Final Report of the
Log Storage Working Group

Prepared for:
The Nanaimo Estuary Management Plan Steering Committee

Prepared by the Log Storage Working Group
January 22, 2002

Table of Contents

1.0 Introduction

The Nanaimo River estuary is the largest estuary on Vancouver Island and the fifth largest in British Columbia. (see Figure 1 for an overview image of the estuary). The estuary is a highly productive ecosystem that provides important habitat for migratory waterfowl, anadromous fish, shellfish and other wildlife. In terms of human activity and uses the Nanaimo estuary is valued for recreational, commercial and industrial activity and has supported and provided for the Snuneymuxw (Nanaimo) First Nation for thousands of years.

1.1 Background of the Planning Process

In 1998, the Ministry formerly known as Environment, Lands & Parks (MELP), The Nature's Trust (TNT) and the Snuneymuxw First Nation (SFN), identified concerns for the Nanaimo River estuary and the impacts of human activities. The Snuneymuxw pursued an audit and remediation plan through treaty negotiations, targeting the estuary for a management plan. In a separate process MELP and TNT began to work on a management plan for the Trust lands on the estuary. Eventually the two processes connected and an overall estuary management plan was pursued looking at recreational, industrial and governance issues.

British Columbia Assets and Lands issues a head lease to the Nanaimo Port Authority (NPA) for the Nanaimo Estuary, which expires in October 2002. NPA subsequently authorizes log storage through sub-leases with industry, most of which expired in October 2001.

The Nanaimo Forest Industry has stored logs in the Nanaimo Estuary since the 1950's, when the first log storage lease was granted by the province. The first leases covered approximately 27% of the estuary. In the 1980's a task force reduced the lease areas to approximately 20% of the estuary.

In the fall of 2000, British Columbia Assets and Lands (BCAL) requested a meeting with the Snuneymuxw First Nation to discuss the upcoming head lease and log storage lease renewals. At this meeting the estuary management planning process was introduced to BCAL and the need for a formal steering committee was identified. A process to establish the steering committee, terms of reference, and the scope of an action plan was undertaken. All parties were in agreement that log storage was of primary concern, however as one portion of an overall management plan that would encompass all human activities and uses.

Faced with high pressure from community and industry user groups and the imminent log storage lease expiry, BCAL pressed the steering committee to convene a log storage working group prior to the completion of a management plan. The Snuneymuxw First Nation responded by initiating legal action to protect their cultural practices and Douglas Treaty right "to fish as formerly" and to prevent the issuance of a 20 year lease. Subsequently and to forestall litigation, BCAL and SFN met and agreed to convene the log storage working group.

Co-chairs of the LWG are the province (Ministry of Sustainable Resource Management) and the Snuneymuxw First Nation. Representatives include Fisheries and Oceans Canada, Environment Canada, the City of Nanaimo, the Nanaimo Port Authority, the Forest Industry Users Group and the Nanaimo Community Estuary Support Coalition.

The Log Storage Working Group (LWG) was tasked with the development of recommendations regarding log management and storage within the estuary area, by December 31, 2001. Their specific tasks, as outlined in the Terms of Reference for the LWG, are as follows:

1) Identify existing and future log storage needs for local mills, other mills, and offshore sales.
2) Review the configuration and define the areas to be maintained for log storage and management.
3) Define acceptable *Best Management Practices* (BMP's) that may be implemented by companies to manage log lease areas and that may be incorporated into the head lease or subleases to manage log storage use (e.g., environmental monitoring, future planning, etc.)
4) Recommend terms and conditions that could be incorporated into administrative arrangements to assist in managing log storage use
5) Recommend monitoring procedures to assess the effectiveness of BMP's and their impacts on the environment.
6) Recommend a periodic review procedure to monitor effectiveness of BMP'S and the area required for log storage and management.
7) Identify habitat restoration opportunities associated with log storage options.
8) Recommend mechanisms for periodic reduction and the eventual elimination of log storage on the Estuary using best available knowledge.

This report summarizes the work of the LWG, which held three working sessions between September and December 2001 to determine and review options for log management in the estuary. Three options for log management have been prepared by individual members of the LWG, and were made available for wider public review and comment at an open house, held December 15, 2001. As such, this report does not represent a consensus document of the LWG, but rather a record of discussions and potential options.

2.0 Description of the Nanaimo Estuary

2.1 Environmental Values of Estuaries

Estuaries are rare, highly productive ecosystems that provide important habitat for migratory waterfowl, anadromous fish, shellfish and other wildlife. As a transition zone where salt water mixes with fresh water, they provide a unique habitat that is critical to the survival of some fish and wildlife species.

Estuaries support an extremely high rate of primary productivity – the rate at which plants convert the sun's energy by photosynthesis into food that animals can use. Estuarine plants form the basis for a complex, interconnected estuarine food web, whereby decaying plants are coated by protozoa and other microorganisms, which are fed upon by small invertebrates, which in turn provide a critical food source for fish, which may in turn be eaten by birds and mammals.

Only certain types of plants flourish in the salinity and regular flooding conditions of estuaries. Eelgrass is one marine plant that flourishes in estuaries, and indicates highly productive fish habitat, as well as an important food for certain waterfowl species. Mudflats are also important habitats for a myriad of invertebrate species that burrow into the mud, including clams, snails, amphipods, segmented worms and lugworms.

