Additional documents : Draft Comox Valley Project Fact Sheet

DRAFT PROJECT FACT SHEET FOR COMOX LAKE WATERSHED – MNAI PROJECT
[Subject to change]

Annex 1 January 17, 2019

Municipal Natural Assets Initiative Project Fact Sheet
Comox Lake Watershed

1 Purpose of Document

This document describes the Municipal Natural Assets Initiative (MNAI) project in the Comox Valley Regional District (CVRD), BC. It provides a basis for the MNAI launch workshop and for communication and outreach with internal and external stakeholders.

2 MNAI Background

MNAI collaborates with municipalities to develop resilient, long-term infrastructure alternatives at substantial savings. MNAI employs practical strategies to value nature's ability to provide municipal services and to incorporate this information into mainstream asset management systems. This practice is known as municipal natural asset management.

Experience to date shows that this can lead to positive changes in operations and maintenance plans and associated financial planning; development cost and subdivision bylaws, financial planning and reporting, and many other aspects of local government.

3 Project Context

The Comox Lake watershed (Figure 1) is the drinking water source for over 45,000 people in the City of Courtenay, the Town of Comox, and the CVRD electoral areas, as well as over 3,700 people in the Village of Cumberland. In 2018, the K'ómoks First Nation (KFN) signed a Mutual Benefit Agreement confirming cooperation and collaboration in the management of water resources in the region. The agreement includes plans to extend water services to KFN lands and greater participation by KFN in the management of regional water resources.

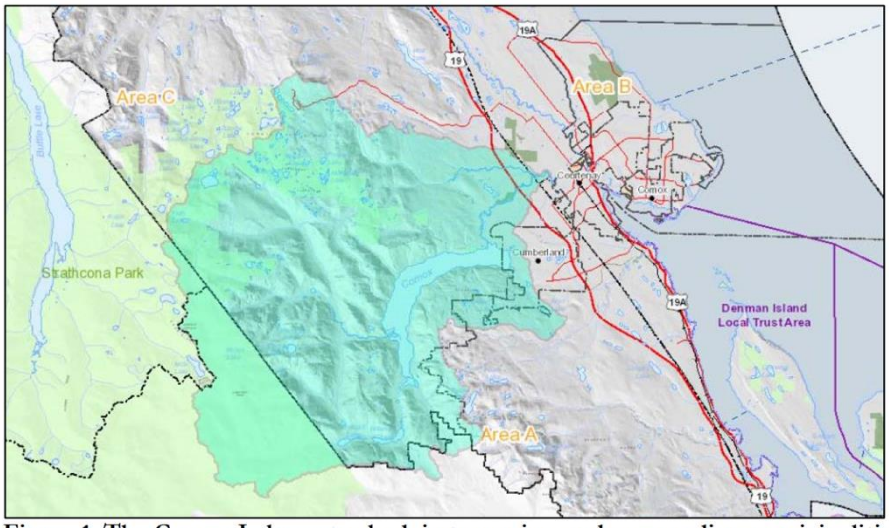

Figure 1. The Comox Lake watershed, in turquoise, and surrounding municipalities.

Policy related to the administration and operation of the Comox Valley water system is determined by the Comox Valley water committee, and comprises directors from Electoral Areas A, B, and C of the CVRD, as well as from the City of Courtenay and the Town of Comox. The water committee provides advice and recommendations to the CVRD board for actions such as adopting bylaws or entering contracts. Voting is weighted based on the water consumed in each participant area. Municipal administrators, engineering and operations staff as well as KFN serve as non-voting members of the water committee.

Policy for the administration of the Village of Cumberland water system is determined by the Council from the Village of Cumberland.

A major challenge in the Comox Lake watershed is that it is a multi-use watershed with multiple owners (Figure 2). Along the shoreline, there are nine different categories of landowners or responsible jurisdictions. The lands and waterways in the watershed are popular recreational destinations for swimming, boating, fishing and hiking, along with active logging throughout much of the watershed. The waterways of the Comox Lake watershed also provide critical fish and wildlife habitat and hydroelectric power generation, and supply drinking water to approximately 45,000 people in the Comox Valley.

