

Updated 2003

The Estuary  
Management  
Plan for the  
Fraser River

# A Living Working River



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# Foreword

The Fraser River Estuary Management Program (FREMP) is an intergovernmental partnership among federal, provincial, and regional governments and port authorities to coordinate planning and decision-making in the Fraser River estuary.

In 1994, FREMP adopted the Fraser River Estuary Management Plan (EMP). Known as “A Living Working River”, the Plan provided a framework for integrating the management of human and natural activities in the estuary. The Estuary Management Plan was endorsed by municipalities in the Fraser River estuary.

“A Living, Working River Updated 2003” is the Estuary Management Plan to guide FREMP and partner activities into the future.

The Estuary Management Plan provides a framework for intergovernmental cooperation on how and where current and future use of the water and shoreline will occur along with linkages to adjacent upland areas within the Fraser River estuary. The Plan integrates habitat management and recreation activities with strategies for water and sediment quality, log management, navigation and dredging, and urban and water-related industrial development.

# Acknowledgements

The update of the Estuary Management Plan began early in 2002 when the FREMP Water and Land Use Committee (WLUC) established a four-phase process to update the Plan.

Over the course of 2002 and into 2003, the WLUC guided the new Plan's development with overall direction from the BIEAP-FREMP Management Committee. Input was also received from FREMP sub-committees, including the Dredge Management Advisory Committee, the Habitat Classification Improvement Task Group and the Economic Development Task Group. Representatives from the public, government agencies, First Nations, industry, local governments, and non-governmental organizations provided valuable input through workshops and individual communications.

Water and Land Use Coordinator, Anna Mathewson, and consultant Wendy Whelen, assisted by FREMP staff including Helen Popple (BIEAP) and Gary MacKinnon, prepared the Estuary Management Plan on behalf of the Water and Land Use Committee. Mapping services were provided by Blakeley Design and Sarah North of Northwest Hydraulic Consultants. Design and production were provided by Blakeley Design.

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## The purpose of this document

This is the Estuary Management Plan for the Fraser River estuary, which revises the original Estuary Management Plan approved in 1994. This updated Plan sets out the direction for collaborative management of the Fraser River estuary, and identifies specific actions that will be undertaken by the FREMP partners in the future.

## How to use this document

The Plan is divided into four parts: Background, the Plan, Implementation, and Appendices.

**Part 1** of the Plan outlines a **background** for those less familiar with FREMP and the estuary. The section reviews what has changed in the eight years since the original Plan was developed, and explains why we are updating the Plan. Part 1 will be useful reading to those who are new to the issues of the Fraser River estuary or those who want a summary to place the issues in context.

**Part 2 is the Plan** itself: a common vision, goals and principles for the estuary are described along with the updated Action Programs. This section will be of most interest to those familiar with FREMP and the original Estuary Management Plan, and who are active participants in issues and projects along the river.

**Part 3 Implementation** explains how the Plan will be implemented and monitored, including how the Action Programs might be funded and how the Plan will adapt to change along the way.

The **Appendices** located in **Part 4** provide background information for those readers not familiar with FREMP or the various jurisdictions in the estuary. A description of the Coordinated Project Review process is also provided.



# 1



## 1. Setting the Context

The Fraser River estuary is a unique place in the middle of a diverse metropolitan area. As one of the largest estuaries along the west coast of North America, the Fraser River estuary is a globally significant ecosystem. Produced by the joining of the Fraser River with the Strait of Georgia, the estuary contains rich habitats for many species of fish and wildlife. The estuary's marshes support millions of migrating salmon at a critical stage in their early development before they migrate out to sea, and act as a staging area for adult upstream spawning migration. The estuary provides an important food source and resting-place for migratory birds on the Pacific Flyway, and is one of the most significant "Important Bird Areas" (IBA) in the country.

The estuary is characterized by ten reaches or ecological segments – from brackish marsh to riverine channels, to the outer banks where eelgrass is prominent. The reaches of the river support different habitats and are characterized by varying degrees of urban development.

Urban settlement is concentrated in the estuary. In recent decades, the population of the Greater Vancouver region has grown to over two million people, with suburban communities locating over the delta flood plain and transforming the shoreline. Over the next 20 years, it is expected that the region will grow by 800,000 residents. People move to this area for its natural beauty and economic opportunities. Many residents live or work along the river, and enjoy visiting the recreational beaches, trails and regional and municipal parks located throughout the region.

At the same time, the Fraser River is an important marine transportation route. Barge traffic, international deep-sea vessels such as container ships and bulk carriers, and recreational boaters all use the Fraser River. Dredging undertaken by the Port Authorities maintains the main navigation channel. Log storage areas located throughout the estuary are also a key component of forest industry operations, as storage of booms in fresh water is required prior to transport to mills for processing.

### **FREMP**

To coordinate the complex governance system existing within the estuary, a number of agencies came together in 1985 to create the Fraser River Estuary Management Program (FREMP). The six partners are: Environment Canada, Fisheries and Oceans Canada, the Ministry of Water, Land and Air Protection, North Fraser Port Authority, Fraser River Port Authority, and the Greater Vancouver Regional District. A Memorandum of Understanding (MOU) guides the partnership. The mandates and responsibilities of each of the FREMP partners are described in Appendix B.

FREMP is a program that coordinates environmental management and decision-making in the estuary. As a program linking the different levels of government with jurisdiction in the estuary – federal, provincial, regional and port authority - FREMP brings together the people with decision-making authority over the estuary and integrates the various policies and programs that affect the river. Municipalities, First Nations and other interests are also involved in FREMP. FREMP facilitates economies of scale, in that the partners each contribute funding and staff resources and reap the benefit of the combined resources. Projects that might be difficult to implement due to limited funds can happen through the FREMP partnership.

### **FREMP Partnership**

Since 1985, the Fraser River Estuary Management Program (FREMP) has been coordinating decision making on conservation and development in the estuary among more than 30 agencies representing federal, provincial, regional, and local governments, port authorities and First Nations. Six authorities contribute financial resources and manage the FREMP partnership. They are:

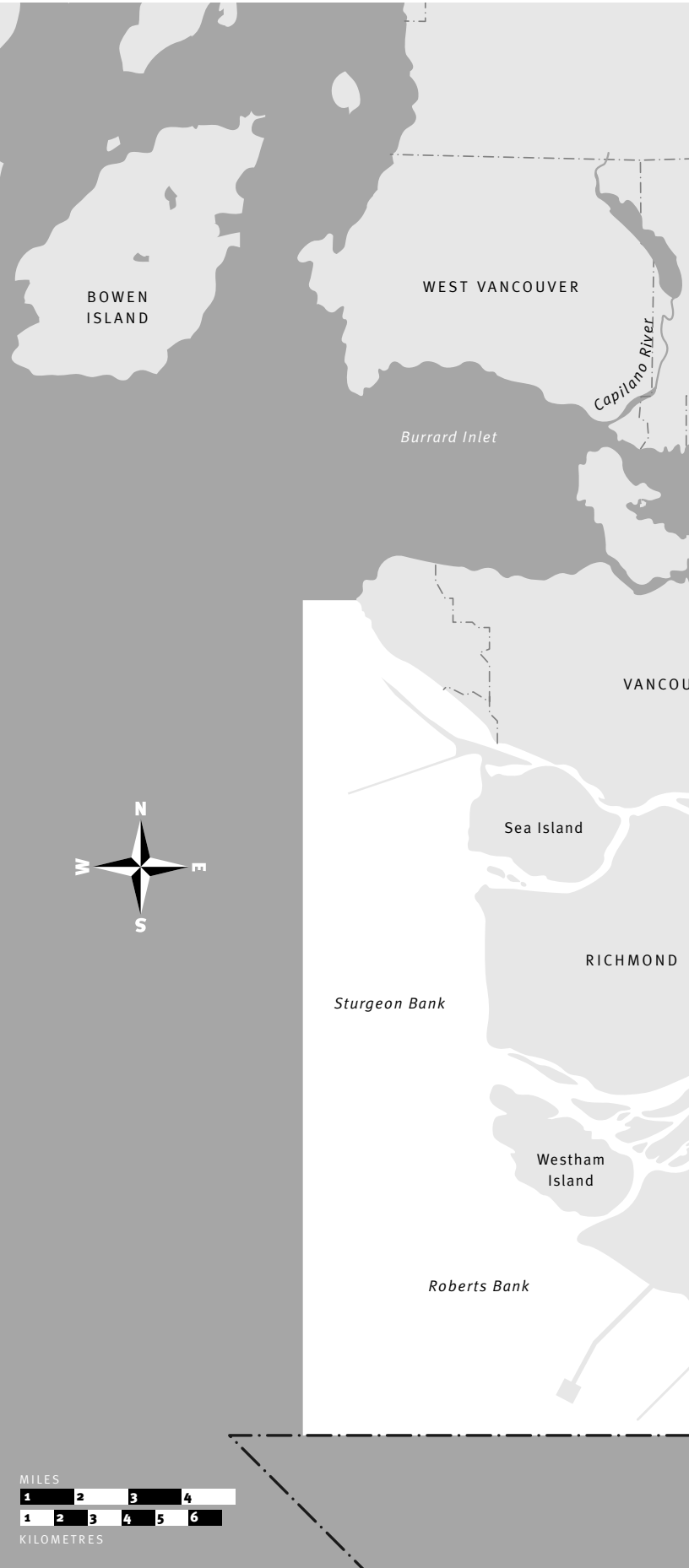
- British Columbia Ministry of Water, Land and Air Protection
- Environment Canada
- Fisheries and Oceans Canada
- Fraser River Port Authority
- Greater Vancouver Regional District
- North Fraser Port Authority

The FREMP area encompasses 155 square kilometres of water and lands outside the Fraser River dikes. The entire Fraser River Basin (two-thirds of British Columbia) drains through the FREMP area.

<sup>1</sup> IBA's delineate areas of importance for birds. For more information, visit [www.bsc-eco.org](http://www.bsc-eco.org).

# Map 1: FREMP Boundaries

## Fraser Basin





Geographically, FREMP applies to the wet side of the dyke of the Fraser River downstream from Kanaka Creek and Pitt Lake to the Strait of Georgia. The FREMP area also includes Sturgeon Bank, Roberts Bank and Boundary Bay. The Kanaka Creek and Pitt Lake boundaries coincide with the upstream boundary of the Fraser River Port Authority.

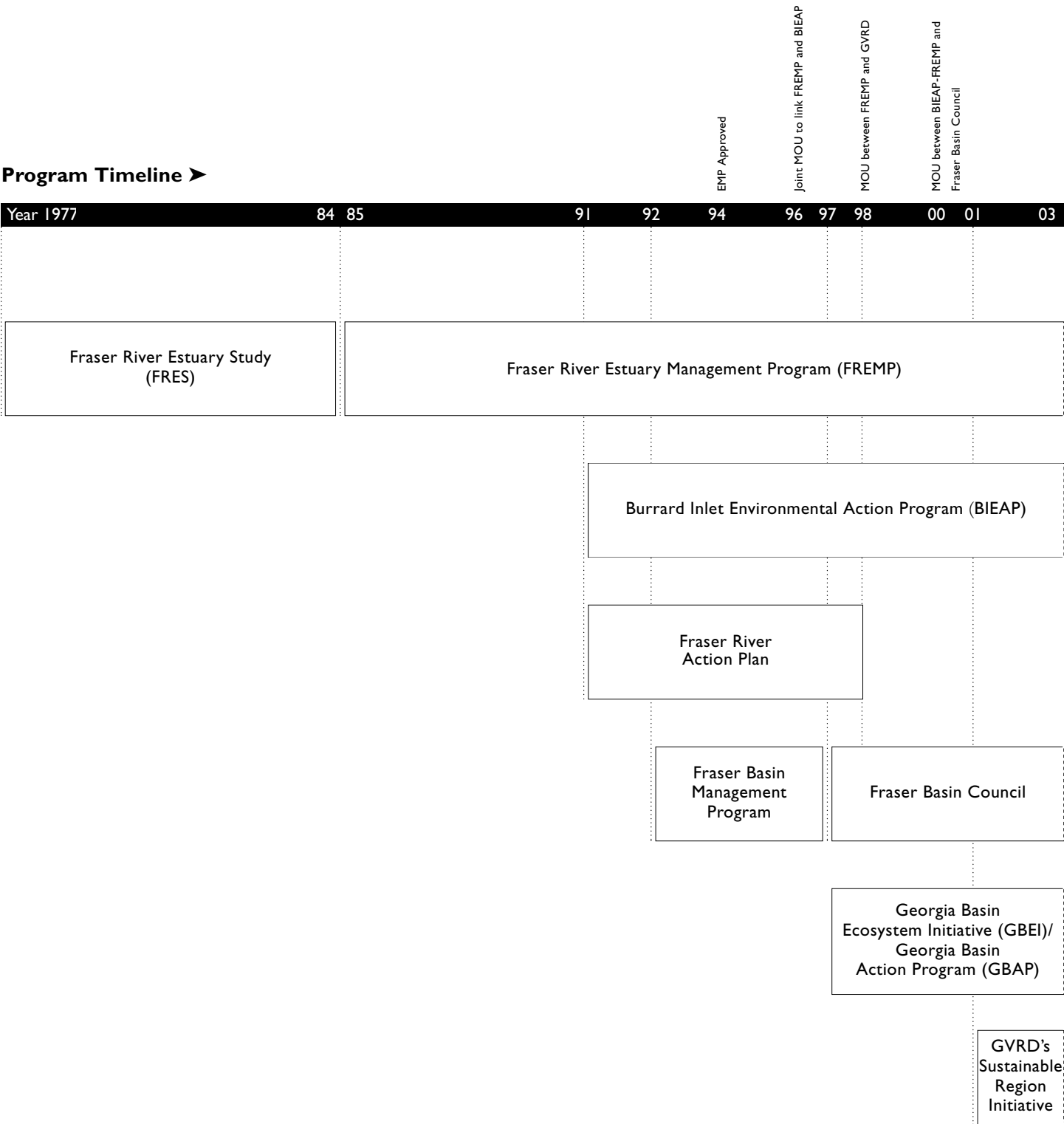
### **FREMP Boundaries**

☐ Fraser River Estuary  
Management Program



Source: GVRD

Figure I:  
FREMP and  
Related Programs



#### **Georgia Basin Ecosystem Initiative (GBEI)/ Georgia Basin Action Plan**

The Georgia Basin Ecosystem Initiative (GBEI) is a coordinated ecosystem planning initiative designed to improve the environmental quality of the Georgia Basin. It is a partnership of three federal (Environment Canada, Fisheries and Oceans Canada, Parks Canada) and three provincial partners (Ministry of Water, Land and Air Protection, Ministry of Community, Aboriginal and Women's Services, Ministry of Sustainable Resource Management), working together to achieve ecosystem health in our region.

The GBEI was renewed for an additional five years on April 1, 2003, under the name Georgia Basin Action Plan.

#### **Fraser Basin Council**

The Fraser Basin Council is a not-for-profit, non-governmental, charitable organization, with a mandate to educate on the need for economic, environmental and social sustainability of the entire Fraser Basin. Through its projects, the Council encourages a good quality of life by helping decision-makers and residents make responsible decisions about how we live, work, and play in the Basin. The Memorandum of Understanding developed between FREMP and the Fraser Basin Council in 2000 emphasizes a cooperative relationship to work towards the social, economic, and environmental sustainability of the Basin.

#### **The GVRD Livable Region Strategic Plan (LRSP) and Sustainable Region Initiative (SRI)**

The GVRD plays an active role in the management of the estuary, particularly through its mandate to manage the sewerage and drainage systems.

As part of a process to update the Livable Region Strategic Plan, the Sustainable Region Initiative (SRI) will provide a framework, vision, and action plan for Greater Vancouver based on the concept of sustainability that embraces economic prosperity, community well-being, and environmental integrity.

The 1998 Memorandum of Understanding between the GVRD and FREMP describes how key GVRD management plans relate to the Estuary Management Plan, and how coordination can be enhanced.

#### **Burrard Inlet Environmental Action Program (BIEAP)**

Established in 1991, the Burrard Inlet Environmental Action Program (BIEAP) is administered out of a joint BIEAP-FREMP secretariat office located in Burnaby, BC.

The two programs have been under a linked management structure since 1996.



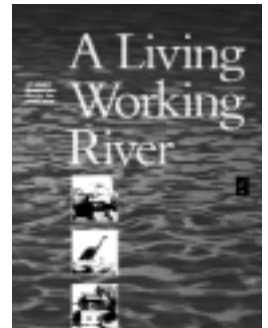
### **The Estuary Management Plan (EMP)**

In 1994, the FREMP partners in consultation with a wide variety of interests developed the Estuary Management Plan for the Fraser River known as “A Living Working River”. The Plan contained six Action Programs with key targets and actions that supported the Plan’s vision, goals and principles. The Plan has been useful as:

- A policy document providing goals and principles
- A strategic document facilitating working partnerships
- An ongoing action plan setting targets and outlining activities

During the past eight years the Plan, and the tools used to implement it, have helped manage the estuary’s economic and biological productivity by integrating economic development and environmental protection. Implementing the Plan has shown that it is possible to work towards sustainability in the estuary by integrating activities and making joint decisions that take into account the different interests.

**1994 Estuary  
Management Plan**

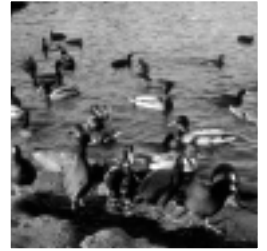


## 2. Updating the Estuary Management Plan

When the Estuary Management Plan (EMP) was approved in 1994, it included the provision to revisit the vision, goals, and guiding principles of the EMP every five years and make refinements based on the ongoing monitoring and evaluation of the Plan's actions and other relevant information. It also contained provision to communicate these findings through a State of the Estuary Report.

In 1997, FREMP produced an update on the EMP, followed in 2001 by a monitoring report on how we were doing in implementing the Plan - highlighting both successes and challenges - but the Plan still needed to be revisited. Many of the actions in the original Plan had been implemented and some were no longer relevant. New actions were needed to keep the Estuary Management Plan a useful and current management tool. We also needed to confirm the original vision, goals and principles as a framework for future activities in the estuary.

Some things have changed since 1994. New laws, plans and policies have come into effect – including the Liquid Waste Management Plan and the Canada Marine Act – that have changed the way FREMP partners do business. The FREMP partnership itself has changed too, with a narrower focus on the services provided by the Program secretariat starting in April 2003. New scientific data are being investigated on issues such as the health of resident fish and water quality. The region as a whole has experienced continued population growth, as witnessed by the push for more, and in some cases denser housing development. Industry has seen changes since 1994, and the estuary has changed in terms of land use, with most land along the river allocated or planned for; and recreation as the prime shoreline use. All these changes needed to be reflected in a revised Estuary Management Plan. A more detailed review of changes in and affecting the estuary since 1994 can be found in Appendix C.