Estuaries provide critical habitat in the life cycle of many fish species. After hatching in the river, salmon fry migrate downstream to the estuary, where they rear for anywhere from 1 to 5 months. Estuaries provide the conditions necessary for the juveniles to feed, grow and adapt physiologically from a freshwater to a marine environment, in preparation for the migration to sea. Returning adult salmon also use estuarine habitat prior to migrating to upstream spawning grounds.

2.2 Fish and Wildlife Species found in the Nanaimo Estuary

The Nanaimo, Chase and Millstone Rivers as well as Hong Kong and Holden Creeks all flow into the Nanaimo estuary, and support fish populations. The Nanaimo River historically supported all five salmon species – chinook, chum, coho, pink and sockeye, however pink and sockeye numbers have declined in recent years to the point where they are only occasionally reported[i1]. Steelhead trout, cutthroat trout and Dolly Varden are also supported in the Nanaimo River.

Steelhead and cutthroat trout have been reported in the Millstone River, Holden creek and Hong Kong Creek. Chum salmon, coho salmon, rainbow trout and cutthroat trout all use the lower Chase River for spawning and rearing

[1] Note: all information in section 2.2 is taken from the following reference:
Dunham, Karen. 2000. 'Inventory and Review of Studies and Data Relating to the Nanaimo River Estuary.

Juvenile Chinook and chum salmon in particular have a high dependency on the Nanaimo river estuary, generally between February and July. Juvenile herring are found essentially year round in the estuary.

Invertebrates and invertebrate habitat found in the Nanaimo Estuary include dungeness crab, clam and oyster beds, shrimp, and prawns. The clam and oyster beds located on the west side of Jack Point are currently closed due to high levels of fecal contamination. The crab fishery is also closed due to dioxin contamination.

The Nanaimo Estuary in conjunction with the surrounding lakes, marshes and fields, is reported to provide habitat for thousands of overwintering birds and lesser mammalian, amphibian and reptilian populations. Some of the bird species observed in the Estuary include dabbling ducks, geese, swans, diving ducks, grebes, mergansers, loons, various marshbirds and shorebirds, gulls, brandts, and six species of raptors, including the bald eagle. Mammalian populations in the estuary include seals, sea lions river otters, muskrats, voles and shrews.

2.3 Economic Values of Log Storage

The Nanaimo River estuary has been used for log storage since 1950, when the first log storage lease was issued. Between 1950 and 1979 log storage lease areas covered roughly 275 hectares (683 acres) or 27% of the estuary. In response to environmental concerns expressed in the early 1980's this lease area was reduced to roughly 200 hectares (496 acres) or 20% of the estuary where it remains today. Table 1 below summarizes the current log storage lease areas and lessees.

Lease #	Lessee	Lease area (ha)
101	Doman Western Lumber	9.68
102	Doman Western Lumber	32.37
103	CIPA Lumber Company	25.89
105	Weyerhaeuser	84.17
106	Doman Forest Products	35.61
213	Coastland Wood Industries	13.23
		200.95

There are six forest companies that rely on log storage in the estuary that together form the Nanaimo Forest Industry User's Group (IUG): Coastland Wood Industries, Doman Industries, Pope and Talbot LTD, Harmac Pulp Operations, Weyerhaeuser Company Limited, CIPA Lumber Company Limited, Alliford Bay Logging and Jones Marine Services.

According to the IUG, hundreds of millions of dollars have been invested in mills in Nanaimo, as a result of the availability of the estuary for log storage. Some of these mills have been specifically designed to receive logs by water, and would require significant capital expenditure to be retooled to accept logs from land transport. Section 4.0 of this report provides additional background information on the economic values of log storage in the Nanaimo estuary.

2.4 Impacts Associated with Log Storage

Environmental impacts related to log storage and handling are well understood through extensive existing studies. Log storage activities impact primarily on low intertidal and shallow sub-tidal habitats within estuaries. Impacts include the physical shading of habitat by booms which results in decreased primary productivity by algae and eelgrass. At low tide the physical grounding and abrasion by booms results in compaction of sediments, scouring and physical disruption of habitats. The working of logs against each other within the bundle results in bark and debris deposition and accumulation on bottom sediments. This in turn creates anaerobic conditions within these bottom sediments. Finally, escaped logs can impact adjacent intertidal marsh area and tow boat propeller wash can scour and increase suspended sediment levels in the water column.

Social and economic implications of log storage include the potential restriction of alternative economic opportunities, such as a commercial fisheries and shellfish harvesting, recreation and tourism opportunities.

3.0 Overview of Options for Log Storage and Management in the Nanaimo Estuary

Three members of the LWG prepared options for log storage and management in the Nanaimo Estuary. Option One was prepared by the Forest Industry User's Group (IUG), Option Two by the Snuneymuxw First Nation (SFN) and Option Three was prepared by the Nanaimo Community Estuary Support Coalition (NCESC).

A summary of the three options is provided in Table One, corresponding to the eight tasks initially outlined in the Terms of Reference for the LWG. Figures 2 and 3 outline the proposed lease configurations associated with Options One and Two. Additional background information for each option is provided in Sections 4 through 7 of this report.

