visitors park in the Barnston Island ferry parking lot and walk into the fill area, using an informal path that follows the eastern shoreline of the park along Parson's Channel. This path provides views onto the Fraser, as well as experiences in the riparian forest zone along the banks of the river with large Cottonwood and Sitka Spruce trees.

Also, visitors use the service road informally for public access as far north as the mouth of Centre Creek at the Fraser River. Park access west of the service road is very difficult due to thick vegetation and watercourses. Informal public use of the site includes dog walking, nature viewing, mountain biking and fishing. Metro Vancouver observations and automatic counters located on the service road indicate that this area of Surrey Bend is visited by between 3,000 to 5,000 visitors annually. Visitor use of the fill area is not tracked presently. A small but regular level of undesirable use takes place on the fill area. This includes motorized off-road vehicles, campfires and parties.

6.11 Community, Stakeholder and Agency Feedback Overview

Members of the public were invited to share their thoughts on the development of Surrey Bend Regional Park. Feedback opportunities included discussions with the project team and voluntarily filling out questionnaires. 149 people attended open houses to provide their input during the planning process.

In Open House #1, participants were asked about their vision for the park, concerns and appropriate uses. The top three appropriate uses identified were walking/running trails and loops, cycling routes, and picnic sites. In Open House #2, participants were asked to comment on the draft vision and guiding principals for the park, three concepts for trail development, three concepts for development in the fill site, and the possibility of including a boat launch in the park.

The majority of public respondents (61%) at Open House #2 felt that the best feature of Surrey Bend is the large amount of undeveloped open space and many comments indicated that the natural features and wildlife habitat should be preserved. The highest priority for passive recreation in the park was for walking trails (88%). Sixty two percent (62%) of respondents preferred the trail concept which offered the most extensive recreational trail network. A significant number of respondents also indicated support for cycling paths, a picnic area, and wildlife viewing facilities. The majority of public respondents were not in

favour of a boat launch in the park, with comments indicating concerns about noise, safety, and boat traffic.

In Open House #3, participants were asked to comment on the draft Park Management Plan with particular emphasis placed on the proposed scaled down recreational trail network, and park entrance and activity unit concepts. Forty nine percent (49%) of respondents did not support the proposed trail network, thirty five (35%) of respondents supported the proposed trail network and sixteen percent (16%) were neutral. Fifty seven percent (57%) of respondents did not support the entry and activity unit concept, thirty five percent (35%) supported the entry and activity unit concept, and eight percent (8%) were neutral.

Open House #3 feedback was a significant departure from the opinions received at Open House #2 which were supportive of a more intensive trail network than advanced in the draft Plan and a similar entry and activity unit concept. Analysis of comments indicates that negative responses to the trail concept do not reflect disappointment in the scaled back trail proposal, but rather a different philosophical perspective than expressed in the Management Plan, and unfamiliarity with park operational programs, and municipal and regional goals and objectives. Comments on the entrance and activity unit reflect a similar perspective. These differences in perspective likely had an impact on the significant difference in opinion between the two open houses.

The planning team reviewed the recent comments within the context of feedback received through the entire stakeholder engagement process, regional and municipal policies and goals, park operations and management experience, and the park management planning process. The conclusion reached by the planning team was that the concepts and strategies put forward in the plan were fundamentally sound, but that several adjustments should be made to address public comments. The trail network (which had been scaled back for conservation purposes) remained scaled back, vehicle parking was reduced to fit with the scaled down trail network, infrastructure development phasing was extended over a longer period of time and the conservation orientation of the plan, key management challenges, goals and objectives were better explained in the final draft.

This information was communicated to all participants in the planning process in advance of final plan adoption and meetings with key group(s) took place for further discussion of the Plan.

Copies of the plan were supplied to key Provincial and Federal agencies. The Ministry of Agriculture and Land's letter of May 26, 2010 (Appendix 9.2.2) confirms that the current plan is in alignment with the restrictive covenant thus the Province endorses the Park

Management Plan. Other comments received to date are included in Appendices 9.2.1 and 9.2.3. Consultation with other stakeholders is ongoing at the time of adoption.

7. PLANNING ANALYSIS

7.1 HABITAT SENSITIVITY ANALYSIS

Surrey Bend encompasses an assemblage of wetland and transitional habitats, many of which are sensitive to disturbance. Metro Vancouver anticipates the adoption of a formal habitat sensitivity analysis methodology to guide park management planning. For the purpose of this plan, a preliminary sensitivity analysis was undertaken by Ron Kistritz, R.P.Bio and Ken Summers, R.P.Bio. The analysis is based on the plant communities identified in An Ecological study of Surrey Bend (Kistritz et.al) and shown in the fold-out map of the same report. The fill area adjacent to Parsons Channel is not included in the assessment as it is a disturbed area, which does not fit into the list of natural habitat types. The habitat sensitivity analysis ranked the habitat types as high, moderate, or low sensitivity to trail incursion. Five criteria were used to make these determinations, including relative size, index of dominance, moisture regime, wildlife disturbance, and regional abundance.

Each criterion was given equal weight and an overall sensitivity rating was calculated by taking the average of all five criteria. The data were then sorted in ascending order to provide a list of prioritized habitat units from most sensitive to least sensitive to trail incursion. A vegetation map was generated from these ratings to provide a graphic representation of the sensitivity ranking (see figure 9 for the Habitat Sensitivity Analysis).

SURREY BEND REGIONAL PARK MANAGEMENT PLAN

Sensitivity of Habitat Types to Trail Incursions

Watercourse with 30m Riparian Setback

MOST SENSITIVE

- F3 Birch Woodland
- M2 Floodplain Marsh
- Tidal Sloughs & Creek
- Intertidal Mudflat
- M1 Tidal Freshwater marsh
- M3 Wet Meadow
- B Bog
- F2 Coniferous Hardwood
- F1 Cottonwood Forest
- S3 Hard-Hack Grass
- S2 Hard-Hack Willow
- S1 Hardhack Thicket
- Fraser River - Parsons Channel

LEAST SENSITIVE

- Fill Site (development area)

Sensitivity Assessment of Habitat Types found in Surrey Bend

Sensitivity of Habitat Types to Trail Incursions 1= High Sensitivity 2= Moderate Sensitivity 3= Low Sensitivity	Map Label	Relative Size	Index of Dominance	Moisture Regime	Wildlife Disturbance	Regional Abundance	Overall Rating
Birch Woodland	F3	1	1	1	1	2	1.2
Floodplain Marsh	M2	1	2	1	1	1	1.2
Tidal Sloughs and Creek		1	3	1	1	1	1.4
Intertidal Mudflat		2	1	1	1	3	1.6
Tidal Freshwater Marsh	M1	1	3	1	1	2	1.6
Wet Meadow	M3	2	3	2	1	1	1.8
Bog	B	3	2	1	3	1	2
Coniferous-Hardwood Forest	F2	3	1	2	3	2	2.2
Cottonwood Forest	F1	3	1	3	3	1	2.2
Hardhack - Grass	S3	1	3	3	2	3	2.4
Hardhack - Willow	S2	3	2	3	2	2	2.4
Hardhack Thicket	S1	2	3	3	2	3	2.6
Fraser River / Parsons Channel		3	3	1	3	3	2.6

Habitat Types are those determined by the ecological study of Surrey Bend (Kistritz et.al. 1992), and shown in the fold-out map of the same report.

HABITAT SENSITIVITY

Figure 9: Habitat Sensitivity Analysis

7.2 PARK CLASSIFICATION AND ZONING

Proposed Classification: Regional Park - Conservation Sub-class

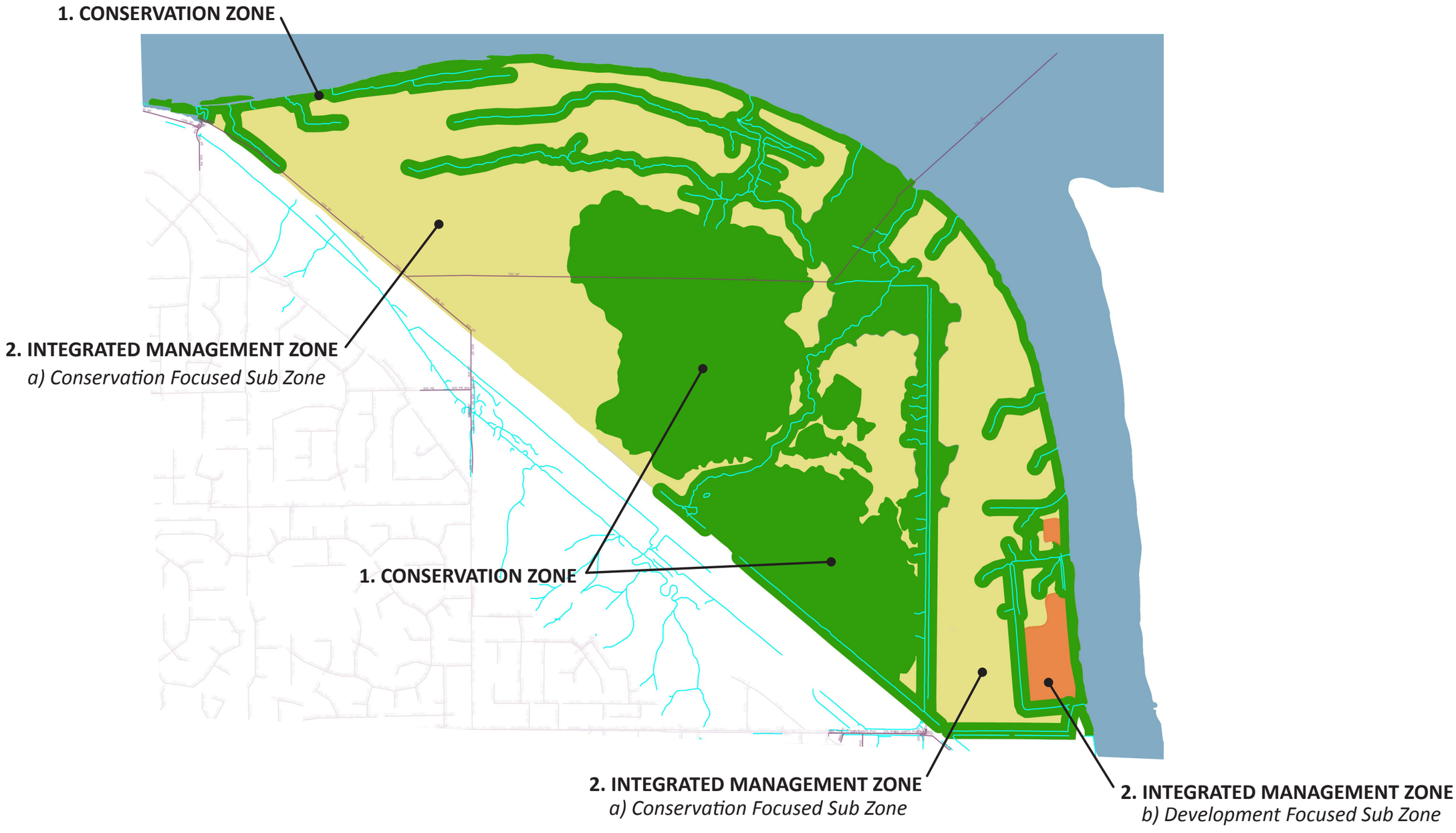
The park classification describes the dominant role of a park within the larger regional park system and provides high level guidance to park management planning and operations. The Habitat Sensitivity Analysis was used to determine classification and zoning within the site. The proposed classification for SBRP is Regional Park – Conservation Sub-class (RPCS). The RPCS classification indicates that the park possesses high conservation values and that recreational activities need to be integrated in a thoughtful and sensitive manner.

Park Zoning Plan

Park zoning allows park planners to classify parklands according to their sensitivity to human activities. Recognizing the sensitivity of natural landscapes to human activities through parkland zoning promotes more sustainable park development and management decision-making in the management planning process. Metro Vancouver Parks uses a modified three zone park zoning system in its park planning and management system. The zones in the Metro Vancouver park classification system are as follows:

1. ***Conservation Zone*** – high sensitivity
2. ***Integrated Management Zone***
    a. Conservation Focused Sub-zone – moderate to high sensitivity
    b. Development Focused Sub-zone – moderate to low sensitivity
3. ***Development Zone*** – low sensitivity

Surrey Bend Regional Park's zoning plan is shown in figure 10. Note that the Development Zone is not represented in the SBRP zoning plan. To reflect the sensitive nature of the parklands at Surrey Bend, the majority of the site is zoned Conservation with a related Integrated Management - Conservation Focused Subzone. This zoning sets the stage for subsequent detailed site planning that protects key habitat areas and identifies areas which will best accommodate public access. The Conservation Zone is the most restrictive to public access. The Conservation Zone does not preclude the development of trails in these areas; however, development in this zone requires application of the highest mitigation standards to help minimize any potential negative impacts. It is understood that there will be a number of constraints to trail and facility development. See the Opportunities and Constraints section for a discussion of these issues.



PARK ZONING MAP

Park Zoning based on Sensitivity Analysis of Landscape Units

Figure 10: Regional Park Classification and Zoning

7.3 OPPORTUNITIES AND CONSTRAINTS

Through the development of every park management plan, a range of potentially competing aspirations for the land base are considered. The planning process examines the consequences of each potential park use, weighs the anticipated trade-offs and arrives at a recommended solution. This section contains a discussion of the competing goals for Surrey Bend Regional Park and documents key decisions made after careful consideration of each issue. The conclusions described in this section set the stage for the concepts, strategies and policies recommended in the park management plan.

Integrating Recreational Use into a Sensitive Landscape

While the ecological function of the landscape at Surrey Bend is the park's greatest asset, it also presents a constraint to park use and development. Surrey Bend possesses a rare association of wetland habitats and a number of individually valuable ecological features and plant communities. The high value of this landscape provides many opportunities for wilderness experience, education, nature viewing, and scenic appreciation. Yet, wetland ecosystems, like the one found at Surrey Bend, are sensitive to human activities that modify their hydrology, disturb vegetation, increase nutrient levels, and/or promote mineral soil deposition.

The key to successful implementation of this park management plan is the manner in which public access is provided and in how the park is managed and operated. Many park systems, including Metro Vancouver's regional parks, have successfully integrated public use into their sensitive and valuable landscapes.

Conclusion: While areas of the park are sensitive to trail and facility development, the public recreational, educational, and interpretive benefits of a well designed and managed park outweigh the ecological impacts of providing public access. Thoughtful facilitation of opportunities for the public to experience the Fraser River and a broad range of habitat types should be promoted through the management plan. To address the constraints to trail and facility development posed by the parklands, the location, design, and construction of recreational elements must be done with care and forethought. In addition, the plan must ensure that Metro Vancouver's proactive approach to park management (e.g. having staff present on site) is applied to ensure optimal protection of Surrey Bend's natural environment and respectful park use by the public.

Protecting Natural Area Integrity

An *Ecological Study of Surrey Bend* (Kistritz et al) confirms that the park is of high ecological value and is sensitive to disturbance. Despite this, the study concluded that the large size and the relatively undisturbed and self sustaining nature of the ecosystem are appropriate for a multipurpose park concept that includes conservation, wildlife management, education, and passive recreation. To protect natural area integrity, park development must be pursued carefully. Key natural features and functions that are important and require protection include the following:

- Hydrological processes;
- The complex mosaic of wetland types representing the greatest diversity of wetlands in the Fraser Valley lowland;
- Key individual examples of large intact wetlands (e.g., bog, wet meadow, marsh);
- Species at risk;
- Significant trees and rare plants; and
- Connections to natural areas outside the park.

Conclusion: To integrate the human use of Surrey Bend with the protection and conservation of its natural values, the plan will ensure the following:

1. The majority of the park is classified as Conservation Zone under the Metro Vancouver Regional Parks zoning system to highlight the area's significant natural values and promote highly sensitive facility development in those limited areas where facilities are planned.

2. Much of the park's shoreline, the bog and large areas of wetland habitats are retained in an undisturbed/undeveloped state.

3. The hydrological processes occurring at Surrey Bend are not altered or disturbed by the construction of dykes and/or significant drainage structures unless required for restoration or conservation purposes, nor should there be any significant additional land filling.

4. The most intensive and extensive park infrastructure developments are located on the least sensitive landscape unit(s), i.e. the fill area.

5. The trail system minimizes the fragmentation of ecosystems and impacts on wildlife, and retains extensive contiguous protected areas of key habitats (e.g. the bog, riparian cottonwood forest, marshes, and wet meadow).

6. The design and implementation of a research and monitoring program is recommended to study the site. The goal of this program will be to collect scientific data on park ecological systems to better facilitate the protection and management of the park. Key topics addressed by the program should include the state of the bog and hydrology.

7. Where there is unavoidable loss or damage as a result of park development, the park development process will strive to replace or improve habitat nearby.

8. Species of concern will be protected following best management practices.

9. Phasing and adaptive management strategies will be employed to test and observe the environmental impacts of trail and facility development and to adjust the program as necessary.

10. To manage uncertainty concerning ecosystem and hydrologic function, all stages of park development and management will be planned, designed and constructed with caution.

Log Booming

Log booming reflects a number of opportunities and constraints to park management and development:

- Log booming represents an important economic use of the Fraser River.

- Log booming is thought to protect river banks from the erosive forces of boat wake. During the field analysis phase of the planning process, observations indicated there were bank stability issues in the fill area along the Parson's Channel portion of the park's shoreline. It is possible that the bank protection provided by log booming could be replicated.

- Log booming can have negative impacts on riparian habitat in foreshore areas if booms are situated where they can rest on the river bank during low tide or if anchor wires are attached to riparian trees.

- Log booming can restrict access to and from shore areas, negatively impacting recreational use of the foreshore. Fishing and paddle sports are two specific recreational activities that are affected by this activity.

- Log booming affects the user experience of a shoreline waterscape. While this industrial waterscape has cultural and aesthetic value, a more natural waterscape is also valued and is more in keeping with the character of Surrey Bend as a wild landscape.

Under the terms of the foreshore consent agreement, log booms are required to be stored in water of sufficient depth as to not ground on the shoreline or riverbed at low tide. As there has not been an audit of the booming practice, it is not known if the operators always comply with this requirement, and if not, the extent of the habitat disruption. Also, although there is evidence of bank erosion along the northwest portion of Parson's Channel, it is not known at this time if this is a natural process or whether human activities are a contributing factor (e.g. wake from boats and log booming at high tides).

Another potential environmental disturbance caused by booming activity adjacent to the shoreline is the historic practice of cable anchoring log booms to larger trees. When cables are not removed, the tree gradually grows in diameter while the cable remains fixed, creating a condition known as tree girdling. Girdling will often slowly kill a tree by interrupting the transport of water and nutrients through its vascular tissues. Observations gathered on site visits indicate that tree girdling has occurred on the Surrey Bend site, specifically on large cottonwood trees. Large trees that are subject to girdling are of concern in areas open to the public.

Despite potential disturbances caused by log booming, it is recognized that working log booms have a place on the river, are part of a rich heritage and may provide opportunities for education and interpretation. Although log booms likely protect shoreline habitat by dissipating the force of currents and waves generated by the Barnston Island ferry or other vessels, it is not well understood how the tug and booming activities are affecting the foreshore habitat.

Conclusion: Developing a full understanding of the positive and negative impacts of log booms on riparian habitat at Surrey Bend requires additional research. In the absence of this research and in consideration of the reported protective effects of log booming and its important economic and cultural contributions, the planning team recommends maintaining log booming along most of the Surrey Bend shoreline. Since there is value in opening up portions of the shoreline for recreational and aesthetic purposes, some limited

windows of open shoreline should be established to promote access to the river from the shore and to the shore from the river.

Motorized Boat Launch

There are few public or private opportunities to launch motorized boats on the south side of the Fraser River within Metro Vancouver. A 1995 boat launch feasibility study by Metro Vancouver indicated that it was technically feasible to develop a motorized boat launch on the fill area in Surrey Bend Regional Park. In response to this information, the planning team explored the potential for motorized and non-motorized boat launching at SBRP.

During a broad review of the suitability of the site for a motorized boat launch, the planning team identified the following challenges to the development of a powered boat launch at Surrey Bend:

1. The presence of red coded riparian habitat on the park shoreline;
2. The significant investment in time and money required to determine if development is possible;
3. The proximity of the Barnston Island Ferry route to the fill site which would be the only possible location for a boat launch;
4. Low public support at Public Open House# 2;
5. Lack of support from the Advisory Committee, including the recreational power boating representative;
6. Existence of alternative strategies with a higher likelihood of success (i.e. broad based initiatives such as the ETF project or a specific boat launch development project); and
7. The low likelihood of approval for development within the shoreline habitat area.