### 3. The Estuary Management Plan: Achievements, Challenges and Opportunities

#### 3.1 Achievements

Through the FREMP partnership and the Estuary Management Plan, much has been accomplished since 1994. At a general level, FREMP has implemented many of the actions in the Plan and reported on progress through the BIEAP-FREMP Annual Reports, our web site, and the 2001 Monitoring Report.

In terms of specific actions, habitat has been created and enhanced, and an extensive Environmental Quality Report was released outlining water quality trends and recommendations. FREMP developed a habitat inventory and classification system to assist with decision-making, and an in-house Geographic Information System (GIS) to capture this and other data. Through the work of sub-committees, Dredge Management Guidelines and Log Storage Guidelines were produced, and a sediment “budget” was established to ensure that the average amount of sediment removed through dredging will not change the shape of the river bed. Intermodal transportation issues have been explored, and six Area Designation Agreements have been completed with municipalities in the FREMP area. Regional and municipal parks systems have expanded and an interpretive guide was produced for the estuary.

On the Coordinated Project Review side, streamlining implemented in 2000 now involves a three-phase four-track process. In 2002, FREMP completed a Toolbox guide to the Coordinated Project Review process for environmental practitioners, developers, applicants and the general public. More information on Coordinated Project Review is contained in Appendix D.

Table 1: FREMP Monitoring Results

FREMP Monitoring: Indicator Trends at a Glance			
Contaminated Lands Remediated	◆	Marine Cargo	▲
Contaminants in Great BlueHeron Eggs	▼	Employment in Water-based industry	◆
Fecal Coliform Counts	▼	Habitat Net Gains	▲
Number Boats Moored/Launched	▼	Health of Resident Fish	◆
Protected Cultural Sites	▲	Waterbird Abundance	◆
Length of Shoreline with Recreational Corridors	▲	Sustainable Sediment Removal	✓
Intensity of Regional Park Use	▲	Amount of Wood Debris	◆
Land for Water-Dependent Industries	◆	Compliance with Log Storage Guidelines	✓

The 1994 Estuary Management Plan included measures to monitor the plan. In 2001, FREMP produced the report titled "Monitoring the Estuary Management Plan: A Report on the Performance of FREMP and its Partners." The publication of this report was the first step toward providing an indicator-based monitoring system to evaluate progress in implementing the Estuary Management Plan.

Legend

◆

Undetermined

▲

Increased

▼

Decreased

✓

Condition Met

## FREMP Achievements



### Water Quality

#### Fraser River Action Plan Studies

Since 1994, FREMP has been directly involved in several studies of environmental quality in the estuary. By measuring and reporting on the health of the aquatic ecosystem, these studies provide a baseline against which efforts to prevent and control pollution can be measured.

#### Water Quality Improvements

While concerns about water quality in the estuary are ongoing, since 1994 substantial improvements to water quality have been observed including: reductions in dioxins and furans from pulp and paper mills, a reduction in fecal coliform counts and up to an 80% reduction of suspended solids and biochemical oxygen demand due to new secondary treatment facilities at Annacis Island and Lulu Island wastewater Treatment Plants.

#### Best Management Practices

Since the Estuary Management Plan was approved in 1994, FREMP and its partners produced an extensive series of Best Management Practices (BMPs) to help users of the estuary undertake more environmentally sensitive activities. A comprehensive list of the BMPs is available on the FREMP website [www.bieapfrempp.org](http://www.bieapfrempp.org).

#### Environmental Quality Report

In 1996, FREMP released the Environmental Quality Report. In doing so, we took the pulse of the Fraser River, to determine trends over time and recommend ways to improve aquatic health in the future. The report concluded that regulation and management activities reduced the levels of some pollutants in the estuary since the late 1970s.



### Fish and Wildlife Habitat

#### New Habitat Protected

Acquisitions through the Nature Legacy Program created more than 2,500 hectares of new parkland for both conservation and recreation. The provincial government also created Wildlife Management Areas (WMAs) at Boundary Bay, Coquitlam River, and Sturgeon Bank. Other initiatives, such as the Pacific Estuary Conservation Program, help to protect valuable habitat. Together, these areas protect more than 10,000 hectares of intertidal habitat.

Habitat is also protected through Coordinated Project Review.

#### Habitat Improvements

There has been more than 75,000 square metres of estuarine marsh habitat, and more than 30,000 square metres of riparian habitat enhanced in the estuary since 1994, all coordinated through the FREMP partnership.

#### Habitat Inventory and Classification

In 1990, FREMP completed an inventory of existing habitat for fish and wildlife in the FREMP area. The habitat classification system based on this inventory uses a colour code to indicate the relative levels of productivity for existing shoreline habitat and the shoreline's overall sensitivity to development. FREMP is currently improving the habitat inventory and classification systems using an "ecological features and functions approach".



### Navigation & Dredging

#### Dredging Guidelines

In 2001, FREMP produced Dredge Management Guidelines. The guidelines reflect a consensus among the regulatory agencies regarding a general approach to dredging within the estuary. An inventory and assessment of the impact of transfer pits was also done.

#### Sediment Budget

FREMP also developed a management tool called a Sediment Budget, to ensure that the average amount of sediment removed over a five to ten year period will not change the shape of the river bed. In 2002/2003, the Sediment Budget equation was recalibrated to reflect actual conditions in the estuary and a program to review its effectiveness every five years was established.

## FREMP Achievements



### Log Management

#### Log Storage Guidelines

The FREMP Log Storage Guidelines developed in 1991 and updated in 1999 have been adopted by the forestry industry. All the storage lots have complied with these guidelines and as a result, more than 20 hectares of marsh and mudflat have seen habitat growth and regrowth. The Log Handling Debris Task Group was established in 1999 to explore options for reducing waterborne debris resulting from log handling in the estuary. Initiatives included encouraging the implementation of Best Management Practices to minimize debris from forestry operations, and testing "mini booms" in the estuary.



### Industrial & Urban Development

#### Intermodal Transportation

FREMP's Economic Development Task Group has been focusing on the "working" aspect of the EMP since 1999. The Task Group initiated research on the benefits of water-related industry and the pressures these industries are facing and developed ideas for increasing the use of the Fraser River for transportation based on the creation of strategic nodes and the use of barges.

#### Area Designations

An important tool in the 1994 EMP is the designation of specific locations for current and future water and land uses. FREMP has worked with municipalities in the estuary to coordinate upland and foreshore activities through Area Designation Agreements, concluding agreements with the City of Richmond (1991), the City of Burnaby (1993), the City of White Rock (1997), the City of New Westminster (1999), the City of Surrey (2001), and the City of Coquitlam (2002). Negotiations are underway in Delta.



### Recreation

#### Park Expansion

Since the mid-1990s there has been a large expansion of the regional parks system. Through the Nature Legacy Program, the different levels of government and other organizations helped purchase or transfer more than 2,400 hectares of land, including hundreds of hectares on the riverfront. All of these lands have played an important role in both protecting habitat and providing more recreational areas for the region's residents.

One of the Estuary Management Plan's targets was to protect 16 recreational units along the estuary, and many components of these units have now been protected as parks.

#### Archaeological Wet Sites

In 1993, FREMP in association with the Katzie, Musqueam, and Tsawwassen First Nations and the British Columbia Archaeology Branch, sponsored a survey of wet sites in the FREMP area. As a result of this work, 26 sites that had previously been known to exist were identified along with 28 additional sites. As well, in cooperation with the Katzie First Nation and the Archaeology Branch, FREMP commissioned an archaeological overview assessment of the Lower Pitt River in 1995. The study recommended that archaeological impact assessments be performed for development proposals taking place in areas of high or medium archaeological potential.



### Public Education & Communications

#### Public Education and Communications

FREMP has historically been active in promoting awareness of the estuary and continues to foster transparency in its program by involving the public in its planning processes, and maintaining an informative web site as a communications tool. Some of the past education and communication programs included: school programs and support for community groups, a series of special stewardship programs (e.g. Adopt a Shoreline clean-up campaigns), and the annual Fraser River Festival.

#### Clean-ups

Since the publication of the EMP, FREMP has coordinated an enormous volunteer clean-up effort including: 88 clean-up events; more than 500 volunteers from environmental groups, businesses, industries and community service organizations donated more than 9,000 hours to clean-ups; and more than 4,100 cubic metres of wood debris and garbage were removed from the estuary.

### 3.2 Challenges and Opportunities

Despite the many accomplishments, we still face some challenges along with opportunities for better decision-making and greater efficiencies.

#### Environmental

FREMP faces a number of continuing environmental challenges related to pollution abatement and impacts on fish, amphibian, wildlife and benthic organisms. For example, run-off from agriculture and urban areas is a significant source of pollution. Ongoing concern exists about non-point source pollution in the estuary and the requirement for secondary upgrade of the Iona Sewage Treatment Plant has been identified by the Minister of Water, Land and Air Protection. Environmental contaminant levels continue to be a cause for concern, including the issue of new contaminants such as endocrine disrupting compounds and their impact on the food chain.

Habitat protection and enhancement continues to be a challenge in the heavily-populated and utilized estuary, particularly in the context of maintaining biodiversity and finding new ways to facilitate stewardship.

#### Navigation and Dredging

While the sediment budget was recalibrated in 2002 and guidelines for dredging have helped effectively manage dredging activities in the river, there remains a need for a comprehensive dredge management strategy. The process to prepare this strategy was initiated by FREMP in 2002 but needs to be completed to ensure that site-specific dredging is coordinated in a comprehensive way.

#### Industrial and Urban Development

To ensure that industrial and urban development in the estuary continues to move towards sustainability, we need tools to manage and keep track of changes and trends. Opportunities to integrate foreshore and upland development must be pursued to ensure that development does not reduce the overall ecological productivity of the estuary.

A continuing challenge for the FREMP partners is managing the river to protect the land and water area required to satisfy the demand for water-related industrial use. One option is to identify specific areas that could serve as integrated storage, transfer and transportation nodes for more than one water-related operation or type of operation. We also need to explore how to integrate water-based transportation into a regional plan and address policy gaps concerning the movement of commercial goods within the region.

#### Public Education and Communications

Specific FREMP outreach and education programs were discontinued in 1998 due to overlaps in similar activities operated by several of the FREMP partners and other organizations like to Vancouver Aquarium. With the establishment of the Fraser River Discovery Centre and the interest of groups like the Fraser River Coalition and Fraser Basin Council, opportunities exist to explore new ways to inform and educate the public about the estuary.

## **Sustainability Framework**

Although the FREMP area of interest stops at the high-water mark or, where they exist, at the crest of the dykes along the Fraser, this boundary is artificial to both ecosystems and water-related industries. With the introduction of new planning tools for municipalities, innovative ways are needed to link the Estuary Management Plan with upland planning activities. While there are considerable jurisdictional challenges to achieving a fully integrated, comprehensive management framework, an opportunity exists to integrate the Plan's action programs through a sustainability management framework. This framework takes the recently adopted "features and functions approach" and expands the concept to the preparation of reach overviews for the ten reaches in the estuary.

## **Monitoring**

The FREMP 2001 Monitoring Report indicated that, although good progress has been made in taking stock of environmental quality, the challenges around environmental quality targets and integrated water quality monitoring remain. There are opportunities through the Estuary Management Plan and the GVRD Liquid Waste Management Plan (LWMP) Environmental Monitoring Committee to establish and maintain an effective monitoring program for the years ahead.

The 2001 Monitoring Report recognized that progress has not been made in all areas, and that new indicators may be needed to measure progress. Monitoring is hampered by the inability to obtain appropriate time-series data and some components of the Plan are difficult to measure quantitatively. One of the biggest challenges to establishing a monitoring program is to secure sustained funding.

## **Institutional Issues**

Finally, there are the ongoing changes to the organizational frameworks of FREMP and the FREMP partner agencies. Reductions in funding, redirecting of priorities and general reductions in resources will make implementing the Plan a challenge.

There are also challenges with respect to coordinating the activities among the FREMP partners to achieve the objectives and actions contemplated by the EMP. An updated EMP with provisions for annual work plans and FREMP partner commitments to the actions may serve to address these concerns.

## **What is our definition of sustainability?**

According to the FREMP partnership Memorandum of Understanding, "sustainability" is the point at which economic, environmental and social/cultural activities meet the needs of the present generation without compromising the ability of future generations to meet their own needs.

# 2



## 1. Vision, Goals and Principles

A vision provides the direction we need, goals set out how we will make that vision a reality, and principles provide guidance for how we implement. Taken together, the vision, goals and principles provide a framework for action.

### **The Vision of A Living Working River**

The vision of the Estuary Management Plan is:

*A sustainable Fraser River estuary characterized by a healthy ecosystem, economic development opportunities, and continued quality of life in and around the estuary.*

### **Goals of a Living Working River**

A goal is an aim or objective that achieves the vision. The goals of the Estuary Management Plan are linked to key water and land use issues in the estuary:

- 1 Conserve and enhance the environmental quality of the estuary to sustain healthy fish, wildlife, plants and people.
- 2 Respect and further the estuary's role as the social, cultural, recreational and economic heart of the region.
- 3 Encourage human activities and economic development that protect and enhance the environmental quality of the estuary.



## **Guiding Principles**

Principles are broad guidelines for decision-making concerning the use of the estuary. They are a set of shared values that the FREMP partners will measure decisions against. Although the principles are grouped according to their focus on natural, human and governance systems, they are intended to be applied collectively.

### **1. Principles for Conserving and Enhancing the Estuary**

FREMP operates using the following three principles which recognize that the region's quality of life and the health of its economy rely on a healthy environment.

#### **a. Keep the Estuary Healthy**

Efforts will be made to protect ecosystem health and enhance biodiversity. Waste from human activities in and around the estuary should not exceed levels safe for fish, wildlife, plants, and people. Existing sources of pollution will be abated to safe levels.

#### **b. Conserve, Enhance and Protect Natural Habitat**

Efforts will be made to enhance aquatic and riparian habitat in selected areas where the production of aquatic resources can be increased for the social or economic benefit of citizens. Highly productive habitat will be protected and a net gain of habitat will be pursued.

#### **c. Take a Precautionary Approach**

In managing the estuary the FREMP partners will implement risk management through the precautionary principle: Guidance and assurance are particularly needed when there is a risk of serious or irreversible harm, the scientific uncertainty is significant and a decision must be taken.<sup>2</sup>

### **2. Principles for Integrated Management**

Given the complexity of jurisdictions in the estuary, a common set of operating principles will help coordinate activities and decisions that support the vision and goals.

#### **a. Encourage Multiple Uses within the Estuary**

Mixed, compatible uses will take priority over exclusive uses where possible. In certain areas, single uses, such as habitat protection, recreation, or port and airport facilities, may take precedence.

#### **b. Provide Equitable Access to the Estuary**

Equitable opportunities to gain access to and enjoy the estuary will be provided as long as those opportunities respect environmentally sensitive areas and other human activities.

2 Adapted from Fisheries and Oceans Canada, 2002. "Canada's Oceans Strategy".

c. Integrate Decision Making

Using the features and functions approach, the environmental, economic, and social implications of all actions in the estuary will be considered by proponents and agencies. Although individual agency mandates and government jurisdictions will be respected, all plans affecting the estuary will be mutually supportive and coordinated with the Estuary Management Plan.

### 3. Principles for Good Governance

Principles of good governance, including accountability, will be incorporated in the implementation of the EMP and are fundamental in building consensus and resolving conflicts.

a. Establish and Maintain Informed Management Processes

Sound knowledge of the estuary's resources will be maintained, enhanced, and used to inform decision making. All interested parties and the public will be informed and advised about uses and users of the estuary and related planning and management activities. Dialogue among interested parties will be promoted.

b. Promote and Employ Consensus-Based Decision Making

Consensus is the primary and preferred mode of decision-making within FREMP and in carrying out the Estuary Management Plan. The FREMP partners will actively support decision-making by consensus and abide by those decisions, within the limits of their mandates.

c. Establish and Maintain Accountable and Adaptive Management Processes

Estuary management goals, objectives, actions, and procedures will be regularly monitored, objectively evaluated, and refined as necessary. The monitoring and evaluation results will be communicated to the public and interested parties on a regular basis.

d. Develop Active Partnerships with the Public in Management Activities

All interested parties will be offered opportunities to contribute to the pooling and sharing of expertise and information in management processes and projects. Efforts will be made to share information and data among partner agencies and with the public. All interested parties will have opportunities to contribute to the evaluation of the Plan.

## 2. Action Programs

### **Introduction to Action Programs**

The Plan is divided into seven Action Programs so that key issues and the tasks to deal with these issues are clear and easily understood. Included in each Action Program are objectives (what we want to achieve) and actions (how we want to get there). We also suggest which participants may assist in implementation and how success in implementing the objectives might be measured. Some success measures lend themselves to numbers, while other measures lend themselves to a more qualitative evaluation.

**The FREMP partnership has agreed to take action and achieve results through seven specific Action Programs:**

- 1) An Action Program to Integrate the Plan
- 2) Water and Sediment Action Program
- 3) Fish and Wildlife Habitat Action Program
- 4) Navigation and Dredging Action Program
- 5) Log Management Action Program
- 6) Industrial and Urban Development Action Program
- 7) Recreation Action Program

An ecosystem-based approach is proposed as an overarching element of the Plan, to bring together all of the Action Programs. It is presented as a separate Action Program because it links the programs through two specific actions.

### Action Program 1

#### **An Action Program to Integrate the Plan**

Links exist between Action Programs and many of the tasks are inter-related. For example protecting critical habitat areas can include a recreational component, and maintaining areas for log storage along the river can protect shoreline habitat from the wake of passing ships.

We also need an integrated view of the river. The lower reaches of the river are linked with the upper reaches of the Fraser River, as water flows from the headwaters in the Robson valley all the way down to the estuary. As well, what happens on the shoreline affects the upland areas and the reverse is also true. Natural and human systems reliant on the Fraser River do not operate in isolation of one another. So while the FREMP boundary is on the wetted side of the dyke, achieving a healthy ecosystem means the Plan must reflect the linkages between land, air and water. Working towards sustainability requires us to consider and balance many elements – economic, ecological, physical, social, governmental and cultural.

**Figure 2: An Integrated View**





### **Ecosystem-based management**

The foundation of the Estuary Management Plan is the estuarine ecosystem. The Estuary Management Plan advocates an ecosystem planning and management approach - a form of management that seeks to understand ecological systems, which are infinitely complex, and to make judgements and decisions about how humans can be better stewards of the natural environment on which we depend. An ecosystem approach is flexible and collaborative, involves a comprehensive geographic perspective and encourages innovation.