3.1 Public Input Received on Options

The LWG held an Open House on Saturday, December 13, 2001 to present their three options for review to the general public. Roughly 700 people attended the Open House, and of the attendees, more than 500 provided written comment through a questionnaire or by completion of a petition circulated by the NCESC.

The following criteria are under discussion and may be used as guidance by the Steering Committee in formulating a final recommendation:

- potential impacts to fish, wildlife and their habitat
- economic viability of alternatives to storing logs in the estuary
- potential impact of log storage on marine water quality
- potential impact to the viability of the forest industry of the region
- potential impacts to marine navigation and safety
- community and First Nations interests
- potential impact to local employment at mills
- potential impact to the local economy
- potential impact to culture and recreation
- other criteria to be determined

A cursory review of the questionnaires indicates that a large proportion of the respondents expressed concern with potential job losses associated with reductions in log storage and emphasized the need to maintain jobs and community stability. Some of these respondents directly noted support for Option 1. Roughly 20% of respondents indicated support for Options 2 or 3.

Table One: Summary of Options Provided Corresponding to the LWG Terms of Reference

Terms of Reference	Option One: Forest Industry User's Group	Option Two: Snuneymuxw First Nation	Option Three: Nanaimo Community Estuary Support Coalition
1. Identify Log Storage Needs	➢ IUG estimate is outlined in Section 4.0.	➢ Not Identified.	➢ Not Identified.
2. Proposed Log Storage Area & Configuration	➢ Immediate reduction in the industry's lease area by roughly 17%, to a total of 166 hectares. ➢ Proposed lease configuration is outlined in Figure 3. ➢ Cooperate in sharing log storage areas among User Groups to maximize efficient use of leases and minimize area required.	➢ Immediately scale back the log storage areas by approximately 46%, to roughly 108 hectares. ➢ Figure 4 shows the proposed configuration for log leases. ➢ Use the "warehousing" method brought forward by the Industry User Group which has one warehouse with areas assigned to each User.	➢ Reduce the current log storage area by approximately 50%, and give existing mills within the estuary priority access to the remaining lease areas. ➢ Reconfigure remaining lease boundaries as required to impose the least possible impact on ecological values within the estuary and allow for effective monitoring.
3. Best Management Practices	➢ The IUG have recommended the Best Management Practices outlined in Appendix A, with the goal of ensuring that log handling, debris containment, dredging and lease maintenance meet the highest standards of performance.	➢ BMP's not identified. ➢ Support having BMP's. Would like a detailed review of the proposal from IUG group.	➢ BMP's not identified. ➢ Support the adoption of BMP's (have not specifically reviewed and provided input into the BMP's recommended by the IUG).
4. Lease terms & conditions	➢ A 20 year lease with review of log storage requirements every five years to ensure the industry is responding to community needs and preserving economic and employment opportunities.	➢ Shorten the lease terms to 5 years, with Terms and Conditions for an automatic review with renewal provisions and mechanisms to reduce the "warehouse" area when a mill closes permanently.	➢ Existing leases should only be extended until an estuary management plan is adopted. Locking in long-term leases may severely compromise plan options. ➢ Lease durations to be a maximum of 5 years with options to renew at 5-year intervals subject to a habitat surcharge that would be dedicated for restoration work within the estuary as determined by the management plan. ➢ In the event of a permanent mill closure or relocation, terminate associated log storage leases and return that area to a natural state.

Terms of Reference	Option One: Forest Industry User's Group	Option Two: Snuneymuxw First Nation	Option Three: Nanaimo Community Estuary Support Coalition
5. Monitoring Procedures	➢ Implement monitoring of log movement and developing a transparent data base for future log storage decisions. ➢ Ongoing monitoring will allow log lease areas to reflect changing community priorities and the industry's ability to adapt.	➢ Not identified.	➢ Not identified
6. Periodic Review Procedure	➢ Every five years.	➢ Every five years or triggered by permanent mill closure.	➢ Every five years. Permanent mill closure means cancellation of associated lease area.
7. Identification of Restoration Opportunities	➢ Not identified.	➢ As per DFO policies.	➢ As determined by an estuary management plan and funded through a habitat surcharge.
8. Periodic Reduction and Eventual Elimination of Storage	➢ Ongoing monitoring to reflect community priorities and industry's ability to adapt.	➢ Identify reduction opportunities at time of five year reviews.	➢ The estuary management plan must contain a strategy for reduction and future elimination of log storage within the estuary.

4.0 Option One: Prepared by the Nanaimo Forest Industry User's Group

4.1 The Importance of the Coastal "Log Highway"

The majority of logs on the coast are transported by water. Logs move from logging operations located along the coast to mills concentrated in the southern end of Georgia Strait (see Figure 4). These are part of an extensive water based log transportation system. Nanaimo's central location relative to this highway puts it in a particularly advantageous position.

The waterborne movement of logs has evolved into a highly cooperative activity that attempts to minimize costs for all concerned. Log booms from many sources will be rafted together and towed to storage areas close to the mills. Log storage areas close to the mills are considered vital for continuous mill supply and permit booms to be bought and sold between operators.

Some sawmills specialize in one or more species or size of log that better suits their order file. To optimize value, log booms are bought and sold between operators. Some booms are resold to buyers elsewhere on the log highway.

