



Somass Estuary Management Plan

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EXECUTIVE SUMMARY

Context for a Plan



The Somass River Estuary, at the south end of the Alberni Valley, lies at the mouth of the Somass River, the second largest river on Vancouver Island. Subject to alteration from agricultural, industrial, water management and development pressures, only a small portion of the original estuary remains relatively undisturbed. This low-lying terrain includes mudflats, salt marshes, meadow-type vegetation, shrubs and a few small trees. The intertidal, marine and river portions of the estuary together are of major importance for fisheries, waterfowl and botanical values.

Attempts to preserve the Somass Estuary date back at least as far as the 1970's. After a number of unsuccessful attempts, the Pacific Estuary Conservation Program (coordinated by Ducks Unlimited) purchased a 100-hectare parcel in the Somass Estuary in 2001. Efforts are underway to transfer another 100 hectares of non-navigable water south of Johnstone Island from Transport Canada to Environment Canada.

Once Ducks Unlimited completed their purchase, it became evident that a management plan was required for the Somass Estuary, and that the planning process should involve partners from all levels of government, including First Nations, the community and industry. Discussions were therefore initiated with key government and non-government interest groups, and the Somass Estuary Management Plan Steering Committee (SC) was formed. A planning process initiated in February 2003 included numerous SC meetings and two public meetings.

The study area boundary includes all intertidal and marine lands, and associated land within the estuary that is in public ownership. Other privately-owned areas with resources that are important to the functioning of the estuary are termed the Key Adjacent Properties. The plan also recognizes and addresses activities throughout the watershed that have significant impacts on the estuary.

Vision



The vision is to maintain and enhance the productivity and diversity of the natural resources in the estuary with consideration for social and economic returns and benefits to the community as a whole. The plan will provide a balanced approach to the future management and use of the Somass River estuary, recognizing that it is one of the greatest natural assets in the region.

Objectives

The following are the primary objectives of the SEMP:

1. Reduce and eventually stop the degradation of existing habitats, and in particular stop the loss and degradation of the high value habitat types.
2. Maintain and improve where possible the existing habitat base in the estuary to support viable and productive populations of fish, wildlife and plants, including invertebrates.
3. Maintain a diversity of productive habitats within the Somass River Estuary in order to sustain and improve the estuarine ecosystem.
4. Work cooperatively to expand the size of the area subject to management in order to protect the ecological integrity of the estuary, through land acquisitions, conservation covenants, stewardship agreements or management agreements on adjacent lands where possible.
5. Respect and promote awareness of the cultural and heritage values of the plan area.
6. Ensure that the water quantity from the Somass River and other watercourses can support and enhance fish and wildlife populations and habitat.
7. Work with others on management of all discharges in order to continue to improve the water quality in the estuary.
8. Work with other agencies to ensure that new development respects and protects the ecological integrity of the estuary in addition to supporting appropriate economic objectives.
9. Provide educational, recreational and interpretive opportunities for the public, including wildlife viewing, provided that the use is compatible with protection of the environmental values.
10. Provide opportunities for scientific inventory and research to establish baselines and to further our understanding of this ecological system.
11. Work with other agencies to support water-dependent industrial use while addressing the other objectives of this plan.
12. Promote monitoring of the health of the estuary over time to ensure that management strategies are having the desired beneficial effects.



Natural Resources and Human Activities



The plan provides an overview of the vegetation, birds, fish and wildlife in the estuary. Habitat types and features are mapped, described, and evaluated. The issues with respect to natural resources are identified, along with possible opportunities for addressing the issues.

The human activities portion of the plan provides an overview of First Nations and post contact history. Existing land and water uses and human impacts are described. The issues with respect to human activities are identified, along with possible opportunities for addressing these issues.

Management Strategies

The management strategies of the SEMP are provided under three separate headings:

- the designation plan, which identifies where certain uses should occur, with accompanying objectives and guidelines,
- management strategies related to specific topics, and
- management strategies related to specific locations.

The designation plan identifies proposed designation categories (see section 4.1 and Map 7) that include various levels and forms of conservation, agriculture, commercial, marine, industry, recreation and environmental restoration.

The following table provides a summary of the management strategies by topic and location, along with:

- their relative priority (high, moderate or low),
- proposed timing (short term = within 2 years, medium term = 2 to 5 years, long term = > 5 to 10 years), and
- lead agency proposed, subject to change by the SEMC. The lead agency will be responsible for coordinating and managing the activity. Where more than one agency is indicated, they could cooperate together to lead the project or select one agency as the lead. Lead agencies are expected to consult with other members of the SEMC as appropriate. The lead agency will not necessarily be responsible for funding.



Management Strategies by Topic

Key to Priority Abbreviations	
H	High
M	Moderate
L	Low
Key to Timing Abbreviations	
S	Short Term (< 2 years)
M	Medium Term (2 – 5 yrs)
L	Long Term (>5 – 10 yrs)

Key to Lead Agency Abbreviations	
ACRD	Alberni-Clayoquot Regional District
ASA	Alberni Sportsman's Association
AVEA	Alberni Valley Enhancement Association
AVN	Alberni Valley Naturalists
DU	Ducks Unlimited Canada
CWS	Canadian Wildlife Service
City	City of Port Alberni
DFO	Department of Fisheries and Oceans
HFN	Hupacasath First Nation
MWLAP	Ministry of Water, Land and Air Protection
Norske	NorskeCanada
PAPA	Port Alberni Port Authority
TFN	Tseshah First Nation
Weyer	Weyerhaeuser

Recommendation		Priority	Timing	Lead Agency
<i>Fish and Wildlife</i>				
F1.	Develop a detailed habitat restoration and enhancement plan focused on fish and wildlife habitats, and including potential projects and their priority and phasing based on environmental benefits, and costs of planning and construction (see section 4.2).	H	L	DU, DFO, AVEA
F2.	Support initiatives to study, protect and enhance fisheries resources, particularly sturgeon use and chum spawning.	M	S	DFO, AVEA
F3.	Initiate surveys on small mammal and butterfly use of the estuary to establish a baseline for future monitoring.	M	S	MWLAP, AVN
<i>Vegetation</i>				
V1.	Prepare an invasive plant species management plan, including potential projects and their priority and phasing based on environmental benefits, and costs of planning and construction (see section 4.2).	H	S	DU, AVN, AVEA
V2.	Protect Oregon Ash.	H	M	City, RD
V3.	Initiate surveys of blue- and red-listed plant species occurrence and distribution.	L	M	MWLAP, AVN
V4.	If tidal marsh habitat is extended per F2, monitor and enhance vegetation.	L	L	DU
<i>Culture and Heritage</i>				
C1.	Support archaeological assessments as required.	H	M	HFN, TFN
C2.	Determine what measures are required to protect archaeological sites.	H	M	HFN, TFN
C3.	Identify and assist in supporting First Nations' needs related to estuary management.	M	S	HFN, TFN
C4.	Support cultural and heritage tourism opportunities in the estuary that are in harmony with the conservation values	H	S	City, HFN
<i>Industry</i>				
I1.	Remove log debris in environmentally sensitive areas if environmentally valuable and feasible, with testing first.	L	M	PAPA, DU

Key to Priority Abbreviations

H High
M Moderate
L Low

Key to Timing Abbreviations

S Short Term (< 2 years)
M Medium Term (2 – 5 yrs)
L Long Term (>5 – 10 yrs)

Recommendation		Priority	Timing	Lead Agency
I2.	Adopt best management practices for log handling, storage and salvage.	H	S	PAPA, Norske, Weyer
I3.	Continue to monitor the health of the harbour bottom, and mitigate the effects of the historical deposits (fibre mat) if necessary.	L	L	Norske
I4.	Review environmental protection measures on upland commercial and industrial property and manage to prevent impacts.	H	S	RD
I5.	Assume management and operation of the dam and weir.	L	M	DFO
I6.	Work with the responsible agencies to investigate and mitigate the impacts of leachates from the landfill on fish and plants.	L	M	DFO, City, RD
Other Land Uses				
L1.	Halt the reduction of riparian habitat and restore if possible. Explore Development Permit as a tool.	H	S	City
L2.	Develop education programs for the public regarding impacts on riparian habitat.	H	S	City
L3.	Implement best management practices for stormwater management.	M	S	City
L4.	Develop infrastructure maintenance practices with ecological benefits.	M	S	City, RD
Recreation and Access				
R1.	Designate environmentally sensitive areas where public recreation is not encouraged.	H	S	DU
R2.	Develop a public recreational system with support facilities and amenities.	H	S	RD, City
R3.	Publicize hunting regulations at key access points, and identify City boundaries.	H	S	MWLAP, RD, City
R4.	Enforce hunting regulations, potentially through a Compliance/Enforcement agreement among key agencies.	H	S	MWLAP, RCMP, City, CWS
R5.	Identify and publicize a new official name for lands to be managed within this plan.	M	S	RD, City
R6.	Develop, publicize and enforce a dog management plan.	H	S	RD, City
R7.	Work to obtain off-road pedestrian links to	M	M	City

Key to Priority Abbreviations

H High
M Moderate
L Low

Key to Timing Abbreviations

S Short Term (< 2 years)
M Medium Term (2 – 5 yrs)
L Long Term (>5 – 10 yrs)

Recommendation	Priority	Timing	Lead Agency
connect Clutesi Haven Marina and adjacent park, Harbour Quay, and Maritime Museum.			
R8. Develop an interpretive and education plan for the estuary.	M	S	RD, City
R9. Consider an additional trail in the future east along the Somass River from the proposed boat haulout to a viewing tower.	L	L	DU
R10. In consultation with the landowner, consider an additional trail in the future along the north edge of the wooded bluff.	L	L	Weyer

Management Strategies by Location

Recommendation	Priority	Timing	Lead Agency
Somass River			
Minimize dredging, and sedimentation associated with dredging.	H	S	PAPA
Review the timing windows for dredging to minimize impacts on fish.	H	S	DFO
If Clutesi Marina were ever decommissioned, explore other options for reestablishment of the marina in order to restore habitat.	L	L	City
Ducks Unlimited Lands			
Create additional side channels for juvenile fish rearing. Plant riparian shrub vegetation.	M	M	DFO
Remove large log accumulations if environmentally feasible and valuable, with testing first.	M	M	DU, PAPA
Plant and support the establishment of a group of Douglas-fir trees near the existing tree.	M	S	DU, AVN
Manage the upland field to maintain some old field/upland meadow habitat. Provide interpretive signage on the role of agriculture in wildlife management. Clearly delineate the haying area in the field.	H	S	DU
Effluent Lagoons			
Ensure the reeds around the lagoons are not disturbed during bird breeding season (mid March to mid August).	H	S	Norske, City

Key to Priority Abbreviations	
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M	Moderate
L	Low
Key to Timing Abbreviations	
S	Short Term (< 2 years)
M	Medium Term (2 – 5 yrs)
L	Long Term (>5 – 10 yrs)

Recommendation	Priority	Timing	Lead Agency
If the effluent lagoons were ever decommissioned in the future, explore other options for reestablishment of effluent and sewage treatment.	L	L	City
Explore opportunities for improving habitat around the existing lagoons.	M	M	City
Take measures to remove the plastic from the sewage lagoon.	H	M	City
Develop management strategies that negate the need for increasing the extent of the lagoons in the future.	L	L	City
Mudflats, Intertidal and Near Tidal Area			
Restore vegetation on degraded mudflat areas in phases per recommendation F3, with monitoring to evaluate the success of each restoration effort.	M	L	DFO
Marine Area			
Review all regulatory guidelines to determine if adequate considerations are being given to the environmental conservation and protection.	M	M	DFO
Continue the Port Alberni Paper Mill Environmental Effects Monitoring program.	H	S	Norske
Riparian Area			
Work with agencies to protect the riparian vegetation.	H	S	City
Develop public education information regarding the sensitivity of the resources in these areas and the importance of staying on trails.	M	S	City
Poplar Plantation (Key Adjacent Properties)			
Work with the existing owner of the poplar plantation in the Key Adjacent Properties and secure or manage the land to restore the area to an improved ecological condition after poplar harvest.	H	M	DU Norske
If the above is accomplished, implement the relevant management strategies (by topic) in this area.	M	L	DU
Forested Patches (Key Adjacent Properties)			
Work with the existing owner of the upland and riparian forested areas in the Key Adjacent Properties and secure or manage the land to protect its existing fish, wildlife and vegetation values.	H	M	DU Weyer
If the above is accomplished, implement the relevant management strategies (by topic) in this area.	M	L	DU

Monitoring Plan



The monitoring plan provides a framework and guidelines for a comprehensive and integrated biophysical monitoring program. The overall goal of the monitoring program is to assess the long-term health and integrity of the Somass Estuary, and the success of habitat restoration and enhancement initiatives. The program will collect and build upon monitoring efforts that are ongoing.

Goals, actions and potential partnerships are provided to guide monitoring of river flow, water quality, vegetation, fish, wildlife, recreation use, and impacts from industrial use.

Implementation Plan

The SEMP will be implemented by the same agencies and interest groups involved in the preparation of the plan; they will form the Somass Estuary Management Committee (SEMC). Implementation of the SEMP will not require any new jurisdictions or bylaws. To ensure that the plan is implemented, the SEMC members will endorse the plan and work cooperatively together to implement the provisions of the plan in accordance with each member's existing jurisdiction.

The SEMP is “without prejudice” to the rights of First Nations.

The role of the SEMC will include the following responsibilities:

- Forge partnerships and develop Memoranda of Understanding,
- Agree to promote and abide by consensus-based decision-making,
- Oversee the monitoring component of the SEMP,
- Share information about proposed projects within the plan area,
- Seek out and secure funding for capital projects and operations, and establish budgets,
- Commit to cooperative management of funding for SEMP implementation,
- Evaluate and update the plan on an ongoing basis, and
- Ensure that the plans and policies within their jurisdiction remain consistent with the SEMP, e.g. OCPs, Port Authority's Port Master Plan.

1 . 0 T H E P A S T , P R E S E N T A N D F U T U R E

1.1 Context for a Plan

Overview of the Estuary



The Somass River Estuary lies at the south end of the Alberni Valley, almost mid-way between the east and west coasts of Vancouver Island (see Figure 1). The Somass River is the second largest on Vancouver Island with a watershed of approximately 1,280 square kilometres. It encompasses the Ash, Stamp and Sproat River systems, includes Great Central and Sproat Lakes, and drains the western side of the Beaufort Range. The Somass Estuary lies at the north end of the Alberni Inlet, which extends inland approximately 40 kilometres from Barkley Sound.

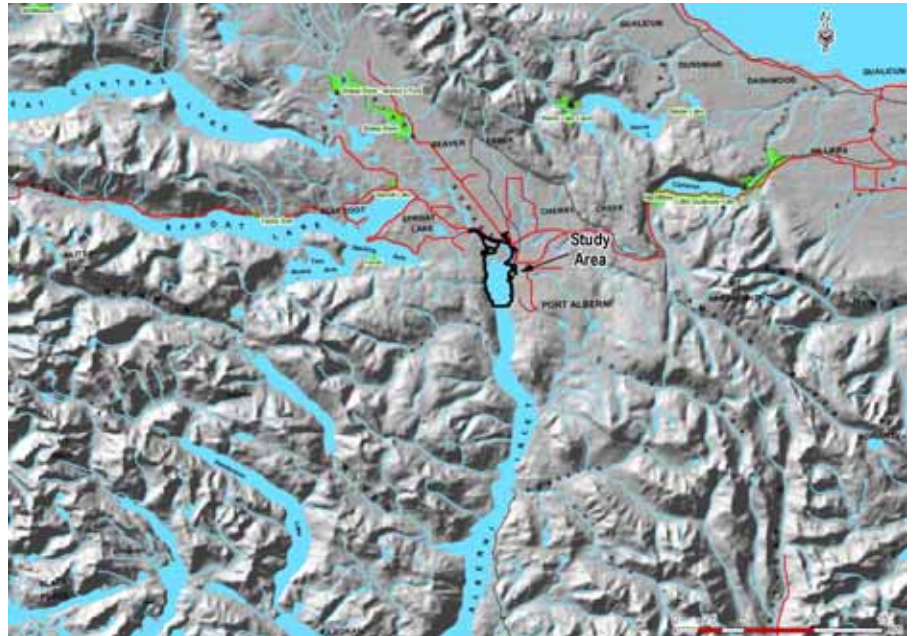


Figure 3: Location Map

Since the start of European settlement in the late nineteenth century, the estuary has been subject to alteration from agricultural, industrial and development pressures and to man-made efforts to manage the river system for the benefit of both fisheries and industry. The largest impacts have resulted from industrial development along the City's waterfront, from dyking, and from the location of sewage and effluent lagoons on the tidal flats.

Today, only a small portion of the original delta, including Johnstone Island and parts of Shoemaker Bay, remains relatively undisturbed. This area is low-lying terrain subject to tidal inundation. It includes mudflats, salt marshes, meadow-type vegetation, shrubs and a small stand of

trees. The intertidal, marine and river portions of the estuary together are of major importance for fisheries, waterfowl and botanical values.