### **The purpose of the Features and Functions Approach is to:**

- provide a standardized ecologically based system for updating the FREMP habitat inventory and classification systems
- appropriately identify biological values in the estuary ecosystem (including areas with high value to wildlife)
- provide a system that will capture biological change over time
- facilitate ecological understanding through the use of GIS and associated databases
- identify upland uses and human functions along the estuary
- allow the potential for greater flexibility in foreshore land use
- lead to more objective determination of habitat classification
- provide more certainty to planners and developers.

## Features and Functions Approach

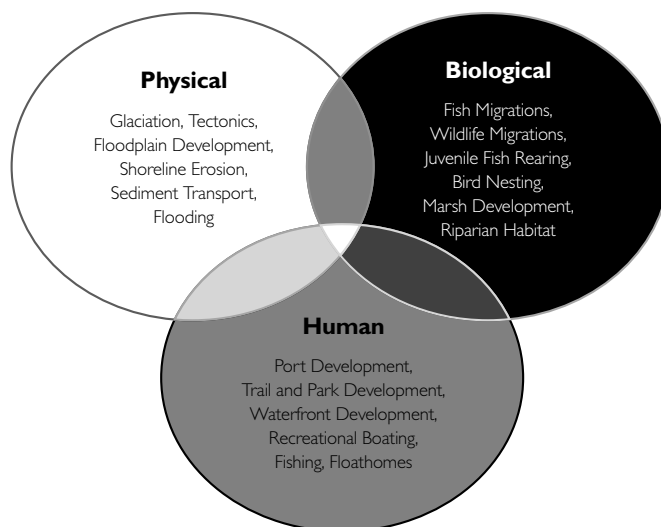
One way to link the different aspects of the Plan together is by looking at the varying features and functions of ecosystems and human activities within the estuary. A “features and functions” approach to management identifies the natural and human processes that need to be preserved in any given location, then identifies the types of activities that can occur in these places without compromising these processes. Rather than focusing on specific resources, the approach – also known as “ecosystem-based management” - attempts to reveal and protect the underlying needs within a system.

For example, we would look at a natural process like nesting birds (the “function”), discover that tall trees are needed for this function (the “feature”), and then plan accordingly. Other examples are deep water requirements for navigation and ship moorage, and intertidal marsh needed for fish rearing.

The features and functions approach is particularly useful in the FREMP area because it requires managers to look beyond the immediate intertidal and riparian zones to understand the role of the Fraser River in the region as a whole, then encourages site-specific activities consistent with regional requirements.

To apply the features and functions approach to effectively manage the Fraser River estuary, we need to document and consolidate information, policy, plans and regulations affecting shoreline activities.

**Figure 3:**  
**Physical,**  
**Biological and**  
**Human Processes**  
**in the Estuary**



## Map 2: Reaches of the Fraser River Estuary



### The ten reaches of the Fraser River estuary<sup>4</sup>

Based on a scientific review and consensus among the FREMP partners technical teams, the estuary can be divided into ten reaches or ecological-based segments which allow for practical management of the estuary. The location of the ten reaches are shown on Map 2. These ten reaches may be categorized three ways, as:

- marine delta fronts (outer banks),
- lower, brackish channels (transition areas), and
- fresh channels.

### The Marine Delta Front (outer banks of the river)

Two reaches are characterized as marine delta fronts: Reach #1 - Sturgeon/Roberts Banks and Reach #2 - Boundary Bay. These segments are directly influenced by marine waters from the Strait of Georgia. They are separated from the Strait but the salinity of the waters influence the types of flora and fauna found in these reaches of the estuary. Staging areas for migratory birds and rearing habitat for juvenile fishes (i.e. Pacific salmonids) exist on these reaches. They are highly productive parts of the estuary and are mostly red-coded in the FREMP habitat classification system. The Vancouver International Airport lands are located here as well as the Vancouver Port at Roberts Bank and the Tsawwassen Ferry terminal.

### The Lower, Brackish Channel (transition areas)

Three reaches are characterized as lower, brackish channels: Reach #3 - the Lower North Arm, Reach #4 - Middle Arm, and Reach #5 - the Lower South Arm. These reaches are located where the marine waters from Georgia Strait mix with the fresh waters of the river. These areas contain natural wetland habitat and the shorelines are highly productive. The shorelines are red colour-coded and provide habitat for juvenile salmon rearing and feeding. They also provide feeding and cover for waterfowl and wildlife. The reaches include residential and industrial development. The North and South Arms are used by ships and are therefore dredged. They are administered by the North Fraser and Fraser Port Authorities. The Middle Arm contains marina and seaplane operations.

### The Fresh Channel

Five reaches are characterized as fresh channels: Reach #6 - the Upper North Arm, Reach #7 - the Upper South Arm, Reach #8 - the Lower Fraser Main Channel, Reach #9 - the Upper Fraser Main Channel, and Reach #10 - the Pitt River. These are tidal reaches but dominated by freshwater flows and feature freshwater flora and fauna. While the Pitt River reach is mostly in its natural condition, the others contain the main navigation channels of the Fraser River Port Authority and North Fraser Port Authority, containing substantial industrial development.

4. The reach descriptions have been adapted from G.L. Williams & Associates, 2000 report: "Pilot project to apply an ecological features and functions approach to a test area in the Fraser River estuary."

## Reach Overviews

A reach overview will provide a summary of the ecological, economic, social and cultural importance of specific units or “reaches” of the estuary. It will also document and consolidate all of the current plans (federal, provincial, municipal, regional and port), policies and regulations in place for the reaches of the estuary. A valuable outcome of reach overviews will be the identification of issues and areas where consensus exists between the various plans and where it does not. From this, we may be able to identify strategies to address long-term planning and development in the reach. Appendix E contains the process to prepare a reach overview as well as what it might contain.

In bringing together pieces of critical information, reach overviews are another tool for the FREMP partners and municipalities to draw on to link water and upland issues. The parties involved in developing these overviews would include FREMP partners and municipalities.

The tasks outlined in the six Action Programs that follow will be linked and some of them implemented through the reach overview discussions. For example, reach discussions could look at links between foreshore and upland planning, log storage needs, and industrial nodes along the river.

### Objective 1

To develop and implement a features and functions approach to management and decision making in the estuary.

## Action

- I For each reach in the FREMP area, develop a reach overview that compiles information on the natural and human features and functions, planning designations and zoning, and FREMP habitat classifications and area designations (if completed) for the reach. As a first step, undertake one reach overview in the estuary and evaluate the effectiveness of the process in order to improve it for the remaining reaches of the estuary.

Suggested implementation partners: FREMP partners, coordinated by the FREMP secretariat

### Success measures

- Completion of a “features and functions” pilot project for one reach, and evaluation of the process by all participants.
- Number of reach overviews completed and success of reach overviews at linking water and upland issues.

## Environmental Protection

Estuaries are among the most biologically productive areas in the world, supporting a great variety of fish, wildlife, insects and plants. The Fraser River estuary has Canada's highest concentration of wintering birds. The estuary is a key feeding and resting stop on the Pacific Flyway for migratory birds, and provides essential habitat for over 300 species of birds and over 80 species of fish and shellfish, including all five Pacific salmon species. Given the global significance of the Fraser River estuary, environmental protection has a high priority in the Estuary Management Plan. Improvements to water and sediment quality and fish and wildlife habitat are the primary goals within the theme of environmental protection.

Because of the linkages between the estuary and both the upland and upper reaches of the Fraser River, the objectives and actions identified below are not necessarily limited to the wetted side of the dyke. Environmental protection will require cooperation from agencies and organizations that might consider their mandates as being outside the FREMP boundaries. When implemented in concert with environmental management activities on the upland, the Plan can contribute to conserving and enhancing the ecological productivity of the estuary.

The Estuary Management Plan addresses two key areas under Environmental Protection: Water and Sediment Quality, and Fish and Wildlife Habitat.

## Action Program 2

### Water and Sediment Quality Action Program

Water and sediment quality are central issues in estuary management. Water is the one element that directly links urban development – including municipal wastewater treatment – agricultural practices and industrial operations with aquatic life, wildlife, irrigation and recreation opportunities. Water and sediment quality management in the estuary is complex, and greater integration is needed. The GVRD Liquid Waste Management Plan (LWMP) will assist with the integration of water quality management and monitoring, and is a critical part of implementing this action program. Integration will also happen by promoting watersheds as the basis for water quality improvement and management in the estuary.

Approved in 2002, the Liquid Waste Management Plan aims to improve water quality by addressing the impacts of wastewater discharges into the Lower Mainland's receiving waters.

#### Objective 1

Develop an integrated water quality monitoring framework for the estuary that identifies ongoing water quality monitoring and how monitoring efforts might be coordinated. The framework will also identify gaps in monitoring and options to fill them.

## Actions

- 1 Establish and maintain a database to track ongoing water quality monitoring programs in the estuary (who is monitoring for what and where/when). Communicate this information through the Internet and other available means.

Suggested implementation partners: GVRD, MLWAP, EC, DFO

- 2 Work with the GVRD's LWMP Environmental Monitoring Committee to determine duplication and information gaps in existing water quality monitoring programs, and coordinate monitoring initiatives in the estuary.

Suggested implementation partners: GVRD, MLWAP, EC, DFO

### Success measures

- Water quality monitoring programs database in place and updated regularly. Database made web-accessible or accessible by other means.
- Water quality monitoring gaps identified and addressed. Monitoring duplication identified and addressed.

## Objective 2

Improve water and sediment quality in the estuary by working to prevent pollution at its source, minimizing the discharge of pollutants, and remediating contaminated sediments.

## Actions

### Water Quality Coordination

- 1 Work with the GVRD's LWMP to promote public understanding of water quality targets, and where possible, promote interagency agreement on water quality targets.

Suggested implementation partners: GVRD, EC, MLWAP, DFO

- 2 Working with the GVRD and municipal stormwater liaison group, coordinate FREMP partner water quality initiatives within the estuary with municipal Integrated Stormwater Management Plans (ISMPs) as they are prepared by municipalities in the FREMP area.<sup>5</sup>

Suggested implementation partners: GVRD Stormwater Interagency Liaison Group, municipalities

### Pollution Prevention and Control

- 3 Increase awareness of source control measures and best management practices for pollution prevention.

Suggested implementation partners: MLWAP, EC, DFO, GVRD

- 4 Continue developing guidelines and enforcing legislation regarding abatement of pollution from point and non-point sources.

Suggested implementation partners: MLWAP, EC, DFO, Port Authorities, GVRD (through the LWMP)

<sup>5</sup> This action is needed only for information exchange purposes because the ISMPs will address waterfront issues, outfalls and run-off into the river.

- 5 Reinforce existing measures and develop new incentives to reduce the introduction of pollutants into the estuary from agricultural practices and run-off.

Suggested implementation partners: MWLAP, EC, DFO, Agriculture Canada, MAFF, GVRD<sup>6</sup>

- 6 Through existing programs, new regulations<sup>7</sup> and incentives, encourage boat owners and other water users to adopt a code of good environmental practice by not discharging sewage or garbage into the waters of the estuary. Encourage and support marina operators in providing sewage pump-out stations and onshore washroom facilities.

Suggested implementation partners: EC, DFO, MWLAP, Port Authorities, municipalities

### **Sediment Remediation**

- 7 Support efforts to identify, assess and remediate contaminated sediments in the estuary, consistent with regulatory procedures for assessing and managing contaminated sediments in British Columbia.

Suggested implementation partners: MWLAP, EC, DFO, Port Authorities

#### **Success measures**

- Trend data showing continuing improvement in the estuary's water quality (e.g. fecal coliform counts, other compounds).
- Interagency agreement reached on water quality targets.
- Integration of ISMPs and related strategies in FREMP reach overviews or Area Designation Agreements. Regular information sharing on the status and contents of ISMPs as they are completed.
- Adoption of pollution prevention BMPs by municipalities, industry and others.
- Continued enforcement of pollution prevention legislation. Development and communication of BMPs and other guidelines.
- New incentives developed to reduce pollution from agricultural run-off. Water quality monitoring data showing long-term reduction in nutrients into the estuary. BMPs adopted by agricultural operations.
- Number of Green Boating Guidelines distributed. Number of existing marinas that move to provide pump-out stations and onshore washroom facilities. Number of municipalities that adopt bylaws regarding pump-outs. Number of no-discharge areas/marinas.
- ERC review of projects involving remediation of contaminated sediments, that are consistent with regulatory procedures.

<sup>6</sup> The Fraser Valley Regional District also plays a key role on this issue.

<sup>7</sup> Pleasure craft sewage pollution regulations are under review by Coast Guard and Transport Canada.

## Action Program 3

### Fish and Wildlife Habitat Action Program

Estuaries provide essential habitat for many fish and wildlife species. Over two billion juvenile salmon spend several weeks feeding and rearing in the brackish shallow waters and sloughs of the estuary, making the adjustment from fresh to salt water conditions before they migrate to the ocean. Other fish species like starry flounder spawn and rear in the protected waters of the estuary. Thousands of waterfowl and shorebirds stop in the estuary during their summer and winter migrations along the Pacific Flyway. The abundance, distribution and variety of wildlife species in the Lower Fraser Valley has changed over the last century with conversion of natural habitat – wetlands, forests and fields – to agricultural and urban uses.

Using the “features and functions” approach to identify areas of high ecological value, along with information on biodiversity in the region, habitat enhancement and creation projects can help stem the loss of tidal wetlands and other habitat.

#### Objective 1

Conserve and enhance the existing habitat base in the estuary. Secure protection for additional habitat areas with high ecological and biodiversity significance.

### Actions

#### Habitat Enhancement

- I Work in partnership with local and regional governments and stewardship groups to facilitate completion of habitat improvement projects on priority sites in the estuary.

Suggested implementation partners: DFO, GVRD, EC, MWLAP, municipalities

**In the estuary, habitat can be improved through:**

#### Enhancement

Improving the productivity of existing habitats through appropriate modifications.

#### Restoration

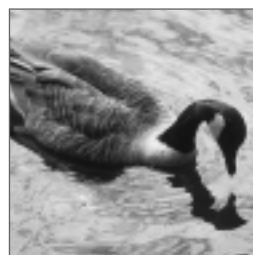
Removing debris and unauthorized fill to increase productivity.

#### Creation

Building new habitat through banking and compensation projects in areas with low productivity.

#### Biodiversity

Biodiversity is life in all its forms and the habitat and natural processes that support it. The term “biodiversity” encompasses all aspects of biological differences and permutations, including species richness, ecosystem complexity and genetic variation.



## Habitat Creation and Protection

- 2 Participate in developing the Biodiversity Conservation Strategy for the Greater Vancouver Region to identify ecologically-significant habitat lands in the estuary that still need protection. Integrate the recommendations with regional context statements, reach overviews, and Integrated Stormwater Management Plans, and support efforts to protect appropriate lands through management arrangements (e.g., voluntary stewardship, nature reserve) and acquisition by partnership. As part of this, develop incentives for habitat protection that would involve private industry, local organizations and individual citizens.

Suggested implementation partners: MWLAP, GVRD, EC, municipalities

- 3 Work with the appropriate parties to create additional habitat compensation banking projects in the estuary.

Suggested implementation partners: DFO, Port Authorities, municipalities

## Biodiversity Conservation Strategy for the Greater Vancouver Region

The aim of the Biodiversity Conservation Strategy for the Greater Vancouver Region is to assess and communicate the status of biological diversity in the region, develop coordinated management strategies to conserve and enhance that diversity, and evaluate the benefits of doing so. The project will also provide partners and stakeholders with information and tools for prioritizing resources for conservation efforts.

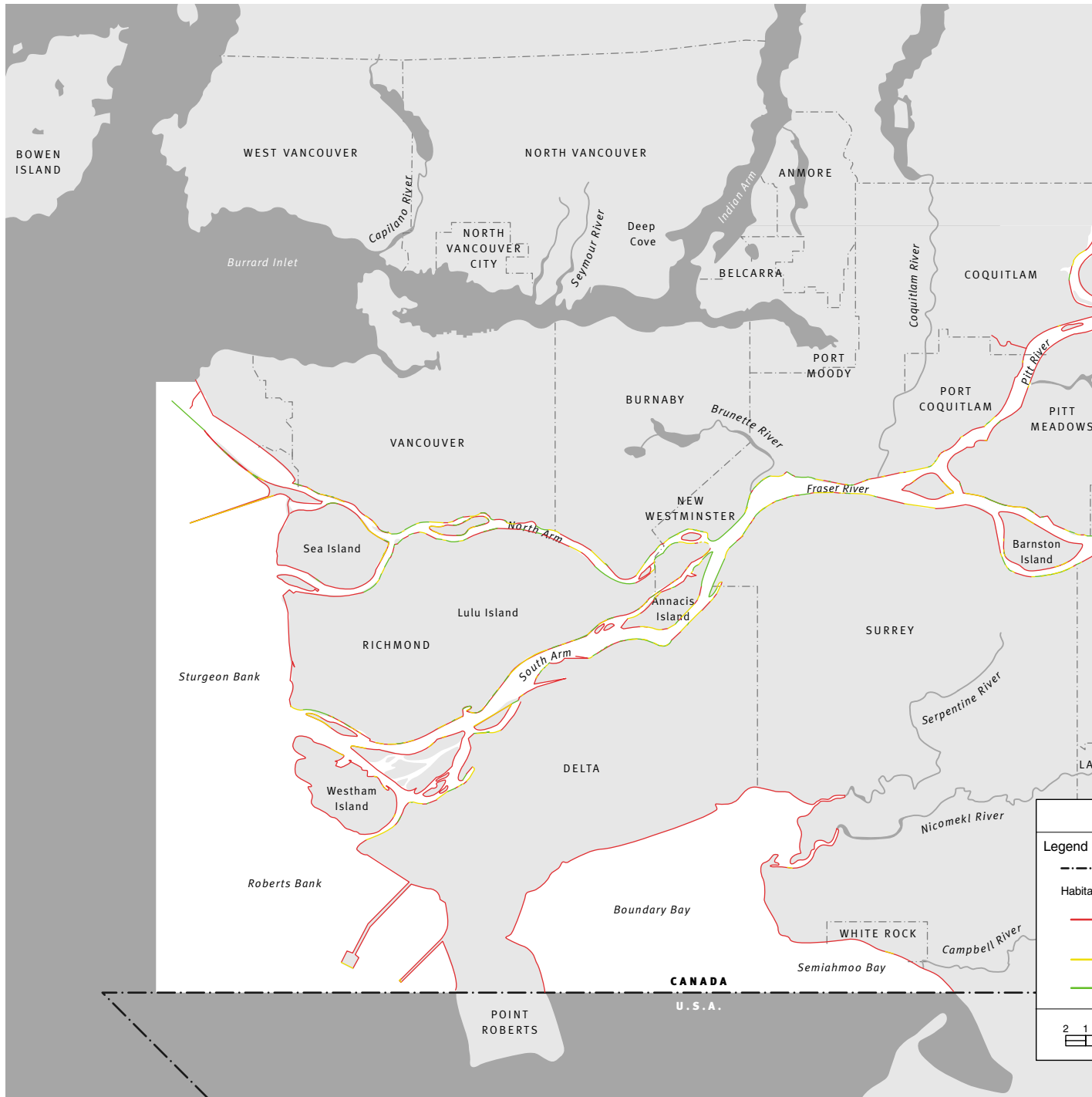
There are four main phases involved in developing the Strategy:

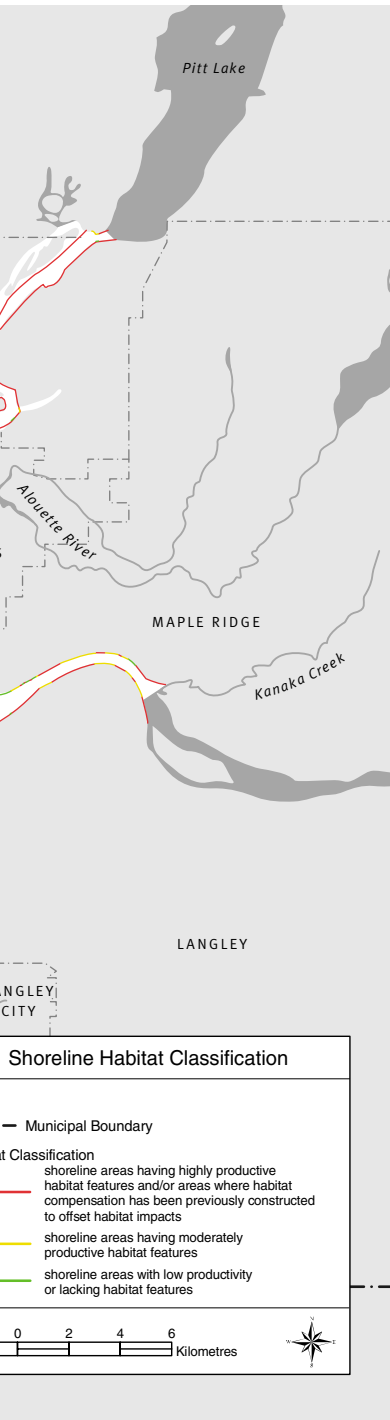
- Phase 1: Background and Scoping
- Phase 2: Habitat Mapping and Analysis
- Phase 3: Assessment and Strategic Directions
- Phase 4: Developing a Framework for Biodiversity Conservation.

The Strategy is being developed under a partnership through the Georgia Basin Ecosystem Initiative, involving Environment Canada, the Province of BC, the GVRD and BIEAP-FREMP.

BIEAP-FREMP is an active partner in this initiative and will help to implement the Strategy through the Estuary Management Plan.

# Map 3: FREMP Habitat Classification





### FREMP Colour Coding

Shorelines that include intertidal and riparian areas within FREMP have been classified and colour-coded on the basis of the relative values of their habitat features. Examples of habitat features include mudflat, marsh, and bottomland forest.

The codes are intended to guide prospective developers in selecting appropriate sites and identifying suitable design concepts prior to making application for approval of their projects. Such approvals are obtained through application to the appropriate Lead Agency and subsequent review through the FREMP Coordinated Project Review Process.

Shorelines are inherently dynamic areas in any river estuary, and habitat features will change over time. Periodic review and updating of colour coding is therefore required. Appendix F outlines the FREMP policy on responding to habitat reclassification requests. Persons involved on an ongoing basis with development on the Fraser River Estuary shoreline are therefore urged to maintain a familiarity with the current codings and habitat features in their areas of interest.

The following colour code definitions were revised in 2002:

#### Red Coded (High Productivity) Habitat

Red coded habitats include productive and diverse habitat features that support critical fish and wildlife functions onsite or as part of a more regional context and/or areas where habitat compensation has been previously constructed to offset habitat losses. Development in red coded areas is restrictive but may occur provided that mitigation is applied through site location and/or design to avoid impacts on habitat features and functions of the area. Habitat compensation is not an option as a rule. The only circumstances whereby exception to the above guideline can be considered are where the project is specifically undertaken in the interest of public health and safety. Even in these cases alternative siting and design mitigation must be pursued to the maximum extent possible.

#### Yellow Coded (Moderate Productivity) Habitat

Yellow coded habitats include habitat features that are of moderate value in structure or diversity due to existing conditions (e.g. surrounding land uses or productivity) and support moderate fish and wildlife functions. Development may occur in yellow coded areas provided that mitigation and/or compensation measures are incorporated into the project design to ensure that there is No Net Loss, and where possible a Net Gain, of productive capacity as a result of the project. Mitigation options must be pursued to the maximum extent possible prior to consideration of compensation for unavoidable impacts to habitat features and functions.

#### Green Coded (Low Productivity) Habitat

Green coded habitats include areas where habitat features and functions are limited due to existing conditions (e.g., developed for port or other urbanized uses). Development may occur in green coded areas provided that environmental impacts are mitigated through appropriate location, scheduling, design and operation and No Net Loss, and where possible a Net Gain, in the productive capacity of the site is achieved.

### Decision Making Tools

- 4 Use and update the FREMP habitat classification (“colour coding”) system.  
Suggested implementation partners: DFO, Port Authorities, EC
- 5 Use the Coordinated Project Review process to support the adoption of FREMP partner policies and guidelines for protecting and managing habitat.  
Suggested implementation partners: FREMP partners

### Information Sharing

- 6 Regularly compile and distribute available knowledge and ongoing research of estuarine processes. As part of this effort, sponsor periodic information exchanges where participants can share and discuss new findings.  
Tap into local stewardship groups where they can assist with this effort.  
Suggested implementation partners: FREMP partners, local groups where appropriate
- 7 Coordinate the establishment of administrative and financial arrangements between academic institutions, government agencies and the private sector to facilitate estuary management-related research projects.  
Suggested implementation partners: FREMP partners

### Success measures

- Number of sites and land area where habitat improvement takes place. Long-term success of the enhancement works. Level of partnership developed for these projects (qualitative measure).
- Identification and protection of important habitat. FREMP partner participation in developing the Biodiversity Conservation Strategy for the Greater Vancouver Region.
- Number, quality and endurance of new habitat banks created in the estuary.
- Habitat coding updated as needed (i.e. when changes identified on the ground and reviewed/approved by FREMP).
- Hectares of habitat created through compensation or mitigation. Quality of habitat in terms of how it contributes to regional biodiversity and connectivity.
- Development of a compendium of estuary-related research. Number of copies of this compendium that are distributed, and regular updates to the compendium.
- Number of research projects/studies/pilot projects and nature of partnerships.

## Objective 2

### Monitor habitat losses and gains.

#### Actions

- 1 Monitor habitat loss and gain from compensation sites as well as habitat enhancement, restoration, and creation projects. As part of this, monitor and report on changes in the habitat colour coding (red/yellow/green trends) on a regular basis.

Suggested implementation partners: DFO

- 2 Conduct audits of projects through the Coordinated Project Review's Environmental Review Committee (ERC).

Suggested implementation partners: FREMP partners

#### Success measures

- Quantity and quality of habitat created from compensation/ mitigation, habitat enhancement and habitat restoration.
- Number of projects in the estuary that are audited annually and results of those audits.

## Human Activities

The estuary has always figured prominently in the region's history of human settlement. The rich and varied resources of the estuary have sustained settlements for at least 9,000 years. Coast Salish First Nations established villages on the south arm of the Fraser River, using the river as a transportation and trading route. The Musqueam, Katzie, Tsawwassen and Semiahmoo had winter villages close to or within their current Reserve areas, and these villages depended on the abundant runs of salmon as their main source of food and as a highly valued trading commodity. In summer, these First Nations moved to their summer homes throughout the estuary and were joined by other First Nations from upriver, the south and Vancouver Island, who traveled here for the late summer runs of sockeye salmon.

Resource extraction was the driving force behind the exploration and settlement of the lower Fraser River. With the arrival of European settlers in the 1800s, salmon was soon traded around the world. In response to the huge demand for salmon, canneries became one of the dominant industries in the estuary during the late 1800s and early 1900s. Much of the estuary was also changed by the installation of river training structures, such as dykes, in part to protect upland areas from flooding.

Today, human activities within the estuary are evolving from a diversity of primarily industrial uses in discrete locations to a more continuous integrated ribbon of industrial, residential, commercial and recreational uses. The estuary is home to seven fish processing plants and a fleet of over 850 fishing boats, five deep sea port terminals, a ferry terminal, and over 250 industrial operations. These companies use the river to move raw materi-

als (e.g. logs, fish, construction aggregates) and finished products as well as provide shipbuilding and repair facilities, marinas, floatplane terminals, and a wide range of supporting services. The estuary is an economic asset that continues to act as a critical lifeline for hundreds of firms and thousands of employees, with economic benefits extending well beyond the FREMP boundary. The estuary also supports many log booming grounds, including one of the largest in the world, located at the mouth of the North Arm.

Urban development meets the estuary at several places. The communities of Steveston, Ladner and White Rock have historical links with the region's European and Asian settlement history. New developments at Queensborough in New Westminster, the Fraser Lands in Vancouver, and Citadel Landing in Port Coquitlam provide public access to the river in former industrial sites. The region's residents now have many places to walk or bike along the estuary, such as the dykes in Richmond and Delta, the riverfront quay in New Westminster, Kanaka Creek Regional Park, Brownsville Park and the Fraser River boardwalk near Fraser Port. People can also paddle through the channels in the wetlands of Widgeon Marsh Reserve or the South Arm marshes.

The Estuary Management Plan addresses four key areas under Human Activities: Navigation and Dredging, Log Management, Industrial and Urban Development, and Recreation. These activities take place on the river, along the shore, and/or on the uplands adjacent to the river.

## First Nation Profiles

First Nations have lived in the FREMP area for thousands of years, and have traditional territories that extend over the region. All are of the Salishan language group, but with a rich and diverse history.

### Katzie First Nation

Located in Pitt Meadows, Katzie First Nation has a population of 460 people and its main office on Katzie Road. Katzie First Nation has reserves in Pitt Meadows, Langley and on Barnston Island that total about 340 hectares.

Katzie First Nation is negotiating a treaty with Canada and British Columbia and is currently in Stage 4 of a six-stage negotiation process. The purpose of Stage 4 is for the parties to negotiate an Agreement in Principle that will form the basis of the treaty and contain the essential points of agreement among the parties.

As part of the treaty process, Katzie has completed an economic development study including research on the general economy within Katzie traditional territory and "best practices" of economic development. Assessment of future employment and training opportunities for Katzie members formed part of this study. The First

Nation has also explored directions for future governance, and worked to improve relationships with neighbouring local governments.

### Kwikwetlem First Nation

With a population of 63, Kwikwetlem First Nation has its office on Colony Farm Road in Coquitlam and identifies the Coquitlam River watershed as its core territory. The First Nation has two reserves located on Coquitlam River – one at the mouth of the river and one upriver in Port Coquitlam – that total about 84 hectares. Formerly part of the Chilliwack Tribe, Kwikwetlem First Nation was established in 1979.

### Musqueam First Nation

Musqueam First Nation has a population of over 1000 people, with its main community located on a reserve (IR 2) in the Point Grey area of Vancouver. There are four reserves in total equaling about 254 hectares. The First Nation also has reserves in other ridings. The name "Musqueam" comes from a Halkomelem word which means "place always to get [the root of] iris-like plant." Musqueam offices are located on Salish Drive in Vancouver.

Musqueam First Nation is engaged in treaty negotiations with Canada and BC, and is currently in Stage 3: Framework Agreement. A Framework Agreement is a negotiated agenda for Agreement in Principle negotiations.

### New Westminster First Nation

New Westminster First Nation (also known as Qayqayt First Nation), is a small group with offices based in Vancouver. At present, the First Nation has no reserve lands.

### Semiahmoo First Nation

Semiahmoo First Nation is located on Semiahmoo Bay at the international border, with offices on Beach Road in Surrey. The First Nation has a population of 70 people and one reserve totaling about 29 hectares. The name is said to mean "Half Moon".

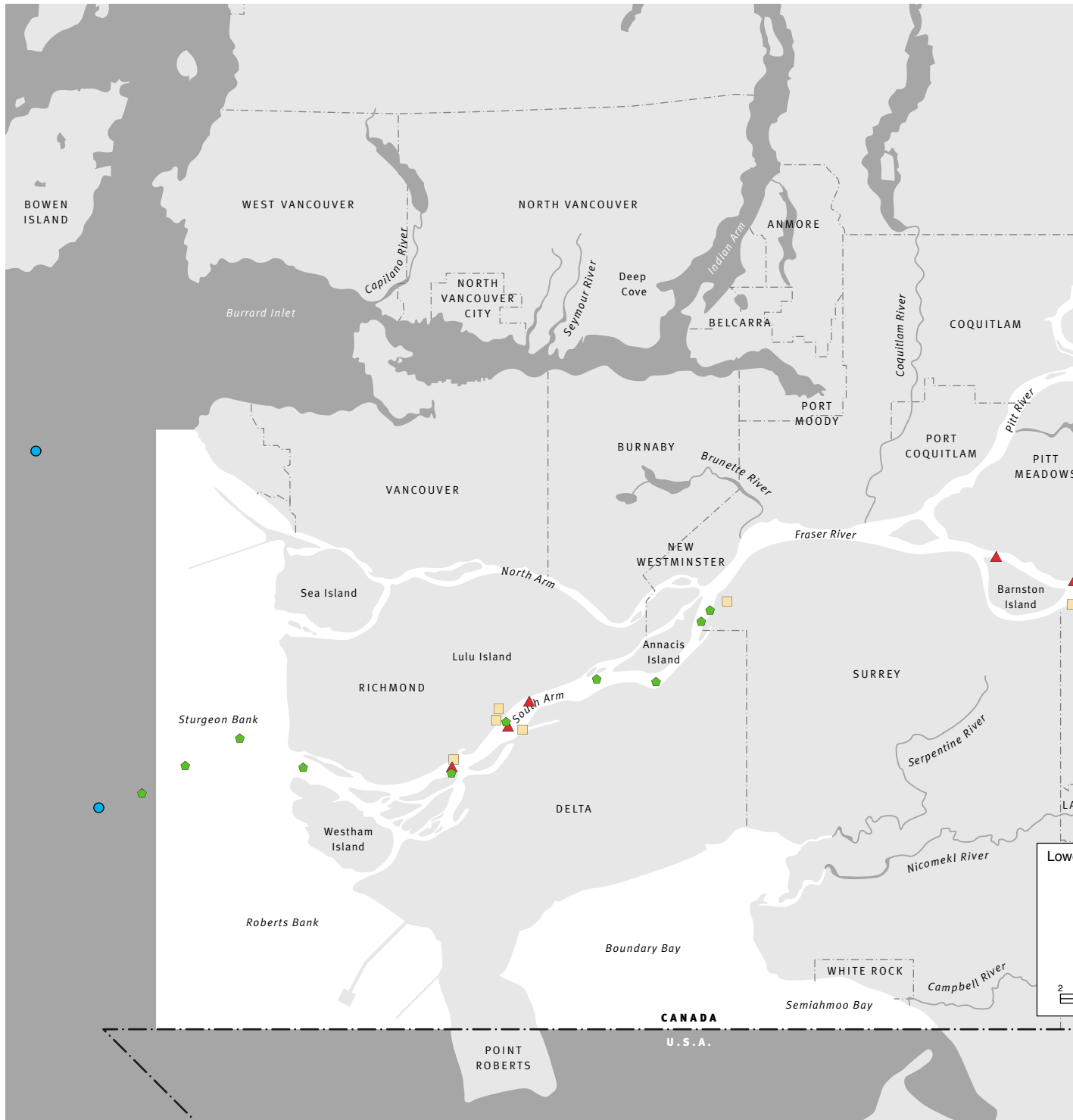
### Tsawwassen First Nation

The Tsawwassen First Nation reserve is located overlooking the Strait of Georgia in Delta. Tsawwassen has approximately 270 members, both on and off reserve, and the reserve itself covers about 700 acres (272 ha). The government system used is

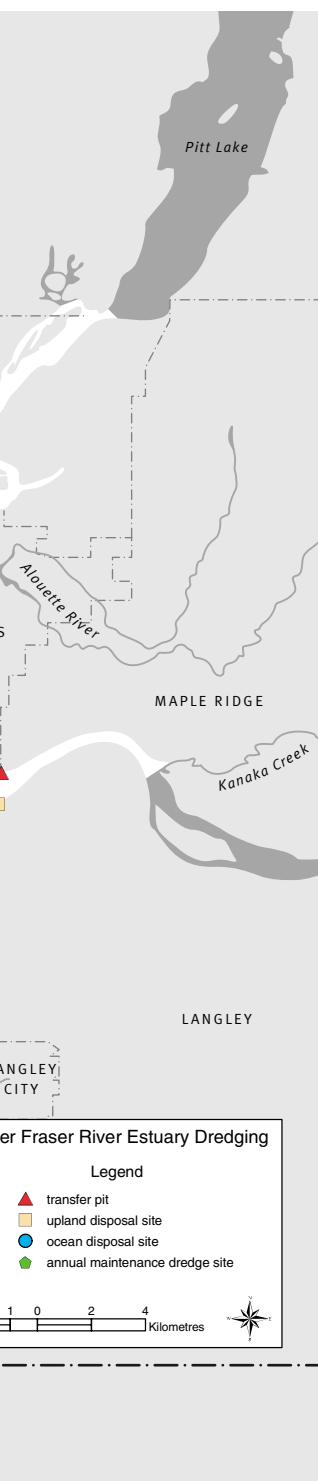
the band council system and the First Nation has an administration staff of about 30 that offers a range of social, cultural, economic and administrative services to the community. Tsawwassen is a Halkomelem word which means "beach at the mouth" or "facing the sea".

Tsawwassen First Nation is engaged in treaty negotiations with Canada and BC, and is in process of negotiating an Agreement-in-Principle. At the treaty table, a number of interim and treaty-related measures have been negotiated, including developing Tsawwassen economic development and community plans. The parties at the treaty table have accelerated their negotiations in order to reach an Agreement-in-Principle in 2003.