The log highway assures that the most competitive buyers can obtain the log supply that they need to survive. The final destination for a given log is not actually determined until that log has been consumed by its final buyer. However, it is estimated that on an annual basis over 70% of the volume of booms that are towed into the Nanaimo estuary will be consumed by mills located from Nanaimo to Chemainus.

4.2 Prime Storage Areas

The Nanaimo River estuary is considered to be a prime storage area, as it offers both protection against high winds and fresh water flushing that prevents teredo marine borer infestation. The IUG believes that there are relatively few prime storage areas that offer both weather protection and fresh water flushing, and are suitable for log boom tie-ups. The Nanaimo estuary and the Fraser River are considered two of the best, and the majority of mills are located close to these sites.

The Chemainus River estuary previously provided log storage for logs destined to the Chemainus sawmill. However, the identification of this estuary as a prime eel grass site has led to the phasing out of storage in the Chemainus estuary, and an increase in storage pressure in the Nanaimo estuary. Similarly, with the reduction in the storage capacity of the Fraser as a result of the implementation of the North Arm Land Use Plan 2000 additional pressure has been put on storage areas such as the Nanaimo estuary.

4.3 Estimate of Log Storage Requirements

The IUG has created the following table to summarize the annual log consumption of the mills dependent on the estuary for log storage, when operating at their maximum capacity.

Table 1: Log Consumption At Maximum Operating Capacity

Licensee / Mill	**000's cubic meters**
CIPA	750
Doman - Duke Point sawmill	1000
Doman- Merchandizer	1000
Doman- Western	1000
Weyerhaeuser - IPD	750
Coastland - Veneer	600
Harmac - Chipping	300
- Log Merchandizing	150
Weyerhaeuser - Chemainus	100
Doman - Ladysmith	200
Total	**5850**

The IUG expects that as the number of mills on the coast decrease as a result of the current market downturn, log supply, coastal rationalization and export restrictions, the remaining mills will operate at higher levels in order to be globally competitive. Further it is their expectation that most of the mills utilizing the estuary will be survivors, or be replaced with facilities that are competitive, and therefore the area mills will continue to require area within the estuary to store logs.

According to the IUG, the storage area required based on mills operating at maximum capacity (3 shifts/day) is defined as follows:

- 1.5 months of storage is required at a given time
- 1.5 months x (5,850 m^3 / 12 months)= 730 000 m^3
- 250 m^3 / average section of boomed bundled logs
- 6.6 sections / acre being full practical storage capacity
- 1650 cu. meters can be stored /acre

therefore $\frac{730{,}000}{1650} = 442$ acres needed (roughly 185 hectares)

The 1½ months equivalent area requirement was developed by the 1982 Nanaimo Estuary Task Force and is believed to be a satisfactory rule of thumb. At the present time the Nanaimo mills are not operating at capacity and there is some additional volume of logs stored temporarily in the Nanaimo Estuary that are sold to buyers outside of the IUG. As local consumption increases and the carrying capacity of the estuary encountered, logs most likely to be destined for local consumption will be given priority for storage.

The IUG notes that the evolution of the forest industry operating practices may justify changes to log storage requirements. However, the 'consolidation'

of the forest industry may also put pressure on log storage capacities. For example, a mill adding an extra species to its production would increase its log inventory requirements. Similarly, a mill cutting mid-grade cedar would likely get a greater proportion of its logs in flat rafts that would take up more area for a given volume. In anticipation of the cedar possibility the Users would like to retain the shallow water south-end of their leases.

4.4 Implications of Log Storage Reduction in the Estuary

The ability to move logs by water is considered by the BC coastal forest industry as critical to their viability. It is considered one of the few advantageous cost factors in a time of very marginal economic viability, and fiercely competitive markets. The log highway ensures that the most competitive buyers can obtain the log supply they need to survive.

Alternatives to log storage in the Nanaimo estuary include the potential for developing increased dryland storage, either through a centralized dryland sort or through incremental additional dryland storage at each mill. Previous studies have looked at cost factors associated with different options, and have concluded that alternative options are more expensive.

Dryland sort could also significantly increase the amount of truck transport on Vancouver Island. The IUG notes that the ability to float logs in the ocean and tow thousands of tons of logs with a single several thousand horse-power tug boat can be an efficient use of energy, in comparison to the highway truck hauling of logs, then unloading and handling several times before they are consumed

4.5 The "Three-Point Plan for Continuous Improvement"

The IUG have recommended a '***3-point plan for continuous improvement***' that they believe will address concerns raised by the community and still provide stable employment.

1. Immediate reduction in the industry's lease area by 15 percent. This allows local mills to operate while coexisting with emerging industries and recreational users.

2. Implementation and monitoring of Best Management Practices (outlined in Section 7.0 of this report) of the log lease area to assure that log handling, debris containment, dredging and lease maintenance meet the highest standards of performance.

3. Review of log storage requirements every five years to ensure the industry is responding to community needs and preserving economic and employment opportunities. This will include monitoring of log movement and developing a transparent data base for future log storage decisions. Ongoing monitoring will allow log lease areas to reflect changing community priorities and the industry's ability to adapt.

5.0 Option Two: Prepared by Snuneymuxw First Nation

The Snuneymuxw First Nation is working to restore the health of the estuary, protect cultural and traditional practices associated with the estuary, ensure there is balance in the economic initiatives associated with the estuary and participate fully in management of the estuary.