History of Conservation Attempts



Somass River 1970's

Attempts to preserve the Somass Estuary date back at least as far as the 1970's. MacMillan Bloedel, the landowner at the time, recognized the estuary's importance for wintering waterfowl, particularly the Trumpeter Swan. The company gave Johnstone Island and the surrounding tidal flats the unofficial designation of "The J.V. Clyne Bird Sanctuary". During the 1970's, work was done by the Canadian Wildlife Service to refine the boundaries of a sanctuary for migratory birds. This culminated in a 1980 report recommending that the area be turned over to the Canadian Wildlife Service and managed as a National Wildlife Area. This did not come about.

In 1981-82, Bill Van Dieren, a local amateur botanist, carried out extensive botanical research in the estuary. His study, "The Somass River Estuary, A Study of the Flora and Vegetation" demonstrated the Somass to be unique among coastal estuaries on Vancouver Island. An application was submitted by the Provincial Museum in 1983 to have the estuary designated as an ecological reserve based on its botanical and ornithological values. The application was not successful.

In 1990, MacMillan Bloedel applied for rezoning to expand the effluent lagoon for the paper mill on the tidal flats. Mr. Van Dieren made a comprehensive presentation to the public hearing, bringing the value of the estuary to the attention of civic leaders. MacMillan Bloedel subsequently withdrew their application and the Regional District of Alberni-Clayoquot reiterated the request to the Province to have the estuary designated an ecological reserve. Again, this was unsuccessful.

In 1994, the Vancouver Island Land Use Plan identified the Somass Estuary as one of two Goal 2 protected areas to be acquired in the Alberni Valley. As these were private lands, the proposed designation was subject to negotiation for purchase.

In the mid 1990's, Ducks Unlimited and the Alberni Valley Enhancement Association initiated discussions with MacMillan Bloedel. After lengthy and complex negotiations, the Pacific Estuary Conservation Program purchased a 100-hectare parcel in the Somass Estuary in 2001. The purchase area includes Johnstone Island, the majority of the outer marshes of the estuary and one adjacent parcel of farmland containing tidal channels. Ducks Unlimited, Canadian Wildlife Service, Transport Canada and the Port Alberni Port Authority are also currently working towards the transfer of approximately 100 hectares of non-navigable water south of Johnstone Island from Transport Canada to Environment Canada.

Need for a Plan



In order to manage the estuary effectively, it became evident that a management plan was required for the Somass Estuary, and that the planning process should involve partners from all levels of government, including First Nations, the community and industry. Estuary planning and management processes have been undertaken in a number of key estuaries in British Columbia within the past two decades. The successful ones have brought all of the interests together, and produced comprehensive plans that guide future development and management activities.

Prior to the development of this Somass Estuary Management Plan (SEMP), various studies had been undertaken within the Somass estuary, but no integrated process to consider all resources and involve all interests had occurred. Discussions were therefore initiated with key government and non-government interest groups, and the Somass Estuary Management Plan Steering Committee was formed. The Steering Committee developed Terms of Reference for the Somass Estuary Management Plan in late 2002, and companies were invited to submit competitive proposals.

Study Area Boundary

One of the first tasks of the Steering Committee was to establish the study area boundary. The objective was to incorporate as much as possible of the land and water directly interrelating with the ecology of the estuary, with recognition for the constraints of private ownership and developed land.

The study area boundary was therefore defined by the following (see Map 1 at back of report):

- The extent of tidal influence and the high water mark along the Somass River,
- Forested and riparian park land along Kitsuksis Creek,
- The upland properties purchased by Ducks Unlimited (Johnstone Island and the meadow/farmland on the north side of the pipeline),
- The high water mark around the remainder of the estuary,
- Riparian areas in public ownership along Roger's and Dry Creeks,
- The boundary between federal and provincial jurisdictions on the bed of the harbour in the south, which also coincides with the City boundary.

There are several key areas with resources that are important to the functioning of the estuary. These have not been included in the primary study area since they are in private ownership. However the owners of these properties participated on the Steering Committee and are open to

cooperative management of these properties. They are termed Key Adjacent Properties (see Map 1).

Only the study area is covered by the SEMP area designation plan. Other location-specific recommendations are provided for the Key Adjacent Properties. Since the estuary is part of a much larger biophysical and socio-cultural system, the plan also recognizes that activities throughout the watershed (particularly those involving water quality and maintenance of stream flow) have significant impacts on the estuary and must be taken into account in the management plan. The analysis and recommendations in this plan therefore address that larger area of influence at a broader level, e.g. upstream water resources, adjacent riparian areas, surrounding land uses.

Jurisdiction



The east portion of the estuary is within the City of Port Alberni, and land use is governed by the City's Official Community Plan (1993) and zoning regulations (see Map 2). A portion of the north-west side, within the Alberni-Clayoquot Regional District, is subject to an Official Settlement Plan (1985) governing land use. Both the City and the Regional District are currently revising their plans, and these are expected to make reference to the environmental importance and sensitivity of the Somass River Estuary and to include respective objectives and policies.

The Port Alberni Port Authority (PAPA), previously the Port Alberni Harbour Commission, was established in 1947 by the federal government to oversee activity and shipping in the harbour. Its jurisdiction extends from the Somass Estuary down to Tzartus Island at the south end of the Alberni Inlet. From a federal perspective, PAPA's role is to ensure that the port remains competitive, efficient and commercially oriented. Locally, the activities of the port are varied and relate to shipping, navigation, transportation of passengers and goods, handling and storage of goods, management, leasing or licensing of federal property and various other operations as per the Port's letters patent. A Port Authority Master Plan was prepared by PAPA in 2000. The plan has specific goals and area designations related to environmental protection.

In 1991, the Port Alberni Shoreline Master Plan was prepared. A cooperative effort between the City and PAPA, it provides a vision and land use strategy for the waterfront from Clutesi Haven Marina to Harbour Quay Marina. The plan "encourages environmental protection of the Somass Estuary".

Numerous other federal and provincial agencies have jurisdiction over uses, activities and resources, in keeping with their respective

mandates. The primary agencies with jurisdiction are those on the project Steering Committee.

Ownership



The largest landowner within the upland portion of the study area is Ducks Unlimited, since they recently acquired land from Pacifica Poplars (see Map 2). The City of Port Alberni owns the sewage lagoon and some land around it. NorskeCanada owns their effluent lagoon, as well as their paper mill on the east shoreline of the estuary. The remainder of the harbour bed is federal Crown land administered by PAPA.

The Key Adjacent Properties consist of two primary areas. Pacifica Poplars, a subsidiary of NorskeCanada, owns the poplar plantation. Weyerhaeuser owns two forest patches immediately north of Shoemaker Bay, as well as the forestry shop complex. They also own the land along the western shoreline of the estuary. It is in the private land portion of TFL 44.

Immediately adjacent to the study area boundary, the City of Port Alberni owns some park land and the Clutesi Haven Marina land on the east shoreline of the river. Most of the remainder of the land on the east shoreline is in private ownership, including the large industrial sites to the south, several pockets of commercial land, and residential uses farther upstream.

There are two Indian Reserves near the estuary. The Tsahaheh Indian Reserve of the Tseshaht First Nation lies north of the poplar plantation, south of the Somass River. The Ahahswinis Indian Reserve of the Hupacasath First Nation is on the east (north) bank of the Somass River upstream of Clutesi Haven Marina.

1.2 Planning Process

The Somass Estuary Management Plan (SEMP) was conducted by an interdisciplinary team of consultants guided by a multi-interest Steering Committee (SC). The planning process began in February 2003, and involved the following key steps (see Figure 2):

- Review of existing information, environmental review of the estuary, preparation of habitat classification and values, and preparation of a vision, objectives, principles, issues and opportunities for the plan.
- Presentation of the above information at a public meeting on June 5, 2003, with a request for comments.

- Preparation of the SEMP in stages with significant input from the SC.
- Presentation of the above information at a public meeting on November 6, 2003, with a request for comments.
- Five meetings with the SC throughout the process at key stages.

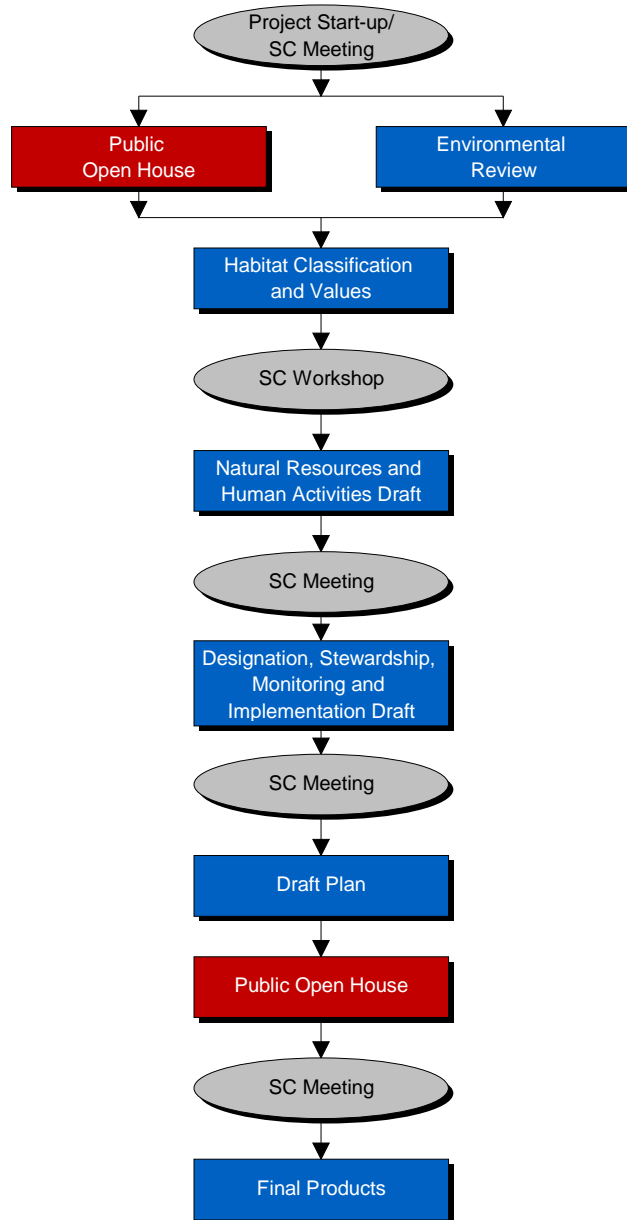


Figure 4- Planning Process

1.3 Visioning

The plan is based on a vision that was developed in collaboration with the SC, with input from the public. Elaborating upon the vision are plan objectives and principles

Vision



The vision is to maintain and enhance the productivity and diversity of the natural resources in the estuary with consideration for social and economic returns and benefits to the community as a whole. The plan will provide a balanced approach to the future management and use of the Somass River estuary, recognizing that it is one of the greatest natural assets in the region.

Objectives

The following are the primary objectives of the SEMP:

1. Reduce and eventually stop the degradation of existing habitats, and in particular stop the loss and degradation of the high value habitat types.
2. Maintain and improve where possible the existing habitat base in the estuary to support viable and productive populations of fish, wildlife and plants, including invertebrates.
3. Maintain a diversity of productive habitats within the Somass River Estuary in order to sustain and improve the estuarine ecosystem.
4. Work cooperatively to expand the size of the area subject to management in order to protect the ecological integrity of the estuary, through land acquisitions, conservation covenants, stewardship agreements or management agreements on adjacent lands where possible.
5. Respect and promote awareness of the cultural and heritage values of the plan area.
6. Ensure that the water quantity from the Somass River and other watercourses can support and enhance fish and wildlife populations and habitat.
7. Work with others on management of all discharges in order to continue to improve the water quality in the estuary.

8. Work with other agencies to ensure that new development respects and protects the ecological integrity of the estuary in addition to supporting appropriate economic objectives.
9. Provide educational, recreational and interpretive opportunities for the public, including wildlife viewing, provided that the use is compatible with protection of the environmental values.
10. Provide opportunities for scientific inventory and research to establish baselines and to further our understanding of this ecological system.
11. Work with other agencies to support water-dependent industrial use while addressing the other objectives of this plan.
12. Promote monitoring of the health of the estuary over time to ensure that management strategies are having the desired beneficial effects.

Principles



The following principles guided the development of the SEMP:

1. Recognize current and historical biophysical characteristics of the estuary.
2. Recognize the short and long-term socio-economic needs of the community as they relate to land and water use decisions.
3. Promote long-term benefits to the natural ecological systems and components over potential short-term gains by any party.
4. Recognize that the estuary is a dynamic system and that conditions will never remain static.
5. Undertake planning and management through an open process involving the public and all stakeholders in the estuary management plan area.
6. Continue to foster cooperative management of the area, involving multiple agencies, First Nations, industry, community groups, and the public.

2.0 NATURAL RESOURCES

Estuaries provide essential habitat for many fish and wildlife species. The habitat is composed of all of the physical (e.g. substrate, soil, and water) and biological (e.g. flora, fauna) characteristics that make up the environment. These conditions together support a variety of mammal, bird, fish, reptile, amphibian and invertebrate populations. Because of the importance of the natural resources in the Key Adjacent Properties, they are included in the descriptions and maps in this section.

2.1 Overview

Vegetation



By virtue of its location, the Somass River watershed represents a transition ecosystem between the east and west coasts of Vancouver Island. This is in part the reason for the diversity of flora found throughout the valley and in the Somass Estuary in particular.

A study carried out by two fish and wildlife assistants from the Province in 1974 (Kennedy and Waters) provides a snapshot of the vegetation and habitats within the estuary at that time.

Extensive research carried out by Bill Van Dieren in 1981-82 on and around Johnstone Island, under the supervision of the Botany Department of the Provincial Museum, has demonstrated the Somass River Estuary to be botanically unique on Vancouver Island. The following are some key findings:

- 204* plant species were documented on Johnstone Island (twice the number typically found on other Vancouver Island estuaries);
- 20* plant species are of special significance because of their rarity, their occurrence at their range limits or because of their type locality on the Somass;
- Nine plant communities were identified, five of which are not known to be protected elsewhere in British Columbia. (Coastal estuaries typically support four to six plant communities.)

[* Subsequent fieldwork has led to the documentation of another species of significance; Oregon Ash.]



Birds

The Somass Estuary is also one of the most important sites on Vancouver Island for wintering and migratory waterfowl. Studies of the estuary were first conducted by the Canadian Wildlife Service in the 1970's. These have been considerably augmented by surveys conducted by local birders throughout the 1990's, the most recent of which is a review of the "Breeding Status of Birds at Somass Estuary" (McRuer, 2003). The following are some key findings:

- Figures from Christmas bird counts* over the last decade have documented an average of 4,778 birds, representing a total of 119 species. [* The area covered includes the estuary proper, Kitsuksis dyke area, Naesgaards' fields, Falls Road and the Somass River as far north as Papermill Dam Park.]
- A report completed for the Canadian Wildlife Service in 1992 cites more than 100 species of birds using the area regularly for wintering, staging or resting/feeding. It also indicates in excess of 10,000 individuals passing through the area annually.
- Over 150 species have been recorded at the estuary.
- Waterbird survey figures from Bird Studies Canada indicate between 863 and 5,609 waterbirds (including ducks, geese, grebes, sandpipers, hawks and king fishers) around the estuary between September and April in a given year. The average is around 2,300. The trend is to find more birds in the winter than in early fall or spring.
- A summary by local naturalists (McRuer) included observations of 79 species of birds. Of these, 52 were identified as breeding within the estuary, with a further 8 possibly breeding there.

The estuary represents important habitat for several red- and blue-listed species, which are particularly vulnerable. These include the blue-listed Trumpeter Swan and blue-listed Great Blue Heron.

Fish

The Somass River system supports one of the most productive fisheries on Vancouver Island. There are five species of Pacific salmon – Chinook (see Appendix A for scientific names), Sockeye, Coho, Chum and Pink - as well as summer and winter steelhead runs. Pink and Chum escapement is typically low for the system with Pink Salmon ranging between 4 and 3500 fish and Chum Salmon ranging between 25 and 7500 fish (average of approximately 1500 fish). Coho Salmon range between 35,000 and 130,000 fish with a historic low occurring in 1994 (977 fish). Chinook returns ranged between 7500 and 15,000 fish prior to 1985. After that date, the Robertson Creek Hatchery increased chinook returns to between 13,000 and 130,000 fish. Sockeye Salmon are abundant in the system with historic ranges between 3500 and

648,000 fish (average escapement about 350,000). Great Central Lake is fertilized to increase productivity, mainly for Sockeye. Dolly Varden and Cutthroat Trout also occur in the watershed.



The Somass River system is of major economic importance to the commercial and recreational fishing industries as well as to the First Nations salmon fishery. It is estimated to account for close to 90% of the total escapement for Barkley Sound

The Stamp River is one of the most heavily fished Steelhead streams in the province and has the largest run of summer Steelhead on Vancouver Island. Summer Steelhead are rare on the island; there are only thirty-six existing populations.