Conclusion: Based on the significant number of challenges to incorporating a boat launch in Surrey Bend and the low public and stakeholder support, the planning team concluded that SBRP is not an appropriate site for this recreational use.

Maple Ridge Force Main

Because the Maple Ridge Force Main's alignment brings it through the sensitive bog habitat and Metro Vancouver's Wastewater collection system planners seek to twin the sewer and to improve maintenance access to it (i.e. 3.5 m wide access road and cleared right-of-way), the force main sewer is one of the biggest park management challenges within SBRP.

Service access roads may provide an opportunity for multi-use path development as evident in the recreational use of the existing service road at Surrey Bend and elsewhere in the Regional Park and Greenways system. Expansion of the utility access infrastructure within Surrey Bend could be a significant recreational opportunity; however, the ecological sensitivity of the bog to deposition of mineral soil and hydrologic disturbance raises significant concerns with respect to the potential negative impacts of this goal. In addition, the tendency of utility corridors to be constructed in straight lines can be viewed by many as having negative aesthetic characteristics.

***Conclusion*:** Since the sewer main is part of the region's liquid waste disposal infrastructure, related decisions on the timing and nature of any future improvements are outside of the scope of this plan. Consequently, the planning team based the concept plan on an optimal scenario for habitat conservation and visitor experience. In making this decision it was recognized that more detailed information received in the future through the sewer expansion assessment process may suggest an alternate course of action for park design. If the sewer main is twinned along its current alignment, routing of the proposed West Trail will likely be revised to follow the sewer.

Seasonal Flooding & Park Hydrology

A key characteristic of SBRP is its hydrology. The complex relationship of water to the park's landscape and habitat provide a strong educational and interpretive opportunity; however, the dominance of water and water processes in this landscape provides a number of significant constraints. The combination of low relief in close proximity to the Fraser River and the absence of a dyke cause Surrey Bend to be heavily influenced by seasonal flooding and the tidal fluctuations of the Fraser River. These influences will not be changed by the regional park.

Surrey Bend's hydrology has broad implications for park planning. Seasonal flooding will make access to the park or zones within the park impossible at certain times of the year. Flooding will impact the location, design and maintenance of the park trail network and other facilities such as parking lots, rest rooms, and shelters. The many drainage channels will impact the location and design of trails, increasing development costs significantly. A significant portion of the park drains directly into the Fraser River via small watercourses and sloughs.

The hydrology of the bog also poses a significant constraint to park development. Intact bog habitats have a contained hydrologic system. Any activity which changes this delicate water

balance threatens the long term health of the bog. The bog in Surrey Bend supports a significant population of large trees some of which are species not generally found in a typical lower mainland bog (e.g. Western Hemlock). This suggests that the bog's hydrology may already be in transition. Potential sources of past impacts are the construction of the Maple Ridge Force Main and the eastern drainage ditch. Further study is needed to better understand the bog.

Centre Creek provides an opportunity for wildlife viewing, management, and quiet reflection. Because the headwaters of Centre Creek are located outside of the park, the quality and quantity of the stream flow is not under Metro Vancouver's direct control. Water quality in the east drainage ditch has been observed to be visibly poorer than that in the main channel of the creek. Due to of the location of the creek's headwaters, improving water quality may be challenging.

Conclusions: Use experience at other Metro Vancouver parks that are subject to Fraser River flooding to guide park facility design, construction and maintenance, as well as general park management. Data gaps need to be filled through detailed multi-year study of the park's hydrology. Operational practices will be developed which respond to the seasonal flooding of areas inside and outside of the park boundaries. Trails and facilities will be designed in a manner that optimizes their ability to withstand seasonal flooding.

Legislation and Covenants

A conservation covenant has been registered on the titles of the land registry parcels that make up SBRP to protect the parklands natural values. This covenant restricts excavation of soil and the cutting of trees, placing constraints on trail development, particularly if boardwalks are required. Thus, any park development or management activity which requires excavation or tree cutting will require Provincial approval.

Conclusion: Realization of park infrastructure and management programs will require some degree of excavation and tree removal. Provincial endorsement of the Plan has been obtained (see Appendix 9.2.2, page 99). Further requests for approval of work on site will be sought at the appropriate time.

Climate Change

Metro Vancouver recognizes that climate change is a serious threat to the health of the region. Healthy, diverse ecosystems provide essential services that can reduce the impacts

of climate change. The wetlands and plant communities in Surrey Bend sequester carbon, reduce ambient air temperature, absorb water and runoff, prevent erosion, and reduce the risk of downstream flooding. However, climate change can reduce the ability of ecosystems to absorb stress and deliver these services. Furthermore, climate change could significantly change the nature and distribution of wetlands at Surrey Bend.

Conclusion: Metro Vancouver should endeavor to anticipate the likely impacts of climate change, monitoring the park for evidence of these impacts and taking them into consideration in planning and management decisions.

Park Entrance and Activity Area on Fill Site Location

As noted previously, a portion of the southeast corner of the park was filled with a mix of hog fuel, sand, and aggregates to prepare the site for industrial development. This created a raised, flat, relatively well drained area of land in close proximity to the Fraser River and 104th Avenue. Because park development is constrained by the landscape's low relief, high water table, and the impact of seasonal flooding, the fill area provides the best location for the main park entrance and activity area.

The fill area has impacted the park's environment by changing its hydrology and displacing original habitats. In addition, the coarse textured soils used to create the fill area may pose challenges to establishing and maintaining the landscape. The height of the fill area may make it susceptible to erosion from boat wake (evidence of slumping along portions of the fill area is present) and the retention of the fill area eliminates an opportunity for habitat restoration.

Conclusions: Because of the need for a park entrance and activity area, the suitability of the fill area for this use, and the significant challenges associated with restoration of the fill area to a state more closely representing its pre-existing condition, it is recommended that the fill area be retained and utilized as the park entrance and activity area.

Barnston Island Ferry Parking

As noted previously, many visitors to SBRP presently commence their park outing at the Barnston Island Ferry parking lot. The lot is under the jurisdiction of the Ministry of Transportation and Infrastructure. In addition to park visitors, the parking lot also supports ferry passengers (walk on and cycle on) and sawmill employees. The parking lot is gravel surfaced, irregular in shape, and adjacent to a watercourse.

Consideration was given to working with the Ministry of Transportation and Infrastructure to formalize the use of the ferry parking lot for park visitor parking. Likely benefits of this approach would be fiscal efficiencies and minimizing the footprint of park facility/infrastructure within park boundaries. Constraints to this approach are numerous. As noted, the lot is irregular in shape which makes it relatively inefficient. This inefficiency is likely not of significant concern at present; however, with the expanded park visitor demand associated with the formal opening of Surrey Bend as a Regional Park, this area would soon become inadequate, particularly at peak visitation times. Competition for parking spaces between ferry users and park visitors will increase as the park becomes known and more heavily used.

Physical expansion of the ferry parking lot to facilitate increasing visitor demand is problematic due to the watercourse that runs along its northern boundary, the Fraser River and the ferry ramp and loading area. This area is also congested with mill and ferry traffic. In addition, placing the parking lot close to the ferry and sawmill will require the location of the park entrance closer to the southern park boundary in a noisy industrial setting.

Conclusions: The Barnston Island Ferry parking lot should not be pursued as the park entrance point.

8. MANAGEMENT PLAN

8.1 PARK PURPOSE

8.1.1 VISION

Surrey Bend is a landscape dominated by the ebb and flow of water. It is the place that we will celebrate the meeting of the community and the River and the intricate wetland which resulted through the interaction of the complex system of hydrologic processes found there. It is the place we will go to travel back in time to catch a glimpse of what the Fraser River floodplain looked like before European settlement.

8.1.2 GUIDING PRINCIPLES

The Surrey Bend Regional Park Management Plan will:

1. Model sustainability principles that balance social, environmental, and economic values of the park.
2. Be consistent with Metro Vancouver Parks' and City of Surrey Parks' mandate and mission.
3. Protect sensitive and rare habitats, a variety of wildlife and historic cultural features unique to the park within the larger regional context.
4. Promote restoration or enhancement of habitat, where appropriate.
5. Provide park access, educational and passive recreational opportunities for a range of ages, physical mobility, and income groups.
6. Provide appropriate access, recreational opportunities and experiences at the Fraser River.
7. Work co-operatively in managing operation of and improvements to regional scale utility structures in the Park within the context of the above principles.

8.1.3 GOAL

Surrey Bend Regional Park will support regional biodiversity by protecting rare examples of freshwater bog, marsh and riparian forested areas. The park will carefully integrate passive recreation activities and appropriate access to the Fraser River in a range of natural settings.

8.1.4 OBJECTIVES

Surrey Bend Regional Park will protect a range of sensitive vegetation types and habitat, provide good opportunities for interpretive and educational elements, and provide potential for passive recreational activities. The following objectives aim to balance these different and sometimes conflicting interests:

Objective 1: Protect and enhance sensitive ecosystems and critical habitats for wildlife and vegetation, including bog, marsh, and riparian forest areas.

Objective 2: Recognize the potential for the presence of archaeological sites and respond appropriately.

Objective 3: Provide and maintain appropriate access to scenic views of the Fraser River in conjunction with interpretive opportunities that promote a better understanding of the importance of the river recreationally, culturally, and economically.

Objective 4: Provide recreational access to the Fraser River shoreline and Parsons Channel and contribute significantly to the water based recreational opportunities envisioned in the "Experience the Fraser" project.

Objective 5: Provide access to a variety of unique wetland landscape types for passive recreation, education, and nature study.

Objective 6: Determine and manage the impacts and opportunities of twinning the existing regional sewer and of associated maintenance access.

8.2 PARK CONCEPT PLAN

The Park Concept Plan recognizes the high conservation value of Surrey Bend parklands. Seventy five percent of the 348 hectare site will remain in an undisturbed state. As shown in figure 11, this undisturbed area is made up of two blocks: a 71 ha area of shoreline, wetland and forest containing numerous small channels located adjacent to the Fraser River, and a 190 ha area containing bog and forest located in the interior of the park. The daily and annual cycles of tides and flooding, important to the site's ecological function, will be retained throughout the site.

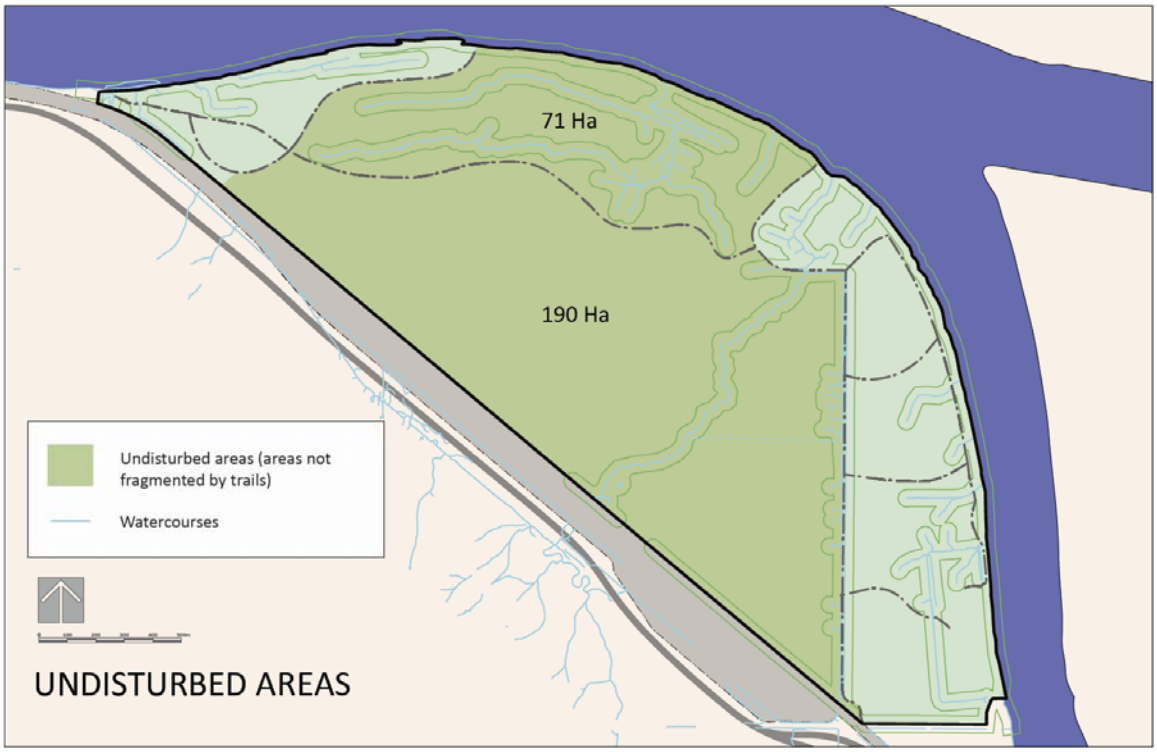


Figure 11: Undisturbed Areas

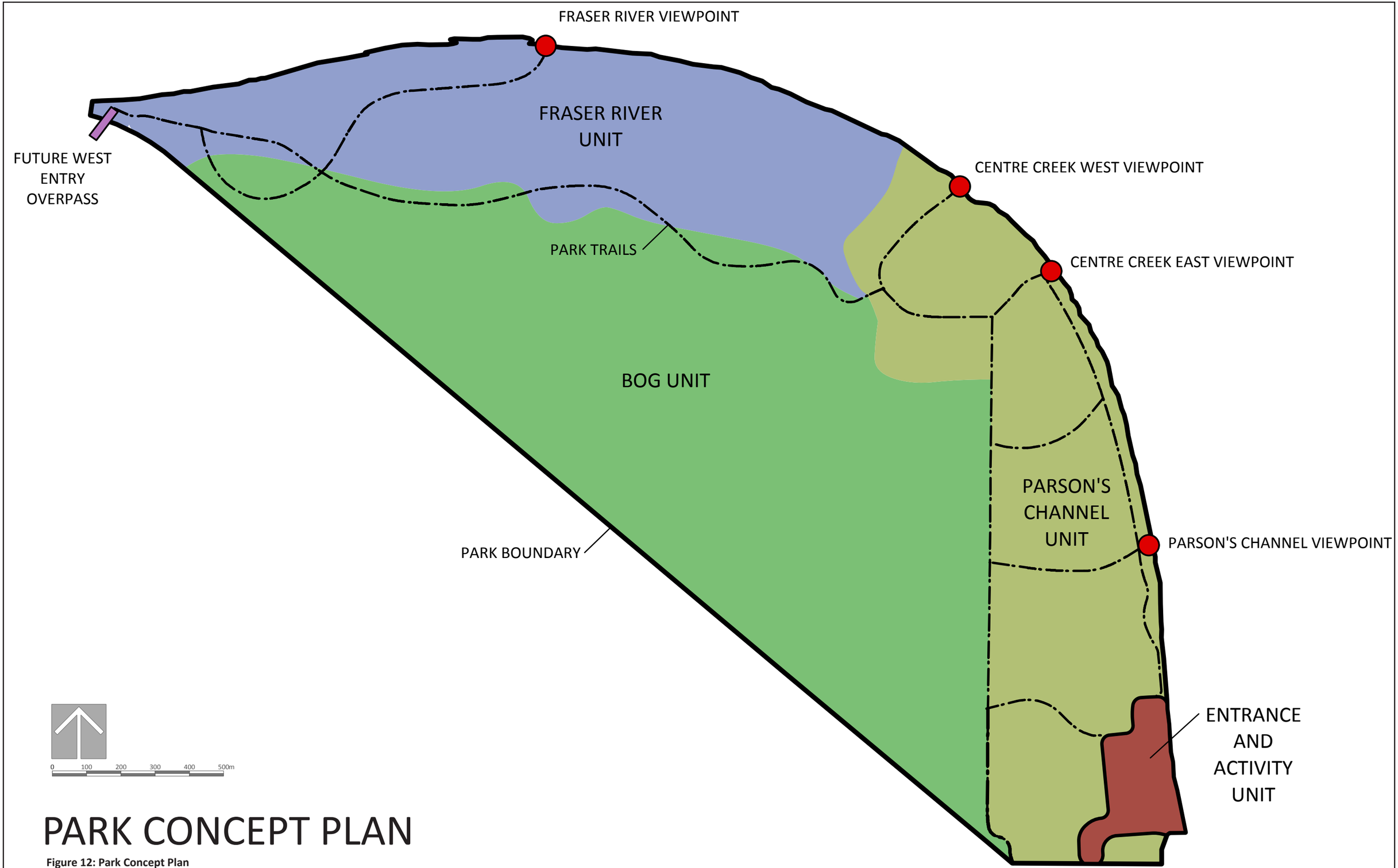
Recreational use of the site will focus on passive recreation and be facilitated by a modest network of trails, viewpoints, and facilities located on the remaining twenty-five percent of the site. Full development of the trail network will result in 7.2km of trails, many of them universally accessible. A portion of the trail system will include shared trails for bicycles and pedestrians (see Figure 13). A number of trail loops enhanced with viewpoints will be created. While viewing and enjoyment of the Fraser River is the main focus of the trails and viewpoints, the trail concept includes one trail that enables park visitors to enter the bog for recreational and educational purposes.

To facilitate safe and convenient public use of the park, an entrance area (the Entrance and Activity Unit) will be built on a previously disturbed site at the southeast end of the park (see figure 14). The Entrance and Activity Unit will have basic facilities, such as a primitive washroom, picnic tables, a reserveable picnic shelter, open grass areas, a natural play area, views of the river and a pier and float/dock for viewing and fishing. These simple entrance facilities will serve as a staging area for visitors, including school children and others coming for a recreational or educational experience.

The Park Concept Plan includes the option to use recreational trails to facilitate necessary maintenance access to the Maple Ridge Force Main Sewer. If trails are required to provide access to the regional utility they will be built to vehicle standard. However, if the trails are not required for utility access, they will be built to a simpler pedestrian/cyclist standard.

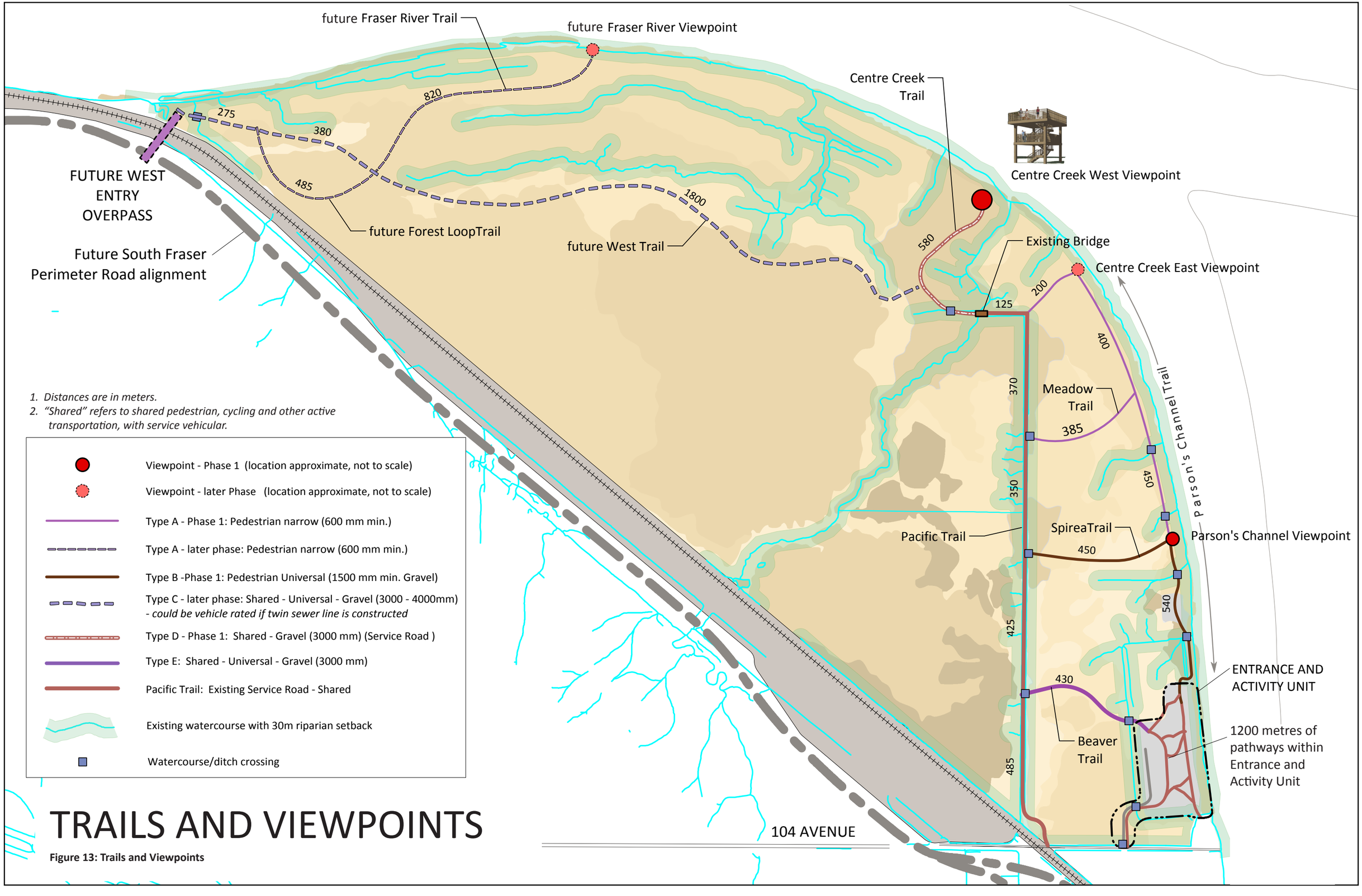
The Park Concept Plan will be implemented in a phased manner to minimize the amount of construction in the park at any one time and to reflect budget availability.