SFN has stated the following goals:

1. Spread out the impacts along the log highway because it is not suitable to focus on just one garage. If you ask any commercial fisherman, focusing the environmental impact in one area is not beneficial to anyone.

2. Preserve the environment. The First Nation is the first to be affected by the diminished health of the Estuary.

3. Restore shellfish areas. The shellfishery is an important food source, as well as a viable source of revenue for the First Nation and for the individual membership.

4. Diversify the economies associated with the estuary. One economic driver is not enough. There must be a balance between Forestry, Shellfish and Fisheries.

5. Keep Industry in the area. A viable industry is of benefit to the entire community. We will endeavour to balance environmental health with the industrial uses and recreational uses of the Estuary.

Snuneymuxw First Nation proposal:

- Seriously scale back the storage areas.
    - Lease area 106 impacts shellfish areas.
    - Lease area 101 directly impacts the shoreline in front of IR #1 by impeding navigation for canoes; and limiting ability to fish.
    - Lease area 103 directly impacts the migration of salmon due to the congestion of the western arm of the river at low tides.

- Maintain and reconfigure lease site in front of Coastland.
    - This will keep a suitable amount of wood in front of Coastland, thereby reducing the need and frequency of movement of booms in from the “warehouse”.

- Use the “warehousing” method brought forward by the Industry User Group which has one warehouse with areas assigned to each User.

- Find innovative other ways and develop new technology to address shipping and storage.

- Shorten the lease terms to 5 years, with Terms and Conditions for an automatic review with renewal provisions and mechanisms to reduce the “warehouse” area when a mill closes permanently.

- Provisions for habitat enhancement and replacement as per DFO policies

6.0 Option Three: Prepared by Nanaimo Community Estuary Support Coalition

The NCESC, representing a range of local and regional community groups and individuals, has stated their opposition to the perpetual use of Nanaimo River estuary for log storage and handling. NCESC's goal is to eventually eliminate log storage on the estuary in order to restore the habitat for the use of aquatic and other natural resources. Their proposal for log storage and management is outlined below.

1. **An estuary management plan should be in place before new log storage leases are issued.** Existing leases should be extended until a management plan is adopted as "locking in" long-term leases may severely compromise plan options.

2. **Reduce the current log storage area by approximately 50%** and give existing local mills within the estuary priority access to the remaining lease areas.

3. **Reconfigure remaining lease boundaries as required** to impose the least possible impact on ecological values within the estuary and allow for effective monitoring.

4. **In the event of a permanent mill closure or relocation, terminate associated log storage leases** and return that area to a natural state.

5. **Lease durations to be a maximum of 5 years with options to renew at 5-year intervals subject to a habitat surcharge** that would be dedicated for restoration work within the estuary as determined by the management plan.

6. **The estuary management plan must contain a strategy for reduction and future elimination of log storage within the estuary**.

NCESC believes that this proposal would allow local mills within the estuary to continue operating but require external mills to seek other options for some of their log storage. It would also enable a significant portion of the current log storage lease area to revert to productive habitat for water birds and aquatic species such as salmon and shellfish.

The NCESC also supports recommendation by 1980 log management sub-committee that:

> "What is now needed is the overall coastal study, to develop an overall approach to resolving the larger coastal problem and thereby end the ad hoc approach of solving fishing-forestry conflicts on an estuary-by-estuary basis"
> *Log Management Sub-Committee, 1980*

In addition the NCESC suggests that such a coast wide review should consider :

- The need to spread costs of system changes through businesses benefiting from present arrangement.
- Promoting “just in time” delivery, so the right logs arrive at the right mills, at the right time.
- Identifying solutions which consider “Triple Bottom Line”—Economic, Social and Environmental.

7.0 Best Management Practices for Log Management

Best Management Practices (BMP's) for log management in the Nanaimo estuary have been prepared by the Nanaimo Forest Industry User's Group, and are included in Appendix A. The BMP's include recommendations for all phases of log transportation and storage including source control, transportation, log boom storage and lease maintenance, breaking open booms, and sawmill debris containment and disposal, as well as recommendations for dredging and public education.

While all members of the LWG support the adoption of BMP's in general, members of the group requested independent review of the draft BMP's. A cursory review was subsequently carried out, but the LWG has not since convened to consider the review comments and finalize recommended BMP's.

8.0 Proposed Lease Administration Measures

The following proposed lease administration measures have been prepared by the Nanaimo Port Authority, but have not been reviewed or adopted by the LWG as a whole.

8.1 Administrative Arrangements for Managing Log Storage Leases

- Lessee will operate using Best Management Practices and in compliance with applicable laws and regulations.
- Logs will be stored only in approved designated areas.
- Existing lease lines and boundaries should be adjusted in to allow for a maximum of 4 booms wide (320') per side, where possible, to assist in monitoring storage areas.
- Lessees to provide to the Port on a monthly basis estuary log inventory data and mill consumption data for use in future review periods.
- Lessees will continue to be responsible for inventory control and related debris removal from the estuary as required by the Port.
- Provide a twenty-year lease term with five-year review periods that assess the needs of industry for log storage within the estuary, examines the opportunity for reduction and allows for adjustment of lease areas based on industry storage requirements.
- Port has authority to control and direct movement of vessels and booms for safety and navigational purposes.