## Map 4: Dredging in the Estuary



Source: FREMP Dredging Annual Reports, with information from Fraser River Port Authority.



## Action Program 4

### Navigation and Dredging Action Program

The Fraser River carries a substantial sediment load, transporting gravel, sand and silt from the interior of BC to the coast. This sediment load is the source for rich agricultural lands in the delta and productive aquatic habitat in the estuary. Dredging is necessary to maintain existing navigation channels between New Westminster and the river's mouth that are critical to river-borne commerce and port operations, and to open new channels should transportation requirements change. Dredging also provides sand for construction and other commercial purposes. All agencies involved with dredging recognize the need to minimize the environmental impacts of this activity, and FREMP Dredging Guidelines were developed in 2001.

Sediment management in the river balances the amount of sediment coming down into the estuary with the amount of dredging allowed annually – the “sediment budget”. The majority of dredgeate meets federal guidelines for ocean disposal - disposal at sea is only permitted for materials where it is the environmentally preferable and practical alternative – and dredgeate that does not meet these criteria must be evaluated for upland disposal according to provincial Contaminated Sites Regulations.

#### Objective 1

Develop and maintain a functional navigation system that supports water-dependent development in a manner that protects environmental quality.

#### Actions

- 1 Develop a comprehensive dredge management strategy for the estuary that will provide a contextual framework regarding the navigation system's relationship with the environment, review existing studies relating to dredging impacts, and recommend areas in the estuary requiring further study.

Suggested implementation partners: FREMP partners, coordinated by FREMP secretariat

- 2 Ensure that an adequate level of channel maintenance is undertaken to support a functional navigation system, and facilitate the provision of funding for this purpose.

Suggested implementation partners: FREMP partners

- 3 Based on the dredge management strategy results, undertake a study of the relationship between dredging and flood plain management.

Suggested implementation partners: MWLAP, Port Authorities, municipalities

### Success measures

- Development and approval of a comprehensive dredging strategy that provides information on the biological impacts of dredging.
- Continued use of main channel for navigation.
- Annual updates to the FREMP dredging database and GIS layer.
- Completion of study on relationship between dredging and flood protection.

## Objective 2

Manage the removal of sediment from the river in a manner that balances with all components of the sediment budget of the river system.

### Actions

- 1 Evaluate the predictive performance of the sediment budget equation every five years to ensure its usefulness as a management tool.  
Suggested implementation partners: Port Authorities, Canadian Coast Guard, Public Works Canada
- 2 Coordinate a monitoring program that supplies the data required to evaluate the sediment budget equation.  
Suggested implementation partners: Port Authorities, EC, Canadian Coast Guard, Public Works Canada

The Sediment Budget is a measure of the net change in sediment stored in the river as a function of inflow less outflow. The Sediment Budget in any year represents the maximum permissible amount of material that may be removed from the estuary.

### Success measures

- Sustainable sediment removal from the river.
- Evaluation of sediment budget every five years.
- Development and implementation of a monitoring program for the sediment budget.

## Action Program 5

### Log Management Action Program

The coastal forest industry uses the estuary as its major wood storage and processing area. Logs travel down the coast in booms or by barge and are then stored in the river for processing or shipment elsewhere. About 60 forestry-related operations are located along the estuary.

The Debris Partners Group, facilitated by the Fraser Basin Council, oversees the operation of a debris trap at Agassiz, where natural debris coming down the Fraser River is captured and disposed of. The debris trap plays a significant role in reducing the amount of debris downriver. FREMP is a member of the Debris Partners Group, which is exploring regional solutions to debris issues.

Dealing with the debris generated locally in the estuary from forestry operations is also important to ensure it remains safe for navigation and other uses. The North Fraser Port Authority operates the only regional wood debris collection and recovery site at the Iona Fibre Recovery Site.

#### Objective 1

Reduce the generation and presence of waterborne debris in the estuary.

#### Actions

- 1 Monitor and promote Best Management Practices (BMPs) that have been developed for log handling operations and log boom construction.  
Suggested implementation partners: DFO, Industry groups
- 2 Promote the use of new mechanisms such as mini-booms to capture debris.  
Suggested implementation partners: Port Authorities, Industry groups
- 3 Develop options to dispose of debris in the estuary, including alternate uses and markets for log debris.  
Suggested implementation partners: Port Authorities, Industry groups

#### Success measures

- Compliance with BMPs.
- Number of mini-booms put in place. Amount of debris collected in the booms.
- Establishment/documentation of debris disposal alternatives. Number of options available/new markets researched or established.

## Objective 2

Ensure adherence to log storage guidelines.

### Action

- I Monitor and enforce the FREMP Log Storage Guidelines.

Suggested implementation partners: DFO, Port Authorities

### Success measures

- Level of adherence to guidelines. Regular updates through FREMP Annual Reports, the web site and other vehicles as appropriate.

## Objective 3

Confirm the long-term continuation of specific log storage areas.

### Action

- I Use agreements between agencies, municipalities and port authorities, including Area Designation Agreements and reach overviews, to designate and protect existing log storage areas.

Suggested implementation partners: FREMP partners, municipalities

### Success measures

- Number of Area Designation agreements or reach overviews finalized. Usefulness of these agreements in protecting existing log storage areas.

## Action Program 6

### **Industrial and Urban Development Action Program**

The economic role of the Fraser River estuary is continuously evolving as the steadily increasing population in the Lower Mainland stimulates the need for jobs and a greater volume of goods and services. Transportation pressures and costs require an integrated approach to managing urban and industrial development and transportation in the estuary. Compounding this are changes faced by the forest industry, ongoing competition from other transport modes such as trucking, changing market demands and sensitivity to ecological functions.

The idea of preserving lands along the river for water-related industry was reflected in the 1994 Plan – thus the “working” component of the river. However economic changes have meant that water-related businesses are not clamoring for lands on the river – in fact, many mills have closed down in recent years due to global market forces and individual business decisions.

The focus on preserving waterfront lands has now shifted to the protection of strategic sites for water-related industries and intermodal facilities. These sites are important pieces in the promotion of water-based transportation as part of the regional transportation system and opportunities exist to preserve critical nodes along the river for intermodal transportation – places where goods shipped by barge can be transferred to rail or truck, and vice versa. Barging is a form of transportation with lower emissions - thus helping meet Kyoto Protocol implementation targets - and will help relieve congestion on Lower Mainland roads. In order to ensure industry has continued access to the river, these strategic lands must be protected from the redevelopment pressures generated by real estate market valuation (highest and best land use) realities.

While the Area Designation process has provided a framework for managing urban and industrial development, new complexities of the economy and environment call for new alternatives. Reach overviews in combination with existing and future Area Designation Agreements will provide an integrated framework to guide land use along the waterfront.

The economic vision for the estuary is: A Living Working river where the economic opportunities are in harmony with the environmental and social well-being of the region. To implement this vision, in 2002 the FREMP Economic Development Task Group articulated a number of strategic outcomes which are encapsulated in this Action Program.

### Objective 1

Protect strategic land and water areas for water-related industries and encourage new industries to locate in the estuary.

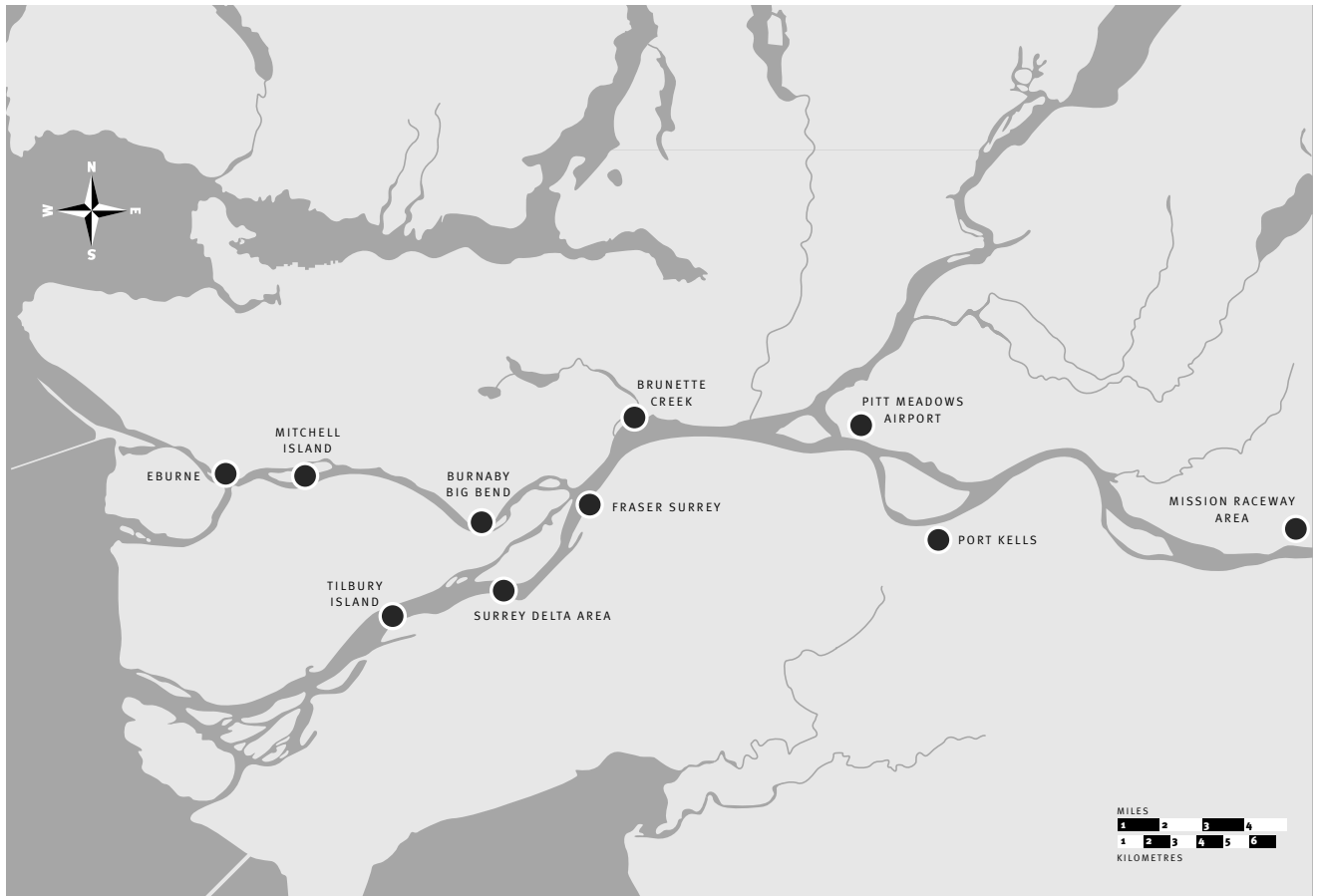
#### Actions

- 1 Protect existing nodes for water-related industries and minimize the impact of industrial nodes on adjacent shoreline uses.  
Suggested implementation partners: GVRD, municipalities, industry, Port Authorities
- 2 Define and protect lands for water-related industry at strategic locations in the intermodal transportation system (see Map 5).  
Suggested implementation partners: GVRD, Port Authorities, municipalities, industry
- 3 Develop partnerships to identify and increase market demand for water-related business and encourage creative revenue generation concepts for public lands.  
Suggested implementation partners: Municipalities, industry, Port Authorities
- 4 Work with various levels of government to promote water-related businesses and integrated waterfront development.  
Suggested implementation partners: Municipalities, industry, Port Authorities
- 5 Ensure that the FREMP's environmental review process, policies and procedures continue to provide the development community with a flexible, effective review process and uniform interpretation of designations and management strategies across the FREMP area.  
Suggested implementation partners: FREMP partners

#### Success measures

- Number of water-related industries in the estuary. Length of fore shore available for water-related industries. Number of people employed in water-related industries.
- Number of new sites and acreage of strategic industrial areas along the waterfront.
- Number of partnerships developed to increase market demand for water-related businesses.
- Number of new industries in the estuary and new mixed-use developments (including water-related industry) on the waterfront.
- Regular reporting on Coordinated Project Review and Estuary Management Plan.

## Map 5: Potential Fraser River Water Nodes



Source: Greater Vancouver Gateway Council, 2001.

## Objective 2

Encourage industrial and urban development to locate in areas in the estuary where conflicts with habitat protection and incompatible uses are minimized.

### Action

- 1 Complete Area Designation Agreements where the parties are ready to move forward. Complete reach overviews for all ten reaches of the estuary incorporating existing Area Designation Agreements where applicable.

Suggested implementation partners: FREMP partners, municipalities

### Success measures

- Number of Area Designation Agreements and reach overviews completed. Success of these tools in reducing conflict between water and upland uses.

Area Designation Agreements between individual municipalities and FREMP partners set out agreement on foreshore activities that are compatible with upland uses.

Area Designation Agreements have been concluded with six municipalities in the FREMP Area: Richmond, Burnaby, White Rock, New Westminster, Surrey and Coquitlam.

## Objective 3

Incorporate water-based transportation for goods and people movement in the estuary into the regional transportation system.

### Actions

- 1 Work with Translink, the railway companies, Transport Canada and others on strategic intermodal transportation planning within the estuary, including the infrastructure needed to support intermodal nodes.

Suggested implementation partners: GVRD, municipalities, industry, Translink, Transport Canada, Port Authorities

- 2 Continue to work with Transport Canada and provincial departments on consolidating and harmonizing regulatory standards for water-based transportation.

Suggested implementation partners: GVRD, Translink, Transport Canada, MWLAP, Port Authorities

- 3 Monitor research on the links between water-based transportation and regional air quality, and research trends in water-based environmental standards and regulations.

Suggested implementation partners: GVRD, EC, MWLAP, Translink, Port Authorities

### Success measures

- Preparation of a compendium of regulations and recommendations for improvements.
- Regular reports and the inclusion of ongoing research activities in work programs.
- FREMP and other agency participation in the regional transportation plan.

## Action Program 7

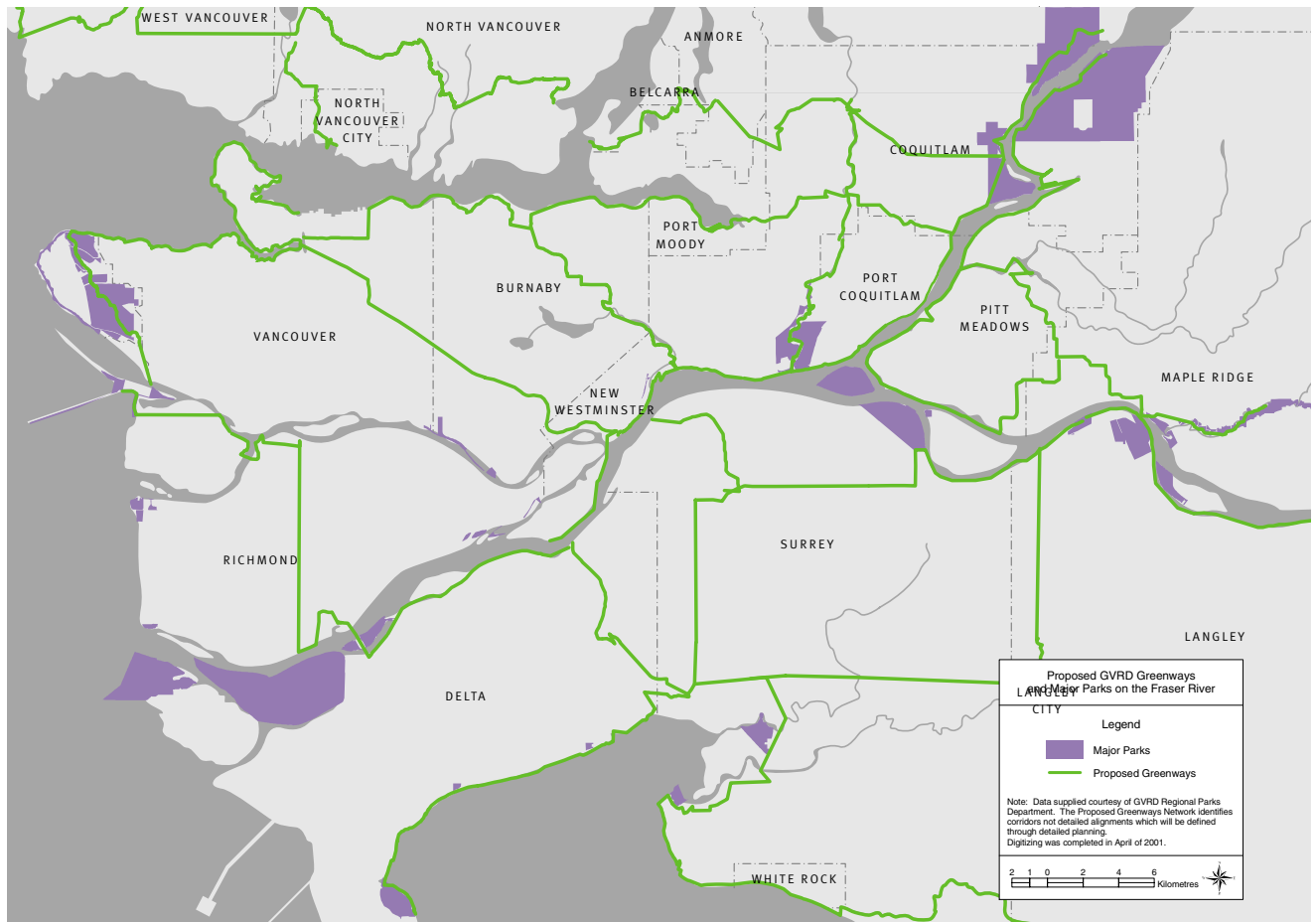
### Recreation Action Program

The Fraser River estuary is a unique recreation asset for residents and visitors to the region. People can visit the water's edge to walk, view wildlife, boat, kayak and wind-surf, among other activities. Interpretation along the estuary will often be part of a recreational experience, helping people to better understand the interaction between the "living" and "working" river.

Recreation is both water and land based, with many regional and municipal parks established on the river providing access to the water. Recreational corridors along the estuary - often located on top of river dykes - give public access to the waterfront without demanding a larger amount of land or facilities. Regional greenways are additional important corridors that connect natural open spaces throughout the urban area for wildlife and people. Many greenways provide recreational opportunities as well as habitat for fish and wildlife, a further example of integrating ecological and human functions.



## Map 6: Parks and Greenways



### Objective 1

Where possible, create new parks and green spaces along the estuary. Develop regional greenways between parks, open spaces and green spaces in the estuary.