For purposes of planning, the park has been divided into 4 units as shown on figure 12: the Entrance and Activity Unit; the Parsons Channel Unit, the Fraser River Unit and the Bog Unit.



PARK CONCEPT PLAN

Figure 12: Park Concept Plan



1. *Distances are in meters.*
2. *"Shared" refers to shared pedestrian, cycling and other active transportation, with service vehicular.*

- Viewpoint - Phase 1 (location approximate, not to scale)
- Viewpoint - later Phase (location approximate, not to scale)
- Type A - Phase 1: Pedestrian narrow (600 mm min.)
- Type A - later phase: Pedestrian narrow (600 mm min.)
- Type B -Phase 1: Pedestrian Universal (1500 mm min. Gravel)
- Type C - later phase: Shared - Universal - Gravel (3000 - 4000mm) - *could be vehicle rated if twin sewer line is constructed*
- Type D - Phase 1: Shared - Gravel (3000 mm) (Service Road)
- Type E: Shared - Universal - Gravel (3000 mm)
- Pacific Trail: Existing Service Road - Shared
- Existing watercourse with 30m riparian setback
- Watercourse/ditch crossing

TRAILS AND VIEWPOINTS

Figure 13: Trails and Viewpoints

- Approximately 110 stalls over three phases
- Pedestrian/cycle facilities, trail access to Barnston Island Ferry
- Viewing pier/dock (with non-motorized boat tie ups)
- Walk-in picnic area & perimeter trails (accessible)
- Staging site to park trail network (longer routes & loops)
- New access road with shared cycling/pedestrian walkway conntected to SFPH Greenway
- Interpretive site with small flex space
- Site Operations/Maintenance secure compound

ENTRANCE AND ACTIVITY UNIT CONCEPT PLAN

Figure 14: Entrance and Activity Unit Concept Plan

0 25 50 75 100 125 m

SCALE

8.3 PARK PROGRAM

8.3.1 VISITOR EXPERIENCE

The Fraser River shoreline is the major attraction for visitors at Surrey Bend Regional Park. The plan provides opportunities to take part in low key day use activities, picnicking, viewing river activities, informal play, walking, cycling and fishing. The variety of forests and wetlands with their associated wildlife will offer opportunities for enjoyment, stewardship, and study. Educational and interpretive programs will highlight the river and the ecological significance of the site.

8.3.2 UNIVERSAL ACCESS

"Universal" accessibility refers to the design of environments for the use of all people, regardless of age or abilities, to the greatest extent possible. Metro Vancouver Regional Parks is working towards the adoption of formal universal access standards. In the interim, accessibility for Surrey Bend will be guided by the following principles:

- Assess and take advantage of opportunities to create universally accessible facilities and limit or eliminate physical barriers to access to the park and park facilities.
- Include universal access to interpretive features and promote access to representative experiences at Surrey Bend.
- Follow current and future accessible design standards and guidelines for park facilities and trails, as identified.

At a minimum, parking lots, pathways, picnic facilities, public washrooms, and some portion of the trail network will be universally accessible. All applicable local building requirements with respect to universal access will be followed as appropriate.

8.3.3 CONSERVATION AND RESOURCE MANAGEMENT

The combination of low relief, close proximity to the Fraser River and the absence of a dyke shape the ecological communities of Surrey Bend. In 2009, Metro Vancouver Regional Parks formally adopted an Ecosystem Based Management (EBM) approach to guide its natural resource conservation and management program in regional parks. EBM is adaptive,

systematic and science-based and its major goal is to protect and sustain the integrity of ecological communities.

The integrity and sustainability of ecological communities is dependent on their resilience, complexity and diversity. Common challenges to the ecological integrity of regional parks include the following:

- disturbance, fragmentation and loss of habitat;
- alteration of drainage patterns;
- reduced water quality and habitat value;
- colonization by invasive species; and
- connectivity to natural areas outside the park.

Due to the nature of the Surrey Bend landscape, maintaining the ecological integrity of the park will be an important undertaking in the coming years.

EBM depends on up-to-date biophysical information. While the work of Kistritz et.al. is valuable, significant gaps remain in the understanding of how the park ecosystem functions. These gaps must be identified and strategically filled through study of the park's natural processes.

The conservation and resource management program will support the achievement of park management objectives. Objectives that will be supported by this program include objectives 1, 3, 5 and 6 (see page 43). The following strategies are proposed to achieve these objectives in whole or in part.

***Strategy*: Assess park hydrology and develop management objectives**

Metro Vancouver will undertake a comprehensive, multi-year hydrology study to better understand the role of hydrological processes in wetland ecology, determine impacts of past and proposed developments, assess risk to infrastructure and human health and better inform management decisions in the face of uncertainty associated with climate change. Climate modeling and assessing the potential impacts of climate change will be integral parts of the hydrology and bog study.

***Strategy:* Assess bog ecology and develop management objectives**

An assessment of the bog's water balance will be included within the terms of the hydrology study. However, further study is needed to fully understand the ecology of the Surrey Bend bog, identify threats to bog functions and develop strategies to protect and restore the bog (if appropriate). Investigations at Surrey Bend will benefit from the wetland data gathered and research processes developed via the

Burns Bog Scientific Research Strategy. Research conducted at Surrey Bend will contribute to our general understanding of bog ecology.

***Strategy*: Monitor and plan for climate change**

Implement a monitoring program at SBRP to seek evidence of climate change. Installation of an automated weather station, monitoring wells and other data gathering initiatives at Surrey Bend would support climate change monitoring.

***Strategy*: Identify and protect critical habitat**

Undertake biological inventories to determine species presence and identify species of concern. Formal studies will be completed as funding permits. Park staff, volunteers, and partners will be encouraged to share sightings and add to inventories. In the absence of confirmed sightings, Metro Vancouver will follow best management practices for species at risk in areas where they are likely to occur.

***Strategy*: Control invasive species**

Undertake an inventory of invasive species at Surrey Bend as time and resources permit and use the inventory to support the development of a pest management plan. The Plan will guide the management of invasive species that displace native species, impair ecosystem processes, reduce biodiversity and threaten human health or safety. It will include control strategies and best management practices, and will provide guidance on control methods.

***Strategy*: Audit log booming practices to determine impacts**

Initiate an audit of site specific booming practices to more fully understand positive and negative impacts on river banks and intertidal foreshore habitats and use this data to inform decision-making on foreshore lease conditions, bank stabilization strategies, etc.

***Strategy*: Implement sensitive infrastructure location, design and construction practices**

Provide low-impact facilities to support recreation in the park. Current mapping shows numerous watercourses and sloughs in the park and it is likely that more will be discovered through the detailed trail location process. Map watercourses to facilitate proper infrastructure location. Site and construct new crossings according to best practices and to conform to Fisheries and Oceans Canada requirements.

Consider avoiding wet terrain or areas subject to seasonal flooding in infrastructure siting. There will be capital and maintenance costs associated with the higher level

of treatment required by flood proofing and opportunity costs associated with operational closures.

***Strategy*: Seek opportunities for improved connectivity**

Explore opportunities to enhance connectivity of Surrey Bend parklands to natural and protected areas outside of the park and act on them as appropriate.

***Strategy*: Identify potential sites for habitat enhancement or restoration; encourage stewardship**

Explore opportunities to restore ecosystem function to degraded ecosystems, enhance habitat for species of concern and increase biodiversity. Enhancement projects will use an adaptive management approach which includes research and long-term monitoring. All projects will be based on clearly defined objectives and should fit visually within the natural landscape. Such projects should provide opportunities for education through community involvement and hands on stewardship. Innovative stewardship projects will serve as a model for sustainable resource management in regional parks.

***Strategy*: Provide purposeful trail locations**

Provide a trail network that carefully traverses riparian habitats to make connections with shoreline viewpoints. Minimize vegetation and wildlife disturbance and use fencing and signage (as required) to promote use of sanctioned trails. See the Trails and Viewpoints Concept Plan for the anticipated final trail network for SBRP (figure 13).

***Strategy*: Apply sustainability principles to utility corridor management**

Use a team of engineers, natural resource management specialists/biologists, operations staff, planners, and landscape architects to guide site planning and the design process to ensure utility operations are conducted within the context of a managed wetland ecosystem and park. Utility management should minimize impacts to sensitive ecosystems and respect Metro Vancouver Board's wetland protection and recreation goals.

***Strategy*: Use education and regulations**

Educational programs and enforcement of park regulations are crucial to minimizing impacts to the ecology of the site. A clear set of park rules regarding behavior, operations and maintenance will be necessary. Programs will be developed that are targeted to educate the public on the park regulations and the ecology of the park.

8.3.4 OUTDOOR RECREATION

Metro Vancouver's Regional Parks and Greenways Plan (2005) and the City of Surrey's Strategic Plan (2008) identify the provision of outdoor recreation opportunities and educational programs, and the fostering of community stewardship as important goals for the park function. Due to the high sensitivity of the wetland habitats located in Surrey Bend, the park will provide passive recreational experiences and activities. Appropriate recreational pursuits include walking, cycling, nature study, picnicking, nature play, paddle sports, and sport fishing. Recreation will be supported by single and multi-use trails, a pier and multi-use float, a viewing tower, open air structures, rustic seating, low-impact facilities, and interpretative signage.

Opportunities for non-motorized boating such as kayaking and canoeing are available in and around the park. The conditions for these activities are challenging due to strong currents, tides, log booms, and water vessel traffic; however, experienced paddlers do use this area of the river. The float and pier included in the Entrance and Activity Unit concept design will support non-motorized boating activities at the park.

The outdoor recreation program outlined above will support the achievement of Surrey Bend Regional Park management objectives 1, 3, 4 and 5 (see page 43). The following strategies have been identified to support the achievement of these objectives.

> ***Strategy*: Purposefully reach out to the river**
> Provide access to carefully selected river shoreline viewpoints, install barriers, and signage (as appropriate) to encourage park users to stay on sanctioned trails and avoid disturbing vegetation and wildlife.
>
> Site, design, and construct a series of viewpoints at strategic locations on the shoreline. Design viewpoints to tolerate seasonal flooding, tidal fluctuations, boat wakes, etc. As a premier feature, locate, design and construct a pier and multi-use float on the Fraser River to promote recreational access to the river. See the Trails and Viewpoints Concept Plan and the Entrance and Activity Unit Concept Plan (in section 8.4) for the anticipated location of trail viewpoints. The following guiding principles were used to select the viewpoints identified in the conceptual trail network:
>
> - Provide more frequent access to the river near the entrance and fewer opportunities in the western part of the park ;

- Provide access to dramatic views and existing local use patterns that draw park users;
- Provide controlled, limited access to sections of shoreline composed of stable, sandy fluvial deposits (sandy shorelines are less sensitive to human activities); and
- Take advantage of naturally occurring vegetation gaps for viewpoint locations.

The above principles were applied to minimize the impact of viewpoint development on park ecosystems while optimizing the park visitor experience.

***Strategy*: Provide a variety of park experiences**

Park Program:

Provide a variety of experiences to attract a diverse range of park users. The park program should provide recreational, cultural and educational opportunities consistent with park vision and goals.

Trail Locations:

Provide access to a carefully selected sampling of the diverse wetland landscapes represented at the park. Endeavor to provide looping trails where appropriate. Trails should be sited and designed in a manner consistent with park vision and goals.

Apply a Hierarchy of Trail Types:

Apply a hierarchy of low-impact trail types for cyclists and pedestrians to provide a variety of recreational experiences. The trail hierarchy will include accessible trails.

***Strategy*: Open windows in booms**

Purposefully open up portions of the Surrey Bend shoreline to provide recreational access to the Fraser River. Providing river access will promote sport fishing, provide access to and from the water for paddle sports and provide views of the Fraser River shoreline uninterrupted by log booming.

Three locations have been identified for consideration:

1. The mouth of Centre Creek: The window should commence roughly 40 m west of the creek mouth and terminate approximately 200 m east of the creek mouth.
2. The fill area: An approximately 100 m window should be situated in the vicinity of the proposed viewing pier and fishing float.

3. Parsons Channel: Parks will work with lessees to establish small windows approximately 10 m in size within the booming area to facilitate access to the channel in case of emergency.

Where windows are established, dolphins will be removed to discourage unauthorized log storage and to improve shoreline aesthetics.

8.3.5 EDUCATION, INTERPRETATION AND PROGRAMS

The spectacular natural setting, Fraser River waterfront, streams, wetlands, vegetation and wildlife at Surrey Bend all lend themselves to outdoor educational programs delivered to small groups on site. The development concept proposes the construction of the minimum facilities required for program delivery (i.e. parking, a washroom and a small shelter).

Metro Vancouver has a well developed interpretive program that provides year round field trips and scheduled programs for park visitors of all ages. Surrey Bend offers many themes and possibilities for education and interpretation varying from broad to very minute in scope. Some key themes include the following: Fraser River and floodplain, wetlands, and streams; First Nations and traditional uses; fish, especially salmon; forest and bog; amphibians and beaver. Other broad themes may be integrated into programs including sustainability, health and wellness, climate change, biodiversity, and species at risk.

The SBRP interpretive program will support the achievement of park management objective 3 (see page 43) in whole or in part.

***Strategy*: Develop and implement an interpretation and education program**
Develop (or adapt) and implement an interpretive and educational program for Surrey Bend as appropriate. The program should be focused on increasing understanding and appreciation for the Fraser River, wetlands, and other associated park features. Communication tools may include:

- Signage, pod casts, and kiosks at trail heads;
- Photo interpretation at river access points to establish location and explain surroundings;
- Illustration of tug and log booming activity; and
- Heritage photos.

8.3.6 PARTNERSHIPS AND COMMUNITY ENGAGEMENT

Metro Vancouver invites community and citizen engagement of all types associated with regional parks. Opportunities range from one-time volunteer participation in an event or work party to full engagement of community-based, non profit societies with a special interest in a particular park. Such societies are called park associations and operate consistently with community development principles such as the following:

- trust, respect and integrity;
- shared vision, decision making and responsibility; and
- inclusivity.

In some cases single purpose community groups take on a special role in a park associated with their primary purposes and interests. The Serpentine Enhancement Society (SES) at Tynehead Regional Park is an example. SES is based in Tynehead and operates the Tynehead Hatchery. While not inclusive of all park interests, the society provides a valuable role in raising fish, protecting fish stocks and educating the public. Members of SES are volunteers who are passionate about their role in protecting and enhancing fish habitat.

When Surrey Bend opens to the public, citizen and community involvement will be invited. Metro Vancouver has resources to support such engagement, but new relationships associated with Surrey Bend will first require community expressions of interest. The Catching the Spirit Youth Society is a group with a regional range of interests, serving youth from age 12-19, which may have interest in Surrey Bend.

8.3.7 MAPLE RIDGE FORCE MAIN

The force main sewer located within the park may pose a significant park management and planning challenge. Park management objective 6 (see page 43) endeavors to address this challenge. As indicated in the natural resource management section, the issue requires support from a number of components of the park management system along with municipal and regional utility partners. The following strategies have been identified to support the achievement of park management objective 6:

***Strategy*: Be responsive when required**
Due to the degree of uncertainty about the timing of the proposed sewer upgrades and its impact on the park, responding to the need when required is appropriate.

Once funding for the design of the sewer has been approved, Regional Parks, Engineering & Construction, and Wastewater Collection System Operations will work together to determine how to proceed. Working within the SRI framework, staff must weigh sewer maintenance needs (including access roads), engineering and construction requirements, and park management and ecosystem conservation requirements/goals. Innovative construction and maintenance methods will be explored as well as alternative park uses for any disturbed areas. Option analysis will increase the design time; therefore, design funds should be secured at least two years before construction is anticipated. Being responsive provides park managers with an opportunity to gather additional information on park ecology to support decision making.

Strategy: **Resolve tenure issues**

Presently, the Maple Ridge Force Main does not have appropriate tenure over the entire portion of the sewer located within the park. As a result of the management planning and lease negotiation process, appropriate tenure consistent with both the needs of utility and park management goals should be acquired for the sewer.

Strategy**: Apply emergency management principles**

Emergency plans are prepared for each park to deal with situations such as fires and flooding. A joint emergency management plan should be developed with the Wastewater Collection System Operations division to describe actions and practices for addressing a potential sewer failure with the least impact on park values. It is anticipated that this plan would be updated as required to address changing circumstances.

Strategy**: Document and implement a development review process**

- *Alignment review process and construction standards:* Review sewer main alignment, construction methods and timing alternatives along with associated costs to arrive at the optimum installation that balances projected ecological impact and environmental risk with total project and life cycle costs.
- *Maintenance access:* Review maintenance access systems and procedures, consider alternatives, and select the optimal solution. Maintenance must be done in a way that is sensitive to the park's ecology and that benefits the park.
- *Approval Process:* Includes an internal Metro Vancouver review process approved by the Parks Committee and Waste Management Committee and approval by the Board.

- *Restoration and Compensation Requirements:* Review alternatives, then design and implement a post construction restoration plan. Compensation for habitat impacts and tree removal may be required.
- *Archaeology:* Sewer construction and maintenance activities frequently require excavation. Ensure guidelines for appropriate archaeological procedures are followed (see Objective 2 and section 8.3.9).
- *Monitoring:* A post construction evaluation and monitoring process should be developed and implemented. Monitoring will provide Metro Vancouver managers with a) an understanding of the long term impacts of sewer enhancements on ecosystem health, and b) a tool to limit environmental impacts to the park in the case of sewer failure.

***Strategy*: Acknowledge need for sewer maintenance**

Existing utility and park infrastructure located within the park must be properly maintained and regularly inspected to minimize the risk of catastrophic failure and environmental damage.

***Strategy*: Implement a coordinated response**

The City of Surrey, Metro Vancouver Parks, and the Greater Vancouver Sewage & Drainage District have interests in Surrey Bend Regional Park. Protecting park assets and sensitive ecosystems will rely on a coordinated effort by these groups to communicate desired outcomes and to set a policy framework to which all parties will commit.

8.3.8 OPERATIONS, SAFETY AND SECURITY

Metro Vancouver has a decentralized mode of park operation. Surrey Bend Regional Park will be operated by staff based in nearby Tynehead Regional Park, a five minute drive away. Operations staff will conduct daily maintenance in the park including litter/garbage pick up, toilet cleaning, and minor repairs. The Park and trails will be patrolled several times a week, with specific scheduling dependent on level of use and management issues.

Surrey Bend will be signed to advise members of the public of the rules and hours of operation. Visitor information, regulatory information, maps and posters about seasonal activities and events in Surrey Bend, other Regional Parks and/or City of Surrey sites (if requested by the City) will be posted in high profile Park kiosks. Trails will be signed and designated for specific uses, e.g. pedestrian, bicycle, or multi purpose. Motorized recreational vehicles will not be permitted. Overnight camping will not be provided in the

park and signage will indicate this policy. Metro Vancouver has a full slate of bylaws, operating procedures and best management practices to deal with most situations or issues that arise. They will guide future practice in the park.