8.2 Monitoring BMP's and Environmental Impacts.

The Port will assist in monitoring lessees for compliance of Best Management Practices during regular lease inspections using patrol vessel and staff. Inspections and monitoring should also include participation by other Agencies having jurisdictional responsibility for protection of environment.

Baseline environmental monitoring program that focuses on the impacts associated with log storage on the benthic substrates and biota in areas affected and unaffected by log storage needs to be implemented to access effectiveness of Best management Practices and their impact on the estuary.

8.3 Reviews for Effectiveness of BMP's and the Need for Log Storage

The Port recommends five-year review periods that include the evaluation of log consumption and log storage needs of dependent mills and review of any mill affected by permanent closure to determine the economic, social and environmental impacts.

9.0 Habitat Restoration Opportunities

Discussions through the LWG have indicated opportunities for habitat restoration in areas affected by log storage are limited, as restoration can potentially be more harmful than beneficial, due to the greatly increased level of disturbance associated with any restoration methods (dredging, scouring etc). The best course of restoration may be to allow the area to recover according to natural processes.

Appendix A:Best Management Practices for Log Management

The following proposed Best Management Practices (BMP's) for log management in the Nanaimo estuary have been prepared by the Nanaimo Forest Industry User's Group. While all members of the LWG recommend the adoption of BMP's in general, the recommendations provided within this section have not reviewed or formally supported by the LWG as a whole, and therefore represent a proposal submitted by the IUG at this time. An independent review of these BMP's carried out by C. Picard on the request of DFO and SFN has also not been formally reviewed by the LWG for consideration in final recommended BMP's.

The proposed BMP's are based on the following principles:

Environmental Protection	The Nanaimo Forest Industry Users Group (IUG) will manage their operation and activities in a manner that protects the environment, placing special emphasis on Estuary habitat, navigational safety and water quality.
Source Control	Forest companies who deliver wood into the Estuary will conduct "source control" of debris in the logging operations to minimize the amount of wood breakage and debris, and provide containment to prevent escape into the Estuary environment.
Contain & Dispose	IUG will contain and dispose of debris in an approved manner
Communicate with Community	IUG will be open and responsive to community views and questions regarding industry operations on or surrounding the Estuary. Also promote the co-existence of log storage activities and other users in the Estuary
Estuary Protection & Rehabilitation	IUG will promote and support Estuary protection and rehabilitation.

1 Source Control: Dryland Sort Operations & Watering Logs

Intent

- ⇨ To minimize the amount of debris generated from the logging operations and during the sorting of logs and bundles.
- ⇨ To reduce or eliminate the amount of wood waste in or around log bundles.
- ⇨ To avoid and control the introduction of wood waste into bundles prior to transport.

Practices:

- ▫ Unmerchantable pieces of logs should be left at the landing and not incorporated into the loading phase.

- Bundle wires must be secured tightly around logs to prevent escape, breakage or excessive shifting of logs during all handling phases.
- Boom preparation at the log dumping source must be done in such a way that ensures localized debris is not incorporated into the boom.
- Barges must be loaded in a manner that prevents or minimizes breakage inside bundles of logs.
- Boomsticks must be high quality and high floating. Special emphasis must be placed on ensuring headsticks and tailsticks are appropriate for towing.
- Log booms must be securely constructed to minimize breakage and loss of logs and debris. Minimize the space between boomsticks to control debris escapement.
- The foreshore and intertidal zones must be kept clear of debris.

2 Log Transportation

Intent

- ⇨ To ensure proper construction of log booms prior to towing.
- ⇨ To ensure proper towing as a means of reducing the generation and escapement of debris.

Practices:

- Any persons or company associated with log transportation must inspect booms prior to transportation to ensure booms will not break apart during the towing process or storage.
- Poorly constructed booms with sub-standard boom sticks should be refitted with safety straps and should be repaired prior to towing to prevent log escapement.
- Deadheads that are identified within the boom must be secured to avoid loss during towing and delivery.
- Where deadheads have escaped they must be towed directly into a mill or be securely placed on top of a bundle to prevent loss.
- Existing debris within the booms should not be allowed to escape when breaking down large coastal tows into single string tows.
-

3 Nanaimo Estuary Log Boom Storage & Lease Maintenance

Intent

- ⇨ To store booms in safe and secure manner within the log storage lease boundaries.
- ⇨ To use the highest quality materials available for dolphins.
- ⇨ To ensure prompt replacement and proper disposal of old or broken dolphins.
- ⇨ To control and fund debris removal from the Estuary

Practices:

- Booms should be stowed in the most compact configuration practical when placed in the leases and when moved to permit removal of inside booms. This will minimize strain on tie-up gear and possibility of wind damage or escapement.
- Steel dolphins should be considered where longevity overrides other considerations. All dolphin tie-up wires must be maintained to prevent loss or boom break up.
- Old dolphins serving an environmental purpose shall remain in place after consultation with regulatory agencies... Old or broken dolphins that are identified for removal must be disposed of in an approved manner.
- IUG will continue to fund, in accordance with agreements with the NPA, the removal of waterborne debris generated from the logs boomed in the Nanaimo Estuary. This agreement is to be administered and managed by the NPA.
- IUG will review on an annual basis with the NPA whether the current agreement on water borne debris is adequate.
- The NPA will ensure that the local beachcombers are performing their job function to reduce the presence of loose logs in the Nanaimo Estuary and surrounding area.
- Tow Boat Yarding contractors will secure all log booms in a secure and safe manner.
- IUG will salvage sunken or deadhead logs in the Estuary periodically as required.