The Somass Estuary is an important staging area for juvenile salmonids as they adapt from fresh to salt water. It is estimated that as many as 25 to 35 million smolt pass through the estuary each spring. Preservation of the intertidal zones and numerous tidal sloughs and channels is therefore of critical importance to maintenance of the fishery. Likewise the control of water quality and temperature is of importance for returning adult salmonids on their upstream migration.

Other non-salmonid marine species which have been documented in the estuary include Three-spine Stickleback, Staghorn Sculpins, Shiner Perch, shrimp, herring, flounder, perch, Walleye Pollock, Pacific Hake and Pipefish.

Terrestrial Mammals

No formal mammal surveys have been conducted to date, however the following species have been observed in the Somass Estuary: Columbian Black-tailed Deer, Black Bear, Beaver, Mink, Red Squirrel, Raccoon, Vagrant Shrew, Townsend's Vole, Deer Mouse, Muskrat, River Otter and possibly bat species. This is one area where there is a significant deficiency in field data.

Herpetiles

A number of amphibian species are expected to occur in the estuary, including species such as Rough-skinned Newt, Long-toed Salamander, Northwestern Salamander, Pacific Tree Frog, and the blue-listed (Species of "Special Concern" under SARA) Red-legged Frog. The interspersed of forested and wetland habitats is particularly important for these species.

In addition, the estuary provides habitat for all three garter species: Western Terrestrial, Northwestern and Common garter snakes.

Butterflies

The area at the base of the bluff along the sewage lagoon access road is an important sunning area for spring butterflies. At least six species have been identified in this area from casual observation, including a subspecies of the Common Woodnymph, which is a "Species of Special Concern" in British Columbia. Scientific data is lacking, however, and there is a need for a comprehensive butterfly survey throughout the estuary during spring, summer and fall months.

Tsunami Hazard



Although the risk of tsunami affects all of Vancouver Island, it is particularly critical for the City of Port Alberni and the Somass Estuary because of their location at the head of Alberni Inlet. Because the inlet is 40 kilometres long and relatively narrow, a funnelling effect is created, which exacerbates tsunami impacts.

The most recent tsunami occurred in 1964, following an earthquake in Alaska. The first wave reached the head of the inlet four and a half hours after the earthquake and only ten minutes after passing Bamfield. It reached a height of 2.4 metres above normal high tide. The second wave was 3 metres above normal and the third 1.5 metres above. Fortunately, there was no loss of life, but there was extensive damage to property, primarily along River Road. On the estuary, the water pipeline to the papermill was ruptured and logs were dumped to a depth of three or four metres in places. Sediments on the seafloor near the head of the inlet were eroded and redeposited in deeper water to the south.

There is also evidence of much larger tsunamis in pre-contact and pre-historic times. Possibly the best documented one occurred in 1700, following an earthquake in Japan. This is spoken of by First Nations here and in Japanese records of the time. It is also evidenced by sedimentary deposits in the estuary which indicate a much more powerful tsunami than that of 1964.

2.2 Habitat Types and Features

Various studies and the section above describe the flora, fauna and fisheries of the Somass Estuary separately. As a tool for summarizing natural resource information and enabling analysis and planning, habitat types in the Somass Estuary were classified based on biophysical characteristics as part of this project by a team of terrestrial and aquatic biologists, local naturalists, and the lead consultant. Map 3 illustrates the distribution of the habitat types, and this section provides a description of their multiple characteristics (in alphabetical order).

This map was derived from a combination of air photo analysis and field review. The scope of this project did not allow for detailed fieldwork to confirm the boundaries of each unit. The map should therefore be considered an approximation of the habitat distribution.

Figure 3 provides a summary of the area covered by each habitat type:

Code	Habitat Type	Area (ha)	%
DS	Deep Subtidal	84.4	9%
GB	Gravel Bar	0.3	0%
LF	Levee Forest	8.5	1%
M	Mudflat	101.5	11%
PT	Permanent Tidal Channels	22.2	2%
RC	River Channel	52.4	6%
RF	Riparian Forest	36.7	4%
RO	Rock Outcrop	41.4	5%
RS	Riparian Shrub	33.6	4%
SF	Sand/Gravel Flat	2.4	0%
SS	Shallow Subtidal	324.1	36%
TM	Tidal Marsh	90.7	10%
UFI	Upland Field	9.7	1%
UFO	Upland Forest	23.1	3%
UM	Upland Meadow	0.6	0%
US	Upland Shrub	61.1	7%
	Total	892.6	100%

Figure 3: Summary of Habitat Types and Extent

Gravel Bar

Description

Gravel bars are dynamic features associated with the active Somass River channel. They consist of unconsolidated gravel to cobble-sized materials that are moved and deposited during river freshet. Gravel bars are typically formed and shifted on an annual basis and only stabilize once vegetation such as willows begin to anchor the substrate. There are very few gravel bars in the study area.

Characteristic or Important Species

Commonly associated species include Spotted Sandpiper, and loafing waterfowl (e.g., Common Merganser) and gulls.

Levee Forest



Description

Levee forest is established along the southern and western banks of the Somass River. The forest is characterized by a high diversity of tree and shrub species. Common tree species include Western Redcedar, Sitka Spruce, and Red Alder, but the red-listed Oregon Ash is also present. Characteristic shrub species in the forest understory and in more open areas include Sweet Gale, Hardhack and Nootka Rose.

Characteristic or Important Species

The high plant species diversity and structural heterogeneity of the levee forests provides habitat for numerous bird species. Large trees along the banks of the Somass River are used as perching and nesting locations by Bald Eagle, Red-tailed Hawk and other raptor species. Common breeding species likely include Winter Wren, Spotted Towhee, Song Sparrow, Cedar Waxwing and Pacific-slope Flycatcher. During the migratory period, excellent foraging opportunities exist for neotropical bird species such as flycatchers, warblers and thrushes.

The combination of forest, shrub and wetland habitats is also of high value to a number of amphibian species (e.g., blue-listed Red-legged Frog). Black Bear also frequent the levee forest, and can often be seen along the shoreline of the Somass River in this area.

Levee forest habitat provides prey organisms as insect drop for juvenile fish rearing in the estuary. The levee forest also supports high quality off-channel habitat that provides important refuge and rearing areas for juvenile salmonids.

Mudflat



Description

Mudflats are an intertidal landform characterized by silt- and clay-sized sediments. The flats have very low gradients and retain high water content throughout the tidal cycle. They are not typically vegetated although diatom covers are common during the summer. Mudflats typically have high organic contents and anaerobic conditions just below the surface (Simenstad et al., 1991).

Characteristic or Important Species

The mudflats in the Somass Estuary contain few clams or worms. Some small clams (2 to 3 cm) are likely Soft shell Clam and Varnish Clam. Some larger Bentnose Clams also occur. The only seaweed observed was Entromorpha, characteristic of freshwater seepage. The mudflats are important foraging areas for numerous bird species, including waterfowl, shorebirds, gulls, and Northwestern Crow.

Permanent Tidal Channels



Description

Within estuaries, channels are defined as troughs within a tidal flat or marsh, which periodically or continuously contain moving water (Simenstad 1983, Dethier 1990). They vary in depth below the surrounding substrate, typically from several centimetres to around a metre. There is one large permanent tidal channel on the west side of the Somass Estuary, with tributaries in its upper reaches. This area is always wet, distinguishing it from the numerous small channels within the tidal marsh that are sometimes dry and subject to change over time.

Characteristic or Important Species

According to Van Dieren (1982), common plant species in the tidal channels are Ditch-Grass (or Widgeon-Grass), Siberian Water-Milfoil, Verticillate Water-Milfoil and Horned Pondweed. The blue-listed Three-flowered Waterwort and blue-listed Flowering Quillwort have also been found in tidal channel habitats.

Common fish species in the tidal channels include Three-spine Stickleback, particularly in the upper reaches and especially in the early summer, herring and pilchard. Numerous bird species, particularly American Widgeon, Greater Scaup, Bufflehead, Green-winged Teal, Mallard and the blue-listed Trumpeter Swan, winter on the tidal channel, and species such as Belted Kingfisher and the blue-listed Great Blue Heron hunt fish throughout the year.

River Channel

Description

For the purpose of this study, the main channel of the Somass River is defined as ending between the outfall from the effluent lagoon and Lupsi Cupsi Point. The river channel through the study area is almost completely urbanized on the east/north bank with riprap, dykes, and industrial pilings. The west/south bank is much less disturbed and has some patches of riparian vegetation, as noted within other habitat categories.



Characteristic or Important Species

The Somass River supports Chinook, Coho, Chum, Sockeye and Pink salmon, as well as summer and winter Steelhead and Prickly Sculpin. The red-listed White Sturgeon has been found on occasion in the river, and blue-listed fish species that are known to occur in the estuary include the Coastal Cutthroat Trout (ssp. *clarki*), and Dolly Varden Char. Fish are important prey for species such as River Otter, Mink, Great Blue Heron and Belted Kingfisher. A number of bird species such as Common Merganser and Trumpeter Swan winter on the Somass River.

Riparian Forest

Description

The riparian forest within the Somass Estuary occurs in several fragmented patches. The primary patch (i.e., Johnston Island) is located within the central portion of the estuary. Sitka Spruce is the most common tree species; Red Alder and Grand Fir are also present in the riparian areas. Understorey vegetation is well established and includes species such as Common Snowberry, Salmonberry, Swordfern, Cascara saplings, and various sedges.



Characteristic or Important Species

As with Levee Forest, Riparian Forest provides feeding and foraging opportunities for many bird species including Winter Wren, Townsend's Warbler, American Robin and Northwestern Crow. Riparian Forest, particularly on Johnston Island, is suitable as a nesting and roosting area for Great Blue Heron and raptors such as Red-tailed Hawk. Based on field observations, Johnston Island also appears to provide important security cover for species such as Black Bear and River Otter. Riparian forest north of the Somass Estuary appears to provide breeding habitat for Wood Duck. The riparian forest habitat also provides prey organisms as insect drop for juvenile fish rearing in the estuary.

Rock Outcrop

Description

Extensive rock outcrop habitat is present along the steep western shoreline of the estuary, all of which has been intersected by a road leading to a large log sort area. Two small islands (Hoik Island and Holm Island) are also rock outcrops. Vegetation in rock outcrop areas is unique, consisting of tree species such as Shore Pine, Arbutus and Douglas-fir.



Characteristic or Important Species

Rock outcrops with open exposed habitats provide niches for a unique and diverse assemblage of herbaceous species (e.g., Sea Pink and Common Camass). Although rare and endangered plant species have not been identified to date, rock outcrops have a high potential for these species. Rock outcrops are also used as feeding areas for butterflies, perching locations for raptors, and loafing areas for large mammalian species such as Cougar.

Riparian Shrub



Description

Riparian shrublands are well represented within the estuary, particularly along the edges of riparian and levee forests. Dominant shrub species include Nootka Rose, Salmonberry, Black Twinberry, Hooker's Willow, Pacific Crabapple, Bittercherry, and Sweet Gale. The red-listed Oregon Ash occurs along the upper edge of the riparian shrub zone.

Characteristic or Important Species

The Oregon Ash is the most important plant species. Riparian shrublands are important living areas for numerous species of birds, mammals and amphibians. Species such as Song Sparrow, Spotted Towhee, Red-winged Blackbird and Cedar Waxwing are common breeders.

Sand/Gravel Tidal Flat

Description

Sand and gravel flats are intertidal landforms composed predominantly of sand but including minor components of gravel (pebbles, cobbles and boulders). The gravel often supports a patchy distribution of attached algae. In the Somass Estuary, there is a small amount of sand/gravel flat, associated with the mouth of a creek and the edges of small shrub patches that stand above the level of the mudflats.



Characteristic or Important Species

The species of the sand/gravel tidal flats are similar to those in the mudflats, including Soft-shell Clam, Varnish Clam and Bentnose Clam. The sand and gravel flats are also important foraging areas for shorebirds and Great Blue Heron, and loafing areas for ducks and gulls.

Shallow Subtidal

Description

The subtidal littoral zone is the permanently submerged habitat of the estuary and inlet from lowest normal tide to approximately -20m depth. This subtidal zone supports most of the marine plant growth of seaweed and macroalgae.



Characteristic or Important Species

Because of their large biomass and high productive capacity, *Fucus* spp., and *Laminaria* spp. are important plant components of the littoral zone in brackish to saline areas of the estuary and inlet. Freshwater littoral areas of the estuary would have a much lower production of aquatic plants. Some important fish species that use the shallow subtidal area are Pile Perch, and Steelhead smolts in the spring.

Deep Subtidal



Description

The subtidal sublittoral area is found generally below the zone of aquatic plant growth. Therefore this zone would occur below approximately – 20m depth down to the bottom of the inlet.

Characteristic or Important Species

Most of the organisms in this zone would be open sea- or sea bed-dwelling species of adult fish and invertebrates. Some species that have been observed include prawns, Ratfish, Pacific Lamprey, and White Sturgeon. Plant life would consist of red algal species adapted to low light conditions and various types of sponges and coral.

Tidal Marsh

Description

Emergent marshes occur in the upper intertidal zone where erect, rooted, herbaceous vegetation that can tolerate submersion in seawater binds otherwise unconsolidated mud and sand with organic fibre. Perennial plant vegetation dominates during the growing season.



Marshes are sometimes divided into high and low marsh classes (Fry and Campbell 1988). The high marsh community is subject to flooding only during river freshet or high storm tides. The vegetation community is therefore comprised of species that are not as salt tolerant as low marsh species, and may include some tree and shrub species that can tolerate some degree of salinity. The low marsh community, which occurs lower within the intertidal zone, is flooded at least once each day by the tide. Because the high and low marsh areas in the Somass Estuary are intertwined and overlapping, and because they are comparable in terms of their environmental value and planning implications, they have been considered as one biophysical unit in this plan.

The high and low marsh areas are situated between upland and riparian habitats and the intertidal mud and sand flats.

Characteristic or Important Species

According to Van Dieren (1982), tidal flats contain some of the highest plant species diversity in the estuary. Common species are American Bulrush, Arctic Rush, Cattail, Creeping Spike-Rush, Hard-stemmed Bulrush, Lyngby's Sedge, Sea Milk-Wort, Pacific Silverweed, Tufted Hairgrass and Western Lilaopsis.

Several blue and red-listed plant species are also present within tidal marsh areas of the estuary: Beaked Spike-Rush (blue), Five-angled Dodder (blue), Henderson's Checker-Mallow (blue), Paintbrush Owl-

Clover (red), Pointed Rush (blue), Small Spike-Rush (blue), and Vancouver Island Beggarticks (blue).

Numerous wildlife species, including a wide variety of waterfowl and shorebird species, the blue-listed Great Blue Heron, blue-listed Trumpeter Swan, Northern Harrier, Marsh Wren, Virginia Rail and Red-winged Blackbird utilize tidal marsh areas. Other marsh birds, such as the blue-listed American Bittern and blue-listed Green Heron may occur occasionally.

Upland Field

Description

Extensive upland field habitat is located on the south bank of the Somass River just upstream of the major bend in the river. Between hay harvests, the grasses grow long and provide habitat areas for small mammals such as Townsend's Vole, which in turn support raptorial bird species. If this area was not hayed, it would likely have characteristics similar to the upland meadow.



Characteristic or Important Species

The upland field area is important to Townsend's Vole, which is an important prey species of Red-tailed Hawk, Northern Harrier, and the blue-listed Short-eared Owl. Other characteristic species are Canada Geese year-round and Trumpeter Swans in the winter.

Upland Forest

Description

Upland forest within the Somass Estuary is fragmented and located primarily at the west central end of the estuary in the Shoemaker Bay area. Characteristic tree species include Douglas-fir, Western Redcedar, Grand Fir, Western Hemlock and Red Alder. Understorey vegetation is diverse and includes species such as Red Huckleberry and Swordfern. Some upland forest is located on disturbed areas east of the sewage lagoons.



Characteristic or Important Species

Upland forest provides nesting, perching and roosting opportunities for many bird species including raptors and owls (e.g., Great Horned Owl). Breeding songbirds include Pacific-slope Flycatcher, Townsend's Warbler and Swainson's Thrush.

Upland Meadow



Description

A small patch of undisturbed upland meadow is located in the western part of Johnston Island.

Characteristic or Important Species

The red-listed Geyer's Onion occurs in this upland meadow. Upland meadows are important to Townsend's Vole, which is an important prey species of Red-tailed Hawk, Northern Harrier, and the blue-listed Short-eared Owl.

Upland Shrub



Description

The upland shrub habitat type has been used to classify the poplar plantation due to the relatively small size of the trees, and also includes shrub communities occurring in small patches on previously disturbed areas (e.g., fill) through the central portion of the estuary.

Characteristic or Important Species

Characteristic plant species include Scotch Broom, Himalayan Blackberry, young Red Alder, Hairy Cat's-Ear, Common Velvet-Grass, and Ribwort (or English Plantain). Few important plant or animal species utilize upland shrub areas, primarily due to the high incidence of invasive species.