Support facilities for Park Operations at Surrey Bend may include a storage shed for tools, a small fenced graveled compound for materials storage and parking for the operations and maintenance vehicle. Equipment (e.g. weed-eaters and lawn mowers) will be transported to Surrey Bend. Electricity may need to be extended to the park to facilitate operations, provide safety lights or enhance security.

***Strategy*: Apply dog on-leash bylaw**

In Surrey Bend, as in most Regional Parks, dog management is an important issue. The public needs to be reassured that rules applying to dogs will be in place. In Surrey Bend dogs will be permitted on trails throughout the park, but must be kept on-leash. Due to the close proximity of the large off-leash dog area at Tynehead Regional Park, the potential negative impacts of off-leash dogs on park ecosystems and the limited area of the park suitable for dog off-leash facilities, there will be no dog off-leash area in Surrey Bend Regional Park.

***Strategy*: Monitor and respond to flooding as required**

As it is anticipated that flooding will occur in the park, facilities will be designed to withstand a certain degree of flooding. Threats to public safety due to flooding may require restriction of public access to the park. In the event that a flood threatens public safety or repairs are required to restore park infrastructure to safe condition, part of or the entire park may be closed to visitor use.

8.3.9 HERITAGE AND ARCHAEOLOGICAL RESOURCES

While there are no registered archaeological sites at Surrey Bend, the park may contain sites linked to the historical uses of the area by First Nations. Subsurface disturbance is the biggest threat to archaeological sites. Subsurface disturbance includes construction activity and riverbank erosion that can expose previously buried sites. Objective 2 (Section 8.1.4) is related to archaeological and heritage resources (see page 43). Provincial regulations and requirements will be followed and may include the following strategies:

***Strategy*: Site identification**

During the site planning and design phase of a facility construction project the proposed development site should be assessed for potential to contain archaeological artifacts. Any identified archaeological sites will undergo further

assessment to determine their extent and significance. In certain cases, the Ministry of Tourism, Culture and the Arts requires that a Heritage Alteration Permit be obtained.

***Strategy*: Archaeologist supervision**
If a Heritage Alteration Permit is required, a registered archaeologist must be present during excavation to identify artifacts of archaeological significance. For larger facilities, such as a viewing tower, engage in investigative digging in the area of proposed disturbance prior to finalizing comprehensive construction documents, tender and construction contract award.

***Strategy*: Minimize disturbance**
In general, development works in Surrey Bend will be planned to minimize the disturbance to the subsurface of the site.

***Strategy*: Use a team approach**
Use a team with representation by engineers, natural resource management specialists/biologists, operations staff and landscape architects to guide site planning and design process.

8.3.10 VISITOR USE MONITORING

Metro Vancouver Regional Parks collects information on visitor use of its regional parks. Trail counters that track park visitation are in place at Surrey Bend and are collecting data in a limited manner. The formal development of the park will require an expansion of the visitor use monitoring program to collect more comprehensive user estimates. New counters will be installed in appropriate areas to track vehicle visits and use of the trail network.

8.4 PARK DEVELOPMENT SUMMARY

8.4.1 OVERVIEW OF SITE DEVELOPMENT UNITS

The fill site in the southeast corner of the park will be the area that accommodates the majority of park amenities. The fill site will contain the park entrance, offering a variety of facilities such as parking stalls, a viewing platform and dock, a picnic area with a reservable shelter, an interpretative and trail staging area, and a children's play area. In addition, the altered landscape in this area will be enhanced through habitat compensation and stormwater demonstration features. See figure 14 on page 48 for a large version of the Entrance and Activity Unit Concept Plan.

8.4.2 SITE DEVELOPMENT UNITS

Unit 1: Entrance and Activity Unit: This includes the parking area, access road, internal paths/trails, toilets, kiosk/signage, picnicking area with reservable shelter and individual tables, bike parking, view point/non-motorized boat launch/float, operations shed, nature play area, multi-purpose special events and interpretive program site, etc.

Unit 2: Parson's Channel Unit: Includes Parson Channel Viewpoint, Center Creek West Viewpoint, and Center Creek East Viewpoint along with Meadow Trail, Spirea Trail, Parson's Channel Trail, Pacific Trail, Center Creek Trail and Beaver Trail.

Unit 3: Fraser River Unit: Includes Fraser River Viewpoint, the West Entry Multi-use Overpass, Fraser River Trail and a portion of West Trail and Forest Loop Trail.

Unit 4: Bog Unit: Includes portions of West Trail and the Forest Loop Trail.

Figure 15: Viewing Tower (conceptual)

8.4.3 TRAIL NETWORK

The park's trail network will provide access to the area's diverse natural landscapes, using sensitive trail location and design methods such as vegetation sensitivity mapping, boardwalks, signage, and barriers, as needed.

As outlined in section 6.8, it has been concluded that carefully located and constructed trails will not adversely impact the majority of the vegetation units. The proposed trails avoid the most sensitive areas to the greatest extent possible, especially vegetation units that are very wet and relatively small that could be fragmented by trail development. The park plan ensures that large, ecologically sensitive and inaccessible areas are preserved, especially in the west end of the park.

Existing Service Road used as a Trail

Quality trail design and treatments are highly effective in promoting positive use and displacing negative activities that can cause harm. See figure 13 for details.

Trail Hierarchy

A hierarchy of trails will be utilized to provide access for various users including cyclists, pedestrians, and people of all abilities. The Surrey Bend trail hierarchy noted below is based on the Metro Vancouver Regional Park's trail standards:

- Type A: Pedestrian Narrow (600 mm minimum)
- Type B: Pedestrian Universal(1500 mm minimum, gravel)
- Type C: Shared Universal (3000 -4000 mm, gravel). Shared bicycle and pedestrian trails.

- Type D: Shared - Gravel (3000 - 4000 mm) (Service Road) Similar to Type C Trails, reinforced to accommodate vehicles of the size required to undertake service activities. Water or pipe crossings will be strengthened.
- Type E: Shared – Universal – Gravel (3000 mm)
- Pacific Trail: Existing Service Road - Shared

Trail Location, Design and Construction

The proposed trail network at Surrey Bend has been guided by this series of principles:

- Ongoing research on habitat and ecosystem function will be used to inform trail siting, design, and location.
- Trails should cross habitat units along their short widths rather than following their longer axis, to the greatest extent possible.
- Trails should avoid displacing ecotones (habitat transition zones) or species of special interest, such as the Fawn Lily (*Erythronium sp.)*.
- The overall trail density should be minimized (as per the Trail and Viewpoints Concept Plan) so as not to compromise the natural integrity of Surrey Bend.
- Performance of trails installed in early phases of park development will be evaluated and the knowledge gained will be applied to the siting, design, and construction of trails installed in later phases.
- Trails must minimize interruptions to existing drainage patterns and apply reasonable measures to maintain naturally occurring drainage patterns.
- Trails will be located, designed, and constructed to withstand seasonal flooding patterns.
- The design and construction of trails and river access points will consider degrees of accessibility. Generally, trails closest to the parking and picnic areas (parking lot) will be universally accessible with more remote trails being designed to a lower accessibility standard. Benches and rest areas will be provided at reasonable intervals.

- Trails and related structures will be sited, designed and constructed as per applicable Metro Vancouver standards.

- Service routes required to support regional infrastructure may double as trails. Where this is the case efforts should be made to design and construct these hybrid trails in an aesthetically pleasing fashion.

Trail Enhancement

High-quality, thoughtful trail enhancements have the ability to reduce the impact on and enhance the natural environment of Surrey Bend, including treatments such as boardwalks, expanded metal mesh over timber, or metal bridge structures that do not interrupt vegetation growth. They may be augmented with native plants or vegetation as a barrier to reduce off-trail excursions. Boardwalks are an effective device to reduce impacts to hydrology, vegetation and wildlife, while providing physical constraints and visual cues that encourage visitors to "stick to the trails."

Fraser River Foreshore Access – Viewpoints

Trails provide access to the Fraser River foreshore at designated viewpoints (see figure 12, Park Concept Plan, for the location of viewpoints). All viewpoints will be sited, designed, and constructed in a manner that minimizes disturbance of riparian habitat and discourages access to sensitive landscapes. Foreshore access will be guided by the applicable Federal and Provincial regulations.

Fraser River Shoreline

8.4.4 GENERAL DEVELOPMENT PRACTICES

Design of park facilities will utilize sustainable, low impact methods and techniques with demonstrated best practices for water conservation, and use of native plant materials, locally available materials, and recycled and/or low energy embodied materials. Facilities will be rustic in nature and follow Metro Vancouver Regional Park design and development standards, where applicable.

8.4.5 ENTRANCE AND ACTIVITY UNIT

The entrance and activity unit is the heart of the park. This is the arrival place for visitors, as well as a place to learn, play, congregate, contemplate, and rest. The following strategies will guide the development of the area:

a. Provide road and parking development, as illustrated.

b. Parking destination should be apparent upon entering the park. Provide appropriate visual cues, including signage, to announce arrival and destinations.

c. Encourage low vehicular speed by using narrow running surface widths in road design. Design should provide separation for pedestrians and cyclists from vehicles. Surface treatments and appropriate traffic calming measures should be considered at the design stage.

d. Survey, evaluate and integrate existing trees into park amenities where appropriate.

e. Incorporate a drop off area in a convenient location to access picnic areas and washrooms.

f. Provide kiosks, signage and other visual cues to help the visitor orient to the park amenities and trail system.

8.4.6 PARK AND SITE STRUCTURES

a. **Parking/stormwater demonstration areas:** The Entrance & Activity Unit Concept Plan identifies the potential development of up to 110 parking stalls at the entrance and activity area over the long term. The parking lot should be designed in a manner that facilitates incremental and logical expansion as budget and demand dictates. Forty stalls have been identified as an appropriate amount of parking for the first phase, if there is to be a picnic shelter. The parking lot design will consider stormwater source controls, detention, and infiltration. The parking lot should also incorporate landscaping and habitat plantings that mitigate the impact of roadway and parking lot development.

b. **Centre Creek West Viewpoint:** This is a two storey tower designed to promote wildlife viewing and provide an alternate perspective on the park landscape and Fraser River waterscapes. Tower design should take views and aesthetics into consideration (see conceptual graphic in figure 15). The first level, at least, should be designed to be universally accessible.

c. **Viewpoint/multi-use float:** This viewpoint/float will be located at the edge of the fill area and will promote visual access to Parsons Channel, Barnston Island, and industrial activities occurring on the river. It will also provide fishing access to Parsons Channel and a place to launch and disembark from paddle boats.

d. **Operations shed:** A small fenced compound will facilitate secure, weatherproof storage of supplies and materials for park operations staff. It may include operations vehicle parking.

e. **Kiosks, signage, and park information:** A kiosk will be required at the entrance and activity area to help orient visitors to the park. The kiosks and signage will be designed to meet Metro Vancouver Regional Park's standards. The location of kiosks and signage will be confirmed at the detail design phase of park development process.

f. **Interpretive signs and elements:** Interpretive signs will be developed as required. The signs and elements will be designed to meet Metro Vancouver Regional Park's standards.

g. **Picnic shelter:** This is a covered picnic facility with an anticipated capacity of 100 people. Design should promote accessibility and facilitate basic food preparation and consumption, and should include running water.

h. **Special events and interpretive program area:** This is an open grassed area sited near picnic tables and washrooms. It can be used for small events, gatherings, and school and other educational programs.

i. **Natural play area:** This is a stylized landscape composed of natural materials designed to facilitate safe nature play by children of all ages. The space should be designed to be high in "challenge" and "chance" to promote positive social engagement. A concept that follows the 7C's of outdoor play space design is strongly recommended (Herrington, et al). The facility should be located in close proximity to restroom and picnic facilities and should promote safe connections and transitions to parking areas.

j. **West entry multi-use overpass:** A bicycle and pedestrian structure that will connect the western end of the proposed multi-use path with the Fraser Heights neighborhood is desired in the long term. This element would also facilitate connections to the Port Mann Bridge and other Surrey Greenways, including the proposed greenway paralleling the South Fraser Perimeter Road. Thought should be given to using the bridge to enhance the connection between Surrey Bend and Fraser Heights for wildlife as well. The specific costs and benefits of this will have to be identified closer to the time of design and construction. Such structures, while they can be costly, are critical to creating or restoring connectivity and to facilitating alternate modes of transportation, especially cycling.

8.4.7 CONNECTIVITY TO MUNICIPAL INFRASTRUCTURE

Surrey Bend Regional Park's utility requirements are relatively minor. The park may need to connect to the municipal road network, ideally on the alignment of Triggs Road, and it may need to connect to the electrical grid if security lighting and other power using facilities are required that can't be powered from renewable energy sources. At this time connections to municipal, gas, or telephone networks are not anticipated. It is anticipated that sewage disposal will be via composting or pump out toilets, neither of which require connection to municipal sewer.

8.4.8 Connectivity to Regional Trails/Greenways

Pedestrians and cyclists will have a variety of opportunities to access the park on greenways and trails. Initially, the main connection between SBRP and regional and local greenways will be via Triggs Road. Over the long term a secondary connection to local greenways in the Fraser Heights Neighborhood will be provided in the west end of the park via the proposed pedestrian/cyclist overpass of the South Fraser Perimeter Road and CN Railway. In addition, a new regional greenway corridor is planned along the alignment of the South Fraser Perimeter Road. Ultimately, this will connect the park to Langley, Delta and areas beyond (see figure 5 for additional detail).

8.4.9 Connectivity to Natural Areas Outside of Surrey Bend

While connectivity to natural and protected areas within the vicinity of SBRP is outside of the traditional scope of a park management plan, due to the ecological significance of this park to the City of Surrey and Metro Vancouver this goal is highlighted within the Plan. At this time it is unclear what opportunities to expand or enhance connectivity may emerge; however, it is important that opportunities to enhance the connectivity of Surrey Bend parklands to natural areas outside of the park are reviewed as they become evident and are acted upon where appropriate. One possible future opportunity to enhance connectivity is the West Entry Multi-use Overpass.

8.5 Implementation Strategy

Both Surrey and Metro Vancouver have allocated funds to plan and commence development of the initial phases of SBRP. Funding for future phases will be provided, based on availability of funds. The primary goal for existing funds is a Park Management Plan, feasibility and technical investigations, detailed design, and to complete the first phase of visitor amenities.

8.5.1 Phasing

Phasing is a common implementation strategy for park developments. It allows park managers to fund park capital developments over multiple business cycles, spreading the financial impact of opening a new park over multiple years. It also supports the principles of

adaptive management by allowing for the study of the impacts of increments of park development and adjustment of following phases to reflect new information.

8.5.2 FIRST PHASE IMPROVEMENTS

The following infrastructure elements are the core components proposed for phase 1 of park development.

- Park access road
- Phase one parking lot (40 stalls)
- Pit or humus toilets
- Picnic area, including reservable shelter for 100 people and landscaping
- Beaver Trail
- Kiosks and signs
- Parsons Channel Trail
- Spirea Trail
- Meadow Trail

Phase 1 is expected to be extended over a period of years to fit with the funding schedule, facilitate testing and evaluation, and minimize the amount of construction on the site at any one time. It is anticipated that phase one will be implemented in two parts, 1a and 1b. For details of the anticipated breakdown of phase one elements, please see the cost estimate that follows in Section 8.5.4.

Centre Creek Trail and viewpoint will be built if and when required for access to the sewer pump chamber on the Fraser River. The majority of the trail cost is expected to be borne by Metro Vancouver's Waste Water Collection System Operations who require this level of access. The cost estimate for this is included in the park program for the sake of completeness. If built for park purposes only, the standard and cost will be lower.

Funds will be sought for design and provision of the Natural Play Area during phase 1, but its construction will depend on the success of fund raising.

8.5.3 SECOND AND THIRD PHASE IMPROVEMENTS

The following infrastructure elements are proposed for phase 2 and 3 of park development:

- Fishing pier and float
- Centre Creek West Tower
- Operations shed and compound
- West Trail
- Fraser River Trail and Fraser River Node
- Forest Loop Trail
- Fraser Heights Overpass (this project will require a large fund raising effort)

Funding for phase 2 is not currently scheduled and will be evaluated through the capital facility development planning processes of Metro Vancouver and the City of Surrey over time.

8.5.4 SURREY BEND REGIONAL PARK PHASE AND COST ESTIMATE

The next several pages summarize park development costs and phasing in more detail. Appendix 9.8 contains additional detail and quantity assumptions.

Item	Phase 1	Phase 2	Phase 3
PARK ENTRY			
Triggs Access Road with adjoining bike/pedestrian path	570,125		
Water supply	28,000		
Entry signage	7,500		
Parking (gravel)	418,750		175,000
Raingarden/bioswales	193,800		96,900
Subtotal	**1,218,175**	**0**	**271,900**
PICNIC AREA			
Picnic tables	60,000	60,000	30,000
Manicured grass/tree landscape	576,000		
Pathways throughout entrance	127,200		
Waste receptacles, hot coal disposal	7,500		
Toilets	50,000		
Signs/kiosk	25,000		
Picnic shelter (Phase 1b)	480,000		
Subtotal	**1,325,700**	**60,000**	**30,000**

TRAIL PROGRAM			
Trail Head Area	50,600		
Existing Trails			
Pacific Trail (Re-Surface)	193,050		
Parson Channel I (southern section)	51,900		
Phase 1a Trails			
Beaver Trail	46,635		
Spirea Trail	48,525		
Watercrossings	125,000		
Subtotal (Phase 1a)	**515,710**	**0**	**0**

Phase 1b Trails			
Parson channel II (middle section)	22,500		
Parson channel III (north section)	20,000		
* Meadow Trail	19,250		
* Centre Creek East	10,000		
Watercrossings	75,000		
Subtotal (Phase 1b)	**146,750**	**0**	**0**

Built by GVS&DD (Timing of construction is uncertain. Included in Phase 1 for convenience.)			
Centre Creek Trail (west)	145,000		
Pipe crossing protection	50,000		
Centre Creek West Viewpoint	30,000		
Watercrossings	25,000		

Subtotal	**250,000**	**0**	**0**

Phase 3 Trails			
West Trail			748,500
Vehicle watercourse crossings			50,000
Forest Loop Trail			79,148
Watercrossings/boardwalks			75,000
Subtotal Phase 3 Trails	**0**	**0**	**952,648**

RIVER VIEWPOINTS			
Parson's Channel Viewpoint	15,000		
Centre Creek East Viewpoint		15,000	
Fraser River Viewpoint			20,000
Picnic area viewing platform, floating dock		300,000	
Subtotal	**15,000**	**315,000**	**20,000**

FUNDRAISABLE PROJECTS			
Nature Play landscape		600,000	
Interpretive Signs	15,000		
Subtotal	**15,000**	**600,000**	**0**

OTHER			
Habitat compensation			
Watercourse crossings	80,000	80,000	80,000
Viewing platform, dock habitat compensation		120,000	

Viewpoints compensation if within riparian setback	24,000		8,000
Operations Compound		20,000	
West Entry Overpass Connection			7,500,000
Viewing Tower (Centre Creek Node)		600,000	
Engineering Pre-design Assessment	275,000		
Subtotal	**379,000**	**820,000**	**7,588,000**

Subtotal by Phase	**$ 3,865,335**	**$1,795,000**	**$8,862,548**
15% Design and Administration fees	$ 579,800	$ 2 69,250	$1,329,382
15% Contingency	$ 666,770.29	$309,637.50	$1,528,789.44
	$ 5,111,906	**$ 2,373,888**	**$ 11,720,719**
GRAND TOTAL			**$ 19,206,512**

General Note: Unit Costs indicated are suitable for general budgeting only, and are accurate only to +/- 30% (Class D estimate)

License and permit fees are not included in the costs.

Taxes are not included in the cost estimates.

8.5.5 INTEGRATION WITH PORTFOLIO MANAGEMENT

Metro Vancouver uses a portfolio management system to prioritize recreational development projects in its network of regional parks and greenways. Projects are prioritized according to the goals of the Sustainability Framework and the Regional Parks and Greenways Plan. Future projects conceived of after the first phase of park development at Surrey Bend will be evaluated using this system and funds allocated to the highest priority projects according to the budget available. Capital park construction projects are approved annually by the Metro Vancouver Board.