4 Breaking Open Booms

Intent

- ⇨ To catch and contain existing debris in booms after breaking open.
- ⇨ To ensure that further debris is not generated during the breaking open of booms.
- ⇨ To reduce, reuse and recycle all bundle wire and bucked boomstick ends.

Practices:

- Forest companies must strive to meet their first objective of controlling debris at the source or mill-site location.
- Booms must be opened in a controlled log pocket that is designed to contain any released debris and prevent the escape of floating debris.
- Where conveyor systems or log lifts are available at the mill, mill personnel are to direct as much debris as possible into the infeed system for chips or hog fuel use.
- Bucked boomstick ends must be contained on lines for dewatering and ultimate use in firewood, chipping or hogging operations.
- All bundle wires must be recovered, saved or recycled.

5 Sawmill Debris Containment & Disposal

Intent

⇨ To reduce, reuse, recycle or dispose of all debris from sawmill processes.

⇨ To ensure the proper containment and disposal of all recognizable debris.

Practices:

- Mills must strive to recover wood debris on-site. Debris should be sorted for its ultimate and maximum value to reduce the amount of manageable debris delivered to disposal sites.

6 Dredging

Intent

⇨ To understand and follow the regulatory process for the dredging and disposal of sediment and debris from the mill environment.

Practices:

- Dredging operations must commence only after receipt of an approved dredging permit from the Federal Department of Fisheries and Oceans. Activities must take place within the "window" identified in the approval.
- Mill personnel must supervise any dredging contractor to ensure requirements of the dredging permit are adhered to. Only approved disposal sites and procedures may be used for the disposal of dredging debris.

7 Education

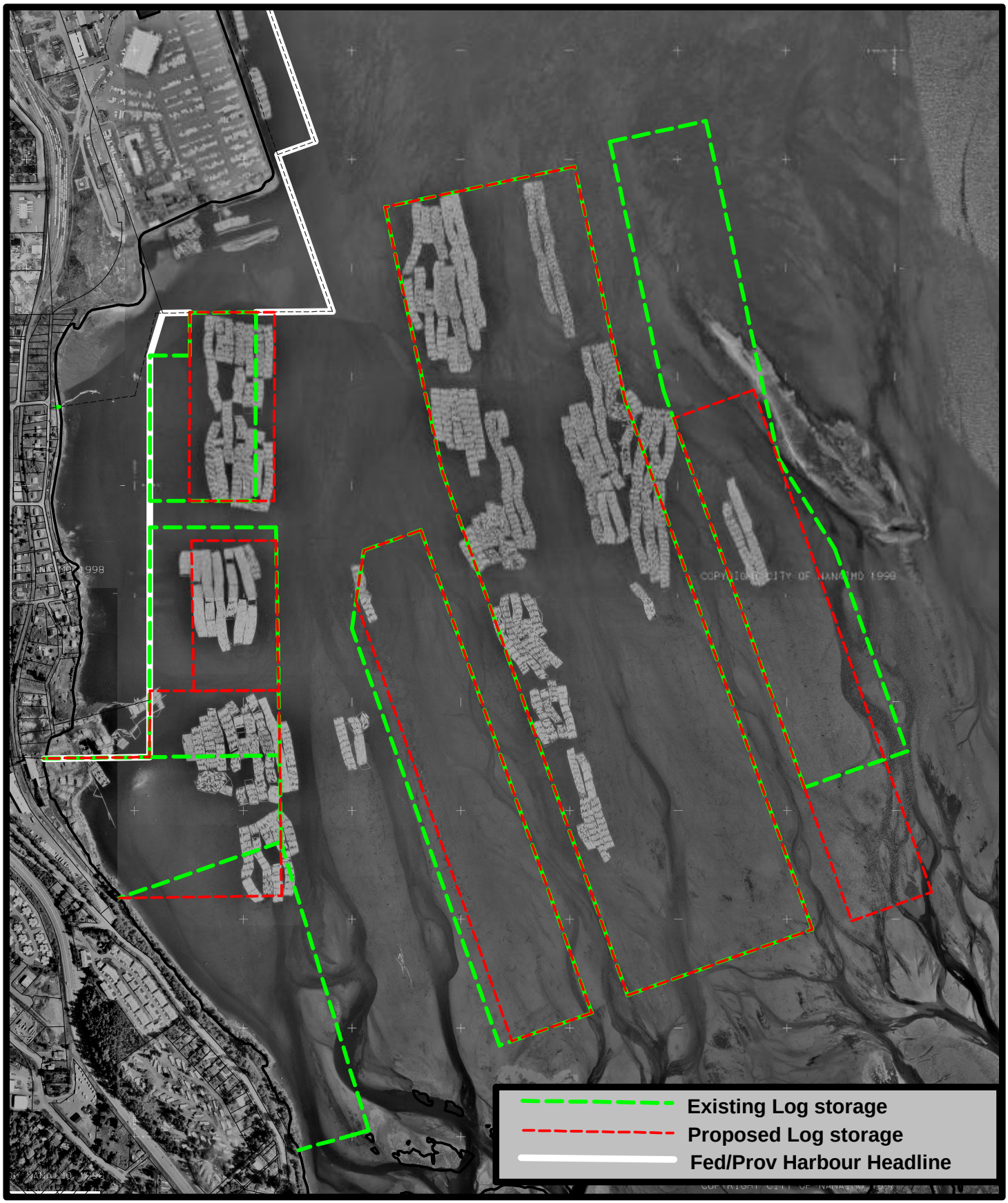
Intent

⇨ To ensure that the general public and regulatory agencies are kept informed of all aspects regarding log booming in the Estuary.