#### Actions

- 1 Support GVRD efforts to use partnerships to acquire and protect land for both recreation and conservation purposes taking into account the biodiversity objectives that will be articulated through the Biodiversity Conservation Strategy for the Greater Vancouver Region. Support municipal efforts to create public parks or green spaces where appropriate along the river. (i.e. integrated waterfront development).  
Suggested implementation partners: GVRD, municipalities
- 2 Support efforts at all levels (federal, provincial, regional and local) to develop greenways between major parks, open spaces and green spaces in the estuary.  
Suggested implementation partners: GVRD, municipalities
- 3 Install consistent signage in parks and along greenways, including an estuary map and information about the site's significance.  
Suggested implementation partners: GVRD, municipalities

#### Success measures

- Number and land area of parks and green spaces created in the estuary.
- Number and length of greenways established in the estuary.
- Signage developed and established in parks.

### Objective 2

Develop a water-based recreation plan for the estuary.

#### Action

- 1 Facilitate development of a water-based recreation plan for the estuary that incorporates issues around navigation, access to the river, public safety, and boating.  
Suggested implementation partners: GVRD, Port Authorities, municipalities

#### Success measures

- Development of a recreation plan. Adoption or implementation of plan.

# 3



# Plan Implementation

## Overview

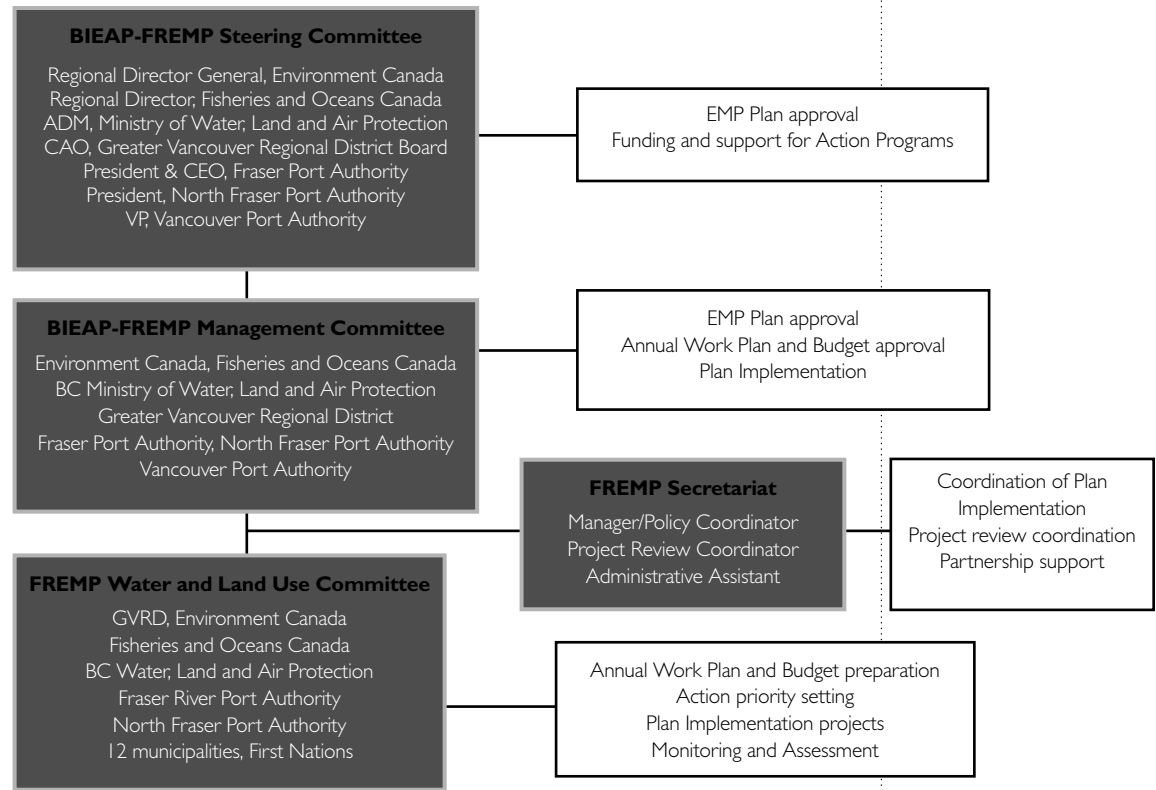
Key to the Estuary Management Plan's success will be the commitment from the FREMP partners to ensure its implementation, evaluation and monitoring. A number of areas are critical to implementing the Plan:

- Implementing the Plan under the guidance of the Water and Land Use Committee
- Using a team approach to ensure that all relevant issues are considered in decision-making
- Securing adequate resources for new initiatives and ensuring funding for ongoing activities that have been successful
- Monitoring, evaluating and reporting on Plan implementation, including through the program's Annual Report and regular updates on the FREMP web site
- Maintaining and improving communication and coordination among the partners, research and educational institutions, and concerned groups and individuals
- Developing additional partnerships with other agencies, local governments, conservation groups, the private sector and the public as appropriate
- Reviewing the Plan every five years to incorporate accomplishments and establish new commitments.

### Structure of FREMP and Implementation of the Plan

The Estuary Management Plan will be implemented under the guidance of the Water and Land Use Committee, which reports to the BIEAP-FREMP Management Committee. Figure 4 outlines the governance structure of FREMP and how it relates to plan implementation.

**Figure 4: Plan Implementation Structure**



### Annual Work Plans

The Estuary Management Plan provides the long-term framework for managing and protecting the estuary. Each year, the FREMP partners, through the Water and Land Use Committee, will develop a work plan designed to implement the Estuary Management Plan. The Management Committee will approve this work plan.

The Water and Land Use Committee will oversee the implementation of the annual work plan, which will identify:

- Priority actions to be undertaken each year
- Which partner will lead or be responsible for undertaking the actions
- Additional partner initiatives and activities that will contribute to implementing the Plan's Action Programs
- Budget and funding sources to carry out the actions.

The BIEAP-FREMP Annual Report will outline progress made in implementing the Plan through these work plans, and recommend the redirection of efforts, as necessary, to meet the objectives of the Action Programs.

### **Coordinated Project Review**

A key management tool of the FREMP partnership is the coordinated environmental review of proposals for shoreline development and other activities in the Fraser River estuary. The FREMP Environmental Review Committee (ERC) will continue to play an important role in implementing the Plan through the Coordinated Project Review Process. ERC is a one-window approach for lead agencies and developers to obtain environmental recommendations on projects in the estuary. More information on the Coordinated Project Review process can be found in Appendix D.

### **Funding and Resources**

Adequate resources are crucial for managing and protecting the estuary. By endorsing the Plan, the FREMP partners are committing to undertake the prioritized actions identified on an annual basis and funding these as appropriate.

The costs of estuary management efforts are significant. They include the costs of continuing existing programs, the costs of new program initiatives and the costs of capital projects such as acquisition of lands for protection. It is important to note that the FREMP partners already make large investments in many of the actions identified in the Plan. For example the GVRD has an established ambient water quality monitoring program and a greenways program, and the North Fraser Port Authority undertakes debris management in their area of jurisdiction. In addition, local governments are engaged in related initiatives such as Integrated Stormwater Management Plans, habitat protection and environmentally sensitive area mapping.

The Estuary Management Plan builds on existing programs and will benefit from strengthening partnerships. As the federal and provincial governments are experiencing a time of fiscal restraint and program restructuring, creative new approaches will be required to carry out the actions identified in the Plan. Funding for Plan implementation will be secured by the FREMP partners and through partnerships with other agencies, local governments, and the private and voluntary sectors, depending on the nature of the project.

The timing and nature of the actions undertaken and the pace of progress will be directly related to the availability of adequate funding. In some cases, the FREMP partners may redirect some of their programs to accomplish Plan objectives.

### **Monitoring and Evaluation**

Comprehensive monitoring is a key component of the Estuary Management Plan to assess progress and ensure that appropriate corrections can be made along the way. Plan implementation will include monitoring to assess water quality, habitat, aquatic health, biological integrity, urban, industrial and recreational development, navigation and dredging and log management.

The FREMP 2001 Monitoring Report began the process of reporting on the state of the estuary using a number of indicators to assess how we were doing. We will build on this report by using these and other indicators. Data will continue to be collected to establish trends, and new studies will be identified to help fill in gaps in the current knowledge of the estuary.

The Plan also proposes a number of success measures – both quantitative and qualitative – that will be drawn on in order to assess progress in meeting the Plan's objectives. Success measures will help us answer whether the Plan's actions have been implemented.

Using indicators and success measures, we will report on progress through the BIEAP-FREMP Annual Reports, web site and other means. From monitoring efforts, we can evaluate progress in implementing the Plan's specific objectives and more generally, in meeting the Plan's goals of balancing the "living" and "working" aspects of the river.

### **Collaborative Implementation**

Successful implementation of the actions identified in the Estuary Management Plan will require continuing support and participation by not just the FREMP partner agencies but a number of other agencies and organizations. To ensure the Plan is implemented, all agencies and organizations must work together cooperatively and meet a number of conditions:

- Endorse the Plan and create and maintain strong working linkages among all participants in the Plan
- Make a commitment to explore joint funding for project planning and coordination, monitoring programs, and research activities
- Agree to promote and abide by consensus decision-making in following established management and conflict resolution processes
- Agree to help monitor, evaluate and update the Plan on an ongoing basis.

These conditions mean the Plan must be endorsed by all levels within the participating organizations, especially by elected officials and key decision-makers.

### **Coordination with Other Planning Activities**

The Estuary Management Plan does not exist in a vacuum. Several major efforts are underway which complement the Estuary Management Plan. Coordination with these programs will be essential to the successful implementation and ongoing incorporation of an ecosystem approach to management of the estuary.

Key programs include: The Biodiversity Conservation Strategy for the Greater Vancouver Region, the GVRD's Sustainable Region Initiative and Liquid Waste Management Plan, the Georgia Basin Action Plan, the Fraser Basin Council's sustainability indicators initiative, the provincial contaminated sites legislative review and Living Rivers Strategy, and the federal Oceans Strategy, among others.

### **Five-Year Plan Review**

At the end of five years, the FREMP partners will review the Estuary Management Plan to determine how well the goals and objectives have been achieved, whether the Plan is still relevant, and whether new challenges and opportunities require the attention of the FREMP partners.

# 4



# Appendix A

## Glossary and Acronyms

### **Aboriginal rights**

Section 35 of the *Constitution Act*, 1982, affirms that aboriginal title, and the rights that go along with it, exist whether or not there is a treaty. Aboriginal rights refer to practices, traditions and customs that distinguish the unique culture of each First Nation and were practised prior to European contact. Aboriginal title is an aboriginal property right to land.

Nothing in the Estuary Management Plan is to be construed so as to abrogate or derogate from the application of section 35 of the *Constitution Act*, 1982 to existing aboriginal or treaty rights of the aboriginal peoples of Canada.

### **Area Designation Agreement**

An agreement between individual municipalities and FREMP partners on how foreshore and upland activities will be coordinated for specific areas in the estuary.

### **BIEAP**

Burrard Inlet Environmental Action Program

### **Biodiversity**

A term used to describe all aspects of biological diversity, including species richness, ecosystem complexity and genetic variation.

### **Contaminant**

A substance that is not naturally present in the environment or is present in amounts that can, in sufficient concentration, adversely affect the environment. Not necessarily harmful.

### **CWS**

Canadian Wildlife Service, a branch of Environment Canada

### **Delta**

The accumulation of sediments which are deposited where a river meets the ocean.

### **DFO**

Fisheries & Oceans Canada

### **EC**

Environment Canada

### **Ecosystem**

A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

### **EMP**

Estuary Management Plan

### **Environmental Quality**

Defined in the FREMP Memorandum of Understanding, means the quality of the marine, land and air environments and the health of the ecosystems.

### **ERC**

Environmental Review Committee

**Estuary**

The water body where a river meets the ocean so that freshwater and saltwater mix and the river level is affected by tides.

**Foreshore**

Refers to the area between the high water mark and the low water mark. Inter-tidal vegetation occurs between the high and low water mark.

**FREMP**

Fraser River Estuary Management Program

**GBEI/GBAP**

Georgia Basin Ecosystem Initiative/Georgia Basin Action Plan

**Greenways**

Refer to connections to protect ecological functions and provide linear recreational opportunities. Greenways include natural pathways, developed pathways or trails, staging areas and access points.

**Green Zone**

Green Zone lands are designated by municipalities and the GVRD and include important open space lands such as watersheds and flood plains, forests, wilderness areas, wildlife habitats and wetlands, outdoor recreation and scenic land and agricultural and forestry areas. The Green Zone defines where urban development will not occur.

**GVRD**

Greater Vancouver Regional District

**Habitat**

Natural home of plants or animals

**Habitat Compensation Bank**

Foreshore area used to compensate for future waterfront development where on-site mitigation or compensation is impractical or inadequate.

**LRSP**

Livable Region Strategic Plan (regional); the regional growth strategy for Greater Vancouver

**LWMP**

Liquid Waste Management Plan (regional); the regional plan to manage municipal liquid waste adopted under the provincial Waste Management Act

**MAFF**

Ministry of Agriculture, Food and Fisheries (provincial)

**MLWAP**

Ministry of Water, Land and Air Protection (provincial)

**MOU**

Memorandum of Understanding

**NGO**

Non-government organization

**OCP**

Official Community Plan

**Precautionary principle**

States that while caution must be exercised when shaping decisions, a lack of certainty should not prevent decisive actions to improve environmental quality.

**Pollution**

Any substance that is present in or has been introduced into the environment and has harmful or unpleasant effects. Pollution comes in many forms, and may be present in air, land, water, or organisms.

**Regulations**

Enforceable rules and procedures to implement federal or provincial legislation.

**Sediments**

Soil underwater on the bottom of oceans, lakes or rivers consisting of geologic, biologic and anthropologic material.

**SRI**

Sustainable Region Initiative (regional)

**Sustainability**

As defined in the FREMP memorandum of understanding, means the point at which economic, environmental and social/cultural activities meet the needs of the present generation without compromising the ability of future generations to meet their own needs.

**VPA**

Vancouver Port Authority

**Wet Site**

Refers to archaeological sites where vegetal cultural materials are preserved in water-saturated soils.

**WLUC**

FREMP Water and Land Use Committee

**WMA**

Wildlife Management Area, a designation under where the Provincial Wildlife Act conservation and management of wildlife, fish and their habitats is the priority land use but other uses are permitted.

# Appendix B

## FREMP Partner Mandates and Linkages with other Agencies

ORGANIZATIONS OPERATING IN THE FRASER RIVER ESTUARY	JURISDICTION	MANDATE	KEY LEGISLATION/ REGULATIONS
<b>ENVIRONMENT CANADA</b>	<p>Environment Canada (EC) is responsible for administering federal statutes, policies and programs to protect the environment, conserve renewable resources and promote sustainable development.</p> <p>The 1970 <i>Department of the Environment Act</i> outlines EC's environmental responsibilities, which include all matters over which Parliament has jurisdiction and which are not assigned to any other agency, department or board.</p>	<p><b>Protecting migratory birds</b></p> <p><b>Protecting species at risk</b></p> <p><b>Administering pollution prevention and contaminant regulations</b></p> <p><b>Protecting ambient water quality</b></p> <p><b>Managing water resources and quality</b></p> <p><b>Reviewing and conducting federal environmental assessments</b></p>	<p><i>Migratory Birds Convention Act and the Canada Wildlife Act</i></p> <p><i>Species at Risk Act (SARA)</i></p> <p><i>Canadian Environmental Protection Act (CEPA)</i> <i>Ocean Disposal Permits</i></p> <p><i>Fisheries Act (Section 36)</i></p> <p><i>Canada Water Act and Federal Water Policy</i></p> <p><i>Canadian Environmental Assessment Act (CEAA)</i></p>
<b>FISHERIES AND OCEANS CANADA</b>	<p>Fisheries and Oceans Canada plays the lead role in ensuring safe, healthy, productive waters and aquatic ecosystems. DFO provides services pertaining to conservation and sustainable resource use, environmental protection and stewardship, and marine safety.</p> <p>The Canadian Coast Guard, a branch of Fisheries of Oceans, is responsible for the enforcement of the Navigable Waters Protection Act which protects the public's right to navigation. The Coast Guard also has a role to ensure that Canadian waterways are safe and accessible, while protecting our marine environment.</p>	<p><b>Protecting fish and fish habitat</b></p> <p><b>Protecting the public right of navigation (Canadian Coast Guard)</b></p>	<p><i>Fisheries Act and the Oceans Act</i></p> <p><i>(CEAA) Navigable Waters Protection Act</i></p>
<b>FRASER RIVER PORT AUTHORITY</b>	The Fraser River Port Authority oversees the administration and management of the water, river bed, waterlots and certain upland properties from the mouth of the main arm of the Fraser River, east to Kanaka Creek and north to the mouth of Pitt Lake.	<p><b>Managing navigation channels, water, waterlots and upland parcels</b></p> <p><b>Managing marine activities</b></p> <p><b>Land Use Planning</b></p> <p><b>Conducting environmental assessments</b></p>	<p><i>Canada Marine Act</i></p> <p><i>Canadian Shipping Act, Harbour Operations Manual</i></p> <p><i>Fraser River Land Use Plan</i></p> <p><i>Canada Port Authority Environmental Assessment Regulations</i></p>
<b>NORTH FRASER PORT AUTHORITY</b>	The North Fraser Port Authority administers North and Middle Arms of the Fraser River from 22 <sup>nd</sup> Avenue in New Westminister (at the bifurcation of the Fraser River's main and north arms) to the Straight of Georgia.	<p><b>Managing navigation channel, waterlots and upland parcels</b></p> <p><b>Managing marine activities</b></p> <p><b>Land Use Planning</b></p> <p><b>Conducting environmental assessments</b></p>	<p><i>Canada Marine Act</i></p> <p><i>Canadian Shipping Act, Harbour Operations Manual</i></p> <p><i>North Fraser Land Use Plan</i></p> <p><i>Canada Port Authority Environmental Assessment Regulations</i></p>