8.5.6 PARTNERED COST SHARING OPPORTUNITIES

Metro Vancouver works with the Pacific Parklands Foundation (PPF) to raise funds for projects that are of interest to the foundation. PPF will review the management plan to identify such projects. Metro Vancouver can also apply for grants or work with community groups to gather funding for interpretive signage, facilities, scientific studies, and ecological conservation projects.

9. APPENDICES

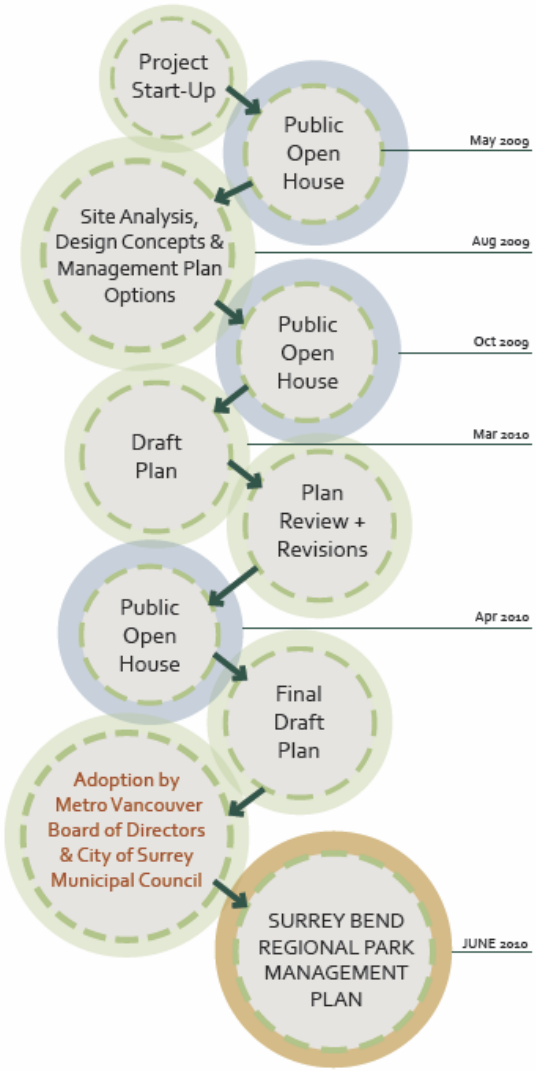
9.1 PLANNING PROCESS

Information to support the development of the Management Plan was gathered from the following:

- Interviews with key stakeholders
- Consultations with landscape architects, biologists, the public and other agency representatives
- On-site visits
- Golder Associates engineering report
- An Ecological Study of Surrey Bend (Kistritz et al. 1992)
- Park Committee Reports and files.

The planning process utilized a collaborative approach, including:

- A Steering Committee made of up staff from City of Surrey Parks and Metro Vancouver Parks to manage the process;
- A project Advisory Committee comprised of representatives of Parks staff, Engineering staff, a local community association, a regional environmental society, and the Province to oversee, provide input, and help guide the direction of the work;
- Consultation with the public as users of the park; and
- Meeting existing restrictive covenants on portions of the Park with respect to process, consultation, and management needs.



Surrey Bend Regional Park Planning Process

9.1.1 PUBLIC OPEN HOUSE #1 – SUMMARY OF FEEDBACK

The following is a summary of all feedback received at the Surrey Bend Regional Park Management Plan Open House #1 held at Anniedale Traditional School on Thursday, May 28th, 2009, 6:00 – 9:00pm. Feedback opportunities included discussions with the project team, notes on boards, and voluntary questionnaires.

	People Were Invited
42	People Attended
19	Comment forms were returned

What are the 3 best features of Surrey Bend Regional Park?

First:

Large unspoiled/natural area/lack of buildings	11
Walking paths	3
Water access	2
Location	2
Picnic Areas	1

Second:

View	3
Wilderness	3
Trails	2
No motorized use	1
Location	1
Camping	1
Diversity	1
Radio flying club potential	1
Wildlife	1
River access	1
River Setting	1
Close to residential areas	1
Dog off-leash area	1

Third:

Natural	1
Recreational facilities	1
Proximity to Tynehead-potential for linkages	1
Potential for park reflecting ethnic diversity of Surrey	1
Wildlife	1
Diversity of plants	1
Location	1

Biking trails	1
Grassland areas	1
Waterfront access	1
Potential	1
Views	1
Dog walking areas	1

What are the 3 greatest concerns about the development of a park at Surrey Bend Regional Park?

First:

Overdevelopment/conservation not a priority/no industrial or commercial/	7
Keeping wildlife	4
Security	2
No motorized vehicles	1
That conservation is the only priority	1
No dog off-leash area	1
No radio flying club area	1
That it serve as many people as possible	1
That it be multi-purpose	1

Second:

Overdevelopment	3
More traffic/noise	3
Parking	1
Vandalism/litter	1
Environmental impact	1
Fish bearing streams	1
No facilities for kids/families	1
Dogs	1
No dog off-leash area	1

Third:

Overdevelopment	2
Path development	1
Parking	1
Access	1
Environmental impact	1
Maintenance	1
Loss of wildlife	1
No consideration of ethnic diversity	1
Undesirables	1

Is there anything else that should be considered when developing Surrey Bend Regional Park?

- Yes, provide space to RCFCBC as a host flying site. Both Ontario & Saskatchewan make it available as does Victoria, BC.
- What parks/activities currently attract the diverse population of Surrey. What currently inspires residents of all ages to head outdoors.
- If parking was next to a well used area, say a playground, I would feel better about parking and then going for a one or two hour walk.
- Possible boating/canoe/kayak access? Foot paths/cycle paths to access water with minimum impact.
- Activities other major sports concerns.
- Civic group use and club use.
- The motorized vehicles accessing park.
- A certain section east end should have parking and a boat ramp (see Maqabeak park in Coquitlam).
- Limit development to hiking trails mostly.
- Multiple access as people can walk or bicycle to the park as if not parking will be an issue.
- 2-3 benches, waste cans, 1 restroom.
- I'd like to see the area as naturalized as possible and uses allowed should be low impact, low maintenance and still be accessible—any parking lots should be gravel + small.
- Benches, education boards—information on wildlife.
- All facilities should be wheel chair accessible, ample toilets should be provided.

What is your VISION for the future of Surrey Bend Regional Park?

- That is stay a mostly untouched natural park, but with walking & cycling trails, but no off-trail access.
- A place that brings families together outdoors, and encourages widespread interest in outdoor activities in an ethnically diverse community.
- Well used park for canoeing, walking & a great place to be.
- Sanctuary for people & animals, minimal impact. Perhaps more contact/community with first nations peoples.
- Keep it as natural as possible.
- My vision is to leave it as is.
- A place to go for long walks, where you can experience nature around you.
- Trails should be environmentally friendly and along river bank.
- Save access to the river.
- To have as much the same with the exception of above stated additions: benches, washroom, wastecans.
- A natural riverside environment with wildlife viewing areas, non motorized uses, perhaps self guided interpretative facilities.
- Nature areas, walking areas, view points, dog areas, picnic areas.
- A natural environment available for citizens and visitors to enjoy as a spot to picnic, rest and relax.

Use/Activities

Walking/running trails and loops	16	respondents
Cycling routes	12	respondents

Look-out platforms	11	respondents
Picnic sites/rest areas	12	respondents
Fishing	7	respondents
Boating	5	respondents
Camping	1	respondent
Bird watching facilities	11	respondents
Outdoor or seasonal cafes	3	respondents
Small restaurant	1	respondents
Convenience kiosks	1	respondents
Rental stations	0	respondents
Special events space	3	respondents
Visitor centre	1	respondents
Dock or boat launch	8	respondents
Shuttle service	0	respondents
Recreational beach access	8	respondents
Dog off-leash area	9	respondents
Marked heritage/cultural sites	4	respondents
Interpretive programs	5	respondents
Educational programs	6	respondents
Other	9	respondents
Radio Controlled Planes	5	respondents
Boardwalks	2	respondents
Benches	2	respondents

Comments and Other Suggestions

- Please contact Brad Ricketts @ 604-951-4251 regarding information on the RC Flying Club.
- Stanley Park is used often by an extremely diverse group of people. It provides a wide variety of activities and draws an equally wide group of visitors. Please give us a park that allows an equally diverse City of Surrey to come together and enjoy outdoor activities, not solely wildlife viewing and nature walks.
- One time I went to walk at Green Timbers & there was a couple there obviously breaking into cars. I waited then phoned police & found that they had the same idea & were working that parking lot.
- Make sure there is a dog bag pick up & disposal.
- I would like to see Surrey Bend left as is. There are many other parks which provide a variety of uses. Surrey Bend is unique because it is pristine and mostly untouched.
- Apart from the noxious fumes from the mill, the park holds enchantment due to its private nature and natural wildlife. Changing that aspect would ruin it for me.
- Some areas should be strictly conservation—no public areas. I am not aware of flood concerns, but obviously this should be considered before spending/investing in infrastructure.
- I like that most of the area is not disturbed by humans. The wildlife has a nice area to thrive in. I would like that the area be reserve as a peaceful quiet are to enjoy, free from extra noisy activities.

What is your interest in this plan?

Park Neighbour	11	respondents
Surrey Resident	14	respondents
Barnston Island Resident	0	respondents
Resident of Lower Mainland	3	respondents
Other	1	respondent

9.1.2 PUBLIC OPEN HOUSE #2 – SUMMARY OF FEEDBACK

The following is a summary of all feedback received at the Surrey Bend Regional Park Management Plan Open House #2 held at Anniedale Traditional School on October 15th, 2009, 6:00 – 9:00pm. Feedback opportunities included discussions with the project team, notes on boards, and voluntary questionnaires.

58	People Attended
51	Comment forms were returned

1. Having read the vision and guiding principles on the welcome board, do you feel that the statement represents a fair and reasonable approach to the Surrey Bend Regional park Management Plan?

Strongly Agree	17
Agree	23
Neutral	6
Disagree	1
Strongly Disagree	2

Do you have any additional comments?

- The vision statement focuses almost solely on habitat and conservation. It says almost nothing about people, recreation, and gathering. The parks' purpose is for the environment and not the people.
- Well explained and three choices well defined.
- Plan seems reasonable
- I have been walking in Surrey Bend Park for 9 years now. I love it. There are deer, beavers, coyotes, garter snakes, frogs, etc. We have carried out many bags of litter over the 9 years. I'm really concerned about disrupting the wildlife there. There is a kildeer who has been nesting out in the open over the years. The less development down there the better.
- Minimize recreational development.
- Should be kept as natural as possible.
- Keep it a park!

- Not other than Surrey Bend is a beautiful spot. Needs sound thought to develop it into an area to be enjoyed by many.
- Environmental considerations should precede economic and recreational ones.
- Education as a leading principal should give way to reasonable access as a leading principal.
- It should be protected in as pristine a form as possible while allowing public access to the trails and river.
- I believe that non-motorized access along 104 Ave and 176 Ave are vital to foster good will of the neighbourhood.
- So long as the trails are least disturbing to the creatures living there.
- Access for disabled and aged need to be considered.
- The city's vision is 'surrey-city of parks'. This must remain the guiding principle upon which to preserve and create enjoyment for all. Acquiring more parks now should also be considered.
- Make a mix of Europe and Canada.
- More trail and openness by river.
- It captures priorities ie protection & conservation vs recreation & interpretation
- Totally agree with the vision statement. Don't k now what guiding principles #2 refers to. Where is this found? If #6 refers to putting in a boat launch it is totally inconsistent with the vision statement.
- I want to see the least impact on this sensitive area and no special accommodations to enhance any special interest groups.
- No soccer fields.
- I use this undeveloped park every day to walk my dog. I would like for it not to be developed/expanded in any way. Put available money into other established parks such as tynehead/Fleetwood/bear creek and leave this park as is!!

2. Which of the three concepts most closely represent the appropriate level of trail development?

Concept A	4
Concept B	14
Concept C	30

Do you have any additional comments?

- Have to design around beavers—they are everywhere
- Boardwalks may popup if not floating kind
- Concerned with infringing on wildlife areas and also introduction of dirt bike activities if now make some areas more accessible.
- We are in great need of an area that offers running/jogging trails. This would answer to that. Tynehead is being paved over on the trails which makes it no better than street running. Also, it is heavily treed and thus unsafe. This will rival Burns Bog as a wonderful outdoor destination for people who enjoy exercising outdoors. A wonderful natural learning environment!
- Plan should include off-leash area for walking dogs.
- More trails mean a variety of options when visiting the park, and encourage return visits to see something new and experience a different element of the park.
- Like the extra trails and the boat launch was excluded.
- I like the option to connect to fraser heights because there are very few parks on north of HW 1 and it is difficult to cross RR & new SFPR.

- Motor boats are a terrible idea. We've seen beaver working on the river bank. Please do as little development as possible. We need a park that isn't overdeveloped. I'm really upset about this. Even option A is too much for the wild life and environment. I'm very disappointed.
- Be sure ramp is far enough away from ferry to Barnston Island and also from log booms! Have you thought of allowing horses on some of the trails ie. Campbell Valley—what type of trail surfaces will you plan to use. Biking?
- My friend is hoping for concept C, so he can go off road dirt biking in more trails. I disagree, and think more trails lead to habitat degradation.
- I would like natural trails with bike allowed with good education for all to respect all who use the park.
- I don't think it needs too many trails, however I would be happy with concept C as well.
- Protect the fawn lily habitat.
- Human interference and access should be kept at a low level. Concept B would be acceptable however please keep most of the park inaccessible to humans and dogs.
- I would love to see connection trail between Tynehead Park and Surrey Bend Park with extensive cycling trails. We need to do more to encourage people to cycle, do more to make cycling safe and pleasant.
- Trails to have greater access to water's edge and less access to interior of Surrey Bend.
- Boardwalk through the bog, some cycling trails would be nice to access Fraser River viewpoints.
- I would like to see a BC Flying field provided in the park plan. We no longer have our Surrey field.
- Should have markers for runners and walkers as to how far to go.
- Concept C allows the public to participate in enjoyment to the best of capability and allows for growth in surrounding population allowed by Surrey City.
- Trails and public access are good in parks, provided that the environment is protected.
- Add an overpass for walking and cycling to cross the railroad at the furthest point NW of the Bend.
- Ensure some access for disabled and aged in wheelchairs.
- Want more trail because will be more interesting in the future because will be more people there after Olympic in Surrey.
- Like to see somewhat like Stanley Park little more activity.
- Great park area and I could walk all the time.
- We live right up from the trail and I have frequented Barnston Island for running and would love to have trails close to home and let kids enjoy the outdoor nature.
- We live right up from the trail and I love biking and going for nature walks, and it would be great to be able to be close and you can get a great bike ride and enjoy nature that is close to home.
- Trail development should be minimal, commensurate with providing safe access to shoreline opposite Barnston, shoreline opposite Fraser River proper and connection outside park at NW corner. Suggest Concept C without 3.2km trail parallel to railway line, important to have access to Fraser River proper in more places but not necessary to have trail along shoreline. Trails must make provision for cyclists (who will inevitably enter park) to be separated from walkers to extent possible.
- Great park area, ride bike trails from my house.
- Please concentrate funding on trail development. Forget new road access and huge parking lot/boat launch/dock. Existing trails along rover north of ferry to connect with 176 access

road could easily be made much more useable by having a crew cut brush and improve the trail in a few places. Please start with this, for example on the .2 km section of trail from the north end of 176 up to the river-fill in low spots.
- I would like stiff penalties for any who abuses the privilege dogs off leash, littering, fireworks—total ban.
- Would like penalties for any who abuse the privilege. Littering, dogs off-leash.
- I think the trail should follow foreshore of Fraser River.
- This park should have the cement barriers improved (or a gate installed) to prevent idiots from taking dirt bikes in and ruining the area but no other development is necessary. Just protect the area from the fools who start bon fires from trees they knock down in the summer. And add a couple of 'port o potties' so visitors to Barnston island don't use the park as a toilet.

3. Which of the three fill site options most closely represents the appropriate level of development in the fill site?

Concept 1	13
Concept 2	9
Concept 3	26

How important is it to you that a boat launch be incorporated into the plan?

- Boat launch would be nice but not a must.
- It would be nice to have a boat launch but is not crucial.
- It would be nice but not crucial.
- Get some rock for the boat launch and sand all around.
- I like concept 3 but without boat launch—too dangerous—not boat tie ups either.
- Not important. I would prefer no motors at all. As close to natural (peace and quiet) as possible.
- I love concept 3 with some water play for the children like at Queens' Park in New West. No boat launch. River is very fast current even for expert canoeist such as my husband. Therefore, boats may be the only safe user of the dock or boat launch. Then it's an accident waiting to happen. Plus the pollution from speed boats etc. Just have a tower to view bog/water.
- Concept 3 provides the most public use.
  Not that important
- I really don't think we need boat traffic in and out of this park.
- Not important at all.
- Not important.
- Have a viewing tower without the boat tie ups. If booms and currents are a factor there will be lots of accidents with inexperienced boaters.
- With strong currents, paddle sports should not be encouraged.
- I do not think that power boat launch is a good idea. Lots of vehicles with large trailers, lots of noise!
- Prefer concept 1 but would consider #3 acceptable as well. Please no boat launching.
- Too close to B. Island ferry for boat launch.
- Not very important at all.
- Not important.

- Just a little important but we might use it once or twice a month in the summer for our zodiac.
- In my opinion the boat launch/dock is a must, since it will be the first thing to pull people in. Plus it will tie in with the Fraser river blueway route. Although option 3 doesn't have one it should be revised with one added.
- Not at all
- Important to have a boat launch!
- Not.
- Very important. There is not a good ramp to the Fraser in Surrey.
- Keep it as simple as possible (less vandalism opportunities) and less cost of maintenance.
- I think it would be a great idea but NOT motor boats. Canoes, kayaks, rowboats not intrusive to the surrounding sensitive areas.
- Not important. Non-motorized boat tie ups—good plan.
- A viewing pier would be an asset to the atmosphere of the park, but a boat launch is not important to me, and I see it as a potentially negative feature.
- I am not in agreement with a boat launch at all.
- Boat launch would be nice as none exist in the area and I have seen cars with boats come in to launch.
- Not important. This is primarily a natural area.
- Forget the boat launch; not an appropriate place. Narrow channel, log booms, tug and ferry traffic, noisy seadoos will spoil tranquility of the area and terrorize wildlife and spoil habitat—very costly.
- I do not believe that a boat launch or a dock should be incorporated AT ALL. Some people are destructive by nature and the area is too sensitive to risk endangering it.
- This is very important part. The log booms do more damage to the tidal flood plains than any dock or boat ramp.
- Fix the boat launch at the park entrance if a boat launch is necessary. Leave park untouched—just more security to this sensitive eco-environment.

4. Considering that park improvements may need to be phased in as funding is available, what are your top three priorities?

- Trails— 26 as priority A, 5 as priority B, 2 as priority C.
- Remain Natural-- 4 as priority A, 2 as priority B, 1 as priority C.
- Family/Children Area— 2 as priority A, 1 as priority B, 6 as priority C.
- Parking— 2 as priority A, 5 as priority B, 2 as priority C.
- Viewing Station— 0 as priority A, 6 as priority B, 5 as priority C.
- Connection to Tynehead— 1 as priority A, 0 as priority B, 3 as priority C.
- Picnic Areas— 1 as priority A, 5 as priority B, 5 as priority C.
- RC Flying Club— 2 as priority A, 0 as priority B, 0 as priority C.
- Interpretative signs— 0 as priority A, 2 as priority B, 0 as priority C.
- Washrooms— 0 as priority A, 0 as priority B, 3 as priority C.
- Boat Launch— 1 as priority A, 0 as priority B, 3 as priority C.
- Beach Access— 0 as priority A, 0 as priority B, 1 as priority C.
- Use of natural materials— 0 as priority A, 0 as priority B, 1 as priority C.
- Stop SFPR— 1 as priority A, 0 as priority B, 0 as priority C.
- Bikes on 104th Ave— 0 as priority A, 1 as priority B, 1 as priority C.

- Exercise— 0 as priority A, 0 as priority B, 1 as priority C.
- Security— 1 as priority A, 0 as priority B, 0 as priority C.