Habitat Features

In addition to the habitat types, there are some specific habitat features in the estuary that have been identified by local naturalists¹. These are identified on Map 3 and described in more detail below:

1. A small sand pit near the beginning of the road into the estuary with reported nesting of Bank Swallows,
2. A series of vertical banks in glacial till that in recent years have been used by both Kingfishers and Bank Swallows for nesting,
3. Three or four large Oregon Ash,
4. Gravel beds that are used by Chum salmon for spawning,
5. An old Douglas-fir that is an important raptor perch,
6. An active eagle nest that can be viewed from Victoria Quay,
7. A number of smaller Oregon Ash, probably in excess of ten,
8. The only known site for *Cuscuta pentagona* (a Dodder).

¹ Rick Avis, Libby Avis, Sandy McRuer, Phil Edgell

9. The only known site for *Allium geyerii*.
10. A backwater that frequently has Wood Ducks present (unconfirmed if they nest there).
11. Two small streams flow in opposite directions. The more northerly one flows back towards the sewage lagoon; the more southerly one flows north to the Somass. The southerly stream and another to the south east of it appear to support considerably more salmon fry than other tidal channels or streams in the estuary. The spruce trees in the lower levee forest are also important perching areas for raptors.
12. Two butterflies that seem rare in the valley occur here; Sara Orange Tips and Margined Whites. The area along the road is also used by Mourning Cloaks and Angelwings in the spring but these butterflies are more ubiquitous in the valley.

2.3 Habitat Evaluation

Habitat Evaluation Method

There was an interest in rating the relative environmental values of the habitats to ensure that those with the highest value would be identified and given the highest levels of protection in the management plan, and to identify habitats that are candidates for restoration and enhancement. In order to determine the relative environmental value of the various habitat types, the following questions were posed for each habitat type. The questions were developed based on the criteria that were considered most relevant in the study area. The questions and the ratings were developed by a team of biologists and naturalists familiar with the Somass Estuary and the Alberni Valley.

Ecological Significance

To what degree does this type of unit play a significant role in maintaining or contributing to ecological processes or functions related to the foundation of the food chain in the estuary (detritivores and heterotrophs)?

Regional Representativeness

To what degree is this type of unit uncommon in the region (i.e., Alberni Valley)?

Rare or Uncommon Species

To what degree does this type of unit contain any plant or animal species which are red- or blue-listed by CDC or other uncommon species?

Fragility

To what degree is this type of unit particularly vulnerable to disturbance from human activities due to its biophysical composition or the species present?

Environmental Value

Figure 4 provides a rating of the habitat types in relation to the above criteria. The coding is as follows:

- H – High
- M_H – Moderate-High
- M_L – Moderate-Low
- Low

Code	Habitat Type	Ecological Significance	Regional Representativeness	Rare or Uncommon Species	Fragility	Environmental Value
DS	Deep Subtidal	M _L	L	L	L	L
GB	Gravel Bar	M _L	M _L	L	M _L	M
LF	Levee Forest	H	H	H	H	VH
M	Mudflat	H	H	M _H	M _H	H
PT	Permanent Tidal Channels	H	H	H	H	VH
RC	River Channel	H	H	H	M _H	H
RF	Riparian Forest	H	M _L	H	H	H
RO	Rock Outcrop	M _L	M _H	M _H	M _L	M
RS	Riparian Shrub	H	M _H	M _H	H	H
SF	Sand/Gravel Flat	M _H	H	L	M _L	M
SS	Shallow Subtidal	H	M _H	M _L	M _L	M
TM	Tidal Marsh	H	H	H	H	VH
UFi	Upland Field	H	H	M _H	M _H	H
UFo	Upland Forest	M _H	M _L	M _H	M _H	M
UM	Upland Meadow	H	H	H	H	VH
US	Upland Shrub	M _L	L	L	L	L

Figure 4: Habitat Evaluation

A four-level scale was used rather than a three-level (high medium low) scale, applied in many estuary studies, because a three-level scale is limited by the single medium category, which typically includes a wide range of values.

The final column, Environmental Value, was derived from an assessment of the other ratings. The rules applied to determine environmental value are as follows:

- Very High = all Highs
- High = 3 Highs, or 2 Highs and 2 Moderate-Highs
- Moderate = at least two Moderate-Low or greater
- Low = remainder

Habitat Ratings

Map 4 illustrates the ratings of environmental value. The following section provides the overall rationale for the ratings.

Gravel Bar - Moderate

The parts of the gravel bar above the water line are very unproductive because of the extremely dry and nutrient-poor conditions. However, parts of the gravel bar that remain submerged throughout most of the year support a diverse and productive community of benthic algae and invertebrates that are vital to the channel and stream ecosystem.

Levee Forest – Very High

Levee forest consists of some of the most biologically diverse terrestrial habitat within the Somass River estuary, yet represents only a small portion (8 %) of habitats within the estuary.

Mudflat - High

Mudflats not only provide exceptional foraging opportunities for many species of waterbirds utilizing the estuary, but are also a critical component of the life cycles for numerous aquatic organisms.

Permanent Tidal Channels – Very High

Tidal channels are critical interfaces within the estuary, linking riverine and marine habitats. Mainstream channels are important habitats for juvenile salmonids at low tide (Healey 1979, 1980). Channels are also used by shorebirds, waterfowl, Great Blue Herons, Raccoons, River Otters, Mink and other animals as forage areas.

River Channel - High

The Somass River is critically important to a variety of salmonids and supports large fish populations.

Riparian Forest - High

Since riparian forest within the Somass River estuary is surrounded by open habitats, it is of high value to birds for roosting, and many wildlife species (e.g., Black Bear) for security and thermal cover. Riparian forests also have high potential as future nesting locations for Great Blue Heron, particularly because of their proximity to important heron foraging areas.

Rock Outcrop - Moderate

Rock outcrops are characterized by unique plant and animal communities, and shallow soils that are vulnerable to disturbance.

Riparian Shrub - High

Extensive riparian shrublands are not well represented in the Alberni valley. They not only provide breeding opportunities for numerous bird species, but also important foraging areas for migrant songbirds, and

security habitat for mammalian species. The riparian shrub habitat provides prey organisms as insect drop for juvenile fish rearing in the estuary.

Sand/Gravel Tidal Flat - Moderate

Sand and gravel tidal flats are not well represented in the Alberni Valley. They provide important elements in the life cycles of many aquatic species.

Shallow Subtidal - Moderate

The productive littoral areas are especially important as nursery areas for juvenile fish because they offer good cover from predators and an abundance of food organisms. Moreover, because of the generally steep shoreline of the inlet, this type of habitat is regionally not very abundant.

Deep Subtidal - Low

Most of the inlet is comprised of subtidal sublittoral habitat, and the productive capacity of this zone is relatively low when compared to the other habitats in the estuary.

Tidal Marsh – Very High

Juvenile salmonids and other estuarine fish access the tidal marsh habitat at high tide via tidal channels and sloughs to feed on the rich abundance of invertebrates present there. Numerous bird species forage and nest in tidal marsh areas, including several blue-listed species. Plant species diversity is high, and a minimum of seven blue- and red-listed species are known to occur.

Upland Field - High

The upland field has an important role in providing habitat for voles and raptors.

Upland Forest - Moderate

Although upland forest is very common in the Alberni Valley, it is of particular importance in the Somass Estuary as a buffer between open, high value estuarine habitats and adjacent human activities, and as a corridor for wildlife. Upland forests also provide breeding and perching opportunities for raptors such as Bald Eagle that forage primarily in estuarine areas.

Upland Meadow – Very High

Upland meadows are regionally rare and provide habitat for a unique assemblage of plant and animal species, some of which are listed by the Conservation Data Centre (e.g., red-listed Geyer's Onion).

Upland Shrub - Low

Upland shrub communities have overall low ecological value within the Somass estuary.

2.4 Issues and Opportunities

The following is a summary of issues and opportunities related to the natural resources of the estuary. These are not presented in any order of priority. The opportunities lead to a set of management strategies presented in section 4 of this plan.

Fish and Wildlife



Issue	Possible Opportunities
<ul style="list-style-type: none"> Intertidal habitat, which is used as a staging area for migrating salmonids, has been significantly reduced and degraded. 	<ul style="list-style-type: none"> Expand tidal channels at upper ends to increase staging areas for migrating salmonids. Restore vegetation on degraded mudflat areas.
<ul style="list-style-type: none"> The high quality juvenile salmon habitat present in the existing levee forest north of the pipeline and elsewhere requires special protection because of its importance. 	<ul style="list-style-type: none"> Identify and develop special protection measures for the high quality juvenile salmon habitat in the estuary.
<ul style="list-style-type: none"> The old river dyke prevents flooding of an area that was previously important habitat for fish and wildlife. 	<ul style="list-style-type: none"> Work with the landowner or secure ownership to allow for introducing openings along the old river dyke to enhance storm and seasonal flooding of the previously wet meadows, after the poplars are harvested.
<ul style="list-style-type: none"> The upland meadow has the potential to provide more diverse and productive habitat than it does currently. 	<ul style="list-style-type: none"> Develop a management prescription to enhance small mammal habitat and create side channels for juvenile fish rearing in the upland meadow.
<ul style="list-style-type: none"> Dredging can have negative effects on fish, especially smolt migration. 	<ul style="list-style-type: none"> Review the timing windows for dredging to minimize impacts on fish.
<ul style="list-style-type: none"> The sedimentation rates of the Somass River and tributaries to the estuary are unknown, and sedimentation can have 	<ul style="list-style-type: none"> Conduct sampling to evaluate sedimentation rates.



Issue	Possible Opportunities
negative impacts on fish.	
<ul style="list-style-type: none"> Minimal information is available on small mammals and invertebrates (e.g., butterflies). 	<ul style="list-style-type: none"> Initiate surveys on small mammal and butterfly use of the estuary.
<ul style="list-style-type: none"> The number of breeding birds is not likely as high as it could be. 	<ul style="list-style-type: none"> Investigate opportunities for increasing the number of breeding birds using the estuary (e.g. Purple Martin nesting boxes)
<ul style="list-style-type: none"> The Somass estuary is an important wintering area for waterfowl and inappropriate land uses or activities could affect bird use. 	<ul style="list-style-type: none"> Ensure habitat is managed to encourage wintering waterfowl.
<ul style="list-style-type: none"> The Marsh Wren nests in the reeds around the lagoons, which are cut as part of the maintenance. 	<ul style="list-style-type: none"> Don't cut the reeds around the lagoons until mid August, after the nesting season has passed.
<ul style="list-style-type: none"> The Clutesi Marina requires dredging, and associated boat traffic, boat wash, and pollutants have negative impacts on fish and wildlife. 	<ul style="list-style-type: none"> Consider relocation of the Clutesi Marina if it were ever decommissioned.
<ul style="list-style-type: none"> There are some locations in the estuary that are particularly important for wildlife, e.g., the Spruce area on the bluff supports an eagle nest, perching for raptors, a sand bank for Kingfisher, Red-tailed Hawks, and nesting for Great Horned Owls. 	<ul style="list-style-type: none"> Protect the most important wildlife habitat areas to the degree possible.
<ul style="list-style-type: none"> The sewage and effluent lagoons occupy a large area that was once a rich estuarine environment. Plastic is found around the sewage lagoon and it has 	<ul style="list-style-type: none"> Restore habitat in the long-term if the lagoons are decommissioned in the future. Explore opportunities for improving habitat around the existing lagoons.

Issue	Possible Opportunities
impacts on wildlife.	<ul style="list-style-type: none"> • Install primary screening of the inflow to the sewage lagoons to prevent plastic migration to the surrounding area. • Develop management strategies that negate the need for increasing the extent of the lagoons in the future.

Vegetation



Issue	Possible Opportunities
<ul style="list-style-type: none"> • There are some areas of significant Scotch Broom infestation that limit biological diversity. 	<ul style="list-style-type: none"> • Remove Scotch Broom and replace with native species.
<ul style="list-style-type: none"> • There are several English Ivy plants on Johnstone Island which could be a major threat to native species if left unchecked. 	<ul style="list-style-type: none"> • Remove English Ivy plants on Johnstone Island.
<ul style="list-style-type: none"> • There are large log accumulations on the south and southwest side of Johnstone Island that may limit the productivity and potential distribution of rare and endangered plant species. 	<ul style="list-style-type: none"> • Investigate the trends and impacts associated with the log accumulations. If the impacts on vegetation are negative, explore the feasibility of removing the log accumulations on the south and southwest sides of Johnstone Island.
<ul style="list-style-type: none"> • Purple Loosestrife is infesting the tidal marsh and spreading through the study area. 	<ul style="list-style-type: none"> • Undertake Purple Loosestrife management and attempt to eliminate it.
<ul style="list-style-type: none"> • The poplar plantation is in a critical location, but its existing environmental values are considerably lower than if this area were in a more natural condition. 	<ul style="list-style-type: none"> • Work with the existing owner or consider securing this land in order to restore the poplar plantation to an improved ecological condition.
<ul style="list-style-type: none"> • The forested knoll north of Johnston Island is an 	<ul style="list-style-type: none"> • Work with existing owner or consider securing this land in



Issue	Possible Opportunities
important habitat linked with the estuary.	order to retain the ecological values of this area.
<ul style="list-style-type: none"> Some unique habitats (e.g. Oregon Ash) are not being managed to protect their values. 	<ul style="list-style-type: none"> Identify unique habitats and develop management prescriptions to protect their values.
<ul style="list-style-type: none"> The estuary contains numerous red- and blue-listed plant species, but little information is available on distribution and abundance outside of Johnstone Island. 	<ul style="list-style-type: none"> Initiate studies of red- and blue-listed species, including mapping their locations, so these species can be managed appropriately.
<ul style="list-style-type: none"> The lone Douglas-fir tree (that used to be in a group of 5 or 6) near the haying area provides excellent perching opportunities for raptors. 	<ul style="list-style-type: none"> Plant and support the establishment of a group of Douglas-fir trees in this area to reflect the past and to replace the existing tree at the end of its lifespan.
<ul style="list-style-type: none"> Some culverts have been opened, increasing estuarine circulation and fish passage; habitat could be increased by opening other culverts or breaching dykes. 	<ul style="list-style-type: none"> Explore opportunities for opening additional culverts or breaching dykes to increase tidal marsh habitat.

3.0 HUMAN ACTIVITIES

3.1 Historic Uses



First Nations²

The geological age of the Somass River Estuary is estimated to be at least 5,000 years and there is evidence of First Nation's occupation of the area dating back more than 4,000 years. An archaeological inventory survey was conducted in the north portion of the estuary in 2001 (Maxwell). This survey revisited four archaeological sites and found one new one. The sites are located on the north shore of Shoemaker Bay, and along the south bank of the Somass River. These sites have been protected by covenants.

A more recent traditional use study found around 20 archaeological sites in and around the estuary including middens, CMTs, canoe landing areas, and tools. Shoemaker Bay is particularly important as it contains medicinal plants (e.g., crabapple bark, wild onion), weaving grass (sedges), camas, clover, riceroor, silverweed, old weir sites, and a burial cave. Roger's Creek had fish weirs, bear traps, a bathing area (near the site of the present paper mill) to prepare for whale hunting, and important plants.

Grasses in the estuary were gathered for the weaving of clothing and basketry as recently as the 1950's and 60's. The gathering of medicines took place in all areas of the estuary in early spring when the herbs and roots were more potent. These medicines had great sacred value because of their ability to heal many illnesses. Many of the traditional medicines were lost or forgotten due to the degradation of the estuary by urbanization, dredging of the Somass River, and pollution. Bear, deer, ducks, salmon, berries and Cedar bark and boughs are staples of the First Nations that were and still are hunted, fished and collected in the estuary.

The Somass Estuary is within the asserted territories of two Nuu-chah-nulth speaking groups, the Hupacasath and the Tseshaht. The name "Nuu-chah-nulth" means "all along the mountains" and refers to the central Vancouver Island Mountains, which formed a background for west-coast villages.

² Information in this section was provided by the Tseshaht and Hupacasath First Nations.

The establishment of reserves in the early 1880's had a major impact on First Nations' lifestyles, impeding their seasonal movements and disrupting their traditional use of natural resources. The Hupacasath were given one reserve on the Sproat River, one on the Somass (both of which are occupied today) and two on the upper Alberni Inlet. The Tseshaht were assigned one reserve on the Somass River (their main settlement today), two on the inlet and several smaller reserves in Barkley Sound.

The Somass River estuary is still actively used for fishing, hunting, collecting, and beachcombing. First Nations have interests in retaining access to the resources that they have traditionally used.

Post Contact



European settlement of the Alberni Valley began in 1860 with the construction of the Anderson Sawmill at the foot of Argyle Street. Logging of areas readily accessible by water also began at this time, and the Somass Estuary was one of the first areas to be logged. The estuary was also the site of the first farm in the valley, established in 1861 by the Anderson Company to supply produce for the sawmill and proposed town site. Although the mill was abandoned in 1864, the farm remained. It was later known as the Somass Dairy Farm and it is still under cultivation today. The lower Somass River was the site of another short-lived project in the 1890's when a paper mill was established at what is now Papermill Dam Park.