<b>ORGANIZATIONS OPERATING IN THE FRASER RIVER ESTUARY</b>	<b>JURISDICTION</b>	<b>MANDATE</b>	<b>KEY LEGISLATION/ REGULATIONS</b>
<b>BC MINISTRY OF WATER, LAND AND AIR PROTECTION</b>	The BC Ministry of Water, Land and Air Protection (MWLAP) is responsible for the management, protection and enhancement of BC's water, land and air resources.	<b>Managing fish and wildlife resources</b>  <b>Protecting species at risk</b>  <b>Managing pollution discharges to air, water and land; regulating contaminated sites</b>  <b>Managing water and sediment quality</b>  <b>Conducting provincial environmental assessment</b>  <b>Overseeing provincial parks, ecological reserves and recreation areas</b>	<i>Wildlife Act and Fish Protection Act</i>  <i>Provincial Species at Risk</i>  <i>Environmental Management Act (2003) (combining previous Environment Management Act with the Waste Management Act)</i>  <i>Fish Protection Act, Water Act, Water Management Act, Contaminated Sites Regulation</i>  <i>BC Provincial Environmental Assessment Act</i>  <i>Park Act and Ecological Reserve Act</i>
<b>GREATER VANCOUVER REGIONAL DISTRICT</b>	The Greater Vancouver Regional District (GVRD) is a working partnership of twenty-one municipalities and one electoral area. The GVRD functions include strategic planning, liquid waste management (e.g., source control, combined sewer overflows, sewage treatment plant upgrades), solid waste management, air quality, water supply management and regional parks. The GVRD promotes the regional vision and goals set out in the <i>Livable Region Strategic Plan (LRSP)</i> .	<b>Strategic Planning and Regional growth management</b>  <b>Delivering essential services to the region such as water, sewerage and drainage, and solid waste management</b>  <b>Managing air quality and regional parks</b>	<i>Local Government Act, Livable Region Strategic Plan</i>  <i>Water Control Quality Plans, Liquid Waste Management Plan</i>  <i>Air Quality Management Plan (AQMP), Various Park Plans</i>
<b>OTHER AGENCIES LINKED WITH FREMP</b>			
<b>BC Ministry of Health Services Planning (Vancouver Coastal Health Authority)</b>	The Health Authority is responsible for monitoring water quality of recreational waters to ensure adequate quality for contact recreation activities; surveillance of activities which may have impact on public health; and works with the province to advise on the health implications and concerns of all discharges to the environment.	<b>Monitoring water quality of recreational waters to ensure adequate quality for contact recreation activities</b>  <b>Surveillance of activities which may have impact on public health</b>  <b>Permitting sewer discharges</b>  <b>Approving and consulting on health implications of all discharges to the environment</b>	<i>BC Health Act</i>

<b>ORGANIZATIONS OPERATING IN THE FRASER RIVER ESTUARY</b>	<b>JURISDICTION</b>	<b>MANDATE</b>	<b>KEY LEGISLATION/ REGULATIONS</b>
<b>BC Ministry of Sustainable Resource Management</b>	<p>The BC Ministry of Sustainable Resource Management (MSRM) is the lead provincial agency responsible for the "planning, policies and resource information to support sustainable economic development and environmental integrity".</p> <p>MSRM's mission is to "to provide provincial leadership, through policies, planning and resource information to support sustainable economic development of the province's land, water and resources".</p> <p>Land and Water BC is the provincial corporation responsible for Crown Land and Water. The corporation reports to the Minister of Sustainable Resource Management</p>	<p><b>Developing strategic policies and plans concerning sustainable management of Crown land and water use</b></p> <p><b>Pricing, registration of private land titles and other tenures</b></p> <p><b>Strategic policies concerning property assessment</b></p> <p><b>Providing information on all natural resources</b></p>	<p><i>Land Act, Water Act and Land Title Act.</i></p> <p><i>Some sections of Forest Practices Code of British Columbia</i></p> <p>Key Boards/Commissions also include the Agricultural Land Commission and the BC Assessment Authority</p>
<b>Public Works and Government Services Canada</b>	Public Works and Government Services Canada (PWGSC) provides professional and technical advice to the Coast Guard, the Department of Fisheries and Oceans and Environment Canada on matters related to dredging and construction of structures in the water.		
<b>Transport Canada</b>	Transport Canada has a mandate to help ensure that Canadians have the best transportation system by developing and administering policies, regulations and programs for a safe, efficient and environmentally friendly transportation system. The Department also contributes to Canada's economic growth and social development; and protects the physical environment.	<p><b>Setting policies, regulations and standards to protect Canada's rail, marine, road and air transportation systems, including the transportation of dangerous goods and sustainable development</b></p> <p><b>Enforcing departmental policies, regulations and standards through inspection, education and consultation</b></p>	<p><i>Canada Marine Act and Regulations</i></p> <p><i>Canada Shipping Act and Regulations</i></p> <p><i>Marine Transportation Security Act and Regulations</i></p> <p><i>Transportation of Dangerous Goods Act and Regulations</i></p> <p><i>Rail and Road Regulations</i></p>
<b>Vancouver International Airport Authority</b>	The Vancouver International Airport Authority (VYR) is operated under a long-term lease with the Government of Canada.	<p><b>Serving Canada's west Coast with regional, national and international air services</b></p> <p><b>Managing, Regulating and Permitting Development on Airport Lands on Sea Island, including Sea Island Conservation Area</b></p> <p><b>Responsible for the Airport operations – including noise management and environment safety</b></p>	<p><i>YVR Airport Plan</i></p> <p><i>Noise and Air Quality Management Plans</i></p> <p><i>Solid Waste Management and Recycling Regulations</i></p> <p><i>Water Quality Protection</i></p> <p><i>North Runway Operations</i></p>

<b>ORGANIZATIONS OPERATING IN THE FRASER RIVER ESTUARY</b>	<b>JURISDICTION</b>	<b>MANDATE</b>	<b>KEY LEGISLATION/ REGULATIONS</b>
<b>Vancouver Port Authority</b>	<p>The Vancouver Port Authority (VPA) is a Canadian Port Authority operating within the FREMP area. Specifically, VPA is responsible for port management at the Roberts Bank Port.</p> <p>VPA declined to become a FREMP partner, but remains active in BIEAP.</p>	<p><b>Managing navigation channel, water, waterlots and upland parcels</b></p> <p><b>Managing marine activities</b></p> <p><b>Land Use Planning</b></p> <p><b>Conducting environmental assessments</b></p>	<p><i>Canada Marine Act</i></p> <p><i>Canadian Shipping Act, Harbour Operations Manual</i></p> <p><i>VPA Port Plan 2010</i></p> <p><i>Canada Port Authority Environmental Assessment Regulations</i></p>
<b>FIRST NATIONS</b>  <b>Katzie First Nation</b> <b>Kwikwetlem First Nation</b> <b>Musqueam First Nation</b> <b>New Westminster First Nation</b> <b>Tsawwassen First Nation</b> <b>Semiahmoo First Nation</b>	<p>There are six First Nations within the FREMP boundaries. Three First Nations are involved in treaty negotiations with the governments of BC and Canada – Katzie, Tsawwassen and Musqueam First Nations. The goal of the treaty process is to provide certainty over jurisdiction, land and resources, and governance.</p>	<p>First Nations assert aboriginal rights and title over traditional territories. However the ways in which First Nations across the province translate and assert these rights differs with each Nation.</p> <p>The Musqueam First Nation is one of the first Nations to manage their lands under the new Land Management Act.</p> <p>The Tsawwassen First Nation recently signed on to this Act as well.</p> <p>The Semiahmoo First Nation is undergoing a land use planning process similar to an Official Community Plan process for their reserve lands.</p>	<p>In many cases the use or development of land or water may be affected by treaties or agreements presently under negotiation or expected in the future.</p> <p><i>First Nation Land Management Act</i></p>
<b>MUNICIPALITIES</b>  <b>Burnaby</b> <b>Coquitlam</b> <b>Delta</b> <b>Langley</b> <b>Maple Ridge</b> <b>New Westminster</b> <b>Pitt Meadows</b> <b>Port Coquitlam</b> <b>Richmond</b> <b>Surrey</b> <b>Vancouver</b> <b>White Rock</b>	<p>There are twelve municipalities bordering on the Fraser River within the FREMP area boundaries. These municipalities control the use of uplands within the estuary (i.e., lands above the high water mark) through municipal plans, policies, by-laws, zoning and other regulations.</p>	<p><b>Planning and managing land use</b></p> <p><b>Regulating development</b></p> <p><b>Servicing of upland properties</b></p>	<p><i>Local Government Act</i></p> <p><i>Official Community Plans</i></p> <p><i>Area Plans, Zoning and Development approvals</i></p> <p><i>Park and Environmental Management Plans</i></p>

# Appendix C

## What's Changed: 1994 – 2003

In the eight years since the original Estuary Management Plan was approved there have been changes in the environment, in socio-economic conditions, governance and legislation.

### Environmental Trends

#### Move Towards Ecosystem-Based Management

Since the adoption of the 1994 Estuary Management Plan, governments have started to change the way they manage the environment. In particular, a move toward “adaptive management” techniques, sustainability and biodiversity has taken place. These new approaches involve regional initiatives affecting the Fraser River estuary such as biodiversity conservation strategies and ecosystem and watershed-based planning. The approach most recently adopted by FREMP to update the habitat inventory and classification systems is the “ecological features and functions approach” to achieve a ecosystem-based management framework for the estuary.

#### New Data and Findings

New scientific research is available on issues of importance in the estuary. Some of the new research initiatives presented at an April 2002 symposium on the state of the estuary<sup>8</sup> included:

- 1 The impact of river training structures and their role in the recent development of the Fraser River delta marshes;
- 2 New information about chemical substances that can potentially disrupt hormone regulatory systems in aquatic organisms;
- 3 New information about contaminants that enter the estuary through stormwater runoff from urbanized areas;
- 4 Resident fish populations as a new indicator of estuary health;
- 5 The implications of sea level rise at the Fraser delta front;
- 6 Confirming the importance of the Fraser River estuary for bird habitat;
- 7 Changes in the migratory behaviour of late-run Fraser River sockeye and a prolonged river residency time.

In many of these cases, research is ongoing and the subsequent findings will inform how we manage the Fraser River estuary.

#### Adaptive management

Adaptive Management or “learning by doing” sees natural resource management as an opportunity to test and improve knowledge about ecosystems as we make decisions about the estuary. It addresses the high level of uncertainty in our understanding of ecological systems by recognizing that we must be flexible and incorporate new information into our decision making.

#### Watershed-based planning

Integrated watershed-based planning is imperative in the estuary. Watershed-based planning involves using comprehensive strategies to establish broad water management goals and targets for an entire catchment or drainage basin. It documents and examines the physical, chemical and biological characteristics of the basin and uses this information to define existing and potential water uses. General goals, objectives, control methods and /or technologies are then evaluated and selected on a basin basis to protect or enhance the receiving waters.

In the case of the Fraser River estuary, watershed-based planning should be directly related to municipal stormwater management activities and to the regional and municipal land use planning process because the estuary is the receiving waters for a large portion of upland drainage in the region.

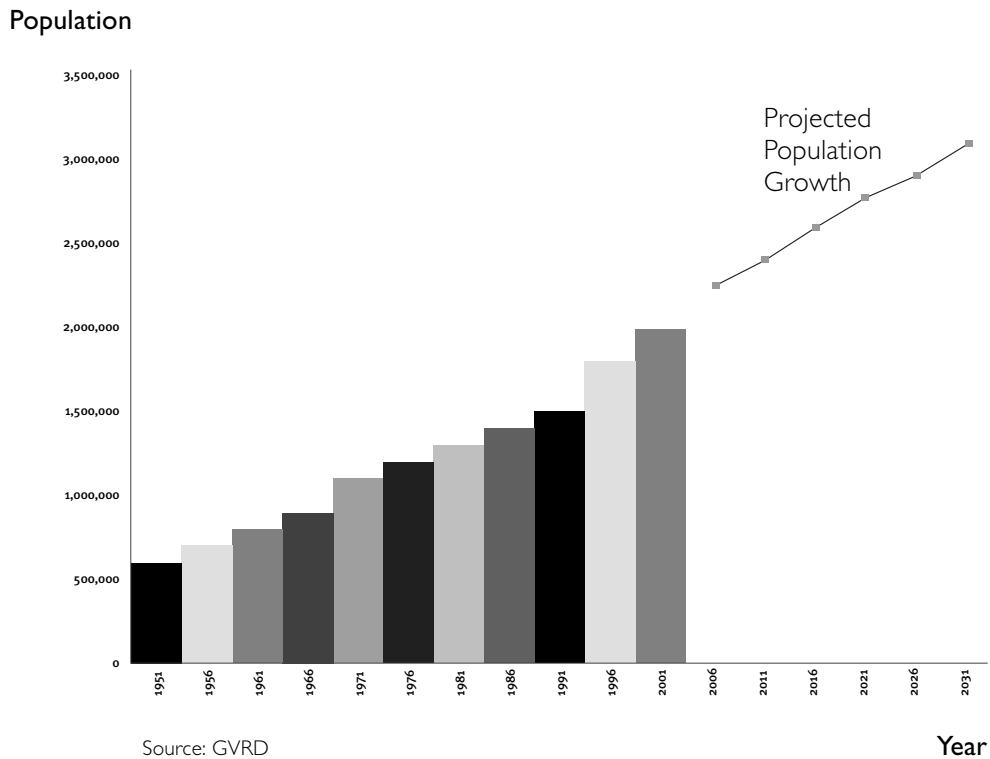
<sup>8</sup> For more information see Proceedings of the April 2002 Symposium “The Changing Face of the Fraser River Estuary”. Available from the Fraser Basin Council ([www.fraserbasin.bc.ca](http://www.fraserbasin.bc.ca)).

## Socio-Economic Conditions

### Increase in Regional Population

The population of the greater Vancouver region increased from about 1.7 million in 1994 to 2 million in 2001. This trend will continue as the regional population is expected to grow to almost three million in the next 20 years. In the past eight years we have witnessed a continued and increasing demand on the estuary for housing, commercial developments, port expansion, industrial development and recreation. Protecting environmental quality in the Fraser River estuary while sustaining a role for economic development and accommodating the population's social and recreational needs remains a big challenge.

**Figure 5: Regional Population Trends**



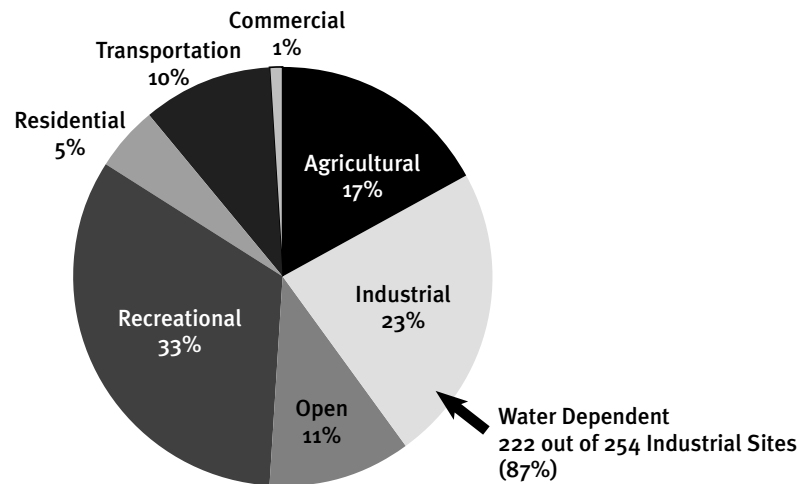
**Table 2: Shoreline Length (metres) Along Fraser River Estuary Foreshore, by Land Use Type**

<b>Metres of Foreshore</b>	<b>1979</b>	<b>1996</b>	<b>2001</b>	<b>Change 1979-2001</b>
Commercial	2,060	3,010	3,590	+1,530
Agricultural	67,230	53,300	53,300	-13,930
Industrial	71,430	74,420	73,015	+1,585
Open	93,320	44,030	34,590	-58,730
Recreational	43,110	95,110	99,800	+56,690
Residential	10,000	14,980	15,700	+5,700
Transportation	24,060	26,360	31,215	+7,155
<b>TOTAL</b>	<b>311,210</b>	<b>311,210</b>	<b>311,210</b>	

### Land Use Changes

Many national and international companies have been drawn to the Fraser River estuary because of the excellent port facilities, abundant hydroelectric power, efficient intermodal transportation and the large pool of skilled people in the surrounding communities.

Most of the river's shoreline is used for recreation, and land use trends along the river are characterized by increasing commercial, residential and recreational uses. In spite of the benefits to the regional economy and the environmental advantages of using water-based transportation and ensuring strategic access points along the river for industry, some industrial sites that were used previously for primary industry and manufacturing have been redeveloped wholly for other uses. Recent large development proposals surrounding the Marpole Basin have elicited community and environmental concerns. Managing all of the differing interests and demands for land is a challenge for all governing agencies. The Estuary Management Plan can help set some actions and guidelines for decreasing uncertainty and capitalizing on the highest and best use challenges inherent in the real estate marketplace.

**Figure 6: Fraser River Estuary Foreshore Land Use, by Type, 2001**

Source: FREMP Report: "An Economic Vision for the Fraser River Estuary", 2002.

## Governance and Decision-Making

### FREMP Partnerships

In April 1996, BIEAP (Burrard Inlet Environmental Action Program) and FREMP were placed under an arrangement for joint administration. Through Memoranda of Understanding, the partners resolved to implement a structure to coordinate both Programs.

The FREMP partnership has evolved with the establishment of new relationships. For example, to strengthen the linkage between the Estuary Management Plan and the GVRD's Livable Region Strategic Plan, in 1998 a Memorandum of Understanding was signed by FREMP and the GVRD. In 2000, a Memorandum of Understanding was signed with the Fraser Basin Council. FREMP has also forged partnerships with the Georgia Basin Ecosystem Initiative (GBEI), and with the Greater Vancouver Gateway Council and the Greater Vancouver Transportation Authority (Translink) through the FREMP Economic Development Task Group.

In 2002, the Programs undertook a fundamental evaluation of the nature and scope of the Program partnership to address the partner's fiscal constraints. This review meant that starting in April 2003, the FREMP program secretariat will provide a narrower focus of activities. Program partners will assume greater responsibility for coordinating specific projects to implement the Plan because of the reduced size and resources of the secretariat.

### **Treaty Negotiations and Aboriginal Rights**

Since 1994, treaty negotiations with BC First Nations have slowly moved forward. While at that time many First Nations were just preparing for active negotiations, substantive negotiations are now underway at a number of negotiation tables. The BC treaty process is a voluntary process of political negotiations among First Nations, Canada and BC, with the goal of providing certainty of jurisdiction over land and resources. Treaties may include government structures and financial arrangements, cash settlements, and jurisdiction and ownership of land, waters and resources. In urban areas where Crown land is limited, private property available from willing sellers will be important to achieving final treaties.

In the FREMP area, Katzie First Nation and Tsawwassen First Nation are in Stage 4 Agreement-in-Principle negotiations. The Tsawwassen treaty table is looking to achieve an Agreement-in-Principle sometime in 2003 that would form the basis of the final treaty. Musqueam Nation is in Stage 3, where the parties negotiate a Framework Agreement.

The treaty process and other mechanisms of recognizing and protecting aboriginal rights will lead to the development of new relationships with First Nations. Recent legal decisions have also reinforced the need to consult with and accommodate First Nations' interests in making decisions on lands and resources.