Comments and Other Suggestions

- My interest in the plan is to be able to drive electric bicycle and electric scooter.
- I have a dog and like to have an off leash area.
- All trails need to accept bicycles. Any cement retaining walls should have 'bird' or 'fish' decorations in the cement. Burnaby Lake has a 3 storey tower for viewing (about 20x20) that would be an excellent end point for bikes to stop and turn around from. Fun to get up high and get a perspective—like at some corn mazes. It would be good to overlook the bog and the water. Parks without water are not used by people, therefore children's water play area is great.
- I would like to see added a plan to incorporate a radio controlled aircraft flying site. An area over an open part of the park would allow for a safe and controllable spot. RC flying has little to no environmental impact.
- An overpass for local residents to get over tracks and freeway to M1/F2 area.
- Set aside a small area in middle of park for model enthusiasts to fly model airplanes.
- Good recreational idea for FH and neighbouring areas.
- I currently run along the road and enjoy it a lot for 19 years now.
- Keeping the beauty and tranquility of the park while offering walking and cycling access to those who want to enjoy the parkland.
- I love Surrey Bend the way it is but I understand.
- Include a bike path and bike bridge connecting parking area to ferry (people park and use the ferry to cycle around Barnston Island).
- Stop Gateway!
- I would like a park similar to Derby Reach in Langley with camping.
- Though the fill site is small, the more variety that is provided in this area (as in concept 3) the more widely the park will appeal to residents of Surrey. As Surrey experiences so much rain, the more shelter available the more use the park will get on a consistent basis. Many ethnic groups enjoy gathering together to eat outdoors, and this abundant shelter will encourage the use of this park by much of our multicultural city.
- We need a park where 176 and 104 meets where there are the 60+ homes this would make it easier to go to that smaller park because of the bend park's new access road was easier to go to before.
- Preserve natural area—I live in area and would like to see unique enviro maintained 'Surrey's bog'
- Improve and complete bike route via roadway & route to NW exit.
- Please don't waste money on access road and parking lots docks or boat launches. The existing ferry parking lot is huge and has tons of space, even when a lot of mill workers are parking there. Why does fill site concept 1 + 2 have car parking for the ferry given that there is already excess space for ferry parking this makes no sense at all. Concentrate on trail development.
- Let's all hope that a road never runs through it!
- I am a home owner and taxpaying surrey resident who uses this beautiful park every day for past 10 years. Please just leave it the way it is with no development other than what I stated above.

9.1.3 PUBLIC OPEN HOUSE #3 – SUMMARY OF FEEDBACK

The following is a summary of all feedback received at the Surrey Bend Regional Park Management Plan Open House #3 held at the Pacific Academy April 15th, 2009, 6:00 – 8:00pm. Feedback opportunities included discussions with the project team and voluntary questionnaires.

Open House Attendance and Findings

49	People Attended
38	Comment forms were returned

1. Do you support the trails and nodes plan as proposed?

Yes 13
No 18
Neutral 6

If no, what needs to be changed for you to support the plan?

Yes:

- In as much as the trails are not overdeveloped. The number of trails should be reduced to minimize fragmentation.
- Love the idea. We need trails to see the environment.
- I would like care taken in construction. I listened to the planners and landscapers and like the concepts. I want the tower #1 at river edge as proposed.
- If done in a sensitive, careful, protective manner. Narrow trails, Raised boardwalk that people can not leave.

No:

- Too developed. Phase 1 to have trail all along river and will negatively impact the Erythranium Lilies. Prefer the inland trail portion with just one way routes out to two access points to river.
- The development is way too extensive/intrusive.
- There are already trails and a small parking lot there, building on this site is unnecessary and costly.
- There's already trails so just leave it how it is.
- Limit offering people to take advantage, litter and destroy an amazing and rare ecosystem. Those trails exist. There already is a barely used parking lot.
- Need the minimal amount of 'human' traffic.
- Leave nature alone—its wonderful. Why are we using money to add parking when what is already there is never more than half utilized?
- Less trails—the plan is based on imaginary human behaviour, not the way people behave today in natural areas and areas beside natural areas.

- Less development of trails to preserve natural state. No dogs off or on leash.
- Fix roads we already can't maintain, wildlife preservation, to industrial.
- We favour the least degradation of habitat, including the option of scrapping the entire project. If something must be done, please do the minimum.
- Less fragmentation with the trails, do not put in the west trail. Leave all the west side as a natural area for wildlife reduce the east area development.
- It is acceptable to have the first loop north of the entrance and activity unit but the remiaing looks to the north and the river front are unacceptable. However, why have any new trails at all.
- Would support the plan if the connector paths in the Parson's Channel unit were limited to 2; and the pathway to the fraser river unit were eliminated.
- A trail cutting across will provide too much access. If the purpose of the park is to protect critical habitat-which it should be – human & dog access should be very limited.

Neutral:

- The more accessible you make the trails the further back we are going to push the animals away.
- I love the idea of people being able to see how beautiful Surrey can be but at the same time how badly could it impact the natural habitat.
- There are already many paths and trails that take you around this region.

2. Do you support the entrance and activity unit concept plan as proposed?

Yes 13
No 21
Neutral 3

If no, what needs to be changed for you to support the plan?

Yes:

- Not bad but please ensure no boat ramp or boat trailer parking. No dogs!!
- A little concerned about 160 cars! Love the small picnic area and trails.
- If hard hack makes a natural barrier I support the trail on the twinned sewer line.
- Ideally integrating access with the MOT parking area for the ferry could rescue the development footprint of the activity area.

No:

- I don't agree with the west entrance maintenance road –it is unnecessary.
- Again, the development is too extensive/intrusive.
- There is already a service road leading to the same point, building an overpass is pointless and you will only be interrupting the natural flow of that environment.
- I just think this plan is stupid don't' build any parking lots or any of it. The area is fine how it is.
- I think that putting a parking lot of any size in the 'fill area' will greatly harm the habitat of the many kinds of wildlife currently living there.
- Leave this beautiful place to the animals and the people that already use it fine.
- Needs to be kept natural.

- I do not support any development into the region. It is already a great park that people enjoy visiting.
- Minimum human impact.
- It is simply a step towards cedeing to demands for even more usage. Please start small and controlled, based on the idea that it is a priviledge to be here, not a right.
- Smaller, simpler concept.
- Well the road is smaller than the trail they want to put in, wish there was a time I could explain verbally.
- Less parking, remove special events/picnic area at north end, move washrooms to south end with a small parking lot.
- Surrey is a city of many parks—there are many opportunities for recreation already. Surrey Bend is an opportunity to retain a wide range of plants, mammals and bird which have been driven out from so many areas.
- Parking should be for 50 only, not 150.
- I would suggest greatly reducing the parking. It is not a large area with limited trails—you don't want it over run with people.

Neutrals:

- I believe it is good for people to be able easy access but is there a safer way for the natural environment.
- Would prefer a maximum of 100 parking stalls—other than that I support the plan.

3. Do you have any concerns regarding the content of the Draft Management Plan other than the two points above?

- Do not include phase II + III. They are not needed. Reassess in 20 years.
- How much it will cost to secure the paths in the bog.
- When humans enter any habitat, they tend to act quite destructively intentionally or not. That means the disturbed area will reach way beyond the built up area. I also do not support the boat launch/tie–up area, as it will affect the shore very negatively.
- Get it done. People need access to the river. Stop the highway.
- It will take way too long for the project to be completed.
- M2 protection should be higher priority. Likewise M3 conservation need be stronger.
- The idea that introducing large amounts of people to an area such as this can 'help' or 'enrich' the natural ecosystems is absurd!
- I'd like to see more trail through the bog area.
- There would need to be less parking, less everything. I don't want to see it change into asphalt.
- Don't spend tax dollars while our economy is down on harming the environment. Health care? Education.
- First 3 concepts—look like Lib, Con + NDP—no green! The whole tilt should be that protection trumps entitlement, otherwise we will see repeated what we see daily in almost all 'parks' and 'natural areas'.
- I have a big problem with the effect of the SFPR and the effect on Surrey Bend.
- Gives local people a destination for a walk. Great ideas! I've been waiting for something for a long time.

- Reduce all the plan to small parking area washrooms and small area to picnic at south end.
- I do not believe that a detailed environmental assessment has been done as preparation for this project.
- Biggest item is always building with least impact.
- No boats, planes, dogs!
- Surrey lacks any public boat launch facilities in Surrey Bned offer one of the opportunities on the Fraser River. Currently there are 2 private launches which may not be available to the citizens of the future.
- Slight concern about the Fraser Heights overpass. Will some cars be parked in the subdivision for people to access the park through this entrance?
- Bicycles should not be encouraged. Bikers always start building their own destructive trails.
- Yes leave the west portion of the Bend in a natural, undisturbed state.

Comments and Other Suggestions

- Do inventory of plants to avoid routing trails on sensitive areas such as Erythranium lilies. Looks like nesting wood duck + killdeer. Inland reed canary grass maybe would have short eared owls. The narrow river route that presently exists is amazing natural vegetation—no invasives once beyond first fill area. Beautiful stand of old growth cottonwood. Tremendous opportunity to enhance wildlife with that long straight edged ditch. Wider in a few places and plant with shrubs etc…
- I like all the picnic tables as planned.
- There could be more important things to spend money on.
- Recently i saw the amount of vegetation, a huge mound and many logs carted away from the 'small' parking lot that is now being constructed at Tynehead Regional Park. I was shocked! The trails will impede the natural flooding and humans will destroy vegetation and scare away the animals.
- Look how liveable a city is by how much access there is to water, lakes, ponds, streams, rivers, etc… Industry might benefit with the node plan, for river access. The city could operate the node—pay for use.
- Although concept #3 was accepted, the trail system is more like concept #2. As part of the Surrey Trekkers Walkers Club, we are always looking for trail areas to walk in – a trail through the existing cottonwoods would add to our repertoire. We regularly walk in Tynehead, Derby Reach as well as on residential streets linking up the parks. We look forward to the completion of all the proposed trails in Surrey. As presently presented one couldn't have a circular walk around the park, it would only have to be in and out and back which is not so preferable. Need a dog off leash area. Care needs to be taken to preserve the flora and fauna that is in those. Apparently there are fawn lilies along an existing trail by the river these should be preserved.
- Your graphs were pretty.
- Just leave it.
- Minimize dog use. Ban motorized bikes. Reduce cycling traffic. Cottonwoods very important. Wildlife should be allowed to burn. Extra protection for nesting birds.
- Surrey Bend Regional Park is a beautiful place and should not be destroyed using millions of dollars from tax payers that love it just as it is. Leave our park alone!!
- Would like to see cycling allowed on main trails.

- I have lived a 10 minute walk away from the park my whole life. I grew up going for bike rides at the river and simply don't want to see the fields change.
- I dont' see at all how allowing more people to trek through and building through is supposed to protect wildlife and ecosystem. The surrey bend regional park is already used and enjoyed by anyone who wants to. I've read your entire park management plan and all it can do is harm. Despite your immense claims about protecting and preserving, the more feet that take place there, the more it will be harmed. The overpass is extremely unnecessary and expensive. Leave it alone!
- No dogs, especially off leash.
- Barnston area is, and should remain a natural area. It is a great place for people to go to enjoy the outdoors. People who appreciate the outdoors already know about the region. The area of the future 'events area' is already used as a fire pit. There are many places you can safely have a fire pit. The sandy field is optimal because it is a large space around the fire pit that can't catch on fire. People will always continue to have fires in the Barnston area. However, taking away the sand could lead to fires in unsafe areas which could be dangerous.
- This is a rare wildlife area. I've seen and loved some of its flora and fauna. Protecting it should be paramount. Not developing it. Any impact should be where it is already impacted.
- Plan for a climate of inching upward, entitlement and you will get it. Metro really has lost its conservation vision. Totally segregated areas needed. Proven time and again in US jurisdictions with longer histories of conflict over natural areas.
- Tynehead regional park with its planned walkways will nicely serve the pedestrian public. Save Surrey Bend with only minimal trail development.
- Wildlife needs to be looked at more closely, fix roads we can't maintain other than expanding and creating more problems we already can't fix.
- There is a high density of school age children in the western part of Fraser Heights. These children would benefit from non 104 Ave access to the park from the ridge. Cycling and trail would be an urgent community facility.
- There are already many recreation areas for people. This is a special area that should be left alone for wildlife.
- Even now there are many incursions into River Bend which are not supposed to occur. Motorized access needs to be eliminated. Now. The maintenance costs of keeping the proposed trails in good shape during high water times will be expensive and it will be difficult to keep users out during the rainy season. Expensive for construct and maintain. Will future leader in Surrey ensure that, once a few trails are built that it will just be a further of more more more. Do not put in a dock/viewing ramp etc… that area is a very sensitive water one.—power boat should be a no no. The whole River Bend conceptual development plan is another step in the continual degradation of the environment. The area is not accessible for much of the year. So why not just have a minimal picnic area at the south entrance and some washrooms and leave the park essentially as a wildlife sanctuary.
- My group is worried re: impact of trails on wildlife. My experience is that they (deer, beavers, etc) use trails as their highways. I'm very concerned about making the twinned sewer like a bike trail. Walking trails predominantly.
- Is there a plan for dealing with the trash generated by people on this trail? Will this plan destroy the habitat of any animals?

- Trail connections to the Surrey land fill area is essential to provide greenway links in North Surrey.
  As a naturalist/environmentalist I prefer the original concept which restricted human intrusion to this significant ecological hub in the area's natural network. However, I realize that the younger computer nurture generation needs exposure to the ecology/natural areas.
- If there is going to be a trail across the park it should be a raised boardwalk with closed sides. Preferably not open to dogs and bicycles. This is such a unique and sensitive area it should not really be put at the disposal of the public.
- I do not support the Surrey Bend plan. I support the comments of Linda McWilliams, my wife who shared the following:
- Way too much development in a sensitive area. What is wrong with the planners.
- It is ridiculous to be putting in a road from Triggs when there is already access through the parking lot at the ferry. One of the people speaking for the plan said there was already a road (Triggs). What he did not explain was that the proposal calls for a very expensive road extension to be built in to the proposed parking area through a bog area. I do not believe people were presented with the information correctly. This road would significantly add to the cost of the project.
- The plan calls for over development and will adversely affect the wildlife in the area unnecessarily. The proposal for 160 parking spaces is totally ridiculous and is much more than existed for years at Tynehead. Why build a 100 seat covered picnic area. The more people encouraged to come in large groups the more it will impact the habitat.
- The proposed dock is also a waste of money that would serve only a few people at a huge cost.
- In difficult financial times this sort of nonsense should not be proposed. My suggestion to council would be to totally cut back the funding until the planning can be demonstrated to be more fiscally responsible and have less of an environmental impact.
- Council should consider cutting back funding for this project and direct that the unnecessary road, the excessive number of parking spaces, the 100 seat covered picnic shelter and the dock are cut from the plan.

-Letters attached—

Surrey Bend Regional Park: Draft Management Plan
April 15 Open House.

City Of Surrey
Parks, Recreation and Culture Dept.

Dear Sir,

Re: Comments to the Surrey Bend Draft Management Plan

In Summary: **I do not support this plan**.

I have been interested in this area for over 20 years. While working for the City of Surrey, I was part of the original research and efforts to save and preserve Surrey Bend. The rail yard and urban development on the upper slopes to the south have already ruined habitat and connectivity into the Bend; and then there is the onslaught of the South Fraser Perimeter Road to come. This is the last remaining, undisturbed, natural area of its kind on the river. With so much habitat loss throughout the City (and in bordering municipalities), the Bend offers a last refuge for a unique ecosystem and the wildlife that use it. The vast majority of the Bend should be protected as a wildlife refuge with no human access.

A brief summary of reasons follows:

- The Plan should keep to the disturbed area on the east side only .i.e. all trails to the west of center creek (Forest Trail & West Trail) should be eliminated. The creek forms a natural barrier that protects the undisturbed wild side of the Bend. Perhaps a raised short board walk to the west on a short alignment to the river with no ground access may be possible - but that's it.
- Access into the Bend from the western corner should be denied and planted with a thicket of inaccessible, barrier vegetation - Hard Hack, Devils Club, Nootka Rose etc.
- Dogs and people will be a very real deterrent to wildlife. People will explore well beyond the trails and their dogs will run amuck all over the place; there is no doubt this will happen. It will ruin the Bend for wildlife.
- The fire risk is too great due to smokers and people (kids) wandering off into the vast area lighting up fires. There is no capability to fight a fire in the Bend and by the time a plane or helicopter got there it would be way too late.
- There are too many parking spaces that will bring too many people into the area all at once. This will increase unauthorized intrusions into the Bend and will be a very real detriment to the natural integrity of the Bend.
- The Bend is big enough such that the eastern, disturbed end could be for access while the remainder (west of Centre Creek) should be "no go". The larger western portion beyond Centre Creek should be a reserve /conservation area for ecosystem and wildlife protection and refuge with access for research only. There was much discussion about this in the past during the review of the original reports and efforts to save the Bend. It was felt that this is such a unique and important, undisturbed, area that people should be restricted from access into the west portion of the Bend.

This is wonderful opportunity to do something different – people do not have to have access to everything. With these changes I could support the plan.

Let's keep most of what is left of the Bend reserved for nature.

Thank you for your consideration.

Ken Bennett, R.P. Bio.

The following letter, in response to Open House #3, was submitted by a member of the Advisory Committee, Kevin Purton, representing Surrey Environmental Partners. The project team subsequently held a follow up meeting with this organization to discuss their feedback and the proposed Concept Plan. They were also advised on the process for submitting feedback to the Metro Vancouver Board and/or the City of Surrey Council.

Dear Metro Vancouver and Surrey staff;

On behalf of Surrey Environmental Partners I would like to start by thanking you for giving our organization the opportunity to be a conservation voice with the Surrey Bend Management Plan Advisory Committee.

After careful consideration SEP executive members have identified some serious issues to be addressed. Therefore, we have decided we can't support the latest draft of the Surrey Bend Regional Park Management Plan as proposed.

The following information is in response to the Open House #3 Comment Form – April 15, 2010.

Attachment 'A' – We would support a management plan that places the conservation of Surrey Bend's natural values above all other needs. Surrey Bend is unique in the Fraser Valley and as such we feel human access should be prohibited in the area west of 176 St. and all trails in that area should be removed from the plan. There is almost nowhere in the Fraser Valley reserved exclusively for wildlife and natural processes. Trails through Surrey Bend west will introduce human influences including dogs, garbage, noise, bicycles, invasive species and the very real prospect of fire to this remote area. We support human access in Surrey Bend being restricted to the eastern end of the park only. We would support a viewing tower somewhere in the vicinity of the bridge at Centre Creek.

Attachment 'B' – The entrance and activity unit concept plan currently allows parking for 160 vehicles. If a figure of three people per vehicle is used, this translates into the possibility of a large group of almost 500 visitors at any given time. For a park with a conservation priority a 160 stall parking lot is too big. We feel that a parking lot half this size would be very generous for Surrey Bend.

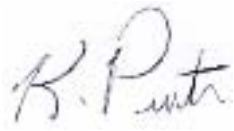
Attachment 'C' – The western portion of Surrey Bend, west of 176 St., should be reserved as a 'No Go' conservation area. The area is an urban wilderness and should be left as it is in order for the natural processes to occur.

Attachment 'D' – When I look at a map of Surrey and the surrounding region, I realize how important it is to keep Surrey Bend intact and whole as a conservation region. The prominence of Surrey Bend in the Fraser River and it's proximity to Douglas Island, Coquitlam River corridor, Pitt Meadows, Pitt River, Addington Marsh and Burke Mountain, make it a one of a kind wildlife corridor connecting to natural areas throughout Surrey. With the prospect of the South Fraser Perimeter Road becoming a significant barrier to wildlife movement through Surrey Bend, and further isolating the park, Surrey

Environmental Partners executive members consider it unacceptable to introduce further human stresses through the construction of fragmenting trails and nodes in the area west of 176 St.

Surrey Environmental Partners would be willing to support the Surrey Bend Management Plan with a few changes as noted above.

Thank you for your attention.
Kevin Purton for Surrey Environmental Partners.



9.2 AGENCY INPUT

9.2.1 LETTER FROM FREMP

June 21, 2010

Mr Doug Merry
City of Surrey
14245 56 Avenue - North Annex
Surrey, BC V3X 3A2

By email: DJMerry@surrey.ca

Attention: Doug Merry, Parks Planning Technician, City of Surrey

RE: Surrey Bend Regional Park Management Plan: Draft – March 18, 2010

Dear Mr. Merry,

The Fraser River Estuary Management Program (FREMP) Environmental Review Committee (ERC) thanks you for the opportunity to comment on the Surrey Bend Regional Park Management Plan: Draft – March 18, 2010. This Draft Plan has been reviewed by BC Environment, Fisheries and Oceans Canada, Transport Canada, and Port Metro Vancouver.