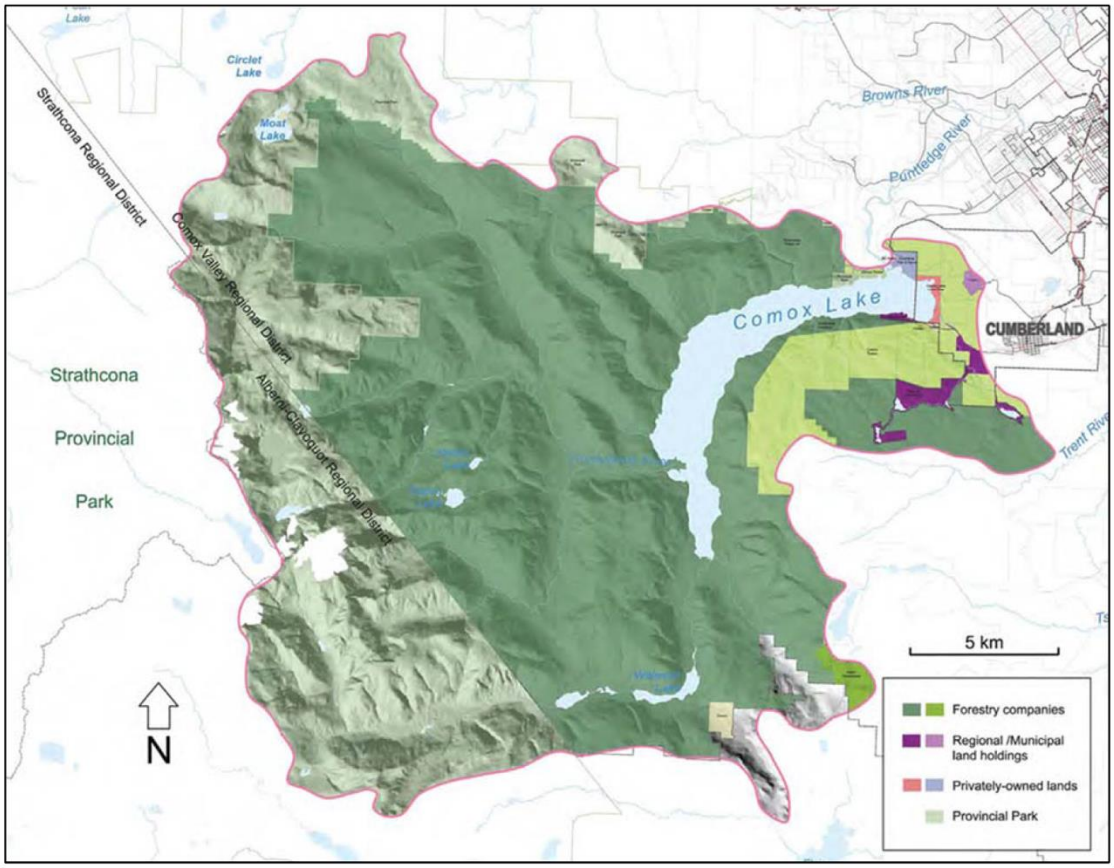

Figure 2. Ownership of lands in the Comox Lake watershed

The Village of Cumberland's water is supplied from a series of reservoirs within the Perseverance watershed, which is one of the sub-watersheds of the Comox Lake watershed. This system supplies drinking water to approximately 3,753 people in the Village of Cumberland (along with bulk water sales to approximately 2,000 people in Royston located in CVRD Electoral Area A). To date, this water system has met the requirements for filtration exemption, due to low levels of turbidity and *E. coli*, and a watershed control program that minimizes the potential for fecal contamination in the sources water. The naturally high quality of the water in this system currently provides a cost savings to the Village of Cumberland by avoiding the need for a costly water filtration plant. As such, the ability of the watershed to provide clean water for the Village of Cumberland is of great importance.

While heavy rainfall is common during the winter months, summer months are often characterized by extended periods with little to no rainfall. Periods of extreme low inflows can result in water shortages, requiring implementation of water use restrictions. Water levels in Comox Lake are controlled by BC Hydro for power generation purposes, and managed according to the Puntledge River Water Use Plan. However, there is also growing concern that dropping lake levels during an extreme drought could result in the complete cessation of flows in the Puntledge River.

High rainfall and inflows to Comox Lake in the winter months can adversely affect water quality via increased turbidity levels which have led to the requirement of boil water notices in the Comox Valley water system and ultimately the need for a water filtration plant for this system, which is currently in the planning stages. This project, which includes a new intake in Comox Lake, as well as pumping stations and pipelines, force mains, transmission mains and a filtration facility, is estimated to cost $110 million and will bring the Comox Valley water system into compliance with the provincial guidelines.

To better understand the potential effects of climate change on water availability, the CVRD engaged the Pacific Climate Impacts Consortium to model climate change impacts on hydrology for the Comox Lake watershed. The results of this work indicated the high likelihood of more and higher intensity rainfall events in the winter, and more and longer drought events in the summer, with overall warmer temperatures leading to a rain-dominated hydrological system rather than the hybrid snow-rain hydrological system that currently exists. These changes could have significant impacts on water quality and water availability for the Comox Lake watershed. As such, it would be beneficial to have a better understanding of the factors that could influence the capacity of the watershed to absorb excess winter water and prolong the release of water through warm/dry weather periods.