Practices:

- The Industrial Users Group will encourage and participate in opportunities that promote the coexistence of log storage activities with other estuary users
- The Industrial Users will work within the Estuary Management Plan to coexist with other estuary users.

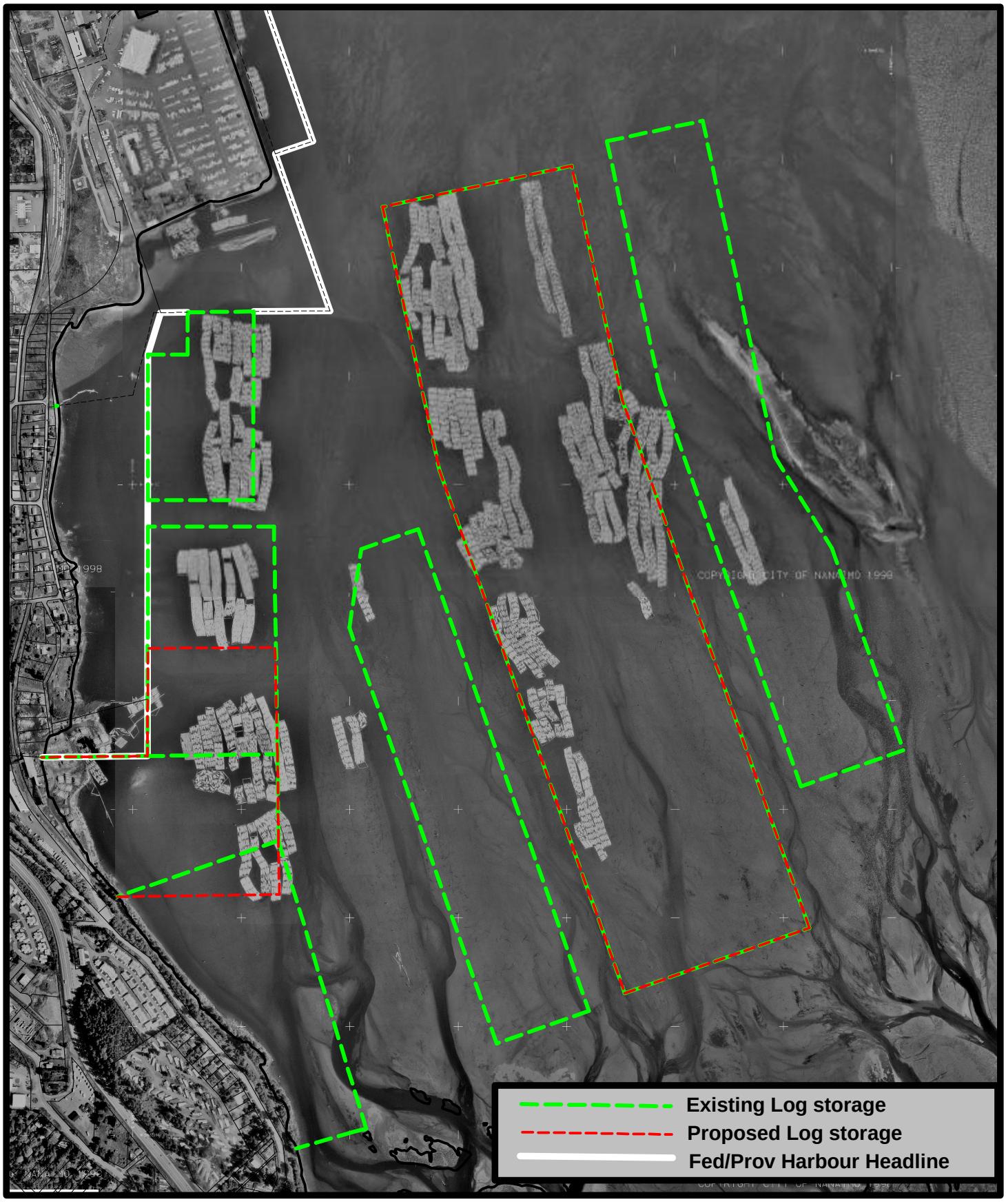
Figure 1: Overview of the Nanaimo Estuary



File = S:\Mapinfo\Base\BrianM_waterLots.wor

Industry Users Group

Option / for Log storage areas within Nanaimo River Estuary



File = S:\Mapinfo\Base\BrianM_waterLotsSnuneymeux.wor

Snuneymuxw First Nation

Option / for Log storage areas within Nanaimo River Estuary

British Columbia's Water Highways