Overall, the Draft Surrey Bend Regional Park Management Plan dated March 18, 2010 recognizes the attributes that make Surrey Bend important as fish and wildlife habitat.

However, the following comments should be noted:

Log Booming (Page 34)

- Log storage should remain as log storage may dissipate wave action and assist in protecting the riverbank from erosion.
- It should be noted that, in the past, logs along Surrey Bend were stored by anchoring the log booms to trees along the riverbank which resulted in damage to trees. However, it the early 1990's, FREMP initiated a program by which log storage companies installed piles in the river to anchor the log booms. This eliminated the need to anchor log booms to trees and relocated the log booms offshore to prevent grounding upon and damage to the intertidal and subtidal riverbed.
- The Vancouver Fraser Port Authority (VFPA) has reviewed the Plan with specific focus on strategies related to VFPA property, including references to the current log booming activity, a proposed pier and multi use float, and waterfront access including viewing opportunities. VFPA's land use designations for the area around Surrey Bend Regional Park include log storage, recreation/park and conservation. The Surrey Bend Regional Park Plan strategies align with these land uses. VFPA would work with the City of Surrey and Metro Vancouver, the consenting upland owners for log boom tenures, to find opportunities for opening windows in the log booms to provide recreational access to

the Fraser River. Proposals for piers or structures crossing the foreshore would be subject to VFPA's development review process and FREMP's coordinated review.

With respect to Section 8.3.4 Outdoor Recreation, the construction of a public pier and float to support non-motorized boating activities in the park will require an approval under the Navigable Waters Protection Act for this portion of the project.

With respect to the proposed Concept Plan for development works and activities for Surrey Bend and, in particular, Section 8.4 Park Development Summary (page 59), the Draft Plan includes measures to protect the attributes that make Surrey Bend important as fish and wildlife habitat during park development. However, the following should be noted:

- The new vehicle access road access will impact vegetated areas and a ditch along 104th Avenue with a direct connection to the Fraser River. These impacts to fish and wildlife habitat are to be mitigated by enhancing fish and wildlife habitat elsewhere in the Park.

Once detail designs are available for the Stage 1 improvements, this information along with a FREMP Coordinated Project Review Application is to be submitted for an environmental review by the FREMP ERC. This process should be followed for future Stage improvements as well.

Again, thank you for the opportunity to provide comments on the Surrey Bend Regional Park Management Plan: Draft – March 18, 2010.

Should you have any questions or require further information please do not hesitate to contact me at (604) 775-5756.

Sincerely,

Environmental Review Committee

Per: Caroline Dorr
Project Review Coordinator

cc: M. Willcox – BC Environment Surrey (by email)
J. Mackie – Transport Canada NWPD (by email)
B. Naito - Fisheries and Oceans Canada (by email)
C. Brown – Port Metro Vancouver (by email)

9.2.2 LETTER FROM MINISTRY OF AGRICULTURE AND LANDS

May 26, 2010

Your refs: PA03-01-SUR-03
CP12-00
6140-20/S

Doug Merry
Parks Planning Technician
City of Surrey
14245 – 56th Avenue
Surrey, BC V3X 3A2

Dear Doug,

Re: Draft Surrey Bend Regional Park Management Plan

Thank you for the letter sent jointly by the City of Surrey and Metro Vancouver dated March 24, 2010, and for providing the opportunity for the Ministry of Agriculture and Lands to comment on the draft Surrey Bend Regional Park Management Plan. We will in this letter focus specifically on the Restrictive Covenant that we understand is registered on the titles of the majority of the parcels at Surrey Bend, noting that the Ministry of Environment may provide additional comment through its membership of FREMP's Environmental Review Committee.

It is our understanding that the Restrictive Covenant was registered on titles of parcels at Surrey Bend to recognize the conservation goals for which the parcels were acquired. Our interpretation of the key terms of the Covenant is that the landowner will seek the prior written approval of the Province of British Columbia ("Province") before undertaking any alteration to the natural state of the Land as it existed at the time of acquisition, and that consultation with First Nations and stakeholders will be undertaken by the landowner prior to that approval being sought.

It appears from the draft Management Plan that the majority of the proposed changes are within a fill site, and that impacts to the conservation goals for which the lands were established would be minimal. It also appears that aboriginal consultation has already been initiated with a number of First Nations. It is hoped that the City of Surrey and Metro Vancouver can involve the interested First Nations in a meaningful way, whether that be acknowledgement of past use and connection to the land through the use of signage, or some involvement in park management processes. We also note that public consultation is under way, and that the Guiding Principles outlined in the plan appear to be consistent with the conservation goals for which the lands were acquired.

.../2

Ministry of Agriculture and Lands
Crown Land Opportunities and Restoration Branch
Mailing Address:
200-10428 153rd Street
Surrey, BC V3R 1E1
Telephone: 604-586-2885
Facsimile: 604-586-2900
Web Address: http://www.al.gov.bc.ca

In conclusion, our preliminary review of the draft Management Plan suggests that the contents are broadly in alignment with the conservation goals which led to the registration of the Restrictive Covenant on title. We would suggest that formal request for approval of any work plan be sought from the Province at the appropriate time, and that any such request should be accompanied by a summary of the outcomes of consultations with First Nations and stakeholder groups.

Please do not hesitate to contact me by phone (604-586-2885) or email (Neil.Curtis@gov.bc.ca) if you wish to discuss any of the above in more detail.

Regards,

Neil Curtis
Manager, Planning and Local Government
Crown Land Opportunities and Restoration Branch

Cc: Jennie Aikman, Michael Willcox – Ministry of Environment

9.2.3 LETTER FROM MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

DEVELOPMENT APPROVALS GENERAL COMMUNICATION

Your File #: PA03-01-SUR-03
eDAS File #: 2010-01852
Date: May/21/2010

City of Surrey
14245 – 56th Avenue
Surrey, BC V3X 3A2

Attention: Tiina Mack
Manager of Park Planning

Re: Draft Surrey Bend Regional Park Management Plan

We have reviewed the above noted document and have the following comments.

While we have no objections to the proposed plan, we note that the document contains an older alignment for the access road from the Golden Ears Connector (GEC). Our current design calls for the intersection of the GEC and Triggs Road to be located further east at 179th Street. Jamie Boan, P.Eng., Transportation Planning Engineer at your Engineering Department can provide more information on the road network if you require it.

If you have any questions, please contact the undersigned at (604) 660-8304.

Yours truly,

Jeffrey Moore, AScT
Senior District Development Technician

9.3 HABITAT SENSITIVITY ANALYSIS TABLE

Sensitivity of Habitat Types to Trail Incursions 1 = High sensitivity 2 = Moderate sensitivity 3 = Low sensitivity	Map Label	Relative Size	Index of Dominance	Moisture Regime	Wildlife Disturbance	Regional Abundance	Overall Rating
Birch Woodland	F3	1	1	1	1	2	1.2
Floodplain Marsh	M2	1	2	1	1	1	1.2
Tidal Sloughs and Creek		1	3	1	1	1	1.4
Intertidal Mudflat		2	1	1	1	3	1.6
Tidal Freshwater Marsh	M1	1	3	1	1	2	1.6
Wet Meadow	M3	2	3	2	1	1	1.8
Bog	B	3	2	1	3	1	2
Coniferous-Hardwood Forest	F2	3	1	2	3	2	2.2
Cottonwood Forest	F1	3	1	3	3	1	2.2
Hardhack - Grass	S3	1	3	3	2	3	2.4
Hardhack - Willow	S2	3	2	3	2	2	2.4
Hardhack Thicket	S1	2	3	3	2	3	2.6
Fraser River / Parsons Channel		3	3	1	3	3	2.6

9.4 GLOBAL SEA LEVEL RISE ESTIMATES AND UNCERTAINTY

Over geological time, sea levels have varied profoundly. Twenty thousand years ago oceans were 120 m lower than today. This was the peak of the last ice age and a large percentage of water was contained in continental glaciers. For the last 2000 to 3000 years, sea levels have been relatively stable. Records show that over the last century, global sea levels have risen 20 cm. Recent evidence projects changes by 2100 to be at least this and most likely more. Sea Level Rise (SLR) estimates are highly variable. The best available guidance for SLR is the BC MoE, Fisheries and Oceans, and NRCan extreme high estimates.

Based on extreme high estimates, areas in the Fraser River Delta will experience sea level rise of 1.2 metres due to sedimentation subisdence (Boston). In addition to SLR, other climate change variables that could contribute to flood levels are intensity and frequency of storm events, mountain snow pack and seasonal temperature changes that contribute to freshet levels. It is uncertain exactly how these factors would contribute to flood patterns. For example, if winters in BC tend to be cooler and wetter as some modeling indicates, snow packs could occur at lower elevations, in greater depths, and melt over extended periods of time. If winters are warmer, snow packs could be lighter and at higher elevations. Precipitation falling as rain in the lower elevations would run off to creeks and rivers shortly after a storm event, rather than being released in late spring as temperatures melt the snow pack. Although there is uncertainty as to exact level and return rate of flooding, there is general agreement within the scientific community that rising sea levels and climate change will cause higher degree of flooding, not less. These estimates should then be incorporated into risk and vulnerability assessments, long range planning and risk management strategies.

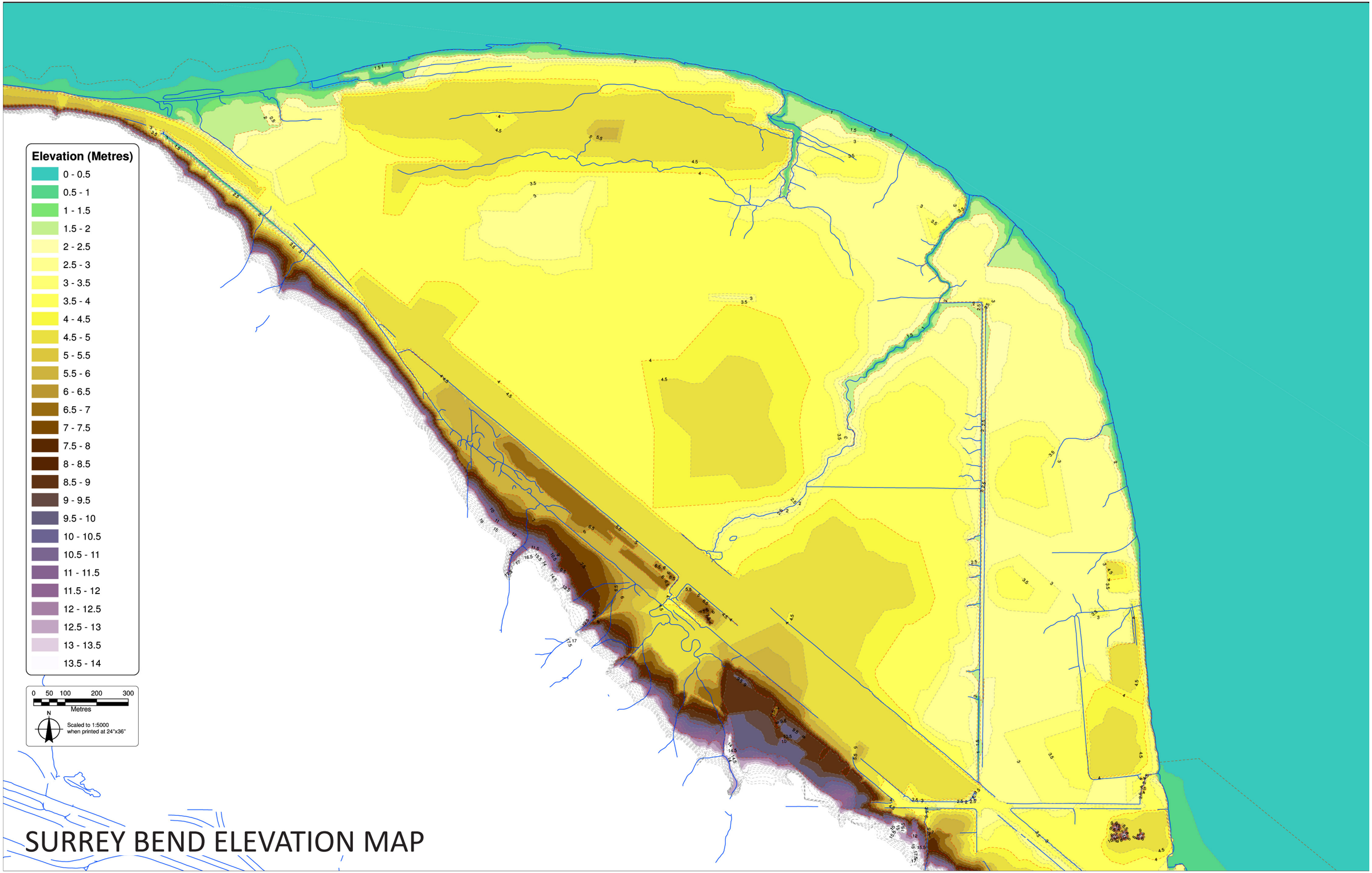
At present, the accretion of sediments along the coast from the Fraser River and coastal erosion is keeping pace with the observed rise in sea level. This means the extent of salt water marshes and intertidal habitats is remaining somewhat constant. If the rate of sea level rise accelerates, as scientists are now suggesting, then salt water marshes, intertidal areas, and mudflats will be inundated, rather than keeping pace with sediment accretion. Plants in these habitats are very sensitive to water levels and would need to migrate to higher ground to survive. However, in most coastal areas in the region, this inland migration of habitat is blocked by dikes and seawalls that protect the extensive human development from flooding by the Fraser River and winter storm surges from the ocean.

The effects of moderate sea level rise by 2100 were recently modeled for 11 key coastal habitat areas in the US Pacific Northwest. The results found that estuarine beaches and tidal flats will undergo the largest losses, at 65 and 44 percent respectively. Just over half of the

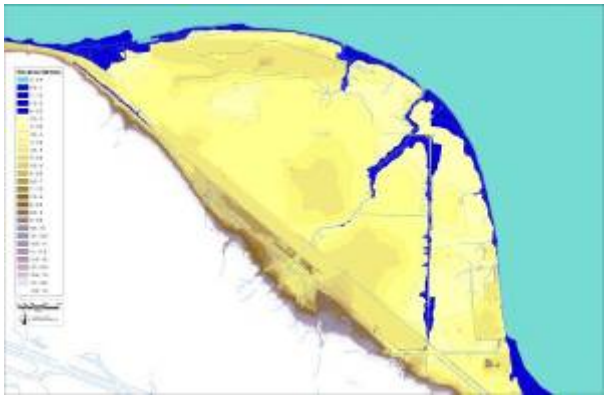
brackish marsh would be converted to other less productive habitats. The report authors recommend taking a longer-term, more comprehensive approach to incorporating sea-level rise in coastal development plans.

The diagrams below indicate general areas subject to flooding at increasing water elevations. For the purpose of the park management plan, these diagrams are not intended to predict flood return rates, but rather to illustrate the extent of flooding at various water levels. With Rising Sea Level predictions, it is likely that flood water will reach these elevations at a higher return rate than historical data would suggest.

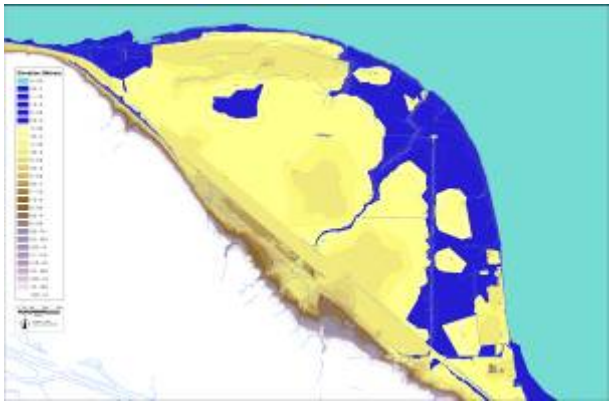
Flood risk assessment is an important factor in the programming and function of the park. Portions of the fill site at the south east corner of the park are between 4.5 and 5.0 meters elevation, so are above present projections of the 100 year flood but below the 200 year event (6.0m). The fill area is the only portion of the park zoned as Integrated Management with Development Focused Sub-Zone, which is suitable for some park amenities such as parking, washroom facility, picnic areas, children's play area, and interpretive information systems. Any structures contemplated within this zone should be designed with this flood risk in mind.



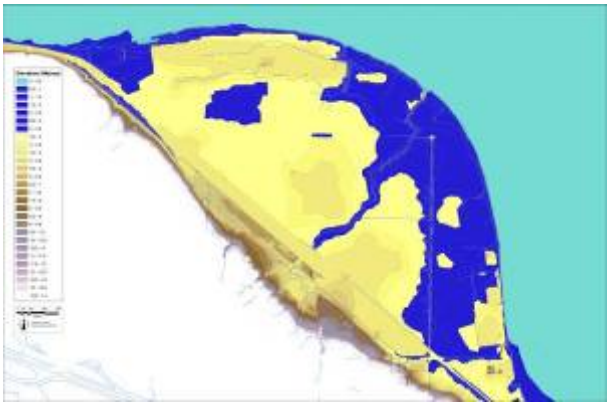
SURREY BEND ELEVATION MAP



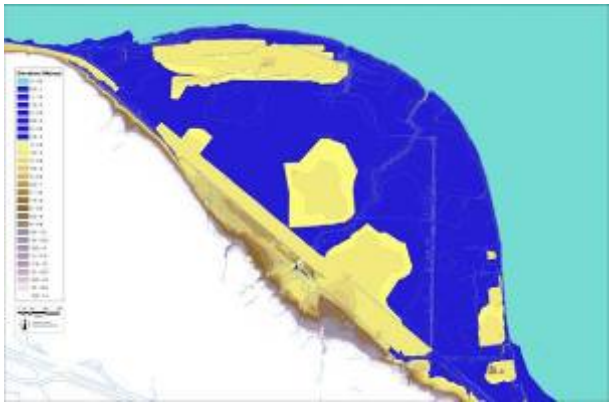
Flooded areas at 2.5m el



Flooded areas at 3.0m el

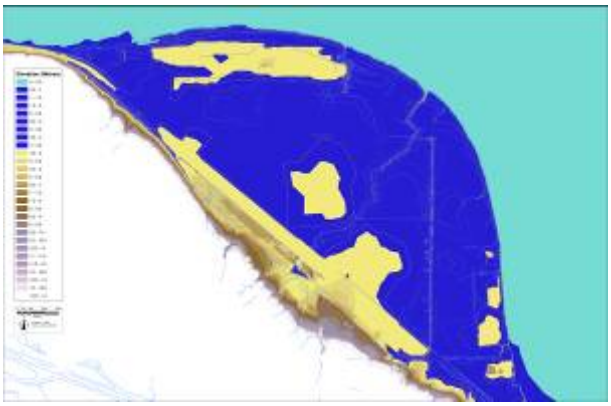


Flooded areas at 3.5m el



Flooded areas at 4.0m el

Mapping showing park areas flooded when water reaches 2.5, 3.0, 3.5, 4.0, and 4.5m elevation. Recent data suggests that rising sea levels may contribute to higher mean elevations.



Flooded areas at 4.5m el

9.5 MOTORIZED BOAT LAUNCH

The City of Surrey has few motorized boat launch facilities on the Fraser River. Although there are no empirical data on demand for a motorized boat launch, information suggests that there is strong interest by the boating public for a launch facility in Surrey on the Fraser River. Currently there is one small, privately operated boat launch on Parsons Channel to the south of the site and another at Brownsville Bar RV site near the Patullo Bridge. These are considered too small to service Surrey's large and growing population.

An option for a public motorized boat launch at Surrey Bend was explored, as an amenity for boaters wanting to access the Fraser River from the City of Surrey. Due to the conservation mandate of the park, the only candidate location for a boat launch is the area in the vicinity of the fill site. A boat launch at this location would require minimal new road construction and no new parking construction due to its proximity to the 104th Avenue entrance.

However, there are several factors indicating that Surrey Bend is not an appropriate location for this facility. Public opinion from the advisory committee and public open houses indicated that a boat launch was not considered a priority, with respondents noting concerns about noise, safety and incompatibility with overall park conservation objectives. Concerns about the safety of a boat launch are valid, due to the narrow width and strong currents of Parsons Channel, log booms, tug boats and proximity of the Barnston Island Ferry operations.