Shoemaker Bay was named after one of the first settlers, a shoemaker named Richard Parkinson, who homesteaded on its shores in the late 1880's. He remained there until 1892 when he relocated to the east side of the inlet. Johnstone Island was also named after one of the first European settlers, Matthew Trotter Johnstone, an accountant with the Anderson Company.



Early settlement relied on transportation by sea, which made the waterfront and the estuary the main focus of development, even after construction of a rough wagon road to Somass in the early 1880's. The importance of its port facilities has remained a permanent and unchanging factor in the growth of Port Alberni. Major industrial development has almost always been centred on the Somass Estuary and the upper Alberni Inlet. The boom in the lumber industry in the 1930's and 40's saw construction of the Alberni Pacific Sawmill (1934), the Somass Mill (1935), Alberni Plywoods (1942) and the paper mill (first operational in 1947 with major expansions in the late 1950's and early 1960's). All were located along the waterfront.

Residential growth resulted in the construction of sewage lagoons in 1958 to provide primary sewage treatment. These are located on 4.6

hectares of tidal flats on the estuary proper. The sewage lagoons are accessed by pipeline beneath the river and discharge back into the river on their south side.



In 1970, following expansion of the paper mill, Macmillan Bloedel (MB) constructed another lagoon adjacent to the City's to treat mill effluent. It occupies an area of approximately 12 hectares. Treated effluent is pumped back to the mill and discharged into the inlet next to the mill. In 1992, MB constructed an expanded effluent treatment system at the mill site (east side of estuary). In 1993, the kraft pulpmill portion of the paper mill operation was shut down. These events significantly improved the quality of the mill effluent.



Log booming and sorting grounds have long been a fixture on the west side of the inlet. A logging railroad built in 1937 (later converted to a logging road) connected Sproat Lake to a dumpsite in the northwest corner of Shoemaker Bay. MacMillan Bloedel operated the log dump until the early 1970's when it was relocated further south. A dryland sort was constructed on the upland, well above the inlet, in the 1990's in part to address environmental concerns.

Other previous developments elsewhere in the watershed have had effects on the quantity and quality of water reaching the Somass Estuary:

- From the 1880's until the present, extensive logging has taken place throughout the Somass watershed.
- A dam was constructed at the outlet of Great Central Lake in 1925, and raised 2 feet in 1958 to ensure adequate flushing and dilution of pulpmill effluent. Although no longer required for this purpose, control of the dam has significant implications for fisheries management. A weir was also built at the outlet of Sproat Lake.
- In 1958, BC Hydro constructed a dam on Elsie Lake and began diversion of water into Great Central Lake.
- In 1972, the Robertson Creek Fish Hatchery was constructed by Fisheries and Oceans Canada to enhance Chinook and Coho stocks and to facilitate the introduction of Pink Salmon into the Somass River system.
- An upland commercial aquaculture facility was established in the early 1980's adjacent to Boot Lagoon at the east end of Great Central Lake. (In recent years, this facility has expanded to grow Atlantic salmon smolts.)
- In addition to BC Hydro and the Robertson Creek Fish Hatchery, up-stream water licences within the watershed are held by

Weyerhaeuser, NorskeCanada, the City of Port Alberni, Beaver Creek Improvement District, farmers and domestic users.

3.2 Existing Use

Land and Water Uses

The Somass Estuary is made up of three primary areas; the marine environment, the tidal flats, and the Somass River. Surrounding this are upland areas that have significant effects on the uses and resources of the estuary.

The marine environment is the permanently wetted area of the Port Alberni Harbour. The main permanent uses in this area are marinas and forestry-related industrial uses along the east side, and log storage and handling in the central area and west side (see Map 5). There are also diverse boat activities, ranging from commercial shipping to recreational boating.

The tidal flats east of Johnstone Island are dominated by the sewage lagoon for the City of Port Alberni and the effluent lagoons for the paper mill, both of which discharge into the Somass River within the study area. The lagoon discharges are permitted by MWLAP and are monitored on a regular basis.



An access road to the lagoons and a water pipeline from Sproat Lake to the paper mill cut through the estuary to the north and east of Johnstone Island. The pipeline is a dominant feature in the estuary, being 1.4 metres in diameter and constructed on a wooden trestle approximately 3 metres above ground level. A buried leachate line from the Alberni Valley sanitary landfill to the sewage lagoons parallels the access road.

North of the pipeline, on the west side of the Somass River, much of the land is under agricultural cultivation. This area includes poplar plantations and an area that is hayed.

The remainder of the tidal flats have no permanent land uses. Informal recreation does take place. The main activities are walking, dog walking, and nature viewing, with birds being of particular interest. Recreational users are typically local residents who are familiar with the estuary. There is very little information that would draw tourists into the estuary.

Recreational activities that are controversial within the community also take place. These include ATV riding and youth parties. The lack of monitoring or surveillance makes it difficult to regulate these activities. Since the site has been gated at various points over recent years, there have been fewer problems with parties.

Within the boundary of the City of Port Alberni, there is a bylaw disallowing the “discharge of firearms”. The remainder of the estuary is subject to a Provincial “no shooting” regulation. Despite these regulations, the illegal discharge of firearms is known to occur, primarily for waterfowl hunting. Within City limits, enforcement is conducted by the City Bylaw Officer through the RCMP. Outside of the City, Conservation Officers from the MWLAP and the RCMP are responsible for enforcement. These two organizations and CWS enforce the *Migratory Bird Convention Act*.

The Somass River portion of the estuary is dredged up to the Clutesi Haven Marina and adjacent boat launch, immediately north of the mouth of Kitsuksis Creek. There is an extensive dyking system along River Road and on lower Kitsuksis and Lugin Creeks; this was constructed after the 1964 tsunami.

Surrounding the south portion of the estuary is heavy industrial development along the east shoreline. This becomes commercial and then residential proceeding north along the Somass River.

There is also industrial development around Shoemaker Bay. Uses include Weyerhaeuser’s Sproat Lake Division shops and marshalling yard and Coulson’s works yard.

Human Impacts

The Somass Estuary is a highly disturbed and degraded environment. Air photos from 1930, 1931 and 1943 illustrate the previous extent of the natural tidal flats and the relatively rural community of Port Alberni.



1930



1931



1943

In order to better understand the extent of modification, old mapping of the tidal flats was used to delineate the original extent of the estuary by following the contour surrounding the low-lying land (see Map 6).

Excluding the river and the marine portion, an analysis was conducted of:

- Areas already developed, where restoration is highly unlikely, e.g. roads, other infrastructure and buildings exist,
- Areas that could be restored to a more natural condition, e.g., fill areas and other impacts from Map 5, and
- Areas that remain in a primarily natural condition, i.e., natural or naturalized vegetative cover over original surface.

Figure 5 provides a summary of the current extent of impact in relation to the estimated original estuary:

Classification	Area (ha)	Percent
Developed	323.0	45.5
Restorable	148.3	20.9
Natural	237.8	33.5
Total Area	471.3	100.0

Figure 5: Extent of Human Impacts (see Map 6)

Only a portion of the 33% of the area that is primarily natural is within the boundary of the SEMP. Many of the vegetated areas mapped as “natural” have been compromised by a variety of uses and impacts.



The following are some of the activities within the estuary and in the surrounding watershed that had major impacts on the estuary in the past:

- Logging of forested areas,
- Log dumps on the shoreline and booming grounds in the mudflats,
- Rerouting of streams,
- Urban development,
- Dyking for agriculture and for a railway across the estuary,
- Power line development,
- Reduction in tidal channels,
- Dredging and piling of dredgeate,
- Previous airport including hog fuel fill,
- Previous landfill near the effluent lagoons.

The main disturbances today include:

- The City’s sewage lagoon and Norske’s effluent lagoon,
- An east/north riverbank that is completely developed for industrial, residential and associated land uses,
- An industrial area immediately north of the estuary that includes log marshalling yards, equipment and material storage and related uses,
- An active log dump and log storage areas,

- Outfalls from the sewage and effluent lagoons that affect water quality and bottom sediments in the estuary and up the river on flood tides,³
- A pipeline and powerline that cross the estuary,
- A poplar plantation,
- Areas where Scotch Broom, English Ivy and Purple Loosestrife are dominant and increasing,
- A field area that is hayed,
- A gravel pit and small parking lot,
- Various deposits of log debris at the high tide level,
- Dredging of Clutesi Haven Marina, the public boat launch upstream of the marina, and the river channel downstream of Clutesi Haven Marina.

The recommendations from the 1974 study (Kennedy and Waters) and subsequent actions with respect to those recommendations provide interesting historical context (see Figure 6).

Recommendations from 1974 Somass River Estuary Study	Action
Separate sewage and storm water systems and expand sewage treatment to handle all domestic waste	Major progress, ongoing work
No dredging of estuary	Much more confined
No landfill of estuary	Yes
Convert to dry land log sorting and storing	Sorting converted, less storage
Log booms in subtidal water only	Yes
Prohibit discharge of firearms	No
Discourage urban development on the estuary	Yes
Find alternate location for airport	Yes

Figure 6: Recommendations from 1974 and Subsequent Actions

³ There are dissolved chemicals and suspended solids in Norske's effluent, but the levels are much lower than they were prior to 1993 when the effluent system was expanded. Current impacts are minimal, although there is still some historical sediment impact in the harbour from mill operation prior to effluent treatment.

3.3 Issues and Opportunities

The following is a summary of issues and opportunities related to human activities within the estuary. These are not presented in any order of priority. The opportunities lead to a set of management strategies presented in section 4 of this plan.

Culture and Heritage



Issue	Possible Opportunities
<ul style="list-style-type: none"> Archaeological sites require protection. 	<ul style="list-style-type: none"> Support archaeological assessments as required. Determine what measures are required to protect archaeological sites.
<ul style="list-style-type: none"> Opportunities for First Nations to conduct traditional practices in the estuary may be limited. 	<ul style="list-style-type: none"> Work with First Nations to determine if they have specific needs related to estuary management.
<ul style="list-style-type: none"> First Nations have recognized minimal benefits from the estuary with increasing urban development. 	<ul style="list-style-type: none"> Coordinate with and support First Nations in providing cultural and heritage tourism opportunities

Industry



Issue	Possible Opportunities
<ul style="list-style-type: none"> Log handling and storage activities have had impacts on environmental resources, including effects on intertidal areas and log debris at the high tide level. 	<ul style="list-style-type: none"> Work with PAPA and industry to periodically remove log debris in environmentally sensitive areas if it is possible to do so without environmental damage, e.g. Dry Creek mouth, log salvage. Adopt best management practices for log handling, storage and salvage.
<ul style="list-style-type: none"> The historical paper mill deposits (fibre mat) on the harbour bottom have been a contributor to poor water quality affecting upstream 	<ul style="list-style-type: none"> Continue to monitor the impact of the historical mill deposits (fibre mat) and the health of the harbour bottom. Work with industry to explore

Issue	Possible Opportunities
<p>migration of fish in the past. Natural remediation is believed to be reducing the impact over time.</p>	<p>opportunities for addressing any impacts if necessary.</p>
<ul style="list-style-type: none"> • Toxic materials are stored and used on land immediately adjacent to the estuary, e.g., Coulson's, Weyerhaeuser, Coop on Kitsuksis, marina, industrial and residential land on east side. 	<ul style="list-style-type: none"> • Work with upland property owners to review the adequacy of environmental protection measures to manage potential leaching or spills.
<ul style="list-style-type: none"> • Water management at the Great Central Lake dam and the Sproat River weir can potentially have significant effects on water flow and temperature, which in turn can affect fish and fish habitat. 	<ul style="list-style-type: none"> • Explore opportunities for a fisheries or water management agency to take over management and operation of the dams, with management that respects the needs to protect fish and fish habitat.

Other Land Uses



Issue	Possible Opportunities
<ul style="list-style-type: none"> • Increasing amounts of rip rap and other shoreline development on private land are reducing the riparian habitat on the east side of the river in the north portion of the study area. 	<ul style="list-style-type: none"> • Work with all levels of government and private landowners to halt this process and to restore riparian areas. • Develop education programs directed at limiting this type of activity in the future.
<ul style="list-style-type: none"> • Stormwater from developed areas is likely having negative effects on water quality. 	<ul style="list-style-type: none"> • Work with the City to develop and implement best management practices for stormwater management.
<ul style="list-style-type: none"> • Maintenance of infrastructure (e.g., pipeline, power line, leachate line, lagoons) could enhance or negatively impact natural resources. 	<ul style="list-style-type: none"> • Work with landowners, managers and government to develop maintenance practices that provide the highest ecological benefits possible.

<ul style="list-style-type: none"> • Agriculture activities, including haying and burning, poplar growing, and seed collection (<i>Scirpus</i>) can have negative effects on vegetation and wildlife. 	<ul style="list-style-type: none"> • Work with agriculture industry to minimize negative impacts and to support the health of vegetation and wildlife resources in the estuary.
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Recreation and Access



Issue	Possible Opportunities
<ul style="list-style-type: none"> • Some portions of the estuary are extremely sensitive and may be degraded by recreational use, e.g. Johnston Island. 	<ul style="list-style-type: none"> • Consider an area (Johnston Island) that is not available for recreation, dedicated to research and educational activities only.
<ul style="list-style-type: none"> • The demand for recreational use of the estuary will likely increase. 	<ul style="list-style-type: none"> • Develop a plan to manage anticipated levels of use, e.g. walking, dog walking, nature viewing, cycling, blackberry picking.
<ul style="list-style-type: none"> • Birdwatchers, naturalists and the general public are interested in retaining access to the estuary. 	<ul style="list-style-type: none"> • Develop an access management plan that will accommodate and potentially enhance appropriate uses, e.g., viewing blinds.
<ul style="list-style-type: none"> • Some recreational activities in the estuary have caused problems related to public nuisance or negative impacts on resources, e.g. ATVs, parties. 	<ul style="list-style-type: none"> • Develop an access management plan with appropriate parking, trails, and public information that discourages inappropriate uses.
<ul style="list-style-type: none"> • Hunting with firearms occurs in the estuary despite “no shooting” and “no discharge of firearms” regulations, causing safety concerns and impacts on wildlife and those interested in wildlife-viewing. 	<ul style="list-style-type: none"> • Publicize and seek enforcement of current hunting regulations.
<ul style="list-style-type: none"> • Some maps show the “JV Clyne Bird Sanctuary”, however such an entity does not technically exist. 	<ul style="list-style-type: none"> • Work to have “JV Clyne Bird Sanctuary” removed from maps. • Identify and publicize a new



Issue	Possible Opportunities
	official name for lands to be managed within this plan.
<ul style="list-style-type: none"> • Due to security and liability issues, NorskeCanada does not want the public walking along the pipeline. 	<ul style="list-style-type: none"> • Ensure that public access to the pipeline is not allowed.
<ul style="list-style-type: none"> • Due to security and liability issues, the City does not want the public in the vicinity of the sewage lagoon. 	<ul style="list-style-type: none"> • Ensure that public access to the City sewage lagoon is not allowed.
<ul style="list-style-type: none"> • People and dogs walking over the farmer's field are affecting the quality of the hay 	<ul style="list-style-type: none"> • Develop trails that respect and protect environmental and economic values. • Consider development of wildlife viewing areas and blinds.
<ul style="list-style-type: none"> • Dogs are often walked off-leash in the estuary, and this can cause disturbances to wildlife. 	<ul style="list-style-type: none"> • Develop, publicize and enforce a dog management plan for the estuary.
<ul style="list-style-type: none"> • The east side of the estuary has significant educational and recreation viewing opportunities, but the various public sites are not connected, e.g., Clutesi Haven Marina and adjacent park, Harbour Quay, Maritime Museum. 	<ul style="list-style-type: none"> • Obtain off-road pedestrian (and non-motorized multi-use) links where possible, installing sidewalks where no better option exists. • Develop an interpretive plan for the estuary with appropriate partners.

4 . 0 M A N A G E M E N T S R A T E G I E S

The management strategies of the SEMP are provided under three separate headings:

- the designation plan, which identifies where certain uses should occur, with accompanying objectives and guidelines,
- management strategies related to specific topics, e.g. fish and wildlife, and
- management strategies related to specific locations.

4.1 Designation Plan

The following are the primary management designation categories proposed, along with permissible uses and guidelines for each. Refer to Map 7 for the designation plan.