4 Project Details

The following sections summarize key details of the scope and objectives of the MNAI project:

4.1 Goal

The overall goals of the MNAI project are (i) to understand the current and possible future roles of natural assets in the Comox Lake watershed in providing safe, reliable drinking water supplies for residents of the Comox Valley, and (ii) to develop strategies for their effective management based on this understanding. Objectives in support of this goal include: (i) quantifying the value of the Comox Lake watershed as a natural asset and a critical component of water quantity and quality in our drinking water systems and (ii), determining associated costs and benefits relative to engineered alternatives (Cumberland water filtration) and/or long term operations and maintenance for engineered assets (CVRD water treatment plant).

4.2 Natural Assets of Interest

The Comox Lake watershed, including its sub-watersheds, is the primary asset of interest. The watershed spans 460 km2, with approximately 2/3 of this area under private ownership by forestry companies. Most of the remaining area is part of Strathcona Provincial Park, with a small amount under municipal land holdings and other private ownership.

Specific questions that will be explored include the value of natural assets relative to strictly engineered solutions for:

- The entire watershed in providing naturally high quality drinking water for the Comox Valley water system
- The Perseverance sub-watershed in providing drinking water meeting or exceeding the provincial and federal criteria for surface water drinking supplies for the Village of Cumberland

4.3 Biophysical Aspects and Services of Interest

- Biophysical aspects:
- The Comox Lake watershed falls on the central eastern coast of Vancouver Island. The watershed is fed by headwater streams and the Comox Glacier, which stands at 2000 m elevation. Most of the land in the watershed is undeveloped forests, approximately 2/3 of which is in active forestry. Over 10 tributary rivers and creeks feed into Comox Lake, which has a surface area of 21 km^2.
- The Comox Lake watershed is within the Coastal Western Hemlock and Mountain Hemlock biogeoclimatic zones. Their key feature from a water quality perspective is that the zones are considered "summer-dry maritime" zones – areas where little rain occurs in the summer months but heavy rainfall often occurs in winter months; and where large wildfires occasionally occur. Historically, the trees in the watershed grew to be very large and had strong root masses capable of withstanding very high stream flows. These same roots were able to stabilize steep slopes present in many areas of the watershed.
- Much of the watershed consists of a bedrock subsurface, however there are areas of unconsolidated glacial till toward the eastern edge of the watershed which are subject to erosion when exposed to overland flow or stream flow. The erosion of glacial till and other unconsolidated sediment contributes turbidity to Comox Lake during and after heavy rainfall events. Turbidity in Comox Lake has been one of the main drivers for construction of a water filtration plant for the Comox Valley water system. (The Village of Cumberland water system currently has filtration deferral due to high raw water quality.)
- Services:
- The ability of the Comox Lake watershed to provide a reliable, high quality raw water supply for the Comox Valley water system and Village of Cumberland water system
- Reduces water treatment costs for the Comox Valley water system, and continues to provide a surface water supply meeting the requirements for filtration exemption for the Village of Cumberland
- Supports indigenous cultural practices
- Provides fish and wildlife habitat
- Provides recreational opportunities including mountain biking, swimming, boating, fishing and hiking; and includes two lakeside campgrounds, one of which is part of the Comox and District Fish and Game Protective Association facilities.
- A dam on Comox Lake controls water for BC Hydro's hydroelectric power generation

4.4 Scenarios Under Consideration

- Status quo / baseline scenario
- Asset Management best practices
- Climate change impacts
- Other scenarios based on input from the MNAI working group

4.5 Possible Operational Outcomes

Each project collaborator (see Section 4.8) has different roles and responsibilities relative to the watershed. Broadly speaking, however, the following operational outcomes are foreseeable as a result of this project:

- Influence watershed protection plans
- Integration of natural asset purchase/restoration into capital plans
- Development of an Operation and Maintenance (O&M) plan for natural assets
- Zoning changes and setbacks
- Land use and access
- Collaborative approach to watershed protection and management

4.6 Outline of MNAI Approach

- Review historical natural systems
- Define the boundaries of the watershed
- Identify and work with jurisdictions and key stakeholders in the watershed
- Identify current assets and their condition
- Determine functions and service levels from current natural assets and integrate this information with the existing Asset Management process
- Determine required service levels in future scenarios
- Model asset changes that would meet required service levels
- Determine estimates of the lifecycle costs
- Financial modeling
- Land use discussions
- Communications approach (internal & external)

4.7 Data Sources, Needs, Gaps

- There are numerous data sources for the project including:
- Capital plans
- BC Hydro modelling process/data
- CVRD data on water quality, rainfall, water temperature, water use – current and projected – and more. LiDAR data has been collected and is now being processed.
- Village of Cumberland water quality and water use data
- Pacific Climate Impacts Consortium data
- Land use/land cover data
- Digitized point locations for known areas of erosion concern and an initial assessment to indicate areas of high, medium and low concern
- Soils data, which can likely obtain from provincial datasets

Furthermore:

- Integrating AM with the watershed protection and drinking water management planning will support lifecycle decision-making and prioritization associated with possible outcomes outlined in 4.5
- There is a need to clarify the asset management framework we are going to use for the watershed