The Fraser River Estuary Management Plan (FREMP) has classified Surrey Bend's shoreline as red coded. This indicates that the shoreline includes "... productive and diverse habitat features that support critical fish and wildlife functions on-site or as part of a more regional context..." (FREMP, 2003) In order to obtain the necessary regulatory approvals for a boat launch on Parsons Channel, an application to FREMP would be required that, at the very least,

- lists a detailed bio-inventory of the existing condition;
- provides detailed design and engineering drawings and construction methods showing precisely the impact on the ecosystem;
- provides a habitat compensation plan that includes a habitat balance sheet to satisfy DFO that there is a net habitat benefit, which may be difficult to achieve as compensation within the park would likely require destruction of one existing habitat type for another;

- provides a commitment to construct, maintain, and protect the compensation works; and

- provides a clear understanding of the impact by high volume of motorized water craft on the shoreline and habitat.

Furthermore, the FREMP review consists of multiple agencies including FOC, Port Metro Vancouver, and Ministry of the Environment. The Fraser River is a working river and the Surrey Bend shoreline contains log booms that supply the adjacent sawmill; therefore, Metro Vancouver anticipates objections to a boat launch as recreational boating may conflict with log booming activity. A boat launch would also trigger a renegotiation of the foreshore lease.

The planning team was advised by Dave Magnusson, Commodore of the Sur-Del Power Squadron, that the Surrey Bend site was a poor location for a powered boat launch. Due to the lack of public and Advisory Group support, the considerable expense entailed in making an application with no guarantee of approval, and the other factors listed above, the boat launch option was abandoned.

9.6 LAND TENURE AND OWNERSHIP

SCHEDULE 1

The City is the owner in fee simple of those parcels or tracts of land and premises situate, lying and being in the City of Surrey, Province of British Columbia, which hereinafter more particularly described as:

11199 – 168 Street
PID: 006-588-387
Section 13 Range 1 New West District Part N ½, except plan R/W CNPR PL3379 & PT lying S & W of CNPR

11399 – 168 Street
PID: 023-073-276
Section 12 Range 1 Plan LMP22741 New West District Parcel 1

16825 – 112 Avenue
PID: 006-818-919
Lot 1 Section 18 Township 9 Plan 557 New West District Part SW1/4

16865 – 112 Avenue
PID: 006-818-935
Lot 2 Section 18 Township 9 Plan 557 New West District Part SW1/4

16909 – 112 Avenue
PID: 006-818-960
Lot 3 Section 18 Township 9 Plan 557 New West District Part SW1/4

16945 – 112 Avenue
PID: 006-818-986
Lot 4 Section 18 Township 9 Plan 557 New West District Part SW1/4

16983 – 112 Avenue
PID: 006-819-010
Lot 5 Section 18 Township 9 Plan 557 New West District Part SW1/4

17015 – 112 Avenue
PID: 006-819-087
Section 18 Township 9 Plan 557 New West District Lot W2.01 CH 6, Part SW1/4

17035 – 112 Avenue
PID: 006-819-192
Lot 6 Section 18 Township 9 Plan 557 New West District Part SW1/4, except Plan W 2.01 CHNS

17145 – 112 Avenue
PID: 006-819-052
Lot 9 Section 18 Township 9 Plan 557 New West District Part SW1/4

17181 – 112 Avenue
PID: 006-819-311
Lot 10 Section 18 Township 9 Plan 557 New West District Part SW1/4

17225 – 112 Avenue
PID: 006-819-320
Lot 11 Section 18 Township 9 Plan 557 New West District Part SW1/4

17265 – 112 Avenue
PID: 006-819-354
Lot 12 Section 18 Township 9 Plan 557 New West District

17303 – 112 Avenue
PID: 006-819-362
Lot 13 Section 18 Township 9 Plan 557 New West District Part SW1/4

17345 – 112 Avenue
PID: 001-766-392
Lot 14 Section 18 Township 9 Plan 557 New West District

17383 – 112 Avenue
PID: 001-766-406
Lot 15 Section 18 Township 9 Plan 557 New West District

17417 – 112 Avenue
PID: 001-766-414
Lot 16 Section 18 Township 9 Plan 557 New West District

17471 – 112 Avenue
PID: 001-766-422
Lot 17 Section 18 Township 9 Plan 557 New West District

17063 – 112 Avenue
PID: 006-819-273
Lot 7 Section 18 Township 9 Plan 557
New West District Part SW1/4

17109 – 112 Avenue
PID: 006-819-290
Lot 8 Section 18 Township 9 Plan 557
New West District Part SW1/4

17529 – 112 Avenue
PID: 001-066-919
Lot 18 Section 18 Township 9 Plan 557
New West District

17605 – 112 Avenue
PID: 013-273-663
Lot FRAC Section 17 Township 9
New West District Part SW1/4

SCHEDULE 2

Metro Vancouver is the owner in fee simple of those parcels or tracts of land and premises situate, lying and being in the City of Surrey, Province of British Columbia, which hereinafter more particularly described as:

17775 – 104 Avenue
PID: 013-259-822
Lot FRAC Section 8 Township 9
New West District Part SW1/4,
Except STAT R/W PL3379, HWY
PL27482, CNR Exprop PL65815, STAT
R/W LMP3185.

17000 – 112 Avenue
PID: 004-952-308
Lot 1 Section 7 Township 9 Plan 51664
New West District Part NW1/4,
P778-120-0000

10451 – 176 Street
PID: 023-083-573
Section 7 Township 9 Plan LMP23023
New West District Parcel 1, Part SE1/4,
REF PL.

10833 – 176 Street
PID: 003-721-051
Lot 1 Section 7 Township 9 Plan 10324
New West District Part NE1/4

10873 – 176 Street
PID: 009-295-887
Lot 2 Section 7 Township 9 Plan 10324
New West District Part NE1/4

10931 – 176 Street
PID: 002-649-331
Lot 3 Section 7 Township 9 Plan 10324
New West District Part NE1/4

10975 – 176 Street
PID: 009-295-895
Lot 4 Section 7 Township 9 Plan 10324
New West District Part NE1/4

10996 – 176 Street
PID: 013-259-873
Lot Part Section 8 Township 9
New West District Part NW1/4,
Lying W of Parsons Channel

11035 – 176 Street
PID: 009-297-090
Lot 5 Section 7 Township 9 Plan 10324
New West District Part NE1/4
P778-080-0000

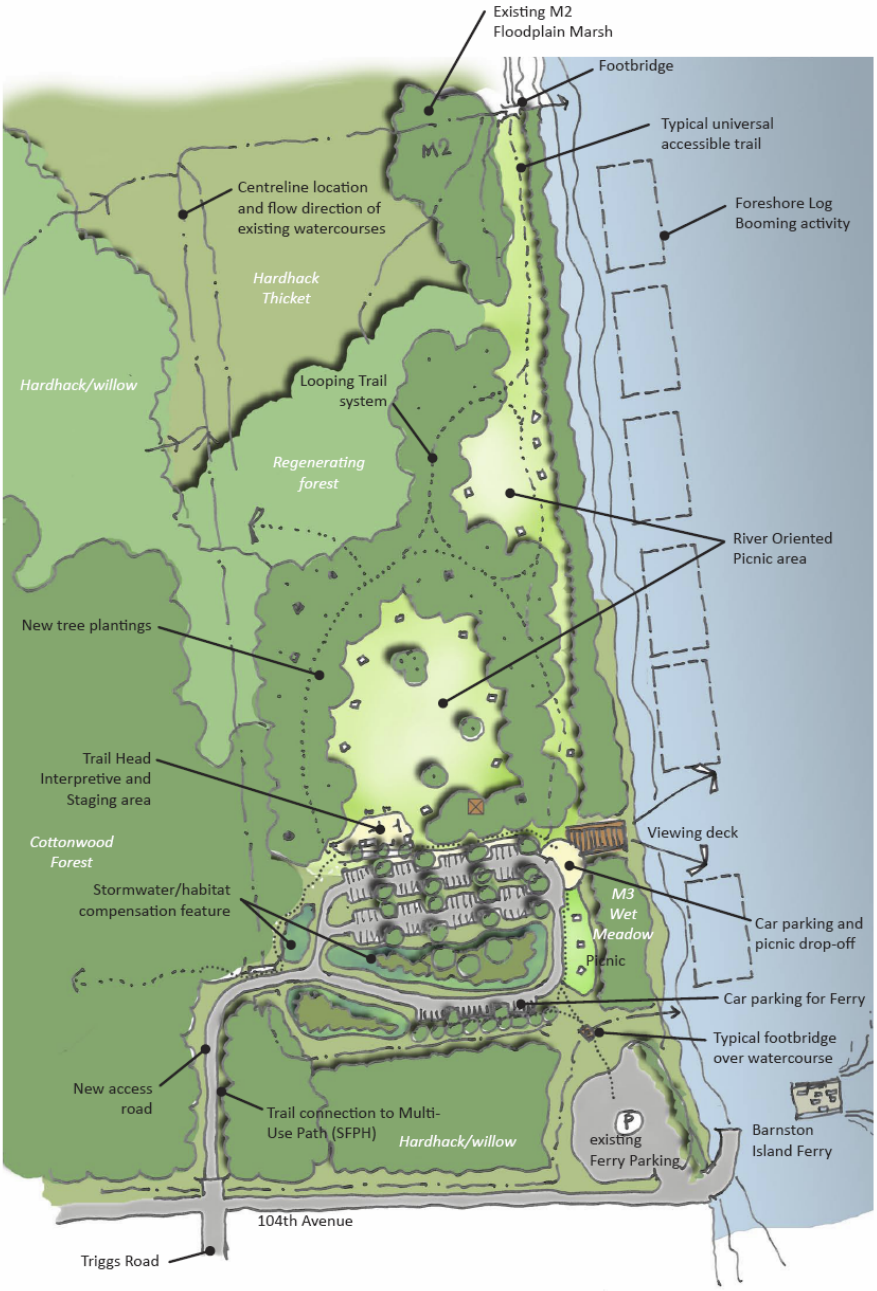
11077 – 176 Street
PID: 009-297-138
Lot 6 Section 7 Township 9 Plan 10324
New West District Part NE1/4
P778-090-0000

11171 – 176 Street
PID: 009-297-189
Lot 8 Section 7 Township 9 Plan 10324
New West District Part NE1/4,
P778-110-0000

11129 – 176 Street
PID: 009-297-162
Lot 7 Section7 Township 9, Plan 10324
New West District Part NE1/4,
P778-100-0000

9.7 Entrance and Activity Unit Concept Options

CONCEPT 1



- Approximately 120 cars - park & ferry parking (combined)
- Pedestrian/cycle facilities, trail access to Barnston Island Ferry
- Viewing deck to Parsons Channel
- Walk-in picnic area & perimeter trails (a portion of which can be accessible)
- Staging site to park trail network (longer routes and loops)
- Habitat compensation area (FREMP required for viewing pier)
- New access road
- Interpretive elements throughout the park and trail network
- Site Operations/Maintenance

CONCEPT 2

- Boat launch & 50 boat trailer parking stalls
- Approximately 136 stalls - park & ferry parking combined
- Potential for 50 additional stalls (future expansion)
- Pedestrian/cycle facilities, trail access to Barnston Island Ferry
- Viewing pier/dock (with non-motorized and motorized boat tie ups)
- Walk-in picnic area & perimeter trails (accessible)
- Staging site to park trail network (longer routes & loops)
- Habitat compensation area (FREMP required)
- New access road
- Interpretive elements throughout the park and trail network
- Site Operations/ Maintenance

CONCEPT 3

- Approximately 160 stalls - park & ferry parking combined
- Pedestrian/cycle facilities, trail access to Barnston Island Ferry
- Viewing pier/dock (with non-motorized boat tie ups)
- Walk-in picnic area & perimeter trails (accessible)
- Staging site to park trail network (longer routes & loops)
- Expanded habitat compensation area with interpretive elements and/water features
- New access road
- Interpretive site with small flex space (satellite classroom)
- Special events site
- Site Operations/Maintenance

Surrey Bend Regional Park Phase and Cost Estimate

Item	Description	Comments	Quantity/ Length	Unit	Budget/Unit	Phase 1	Phase 2	Phase 3
PARK ENTRY								
Triggs Access Road	2 lanes asphalt, edging - 7m width plus 3m ped/cycling trail		350	lm	900	315,000		
with adjoining bike/pedestrian path	Site prep, preload and geotechnical allowance (eg soil removal, replacement)		2000	cm	35	70,000		
	Fill, placed, 150m x 10m wide x 1.25m depth		1688	cm	70	118,125		
	Seeded verge areas with 100mm soil, with establishment maintenance		3000	sm	9	27,000		
	Culverts: 2 - 1 m culverts x 10m ea		2	ea	20000	40,000		
Water supply	assume 75mm dia, check valve, pr valve, meter at stubout	installed at same time as roadway	460	lm	50	28,000		
Entry signage			1	ea	Allowance	7,500		
Parking (gravel)	Clear, grub, install base, edging, verge, gate	40 phase 1a, 30 phase 1b, 40 phase 3	40	ea	2125	148,750		85,000
	Manicured Grass/Shrub/Tree landscape, temporary irrigation for establishment, includes open areas at entry and interim treatments (naturalized grass) before final buildout		6000	sm	60	270,000		90,000
Raingarden/bioswales	Rainwater management with each Parking Phase	Best practices demonstration	600	sm	162	193,800		96,900
					SUBTOTAL	1,218,175	0	271,900
PICNIC AREA								
Picnic tables	Accessible. 20 phase 1, 20 phase 2, 10 phase 3		20	ea	3000	60,000	60,000	30,000
Manicured grass/tree landscape	Incl. temporary irrigation for establishment		16000	sm	36	576,000		
Pathways throughout entrance	Type B, Pedestrian Universal, Granular, (1200mm), benches at 400m intervals	no geotechical issues	1200	lm	106	127,200		
Waste receptacles, hot coal disposal	Bear proof garbage/recycling		3	ea	2500	7,500		
Toilets	M/F, composting or pump out	pricing for pumpout style	2	ea	25000	50,000		
Signs/kiosk	Interpretive panels, metal stands,	Allowance	1		25000	25,000		
Picnic shelter (Phase 1b)	Concrete floor, timber and steel structure, open walls, capacity of 100	40'x80' roof	3200	s.ft.	150	480,000		
					SUBTOTAL	1,325,700	60,000	30,000
TRAIL PROGRAM								
Trail Head Area	Naturalized Grass/Tree Landscape		1800	sm	17	30,600		
Staging area kiosk, trails	Information and interpretive signing, 50 sm ganular surface, benches		allowance			20,000		
Existing Trails								
Pacific Trail	Existing service road upgraded to 3.0m multi use trail/service road- local repairs, 150mm road base granular compacted, seeded verge areas		1755	lm	110	193,050		
Parson Channel I (southern section)	Upgrade to Type B, 1500 Universal, gravel , 2 benches		540	lm	85	51,900		
NewTrails in Phase 1a								
Beaver Trail	Type B pedestrian/universal, geotechnical considerations, 2 benches		430	lm	95	46,635		
Spirea Trail	Type B pedestrian/universal, geotechnical considerations, 2 benches		450	lm	95	48,525		
Watercrossings	Assume 5 required in phase 1a		5	ea/phase	25000	125,000		
Total Phase 1a	Outcome is 0.88 km new, major upgrade 0.54 km, minor upgrade to 1.755 km.				SUBTOTAL	515,710	0	0
Phase 1b Trails								
* Parson channel II (middle section)	Low impact trail; upgrade/relocate to Type A narrow, pedestrian.		450	lm	50	22,500		
* Parson channel III (north section)	Low impact trail; upgrade/relocate to Type A narrow, pedestrian.		400	lm	50	20,000		
* Meadow Trail	Low impact trail; upgrade/relocate to Type A narrow, pedestrian.		385	lm	50	19,250		
* Centre Creek East	Low impact trail; upgrade/relocate to Type A narrow, pedestrian.		200	lm	50	10,000		
Watercrossings	Assume 3 required in phase 1b		3	ea/phase	25000	75,000		
Total Phase 1b	Outcome is 1.435 km new trails				SUBTOTAL	146,750	0	0
Built by GVS&DD	To be built by GVS and DD; lower standard if built by Parks; Multi use							
Centre Creek Trail (west)	Trail Type D - Service Road/Trail, vehicle rated for access to valve chamber	lighweight fill, 3 m wide	580	lm	250	145,000		
Pipe crossing protection	Not needed if built only for park use	assume 1 location	1	ea		50,000		
Centre Creek West viewpoint	Seating, regulatory signage, interp signage, edging, planting, 40 sm granular surface, wood fencing (eg split rail)			ea		30,000		
Watercrossings	Assume 1 required - allowance		1	ea/phase	25000	25,000		
Total Built by others Phase 1	Outcome is maintenance vehicular access to valve chamber, doubling as 0.58 km new trail				SUBTOTAL	250,000	0	0
Phase 3 Trails								
West Trail	May be built by GVS and DD; lower standard if built by Parks, 8 benches	3.5m vehicular rated granular, if constructed at time of sewer twinning	2455	lm	300			748,500
Vehicle watercourse crossings	vehicle rated, if constructed at time of sewer twinningor required for maintenance	assume 1 location	1	ea/phase	50000			50,000
Forest Loop	Type A pedestrian narrow		1305	lm	60			79,148
Watercrossings/boardwalks	Assume 3 required in phase 3, depending on detailed assessment		3	ea/phase	25000			75,000
Total Phase 3 Trails	Outcome is 3.76 km of trail; standard may vary depending on decision about sewer				SUBTOTAL	0	0	952,648
Total Built by others	2.455 km. of universal access trail built by others if required for sewer							
RIVER VIEWPOINTS								
Parson's Channel Viewpoint	Seating, regulatory signage, interp signage, edging, planting, 20 sm granular surface, wood fencing (eg split rail)			ea	15000	15,000		
Centre Creek East Viewpoint	Seating, regulatory signage, interp signage, edging, planting, 20 sm granular surface, wood fencing (eg split rail)			ea	15000		15,000	
Fraser River Viewpoint	same as above but more difficult access			ea	20000			20,000
Picnic area viewing platform, floating dock	Timber viewing structure, floating dock 5m wide x 60m long, pilings, rolling ramp		300	sm	1000		300,000	
Total River Viewpoints					SUBTOTAL	15,000	315,000	20,000
FUNDRAISABLE PROJECTS								
Nature Play landscape	Includes expanded picnic/special events area	landscaped open space meeting area & children's play landscape of gravel, rocks, sand, trees and shrubs & logs	10000	sm	60		600,000	
Interpretive Signs	Comprehensive design , product research, graphics, construction & installation					15,000		
Total Fundraisable					SUBTOTAL	15,000	600,000	
OTHER								
Habitat compensation								
Watercourse crossings			400	sm / phse	200	80,000	80,000	80,000
Viewing platform, dock habitat compensation			600	sm	200		120,000	
Viewpoints compensation if within riparian setback			160	sm	200	24,000		8,000
Operations Compound	Basic storage shed and fenced compound for operations staff.		1	ea	20000		20,000	
West Entry Overpass Connection	Pedestrian & cyclist bridge, Concrete, steel, ramp/ stairs, accessible							7,500,000
Viewing Tower (Centre Creek Node)	based on Piper Spit costs						600,000	
Engineering Pre-design Assessment	Hydrology			allowance	100000	100,000		
	Geotechnical investigations, including fill area settlement, perc tests, soil sampling, topographic survey			allowance	100000	100,000		
	Consruction related environmental monitoring, including foreshore erosion, water quality in ditches, fish and benthic sampling			allowance	75000	75,000		
Total Other					SUBTOTAL	379,000	820,000	7,588,000

General Note: Unit Costs indicated are suitable for general budgeting only, and are accurate only to +/- 30% (Class D estimate)

License and permit fees are not included in the costs.

Taxes are not included in the cost estimates.

Subtotal by Phase	$ 3,865,335	$ 1,795,000	$ 8,862,548
15% Design and Administration fees	$ 579,800	$ 269,250	$ 1,329,382
	$ 4,445,135	$ 2,064,250	$ 10,191,930
15% Contingency	$ 666,770.29	$ 309,637.50	$ 1,528,789.44
	$ 5,111,906	**$ 2,373,888**	**$ 11,720,719**
GRAND TOTAL			**$ 19,206,512**

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