	Description	Permissible Uses	Objectives	Guidelines
C ₁	Conservation – highly sensitive	Research, Education, Environmental Management	Protect the integrity of the tidal flats and associated areas.	No access, except for research and education purposes.
C ₂	Conservation – moderately sensitive	Recreation (non-motorized boating), Research, Education, Environmental Management	Protect the environmental integrity of the mudflats and tidal channels.	Discourage access, except for research and education purposes. Disallow motorized boats.
C ₃	Conservation – sensitive riparian habitat in an urban area	Passive Recreation (e.g, wildlife viewing)	Protect the ecological integrity of the riparian areas. Recognize needs for flood protection.	Encourage users to stay on trails. Work with agencies to protect the riparian vegetation.
RC	River Conservation	Recreational Boating,	Protect the habitat values	Activities to respect

	Description	Permissible Uses	Objectives	Guidelines
	– important river channel	Marine Transportation	of the river channel.	existing habitat, fish and wildlife species.
Ag	Agriculture	Agriculture	Conduct agricultural activities with consideration for environmental values.	Follow detailed management guidelines in hay field. Explore opportunities to restore poplar area after harvest.
CM	Commercial Marine	Boating, Marine Transportation, Marine Fuelling	Support marina needs.	Activities to respect environmental values and opportunities.
M	Marine – harbour	Boating, Marine Transportation	Respect navigational needs.	Activities to respect environmental values and opportunities.
I	Industry – including log storage, loading and transportation related to mills and port	Industry, Infrastructure (e.g., lagoons), Utility Corridors, Recreational Boating	Support the needs of adjacent industry.	Activities to respect environmental values and opportunities.
R	Recreation – staging area, features and trails	Recreation, Research, Education, Environmental Management	Provide opportunities for wildlife viewing and associated low-impact recreational activities.	No discharge of firearms. Provide education and interpretive information. No motorized use beyond parking lot.
Env	Environmental Restoration Area – Env1 highest priority	Environmental Management	Conduct restoration to improve environmental values.	Activities to respect environmental values and opportunities.

Figure 7: Designation Plan Categories

4.2 Management Strategies by Topic

Management strategies related to specific topics apply to the resource wherever it occurs within the estuary.

Fish and Wildlife

- F1. Develop a detailed habitat restoration and enhancement plan focused on fish and wildlife habitats, and including potential projects and their priority and phasing based on environmental benefits, and costs of planning and construction. Figure 8 and Map 9 provide guidance regarding potential restoration and enhancement opportunities.

Opportunity	Description	Location(s)
Marsh Bench Creation	Marsh benches can be created along hard-surfaced steep banks. They require the creation of a trough that can support fine grained substrates. Elevation and drainage are critical. Transplant material can be obtained from donor sites.	MB on Map 9 - Adjacent to Clutesi Haven Marina - near mouth of Rogers Creek - Concrete mattresses near former plywood mill - Road corner near Coulson's yard - Along road on west side of estuary
Fill Removal	Some portions of the estuary have been subject to filling in the past. Removal of fill to elevations that would sustain wetland vegetation would benefit fish and wildlife.	FR on Map 9 - Fill area adjacent to Coulson's yard
Dyke Breaching	Flood protection dykes have historically isolated wetland, mudflat and riparian habitats. Breaching or excavating portions of these dykes can restore tidal inundation or seasonal flooding.	DB on Map 9 - Coulson's cattail pond - Natural breach along trail berm
Culvert Removal	Culverts may prevent fish passage, impede tidal flow or create bottlenecks for water movement. Culvert removal can alleviate some of these issues and improve habitat or access to habitat upstream of the culvert.	CR on Map 9 - Christi Creek near poplar plantation
Riparian Planting	Riparian transplants can create visual and physical buffers to sensitive habitats and restore riparian structure and function for	RP on Map 9 - Along proposed recreation trail on berm - Mouth of Roger's Creek

Opportunity	Description	Location(s)
	fish and wildlife	
Removal of wood debris	Woody debris and wood waste accumulations may alter fish and wildlife habitat and take many years to recover. Removal of wood debris can return intertidal habitats to their former productivity levels.	WD on Map 9 - Near log storage area on mudflats/subtidal area
Channel Building	Use of historical back and side channels to create new channels can enhance refuge and feeding habitat for juvenile salmonids. At the mouth of Kitsuksis Creek, channel improvements would allow better fish access to the marsh.	CB on Map 9 - Old side channel on poplar plantation - other previous channels on poplar plantation - Kitsuksis Creek mouth - Old side channel along Somass River near north of study area
Purple Martin Nesting Boxes	Purple Martin nesting boxes could attract this species to the estuary. Explore suitable nest box locations around the estuary. Review successful enhancement programs at Nanaimo and Ladysmith Harbours.	PM on Map 9 - Old pilings
Wintering Waterfowl Habitat	Winter cover crops on hayfields and other agricultural areas within and outside of the study area boundary can encourage wintering waterfowl. Limit human recreational use of high waterfowl use areas.	WW on Map 9 - DU Lands - Poplar Plantation if possible
Screen for Logs	Install a screen to prevent log intrusion into the tidal marsh north of the pipeline	SL on Map 9 - under pipeline

Figure 8: Fish and Wildlife Habitat Restoration and Enhancement Opportunities

- F2. Support initiatives to study, protect and enhance fisheries resources, particularly sturgeon use and chum spawning.
- F3. Initiate surveys on small mammal and butterfly use of the estuary to establish a baseline for future monitoring.

Vegetation

- V1. Prepare an invasive plant species management plan, including potential projects and their priority and phasing based on environmental benefits, and costs of planning and construction. Figure 9 and Map 9 provide guidance regarding potential invasive plant species management opportunities.

Opportunity	Description	Location(s)
Scotch Broom Removal	Remove Scotch Broom by pulling and cutting. Repeat annually until broom is eliminated. Plant native shrubs and trees in these locations.	SB on Map 9 - dyke east of the poplar plantation - area north of the poplar plantation - DU lands - south of effluent lagoons
Purple Loosestrife Removal	Purple Loosestrife is extremely difficult to control and it is spreading through the estuary. Consider the use of biological control with beetles if removal becomes too difficult or is unsuccessful.	PL on Map 9 - south of Johnstone Island - east end of pipeline - Kitsuksis Creek marsh
English Ivy Removal	Dig out English Ivy plants. Cut English Ivy at the base where it is climbing up trees. Return after it has died and pull from trees.	EI on Map 9 - Johnstone Island
Horhound (Lycopus)	Monitor Horhound. It is surrounding the mill effluent lagoon, especially on the south side, and appears to be spreading to Johnstone Island.	HH on Map 9 - south side of mill effluent lagoons

Figure 9: Invasive Plant Species Management Opportunities

- V2. Protect Oregon Ash by ensuring that recreational activity is not drawn to areas where it is established. Future development of trails and facilities should ensure that areas with significant specimens of this species are avoided. An inventory and mapping exercise to document distribution of Oregon Ash within the estuary would be beneficial prior to making future management decisions.
- V3. Initiate surveys of blue- and red-listed plant species occurrence and distribution to establish a baseline for future monitoring and management.

- V4. If tidal marsh habitat is extended into the poplar plantation, monitor vegetation in that area and enhance with intertidal species if appropriate.

Culture and Heritage

- C1. Support archaeological assessments as required with the involvement of First Nations.
- C2. Determine what measures are required to protect archaeological sites.
- C3. Work with First Nations to identify and assist in supporting their specific needs related to estuary management, e.g., access to the resources that they have traditionally used, involvement in stewardship, interpretive or other economic development opportunities.
- C4. Support cultural and heritage tourism opportunities in the estuary that are in harmony with the conservation values

Industry

- I1. Work with PAPA and industry to periodically remove log debris in environmentally sensitive areas if it is possible to do so without environmental damage, e.g. Dry Creek mouth, log salvage. This could be attempted first on a trial basis with monitoring of the costs, the impacts, and the results with regard to restoration.
- I2. Adopt best management practices for log handling, storage and salvage.
- I3. Continue to monitor the residual effects and gradual degradation of the historical paper mill deposits (fibre mat) on the harbour bottom, and work with industry to explore mitigation opportunities, as necessary. The current approach is natural recovery.
- I4. Work with upland commercial and industrial property owners where toxic materials are stored and used in the vicinity of the estuary to review the adequacy of environmental protection measures to manage potential leaching or spills.
- I5. Explore opportunities for a fisheries or water management agency to assume management and operation of the Great Central Lake dam and the Sproat Lake Weir, with management that respects the needs to protect fish and fish habitat.
- I6. Work with the responsible agencies to investigate and mitigate the impacts of leachates from the landfill on fish and plants, especially at Shoemaker Bay.

Other Land Uses

- L1. Work with all levels of government and private landowners to halt the reduction of riparian habitat and to restore riparian areas where possible. Explore the possibility of establishing a Development Permit area along the east shoreline of the Somass River to help in protecting the riparian resources in that location.
- L2. Develop education programs for the public directed at limiting actions that cause negative impacts on riparian habitat.
- L3. Work with the City to implement best management practices for stormwater management, e.g., encouraging more infiltration (and low-impact development) throughout the watershed.
- L4. Work with landowners, managers and government to develop infrastructure maintenance practices that provide the highest ecological benefits possible. Examples include guidelines for:
 - Removal of non-native invasive species,
 - Identification and protection of important species, e.g., Oregon Ash,
 - Maintaining power line markings for birds (hanging balls),
 - Timing of vegetation control in relation to bird nesting.

Recreation and Access

- R1. Designate environmentally sensitive areas where public recreation is not encouraged, with these areas dedicated to research and educational activities only (see Map 7).
- R2. Develop a public recreational system with appropriate parking, washrooms, trails, benches, viewing blinds, and public interpretive and instructional information (see Map 7). Condoned uses will include low-impact activities such as walking, dog walking (see below), nature viewing, and cycling. Public access will not be permitted on infrastructure where safety, security and liability are concerns, e.g. pipeline, sewage lagoons.
- R3. Publicize hunting regulations at key access points. Identify City boundaries where practical.
- R4. Enforce hunting regulations, potentially through a Compliance/Enforcement agreement among MWLAP Conservation Officer Service, RCMP, CWS, and City of Port Alberni.

- R5. Identify and publicize a new official name for lands to be managed within this plan. Work to have “JV Clyne Bird Sanctuary” removed from maps.
- R6. Develop, publicize and enforce a dog management plan for the estuary, particularly to protect birds during the nesting season.
- R7. Along the east side of the estuary, work to obtain off-road pedestrian (and non-motorized multi-use) links where possible to connect Clutesi Haven Marina and adjacent park, Harbour Quay, and Maritime Museum. Install sidewalks where no better option exists.
- R8. Develop an interpretive and education plan for the estuary with appropriate partners, including signage on the resources and their sensitivity at key locations, including marinas, public use areas and viewpoints; brochures, education programs for schools and other groups, etc. Include First Nations’ history in interpretive information and programs, to be developed with the involvement of First Nations. Work with local groups to establish volunteers willing to conduct estuary tours. Develop a package of information to support this activity.
- R9. Consider an additional trail in the future east along the Somass River from the proposed boat haulout to a viewing tower, in consultation with First Nations and if this can be achieved without undue environmental, social or cultural impacts.
- R10. In consultation with the landowner (currently Weyerhaeuser), consider an additional trail in the future along the north edge of the wooded bluff (an existing bear track) if this can be achieved without undue environmental, social or cultural impacts.

4.3 Management Strategies by Location

Management strategies in this section are related to specific locations within the estuary (see Map 8).

Somass River

- Minimize dredging, and sedimentation associated with dredging.
- Review the timing windows for dredging to minimize impacts on fish.
- If Clutesi Marina were ever decommissioned, e.g., due to tsunami, explore other options for reestablishment of the marina, taking into consideration the ecological importance and sensitivity of the Somass River. If the marina could be relocated, this would eliminate the need for dredging up so far in the river, provide an opportunity for riparian habitat restoration, and reduce motorized boat traffic and

the potential for toxic contamination in such an important fisheries river.

Ducks Unlimited Lands

- Enhance waterfowl, other bird and small mammal habitat and create additional side channels for juvenile fish rearing. Plant riparian shrub vegetation (e.g., willows, twinberry) along new and existing channels to provide habitat for wildlife and shading for fish.
- Explore the feasibility of removing large log accumulations on the south and southwest sides of Johnstone Island and in adjacent high marsh areas. This could be attempted first on a trial basis with monitoring of the costs, the environmental impacts and benefits, and the results with regard to restoration.
- Plant and support the establishment of a group of Douglas-fir trees near the existing tree to ensure long-term perching habitat in this location.
- Manage the upland field to maintain some old field/upland meadow habitat. This entails permitting build-up of a litter layer to provide a refugia for voles and other species, which in turn support predators such as Red-tailed hawk and Northern harrier. This approach is also important for herbaceous species, and can support greater diversity and rare plant species. Work with the farmer to modify the haying to accomplish these objectives, given other considerations. Options include: providing unhayed margins around the edges, around the Douglas-fir tree, and around ephemeral tributaries, or allowing certain portions of the area to lay fallow for a period of time. Provide interpretive signage on the role of agriculture in wildlife management. Clearly delineate the haying area in the field.

Effluent Lagoons

- Work with the City and NorskeCanada to ensure the reeds around the lagoons are not disturbed during bird breeding season (mid March to mid August).
- If the effluent lagoons were ever decommissioned, e.g., due to tsunami, explore other options for reestablishment of effluent and sewage treatment, taking into consideration the ecological importance and sensitivity of the estuary. If the effluent lagoons could be relocated, this would provide an opportunity for tidal marsh habitat restoration, and reduce the existing impacts.
- Explore opportunities for improving habitat around the existing lagoons.
- Take measures to remove the plastic from the sewage lagoon due to its impacts on wildlife in the surrounding area.

- Develop management strategies that negate the need for increasing the extent of the lagoons in the future.

Mudflats, Intertidal and Near Tidal Area

- Restore vegetation on degraded mudflat areas in phases, with monitoring to evaluate the success of each restoration effort.

Marine Area

- Review all regulatory guidelines controlling vessel traffic and fishing to determine if adequate considerations are being given to the environmental conservation and protection of the estuary (e.g., protection from oil spills, bilge and waste discharges; fishing that respects sensitive populations).
- Continue the Port Alberni Paper Mill Environmental Effects Monitoring program started in the early 1990s to determine the recovery of the marine environment due to mitigation measures and upgrades made to the Port Alberni mill.

Riparian Area

- Work with agencies to protect the riparian vegetation by establishing management practices that protect native species, include removal of invasive, non-native species, and minimize the impacts of maintenance measures while recognizing needs for flood protection.
- Develop public education information regarding the sensitivity of the resources in these areas and the importance of staying on trails.

Poplar Plantation (Key Adjacent Properties)

- Work with the existing owner of the poplar plantation and attempt to secure or manage the land to restore the area to an improved ecological condition after poplar harvest.
- If the above is accomplished, implement the relevant management strategies (by topic) in this area.

Forested Patches (Key Adjacent Properties)

- Work with the existing owner of the upland and riparian forested areas and attempt to secure or manage the land to protect its existing fish, wildlife and vegetation values.
- If the above is accomplished, implement the relevant management strategies (by topic) in this area.

5.0 MONITORING PLAN

5.1 Context for Monitoring

The Somass Estuary Management Plan has established a set of objectives and management strategies for measuring and assessing changes in the estuarine environment. This can be achieved by developing an environmental monitoring program.

Some detailed monitoring procedures already exist. Some examples are as follows:

- Until recently, the Water Survey of Canada maintained a gauging station monitoring river flow in the Somass River.
- NorskeCanada conducts an Environmental Effects Monitoring (EEM) program under the federal Pulp and Paper Effluent Regulations. The program was started in the 1990s to determine the impacts of the paper mill effluent and to study the recovery of the marine environment.
- Trumpeter swans are monitored every 3 years by CWS and DU, waterbirds are surveyed every winter, and the Christmas bird count covers the Somass Estuary.
- In July 2002, a data base of water quality monitoring projects in TFL 44 was compiled for Weyerhaeuser. That data base identifies 20 long-term monitoring efforts, and 23 short-term monitoring projects that have been completed. The primary monitoring organizations include DFO, MWLAP, power and hydro industry, drinking water authorities, and First Nations. The main purposes of monitoring include: drinking water, environmental indicator, and fisheries.

There is currently no single repository for the various monitoring efforts. There is likely more information available than any one organization expects. In addition, informal monitoring information is not documented. For example, informal observations could provide important information for the monitoring program if documented consistently.

A completely integrated monitoring program for the Somass Estuary will take some time to develop. There is limited funding available for new monitoring efforts. A comprehensive description of monitoring procedures is therefore beyond the scope of this report. This monitoring plan therefore provides a framework for development of a more detailed monitoring program as part of the implementation of the SEMP.

Purpose

The purpose of this section is to provide a framework and guidelines for a comprehensive and integrated biophysical monitoring program to complement the Somass Estuary Management Plan.

Monitoring Goal and Principles

The overall goal of the monitoring program is to assess the long-term health and integrity of the Somass Estuary, and the success of habitat restoration and enhancement initiatives.

The proposed monitoring program is based on the following principles:

- A central repository of existing monitoring information should be established and maintained.
- Monitoring objectives should be clearly stated.
- A thorough baseline of existing conditions is required.
- Where possible, monitoring should use performance indicators that are scientifically-based calculations and measurements including measurable indices against which to measure change.
- Key biophysical components and functions of the estuarine ecosystem should be represented in the monitoring plan.
- The plan should have a good spatial as well as temporal coverage of the estuarine habitats and the ecological processes.
- Partnerships should be developed with existing government, industry and non-government organizations that are involved in estuarine/marine monitoring efforts.
- Periodic workshops should be organized to help establish and strengthen coordinated estuarine monitoring partnerships that include the Somass Estuary.
- The estuarine performance indicators selected for the monitoring plan should have specific standards or criteria to which results can be compared.
- The monitoring program should include searching out the causes related to the monitoring results.
- The monitoring program should be linked to an adaptive management plan so that recommendations based on the results of the monitoring work can be acted upon.