### New Planning Tools

Planning tools have evolved to better manage growth, achieve diverse municipal tax bases and protect the environment. In 1996, the GVRD completed the Livable Region Strategic Plan (LRSP) and Transport 2021. The LRSP is a long-range plan for the physical development of the region to the year 2021 and Transport 2021 is the complementing regional transportation plan. The LRSP was adopted by the GVRD Board in January 1996 and deemed a regional growth strategy by the Province in February 1996. The LRSP is implemented through mechanisms provided by the Local Government Act, which include regional context statements in Official Community Plans and implementation agreements.

In 2002, the GVRD commenced a review of the LRSP, the process which has been termed “The Sustainable Region Initiative” (SRI). The SRI is intended to provide a framework, vision and action plan for Greater Vancouver based on the concept of sustainability that embraces economic prosperity, community well-being and environmental integrity.

Many of the municipalities in the FREMP area adopted new Official Community Plans and local area plans affecting waterfront land use. Municipalities have also now been mandated to prepare Integrated Stormwater Management Plans or policy statements which relate to water quality management in the estuary. Finally, the two port authorities in the estuary adopted land use plans in 2000 which address land use and infrastructure issues on the Fraser River waterfront.

**Figure 7:  
Planning and  
Policy Linkages**

Planning Tool Applies to:	Water	Shoreline	Upland
FREMP Estuary Management Plan			
Port Authority Land Use Plans <sup>9</sup>			
Livable Region Strategic Plan (LRSP)			
Liquid Waste Management Plan (LWMP)			
Master Drainage Plans (municipal)			
Integrated Stormwater Management Plans			
Official Community Plans (OCPs)			
Zoning Bylaws			
Development Guidelines and Standards			
Best Management Practices (BMPs)			

Grey bars note where the planning tool is applied.

<sup>9</sup> Port Authority Land Use Plans apply to the upland where they own the property.

## **New Legislation**

### **The Canada Marine Act**

In 1999, under the *Canada Marine Act*, the former Fraser River and North Fraser Harbour Commissions, two founding members of the FREMP partnership, became Canadian Port Authorities. As a result, the Ports are now formally recognized as vital to the health of the Canadian economy and international and domestic trade.

The *Canada Marine Act* required both Ports to complete comprehensive Land Use Plans, which they did in 2000. At the same time, the Act paved the way for the Fraser River and North Fraser Port Authorities to become managers of the environmental review of projects and physical works occurring on Port lands. Under the *Canadian Port Authority Environmental Assessment Regulations*, which come under the *Canadian Environmental Assessment Act* (CEAA), the Ports were granted the ability to approve simple environmental reviews in-house. These and other changes culminated in the reform of the FREMP Coordinated Project Review process.

### **The Local Government Act**

In 1997, the provincial government embarked on a multi-year, phased approach to rewriting significant portions of the *Municipal Act*, affecting both regional districts and local municipalities. In 2000, the successive changes to the *Municipal Act* resulted in the renaming of the legislation to the *Local Government Act*. The current *Local Government Act* received royal assent on June 12, 2000, and is still undergoing amendment. As a next step in the legislative reform, the provincial government is drafting a Community Charter for Local Governments. It is expected that this Charter will give local governments further planning and revenue tools to provide services, while strengthening accountability to taxpayers.

### **The Canadian Environmental Assessment Act**

In 1992, the federal government began an extensive public process to update and reform the federal environmental assessment (EA) process. EA processes have been used in Canada since 1974 to provide a systematic approach to identifying environmental impacts of proposed projects.

Proclaimed in 1995, the *Canadian Environmental Assessment Act* (CEAA) sets out responsibilities and procedures for the environmental assessment of projects involving the federal government. It also establishes a clear process that brings a level of certainty to the EA process, and assists in harmonizing the federal and provincial EA systems.

A review of CEAA was launched in 1999, and amendments to the Act have recently been made.

### **The Canadian Environmental Protection Act**

In 1999, the federal *Canadian Environmental Protection Act* (CEPA) was revised and updated, with the goal of protecting human life and health and the environment from the risks associated with toxic substances and to contribute to sustainable development through pollution prevention. The new CEPA recognizes that the management and control of toxic substances and hazardous waste through pollution prevention is integral to reducing threats to ecosystems. The legislation also acknowledges “the need to virtually eliminate the most persistent toxic substances that remain in the environment for extended periods of time, as well as those bioaccumulative toxic substances that can accumulate in living organisms”.<sup>10</sup>

### **The Species at Risk Act**

The federal *Species at Risk Act* (SARA) aims to protect wildlife at risk from becoming extinct, with the ultimate objective of helping their numbers to recover. The Act, which received royal assent late in 2002, will be administered by the Canadian Wildlife Service of Environment Canada and covers all species and their critical habitat at risk in Canada. At present over 300 species in Canada are listed as “at risk”, which is defined as either endangered, threatened or of special concern. Within the Fraser River estuary, sturgeon, the pacific water shrew and the Oregon spotted frog are among the species listed at risk.

The Act builds on federal laws and agreements and covers aquatic and migratory habitats; it also builds on federal and provincial government work under the Accord for the Protection of Species at Risk. An overriding feature of SARA is the recognition of the need to promote collaborative stewardship efforts to protect biodiversity. Protecting species at risk will involve all land managers, partners and stakeholders, including Ports, municipalities and private citizens to identify and protect threatened and endangered species and their critical habitats.

### **The Fish Protection Act**

In addition to other legislation aimed at protecting fish and fish habitat, the Province introduced the *Fish Protection Act* in 1997. The Act has four basic objectives: ensuring sufficient water for fish; protecting and restoring fish habitat; improving riparian enhancement and protection; and granting local government stronger powers in environmental planning. Under the Act, no new dams are permitted on certain rivers.

The Province's Streamside Protection Regulations, which direct local governments to develop measures to protect productive riparian corridors along rivers and streams, were proclaimed in January 2001 but have not yet been enacted. The regulations are under review and may have implications for the management of the Fraser River as well as creeks and streams feeding into the river. The provincial Living Rivers Strategy currently being developed may address and incorporate some of these issues.

<sup>10</sup> For more information, visit the Environment Canada website: [www.ec.gc.ca](http://www.ec.gc.ca)

### **The GVRD Liquid Waste Management Plan**

In April 2002, the Greater Vancouver Regional District's Liquid Waste Management Plan (LWMP) was approved under the *BC Waste Management Act*. The key purpose of the Plan is to improve water quality by addressing the impacts of waste water discharges into the Lower Mainland's receiving waters. The Plan provides a comprehensive approach to the management of the region's water resources and employs environmental monitoring, risk assessment and demand side management techniques to improve the effectiveness of liquid waste management. To support this approach, the LWMP has established a long term research and analysis program to monitor ambient water quality in the Lower Mainland.

The Plan deals with the effects of point source pollution from sanitary, stormwater and combined sewer systems. It also uses pollution prevention techniques to combat pollution, such as source control and best management practices, and demand side management measures. At the same time, the GVRD assists senior agencies in three key areas of non-point source pollution: pleasure craft sewage; on-site disposal systems and agricultural runoff. Under the LWMP, the regional district is working with municipalities to develop integrated storm water management plans that take into account the natural watersheds or catchment areas.

# Appendix D

## Coordinated Project Review Process

### **Coordinated Project Review Process**

The coordinated project review process for the Fraser River estuary involves a three-phased, four-track process. This process includes a pre-review to determine the type of environmental review required, a project review and a post-review or follow-up, which can include a monitoring period. The four tracks are:

#### **Track 1**

Projects where operational guidelines and/or best management practices are already in place, adverse effects are unlikely, valuable habitat is not at risk and public interest is limited.

#### **Track 2**

Projects where operational guidelines and/or best management practices are not in place, some adverse effects are likely, valuable habitat may be at risk and some public interest is anticipated.

#### **Track 3**

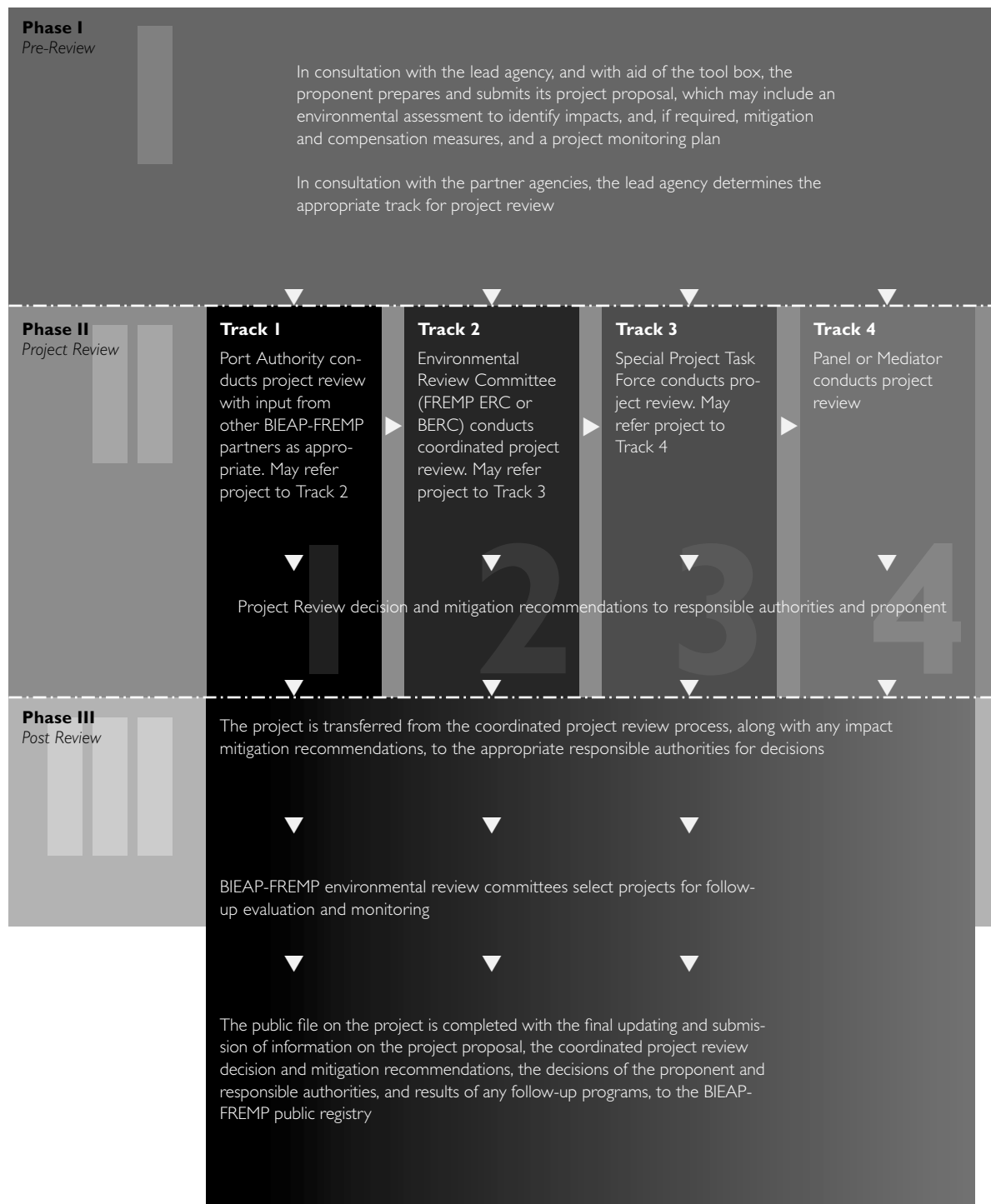
Projects where operational guidelines and best management practices are not in place, adverse effects are likely, valuable habitat is at risk and public concerns are evident.

#### **Track 4**

Projects where environmental, social, economic and/or public concerns are large enough to warrant a federal or provincial review process.

The majority of projects are Track 2 projects. Track 1 projects are reviewed through the applicable port authority. Track 3 and 4 projects are typically handled through the appropriate federal and/or provincial Environmental Assessment Process.

The figure below outlines the three-phase, four-track coordinated review process:



**Environmental Review Committee**

The FREMP Environmental Review Committee (ERC) is comprised of representatives from Environment Canada, Fisheries and Oceans Canada, the Ministry of Water, Land and Air Protection, the North Fraser Port Authority and the Fraser River Port Authority. The Canadian Coast Guard, under Fisheries & Oceans Canada, also participates on the Committee and comments on navigational issues. The Committee reviews the information submitted by a project proponent and makes recommendations regarding project mitigation, compensation and project monitoring if applicable.

**Public Input and Access to Project Records**

The Fraser River Estuary Management Program office maintains records of all projects and the recommendations, comments and decisions relating to them. The project referral log provides a quick reference to project applications and their status. The referral log is available to the public on the website at [www.bieapfremf.org](http://www.bieapfremf.org), or at the FREMP office. The FREMP website also includes an e-mail comment form and links to the Ports.

# Appendix E

## Proposed General Outline of a Reach Overview

### **What is a Reach Overview?**

As an important tool linking the water, upland and shorelines of the estuary, a reach overview is a summary of the ecological, economic, social and cultural attributes of a specific unit or reach of the estuary. For FREMP purposes, the Fraser River estuary has been divided into ten reaches. Industrial, commercial and/or residential development as well as important fish and wildlife habitat characterize most of the reaches. Many are located within more than one municipal jurisdiction. Each is unique and warrants comprehensive analysis and evaluation.

A reach overview documents all of the current plans (federal, provincial, regional, municipal and port), policies and regulations that apply to that specific reach. The process to prepare a reach overview will involve representatives of the FREMP partners and local governments, along with industry, stewardship and public groups as appropriate. The order and timing of the reach overviews will be determined by the Water and Land Use Committee and the Management Committee, and depend on a number of factors including staff resources, available data and ongoing planning processes.

A valuable outcome of the reach overviews will be the identification of issues and areas where consensus exists between the various plans and policies and where it does not. From this overview, we can identify strategies to address long-term planning, development and environmental initiatives for each reach of the estuary.

### Proposed Process to Prepare a Reach Overview

The following table outlines a possible process to prepare a reach overview. The process will be adapted or altered to suit the priorities of the participants and the nature of the reach under review.

	Action or Task	Description
1	Determine reach to be reviewed	Based on the information available and partner priorities, determine priority reaches to review
2	Prepare reach overview	<p>A reach overview could contain:</p> <ul style="list-style-type: none"> <li>■ Map and boundary description</li> <li>■ Current habitat inventory (map and database); Area Designations (if applicable); colour codings</li> <li>■ Predominant physical characteristics</li> <li>■ Biological characteristics (species, life cycle needs and functions)</li> <li>■ Economic, social, recreation and cultural uses of the reach</li> <li>■ Municipal plans, policies and regulations affecting the reach</li> <li>■ Port authorities plans, policies and regulations affecting the reach</li> <li>■ FREMP partner activities in the reach</li> </ul>
3	Consolidate common objectives, activities, policies	Document where commonalities exist in how the water, foreshore and uplands are managed by the respective jurisdictions; articulate as common objectives/policies/regulations
4	Conduct gap analysis, and document commonalities and differences	Identify and document where consensus exists among plans and activities and where it does not; identify where issues are not addressed by existing legislation or policy
5	Develop additional management strategies if required	Where participants deem necessary, examine options and set directions for addressing the gaps to achieve common objectives/goals for the estuary and the activities occurring within the reach

### **Proposed Content of a Reach Overview**

The following outlines the possible content of a reach overview. It is important to note that the process of preparing the reach overview is just as important as the final document. This is because all participants in the process gain knowledge and information on the various attributes of the reach, the activities going on in the reach and actors involved in managing the environment, land use and development.

A reach overview could consist of the following elements:

#### *Location and description of the reach*

- Map

#### *Ecological overview of the reach*

- Ecological characteristics (i.e., marine influences, predominant habitat and processes)
- Terrestrial and aquatic species
- Role of the reach in the region

#### *Historical information*

- First Nations traditional use
- Archeological sites
- Economic importance

#### *Current situation*

- Population, economic, commercial, recreational activities
- Dyking and shoreline development

#### *Local and regional planning*

- Official community plans, local area plans, zoning and development permit areas
- Port land use plans
- GVRD plans (greenways, green zone, regional transportation plans)
- First Nations development plans

#### *FREMP partner information*

- Habitat inventory and classification
- Area Designations (if applicable)

#### *Gap analysis*

- Common management activities and environmental objectives
- Identification of missing data and policy gaps

#### *Recommendations*

- Further management strategies
- Next steps
- Participant approval

# Appendix F

## FREMP Habitat Reclassification Policy

Shorelines that include intertidal and riparian areas within FREMP have been classified and colour-coded on the basis of the relative values of their habitat features. Examples of habitat features include mudflat, marsh, and bottomland forest.

The codes are intended to guide prospective developers in selecting appropriate sites and identifying suitable design concepts prior to making application for approval of their projects. Such approvals are obtained through application to the appropriate Lead Agency and subsequent review through the FREMP Coordinated Project Review Process (see Appendix D).

Estuarine shorelines are inherently dynamic areas and habitat features will change over time. The habitat classification system is based on a habitat inventory of the five main habitat types in the estuary: marshes, riparian grasses, riparian shrubs and trees, mudflats and sandflats. On a regular basis and as resources permit, FREMP updates this habitat inventory and as a result, periodic review and updating of colour coding is required. The habitat inventory was updated in 2003, and future reach updates will provide more detailed habitat information. Colour coding changes that arise from these inventory and reach updates will be reviewed and approved by FREMP. The Geographic Information System (GIS) which houses these codes at the FREMP office will be updated accordingly.

On occasion, proponents, agencies and others may wish to submit a request to FREMP to reclassify a segment of foreshore habitat. FREMP will consider and respond to habitat reclassification requests as they are submitted.

Requests will be reviewed by the Environmental Review Committee according to a number of habitat functional attributes. Following an initial review of these attributes, if the request is found to have merit, a site visit may be conducted by FREMP partner representatives. The visit would be coordinated by FREMP staff at the appropriate time of year. Based on the site visit, the representatives would recommend that the colour-coding change stay the same or change according to the request.

Any recommendation would go through the Water and Land Use Committee (WLUC) for consideration. Additional municipal input could be sought for reclassifications that are recommended, in recognition of the fact that it may have implications for municipal agreements and regulations.

WLUC would then forward the recommendation to Management Committee, and if appropriate, a supplementary report could be prepared to identify any municipal concerns. Management Committee would make the final decision on whether the request is approved or denied. FREMP staff would notify the proponent immediately.

More information on habitat reclassification can be obtained through the FREMP office.