- The results of monitoring should be made available to the public.

Estuarine Performance Indicators

As previously indicated, estuarine indicators must represent the key biophysical components and functions of the estuarine ecosystem. The indicators should therefore serve as sentinels of the health of the estuarine ecosystem. They should also be sensitive and responsive to the effects of human activities so that the monitoring program can serve as an early warning system for the ongoing estuary management and planning process. Finally, the estuarine indicators should be relatively easy and inexpensive to measure so that excessive costs don't become a deterrent to maintaining a continuous and comprehensive monitoring program.

Given the criteria and conditions described above, the monitoring plan provides goals, objectives and other criteria required for measurement of performance indicators related to resources and uses. In addition to biophysical indicators, it is important to monitor recreation and industrial use, so that relationships can be studied between these factors and biophysical conditions.

5.2 Monitoring Framework

River Flow Monitoring

Goals	<ul style="list-style-type: none"> • Maintain a flow regime that will sustain the estuarine biota and also provide an adequate year-round water supply for fish.
Action	<ul style="list-style-type: none"> • Work with partners to reestablish the water flow gauging station on the Somass River.
Partnerships	<ul style="list-style-type: none"> • Water Survey of Canada • NorskeCanada • DFO • Ministry of Water, Land and Air Protection

Water Quality Monitoring

Goals	<ul style="list-style-type: none"> • Minimize contamination in marine and freshwater sources that could have deleterious effects on fish and wildlife. • Reduce contamination levels in the sediments that may present a risk to the estuarine biota.
Action	<ul style="list-style-type: none"> • Evaluate current monitoring programs, including the papermill's EEM and the City's sewer outfall monitoring. • Determine if additional monitoring is required to identify water quality impacts on biota, including consideration of sediment toxicity monitoring in and beyond the deposit (fibre mat) area, e.g., Holm Island.
Partnerships	<ul style="list-style-type: none"> • NorskeCanada • Weyerhaeuser • City of Port Alberni • DFO • Ministry of Water, Land and Air Protection • First Nations

Vegetation Monitoring

Goals	<ul style="list-style-type: none"> • Maintain, and if feasible, increase the amount of very high and high value habitat types, e.g. tidal marsh, upland meadow. • Ensure the appropriate habitat conditions are maintained to support red- and blue-listed species. • Maintain the floristic species diversity. • Improve degraded habitats and decrease their extent.
Action	<ul style="list-style-type: none"> • Monitor extent of invasive species, including Purple loosestrife, Scotch broom and English ivy. • Repeat mapping of habitat types every 5 years to monitor changes. • Monitor restoration areas on an annual basis to assess potential encroachment of invasive species, and health of planted native shrubs and trees.
Partnerships	<ul style="list-style-type: none"> • Alberni Valley Naturalists • Alberni Valley Enhancement Association • City of Port Alberni • NorskeCanada and Weyerhaeuser • Ministry of Water, Land and Air Protection • First Nations

	<ul style="list-style-type: none"> • Ducks Unlimited and DFO
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Fish Monitoring

Goals	<ul style="list-style-type: none"> • Maintain and enhance the abundance and spawning of fisheries, including sturgeon and chum salmon.
Action	<ul style="list-style-type: none"> • Encourage and support existing and future monitoring and conservation programs. • Review dredging operations to ensure that impacts on fisheries are minimized.
Partnerships	<ul style="list-style-type: none"> • DFO • Alberni Valley Naturalists • Alberni District Sportsman’s Association • Alberni Valley Enhancement Association • City of Port Alberni • Ducks Unlimited • Ministry of Water, Land and Air Protection

Wildlife Monitoring

Goals	<ul style="list-style-type: none"> • Maintain and enhance the abundance and diversity of birds, butterflies and small mammals.
Action	<ul style="list-style-type: none"> • Encourage and support existing and future monitoring and conservation programs. • Monitor butterfly use of the estuary. • Review potential methods for monitoring small mammals. • If no method is feasible, conduct surveys of wintering raptor populations to provide some indication of the health of small mammal populations.
Partnerships	<ul style="list-style-type: none"> • Alberni Valley Naturalists • Alberni District Sportsman’s Association • Alberni Valley Enhancement Association • City of Port Alberni • Ducks Unlimited • Ministry of Water, Land and Air Protection

Recreation Use Monitoring

Goals	<ul style="list-style-type: none"> • To determine the patterns and trends in recreation use • To ensure that recreation does not have undue negative impacts on resources • To eliminate illegal, unethical and inappropriate activities
Action	<ul style="list-style-type: none"> • Develop a monitoring system that involves monitoring of major categories of recreation use (e.g., walking, dog walking, wildlife-viewing, hunting, other) for discrete areas of the estuary that are illustrated and named on a map. • Monitor the numbers of participants by activity and location at varying times including all seasons, weekends and weekdays. • Develop a system for reporting and enforcement related to illegal, unethical and inappropriate activities. • Use monitoring information as required to revise recreation aspect of SEMP, improve signage and other education, increase monitoring if necessary
Partnerships	<ul style="list-style-type: none"> • Alberni Valley Naturalists • Alberni District Sportsman’s Association • Alberni Valley Enhancement Association • First Nations • Canadian Wildlife Service • Ministry of Water, Land and Air Protection • Ducks Unlimited • City of Port Alberni • Alberni-Clayoquot Regional District

Industrial Use Monitoring

Goals	<ul style="list-style-type: none"> • Reduce the impacts of industry on the estuarine ecosystem • Promote impact recovery through remediation projects
Action	<ul style="list-style-type: none"> • Ensure that BMPs are followed • Develop monitoring programs as required for impacts not already being monitored • Measure recovery of areas previously affected by industry
Partnerships	<ul style="list-style-type: none"> • NorskeCanada • Weyerhaeuser • City of Port Alberni • Ministry of Water, Land and Air Protection

6.0 IMPLEMENTATION PLAN

6.1 A Commitment to Work Together



Unlike an Official Community Plan for a municipality, the Somass Estuary Management Plan will be carried out by a number of agencies. Those agencies are the same ones that were involved in preparation of the plan.

The proposed Somass Estuary Management Committee (SEMC) includes the agencies with a jurisdiction or mandate related to management of the estuary as well as key interest groups. It is recognized that some of the agencies below may change with government reorganization over time; those with a relevant jurisdiction or mandate are encouraged to participate:

- West Coast Vancouver Island Aquatic Management Society
- Ducks Unlimited Canada
- Department of Fisheries and Oceans Canada
- Environment Canada (Canadian Wildlife Service)
- Ministry of Water, Land and Air Protection
- Alberni-Clayoquot Regional District
- City of Port Alberni
- Tseshaht First Nation
- Hupacasath First Nation
- Port Alberni Port Authority
- NorskeCanada
- Weyerhaeuser
- Alberni Valley Enhancement Association
- Alberni Valley Naturalists
- Alberni District Sportsman's Association

Implementation of the SEMP will not require any new jurisdictions or bylaws. To ensure that the plan is implemented, the SEMC members will need to endorse the plan and work cooperatively together to implement the provisions of the plan in accordance with each member's existing jurisdiction. In addition, the SEMC should contact other agencies for input as appropriate, e.g., Land Commission.

The SEMP is “without prejudice” to the rights of First Nations.

6.2 Role of the SEMC

The role of the SEMC will include working together on the following responsibilities, which are described more fully in the sections following this list:

- Forge partnerships and develop Memoranda of Understanding among the agencies, where appropriate, to facilitate implementation of the SEMP,
- Agree to promote and abide by consensus-based decision-making,
- Oversee the monitoring component of the SEMP,
- Share information about proposed projects within the plan area and provide comments and recommendations related to their level of compliance with the SEMP,
- Seek out and secure funding for capital projects and operations, and establish budgets,
- Commit to cooperative management of funding for SEMP coordination, monitoring, research and planning activities,
- Evaluate and update the plan on an ongoing basis, and
- Ensure that the plans and policies within their jurisdiction remain consistent with the SEMP, e.g. OCPs, Port Authority's Port Master Plan.

Partnerships

Partnerships can play an important role in estuary stewardship, monitoring, enforcement, and special projects such as provision of interpretive signage, or habitat restoration and enhancement efforts.

Special mechanisms that formalize partnerships may be useful in advancing implementation. This could include mechanisms such as shared projects, joint funding applications, and Memoranda of Understanding.

No business conducted by the SEMC will abrogate or derogate from the aboriginal or treaty rights of First Nations or give any government agency a justification for infringing aboriginal or treaty rights.

Decision-making Process

The signatories to the Somass Estuary Management Plan (SEMP) agree to abide by the provisions of the plan, provided that said provisions do not fetter the jurisdiction, statutory decision-making mandate or any other rights or responsibilities of the respective organizations.

The effectiveness and legitimacy of the Somass Estuary Management Plan lies in:

- finding options to meet the plan's purpose that are acceptable to all those concerned, including those who must implement them, and
- where a mutually-acceptable solution cannot be found, providing an informed report on the issues underlying the problem for possible future resolution.

The following statements describe the purpose, conduct and responsibilities of the SEMC.

1. The purpose of the SEMC is to guide the implementation of the SEMP as per the provisions of the plan, including the vision, objectives, management strategies, and the monitoring and implementation plans.
2. The SEMC is composed of representatives from all levels of government, including federal, provincial, local and First Nations, as well as key interest groups. A list of member agencies and interest groups, and their statements of interest and jurisdiction, are provided in the plan
3. The SEMC appoints its own Chair for a period of two years, and this decision will be reviewed every two years. The SEMC will outline the responsibilities of the Chair.
4. The SEMC is responsible for its own process, and members are expected to participate in good faith, conducting themselves reasonably and respectfully without relying on a rigid set of procedural rules.
5. Contact with the media is through a single spokesperson designated as the Chair of the SEMC. Individual members do not speak on behalf of the SEMC unless authorized to do so.
6. The SEMC will typically meet twice annually; in the fall to review management strategies in relation to completed projects, and to establish budgeting requirements, and in the spring to plan for summer projects. More meetings may be held as the need arises; this is based on the discretion of the SEMC.

7. To hold a meeting, eight members must be present. Alternates are acceptable.
8. The SEMC, by its nature, cannot create or take away existing legal rights, or interfere with the jurisdiction or legislated mandate of governments, nor can it make decisions outside the mandates of individual representatives.
9. Because decisions must be acceptable to all concerned, the SEMC makes recommendations affecting the interests of its participants by consensus.
 - Consensus is reached when each participant accepts the combined effect of all the parts of a proposed action or recommendation.
 - A member who cannot accept a proposed action or recommendation should explain how it would adversely affect the group's interests, and should propose an alternative which satisfies all interests.
 - If a problem cannot be solved by consensus, the participants may agree to disagree about certain issues. Information used in to arrive at separate conclusions along with all proposed recommendations will then be identified in the plan.
10. The SEMC may, at its discretion, appoint subcommittees to address specific topics and report back to the SEMC. Members of subcommittees may include individuals or organizations that are not part of the SEMC.
11. Since the SEMP was developed in consultation with interest groups and the public, the SEMC has a responsibility to consult with those parties if major changes to the SEMP are proposed, or if a proposed project or activity may be inconsistent with the provisions of the SEMP.
12. The term of the SEMC is unlimited.

Monitoring

As noted in section 5 of this plan, monitoring will be a key to measuring the strengths and weaknesses of the SEMP, and in determining how it will need to change over time. In order to implement the monitoring program, the following will be required:

- Establish a Monitoring Committee with representatives of the SEMC as well as other local and regional estuarine experts if appropriate.
- The Monitoring Committee will undertake the following:

- Establish a repository for existing monitoring efforts,
- Establish priorities for new and ongoing monitoring,
- Define the monitoring program, including performance indicators, sampling locations, sampling frequency, reporting procedures, and remedial actions,
- Coordinate responsibilities for monitoring, including forging of partnerships to support the monitoring program, and
- Review the results of monitoring efforts and report the results to the SEMC.

Project Review

The SEMC will not have the budget or the need to conduct a detailed project review process separate from existing processes by lead agencies. The SEMC will conduct informal meetings and serve as a clearinghouse for information related to proposed projects.

It is expected that the SEMC members who receive applications will share information about proposed projects within the plan area. Other members will have the opportunity to provide comments related to the level of compliance of the projects with the SEMP, or to make suggestions on potential mitigation or compensation measures.

Funding

The SEMP builds on existing programs and relies on strengthening partnerships, with the intent of optimizing the use of funds and maximizing resources from government and non-government agencies. The SEMP provides a framework for more effective coordination of funding partners and identification of opportunities for linkages among participants.

Two types of costs are involved in carrying out the SEMP: non-capital costs and capital projects.

Non-capital costs include the costs of staff time and administrative expenses associated with coordination, research, planning, monitoring and evaluation.

Capital project costs include costs for materials and labour associated with items such as interpretive signage, trail construction, parking and washroom facilities, and habitat restoration and enhancement.

One of the roles of the SEMC will be to develop cost-sharing agreements among SEMC members, and to solicit funds from other

sources. The requirements for funding will need to be determined during the early stages of plan implementation. There is no obligation for funding associated with being a member of the SEMC.

An opportunity for funding may lie in the “polluter pay” concept, in which users of the estuary contribute funding towards mitigation or compensation of impacts.

Plan Review and Updating

The SEMP will be reviewed at least every 5 years, and updated if necessary at that time, unless there is a trigger that leads to the need for an earlier update. The SEMC will decide if an earlier update is required.

Updating of the plan will involve the following primary tasks:

- Review of the plan vision, objectives and principles to confirm that they still apply or to modify them if required,
- Preparation of a brief “state of the estuary” overview outlining any changes in fish and wildlife habitat, water quantity and quality, and human use of and impacts on the estuary that have occurred since the previous plan was prepared,
- Review of the objectives and management strategies in each section of the plan to confirm that they still apply or to modify them if required,
- Review and report on the utilization and outputs of any funding that has been provided to the SEMC in order to evaluate cost-effectiveness and to determine future funding,
- Update of the Designation Plan based on any new biophysical and human activity information, and the results of monitoring,
- Update of the Monitoring Plan, if required, and
- Update of the Implementation Plan.

At least one public session should be held to allow for review and comment on proposed changes to the SEMP.

APPENDIX A: COMMON AND SCIENTIFIC NAMES

This appendix provides the scientific names for the common species names mentioned in this plan. It is by no means an all-inclusive list of the species found in the Somass Estuary.

Vegetation

COMMON NAME	SCIENTIFIC NAME
Trees	
Arbutus	<i>Arbutus menziesii</i>
Douglas-fir	<i>Pseudotsuga menziesii</i>
Grand Fir	<i>Abies grandis</i>
Lodgepole Pine	<i>Pinus contorta</i>
Oregon Ash	<i>Fraxinus latifolia</i>
Red Alder	<i>Alnus rubra</i>
Sitka Spruce	<i>Picea sitchensis</i>
Western Hemlock	<i>Tsuga heterophylla</i>
Western Redcedar	<i>Thuja plicata</i>
Shrubs	
Bittercherry	<i>Prunus emarginata</i>
Black Twinberry	<i>Lonicera involucrata</i>
Cascara	<i>Rhamnus purshiana</i>
Common Snowberry	<i>Symphoricarpos albus</i>
Hardhack	<i>Spiraea douglasii</i>
Himalayan Blackberry	<i>Rubus discolor</i>
Hooker's Willow	<i>Salix hookeriana</i>
Nootka Rose	<i>Rosa nutkana</i>
Pacific Crabapple	<i>Malus fusca</i>
Red Huckleberry	<i>Vaccinium parvifolium</i>
Salmonberry	<i>Rubus spectabilis</i>
Scotch Broom	<i>Cytisus scoparius</i>
Sweet Gale	<i>Myrica gale</i>
Herbs	
American Bulrush	<i>Scirpus americanus</i>
Arctic Rush	<i>Juncus arcticus</i>
Beaked Spike-Rush	<i>Eleocharis rostellata</i>
Cattail	<i>Typha latifolia</i>
Common Camas	<i>Camassia quamash</i>
Common Velvet-Grass	<i>Holcus lanatus</i>
Creeping Spike-Rush	<i>Eleocharis palustris</i>
Ditch-Grass or Widgeon-Grass	<i>Ruppia maritima</i>
Five-angled Dodder	<i>Cucuta pentagona</i>
Flowering Quillwort	<i>Lilaea scilloides</i>
Geyer's Onion	<i>Allium geyeri</i>

COMMON NAME	SCIENTIFIC NAME
Hairy Cat's-Ear	<i>Hypochaeris radicata</i>
Hard-stemmed Bulrush (Tule)	<i>Scirpus lacustris</i>
Henderson's Checker-Mallow	<i>Sidalcea hendersonii</i>
Horned Pondweed	<i>Zannichelia palustris</i>
Lyngby's Sedge	<i>Carex lyngbyei</i>
Pacific Silverweed	<i>Potentilla anserina</i>
Paintbrush Owl-Clover	<i>Orthocarpus castillejooides</i>
Pointed Rush	<i>Juncus oxymeris</i>
Purple Loosestrife	<i>Lythrum salicaria</i>
Red Sea Spaghetti	
Ribwort (English Plantain)	<i>Plantago lanceolata</i>
Sea Lettuce	<i>Ulva lactuca</i>
Sea Milk-Wort	<i>Glaux maritima</i>
Sea-Pink (Thrift)	<i>Armeria maritima</i>
Siberian Water-Milfoil	<i>Myriophyllum spicatum</i> var. <i>exalbescens</i>
Slough Sedge	<i>Carex obnupta</i>
Small Spike-Rush	<i>Eleocharis parvula</i>
Swordfern	<i>Polystichum munitum</i>
Three-flowered Waterwort	<i>Elatine rubella</i>
Tufted Hairgrass	<i>Deschampsia cespitosa</i>
Vancouver Island Beggarticks	<i>Bidens amplissima</i>
Verticillate Water-Milfoil	<i>Myriophyllum verticillatum</i>
Western Lilaeopsis	<i>Lilaeopsis occidentalis</i>
??	<i>Fucus spp.</i>
??	<i>Laminaria spp.</i>

Wildlife and Fish

COMMON NAME	SCIENTIFIC NAME
Birds	
American Bittern	<i>Botaurus lentiginosus</i>
American Robin	<i>Turdus migratorius</i>
Bald Eagle	<i>Haliaeetus leuccephalus</i>
Belted Kingfisher	<i>Ceryle alcyon</i>
Bufflehead	<i>Bucephala albeola</i>
Cedar Waxwing	<i>Bombycilla cedrorum</i>
Common Merganser	<i>Mergus merganser</i>
Great Blue Heron	<i>Ardea herodias</i>
Great Horned Owl	<i>Bubo virginianus</i>
Greater Scaup	<i>Aythya marila</i>
Green Heron	<i>Butorides virescens</i>
Green-winged Teal	<i>Anas crecca</i>
Mallard	<i>Anas platyrhynchos</i>
Marsh Wren	<i>Cistothorus palustris</i>
Northern Harrier	<i>Circus cyaneus</i>
Northwestern Crow	<i>Corvus caurinus</i>
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>

COMMON NAME	SCIENTIFIC NAME
Short-eared Owl	<i>Asio flammeus</i>
Song Sparrow	<i>Melospiza melodia</i>
Spotted Sandpiper	<i>Actitis macularia</i>
Spotted Towhee	<i>Pipilo maculatus</i>
Swainson's Thrush	<i>Catharus ustulatus</i>
Townsend's Warbler	<i>Dendroica townsendi</i>
Trumpeter Swan	<i>Cygnus buccinator</i>
Virginia Rail	<i>Rallus limicola</i>
Winter Wren	<i>Troglodytes troglodytes</i>
Wood Duck	<i>Aix sponsa</i>
Mammals	
Black-tailed Deer	<i>Odocoileus hemionus columbianus</i>
Black Bear	<i>Ursus americanus</i>
Cougar	<i>Felis concolor</i>
Deer Mouse	<i>Peromyscus maniculatus</i>
Mink	<i>Mustela vison</i>
Muskrat	<i>Ondatra zibethicus</i>
Raccoon	<i>Procyon lotor</i>
Red Squirrel	<i>Tamiasciurus hudsonicus</i>
River Otter	<i>Lontra canadensis</i>
Townsend's Vole	<i>Microtus townsendii</i>
Vagrant Shrew	<i>Sorex vagrans</i>
Herptiles	
Common Garter Snake	<i>Thamnophis sirtalis</i>
Long-toed Salamander	<i>Ambystoma macrodactylum</i>
Northwestern Garter Snake	<i>Thamnophis ordinoides</i>
Northwestern Salamander	<i>Ambystoma gracile</i>
Pacific Tree Frog	<i>Hyla regilla</i>
Red-legged Frog	<i>Rana aurora</i>
Rough-skinned Newt	<i>Taricha granulosa</i>
Western Terrestrial Garter Snake	<i>Thamnophis elegans</i>
Butterflies	
Common Woodnymph	<i>Cercyonis pegala incana</i>
Fish	
Bay Goby	<i>Lepidogobius lepidus</i>
Coastal Cutthroat Trout	<i>Oncorhynchus clarki clarki</i>
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>
Chum Salmon	<i>Oncorhynchus keta</i>
Coho Salmon	<i>Oncorhynchus kisutch</i>
Dolly Varden Char	<i>Salvelinus malma</i>
English Sole	<i>Parophrys vetulus</i>
Pacific Hake	<i>Merluccius productus</i>
Pacific Lamprey	<i>Lampetra tridentatus</i>
Pacific Sandlance	<i>Ammodytes hexapterus</i>
Pacific Staghorn Sculpin	<i>Leptocottus armatus</i>
Pile Perch	<i>Rhacochilus vacca</i>
Pink Salmon	<i>Oncorhynchus gorbuscha</i>
Pipefish	<i>Syngnathus griseoliteatus</i>
Prickly Sculpin	<i>Cottus aster</i>
Ratfish	<i>Hydrolagus colliei</i>

COMMON NAME	SCIENTIFIC NAME
Shiner Surfperch	<i>Cymatogaster aggregata</i>
Speckled Sanddab	<i>Cytharichthys stigmaeus</i>
Snake Prickleback	<i>Lumpenus sagitta</i>
Staghorn Sculpin	<i>Leptocottus armatus</i>
Starry Flounder	<i>Platichthys stellatus</i>
Steelhead	<i>Salmo gairdneri</i>
Threespine Stickleback	<i>Gasterosteus aculeatus</i>
Walleye Pollock	<i>Theragra chalcogramma</i>
White Sturgeon	<i>Acipenser transmontanus</i>
Marine Invertebrates	
Bent-nose Clam	<i>Macoma nasuta</i>
Ghost Shrimp	<i>Callinassa californiensis</i>
Littleneck Clam	<i>Protothaca staminea</i>
Manila Clam	<i>Venerupis philippinarum</i>
Mud Shrimp	<i>Upogebia pugettensis</i>
Nuttall's Cockle	<i>Clinocardium nuttallii</i>
Polychaete sp.	<i>Capitella capitata</i>
Polychaete sp.	<i>Hobsonia florida</i>
Polychaete sp.	<i>Manayunkia aestuarina</i>
Polychaete sp.	<i>Polydora kempj japonica</i>
Shore Crab	<i>Hemigrapsus oregonensis</i>
Varnish Clam	<i>Nuttallia obscura</i>

APPENDIX B: STEERING COMMITTEE INTERESTS AND JURISDICTION

The following are the primary interests and jurisdictions of the Steering Committee and the proposed SEMC members.

West Coast Vancouver Island Aquatic Management Board

Interests

- A forum for coastal communities and others to participate more fully with governments in all aspects of the integrated management of aquatic resources in the management area.
- The objective of the Board is to lead and facilitate the development and implementation of a strategy for the integrated management of aquatic ecosystems.

Mandate

- The level of the Board's participation in integrated management may range from information-sharing to consultation, shared decision-making, or assigned responsibility.
- Recognizing overarching authorities, policies, standards and processes, and the necessity to link with these for effective management, the Board's participation in integrated management decision-making may increase with
 - the extent to which species remain within the area
 - the extent that an issue or activity has an impact on aquatic resources
 - the localized nature of an issue or activity
 - local capacity and demonstrated success.

Activities

- stewardship
- fisheries management
- aquaculture management
- community economic development
- integrated oceans management.

Ducks Unlimited Canada (DUC)

Interests

- Ducks Unlimited Canada is a private, not-for-profit organization.
- Mission: conserve, restore and manage wetlands and associated habitats for North American's waterfowl. These habitats also benefit other wildlife and people.

Primary Activities

- The Coastal office secures, restores and enhances wetland and upland habitats along the BC coast. Habitats include intertidal and freshwater wetlands as well as agricultural land.
- DUC uses a number of conservation tools including: fee simple acquisition, assisting government in Crown transfers, conservation agreements, conservation covenants, developing long term plans with farmers to improve operations.

Department of Fisheries and Oceans Canada (DFO)

Interests

- Net gain of fish habitat is a present and future interest.
- Coastal zone planning under the auspices of the *Oceans Act*.

Mandate

- Responsible for administering the *Fisheries Act* which includes habitat protection, water quality protection, protection of fish.

Existing Plans, Bylaws or Legal Agreements

- *Fisheries Act*
- National Habitat Policy
- *Canadian Environmental Assessment Act*
- *Oceans Act*
- Aquaculture Policy Directive
- MOU, City of Port Alberni/DFO

Environment Canada (Canadian Wildlife Service)

Interests

- Conservation, management and restoration of migratory bird habitats through partnered acquisitions, habitat restoration, project review, providing tools to decision makers, promoting stewardship and engaging the interested public.
- Ongoing performance evaluation through periodic population monitoring.

Mandate

- Conservation and management of migratory bird populations under the Migratory Birds Conservation Act.
- Partnerships for conservation of wildlife and their habitat under the Canada Wildlife Act.
- Some interest and probably future mandate in the recovery of species at risk under the Species at Risk Act.

Existing Plans, Bylaws or Legal Agreements

- Development of management plan for upland and wetland holdings under the Vancouver Island Wetland Management Program.

Ministry of Water, Land and Air Protection (MWLAP)

Interests

- Primary goal is to maintain and restore the natural diversity of ecosystems, and fish and wildlife species and their habitats. Objectives are as follows:
 - Clear strategies and legislation to protect and restore ecosystems, species and their habitats.
 - Improved use of science for the development of standards and for effective monitoring and reporting.
 - Increased number of partnerships to conserve ecosystems, species and their habitats.
- Core business areas are Environmental Protection, Environmental Stewardship and Park and Wildlife Recreation

Mandate

- Protect human health and safety by ensuring clean and safe water, land and air

- Maintain and restore the natural diversity of ecosystems, fish and wildlife and their habitat
- Provide park and wildlife recreation services and opportunities to British Columbians and visitors

Existing Plans, Bylaws or Legal Agreements

- Somass River Water Management Plan completed by the former Ministry of Environment, Lands and Parks.

Tseshah First Nation (TFN)

Interests

- Identification and protection of traditional use sites
- Protection of resources, including fish, mammals and plants
- Rights to access and harvest resources
- Economic development opportunities

Existing Plans, Bylaws or Legal Agreements

- Tseshah Treaty Goal is to negotiate, ratify and implement a modern day treaty based on the Ha-Houlthee of our Ha-wiih which will greatly help us to achieve a healthy, independent and respectful community in which our language, culture and values survive and are enhanced and our people forever can reach their greatest potential.

Hupacasath First Nation (HFN)

Interests

- To preserve the natural features of the estuary to the degree possible
- To ensure that both flora and fauna are conserved and protected, and habitats restored where possible, to maintain a representative assembly of plants
- To increase community awareness about the unique ecosystem in the estuary and the relationship the HFN has to that environment
- To ensure access to the estuary is maintained for exercising aboriginal rights

- To ensure that all archaeological resources are identified and managed appropriately
- To ensure that there is awareness and management parity with the Hupacasath fisheries bylaw

Existing Plans, Bylaws or Legal Agreements

- Hupacasath Land Use Plan
- Hupacasath Fisheries Bylaw

Alberni-Clayoquot Regional District (ACRD)

Mandate

- Land use management
- Protection of the estuary

Existing Plans, Bylaws or Legal Agreements

- Zoning Bylaws and Official Community Plan (OCP)
- Sproat Lake OCP
- Other RDN plans, bylaw, or agreements may also be relevant to the Somass Estuary

City of Port Alberni

Mandate

- City of Port Alberni Strategic Vision - "For the City of Port Alberni to become the most vibrant, healthy and united community in British Columbia."

Existing Plans, Bylaws or Legal Agreements

- Official Community Plan
- Other City plans, bylaw, and agreements

Port Alberni Port Authority (PAPA)

Mandate

- As an agent of Her Majesty in right of Canada, to engage in port activities related to shipping, navigation, transportation of passengers and goods, handling of goods and storage of goods, to the extent that those activities are specified in the letters patent or other activities that are deemed necessary to support port operations.

NorskeCanada, Port Alberni Division

Interests

- Continue to operate the papermill in a sustainable manner respecting the sensitivities of the Somass Estuary

Primary Activities

- Owns and operates the papermill on the east side of the estuary.
- Owns and operates the Great Central Lake dam for the purpose of controlling water flow in the Stamp/Somass system.
- Owns and manages the poplar plantation.

Weyerhaeuser

Interests

- To operate timberlands and sawmills consistent with Weyerhaeuser's vision, values and behaviors.

Primary Activities

- Sort and boom logs on the west side of the estuary.
- Store log on both sides of the estuary.
- Own and operate sawmills on the east side of the estuary.

Alberni Valley Enhancement Association (AVEA)

Interests

- The Alberni Valley Enhancement Association is an umbrella organization for volunteer salmon enhancement groups in the Alberni Valley.

Activities

- The AVEA's mission is to protect and enhance the watersheds within the Alberni Valley and those watersheds that empty into the Alberni Canal by: aiding existing societies, promoting community awareness, co-ordinating funding efforts, creating working partnerships with government and industry and advocating for protection and enhancement of habitat.

Alberni Valley Naturalist Society (AVN)

Interests

- The conservation and enhancement of the natural environment including fish, wildlife, birds, insects and plants for future generations to enjoy.
- Promoting the awareness and the need to protect the natural environment in the community.
- Supporting community efforts to conserve, enhance and preserve natural environments.

Activities

- Producing a Bird Check-list for the Alberni Valley
- Conducting the Christmas Bird Count every year
- Enhancing public awareness of naturalist issues

Alberni District Sportsman's Association (ADSA)

Interests

- Conservation of fish, wildlife and habitat to ensure that future generations will enjoy the opportunity to fish, hunt and enjoy all outdoor activities
- Promoting responsible management of fish and wildlife resources and their habitat
- Promoting the rights of anglers, hunters and shooters.

Activities

- Helped in providing gravel for spawning beds in the Sproat River; participated in the translocation of Elk into the Nahmint Valley and are active in trying to diminish the numbers of Bull Frogs that are threatening fish and wildlife in the local area.
- ADSA provides a forum to voice concerns in hunting, angling, access and a variety of other issues. The organization provides input to the Ministry of Water Land and Air Protection regarding wildlife conservation
- ADSA also provides its members and the public with a place to shoot and the opportunity to associate with those interested in a variety of shooting sports, i.e., skeet, trap, pistol, rifle.

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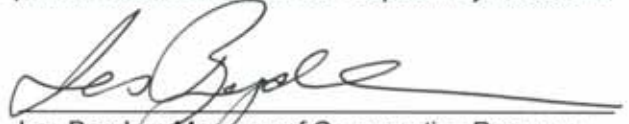
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ENDORSEMENT

We have participated in the preparation of the Somass Estuary Management Plan. We endorse the plan and will work cooperatively together as the Somass Estuary Management Committee to implement the provisions of the plan in accordance with our respective jurisdictions and interests.




Tom Pater and Cliff Atleo, Co-Chairs
West Coast Vancouver Island
Aquatic Management Board



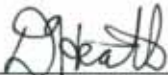
Les Bogdan, Manager of Conservation Programs
B. C. Coastal Eco-Region, Ducks Unlimited Canada



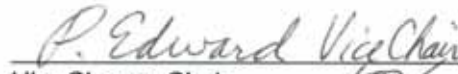
Wilf Luedke, Acting Area Manager,
Habitat and Enhancement Branch,
Pacific Region, Fisheries and Oceans Canada



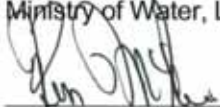
Ken Brock, Head of Habitat Conservation,
Pacific Yukon Region, Environment Canada
(Canadian Wildlife Service)



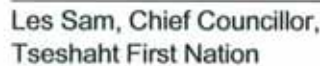
Dick Heath, Regional Manager, Vancouver
Island, Environmental Stewardship
Ministry of Water, Land and Air Protection



Hira Chopra, Chair ^{for}
Alberni-Clayoquot Regional District



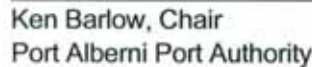
Ken McRae, Mayor
City of Port Alberni



Les Sam, Chief Councillor,
Tseshah First Nation



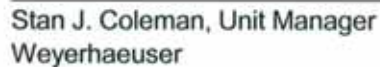
Judith Sayers, Chief Councillor
Hupacasath First Nation



Ken Barlow, Chair
Port Alberni Port Authority



Dave Bird, Site Vice President, Port Alberni
Division
NorskeCanada



Stan J. Coleman, Unit Manager
Weyerhaeuser



Rick Avis, Director
Alberni Valley Enhancement Association



John (Sandy) McRuer, President
Alberni Valley Naturalists



Darlene Clark,
Alberni District Sportsman's Association