

## Our Vision

To protect, enhance and restore the health of Esquimalt Lagoon for future generations of people, plants and animals.

Founded 2001



September 2012 - ELSI and community volunteers at the annual Great Canadian Shoreline Clean-up.

## Our Goals

- Promote and support lagoon stewardship and education
- Prevent further loss or destruction of habitat and wildlife
- Reduce contaminant inputs to the lagoon
- Promote environmentally protective recreation uses in the lagoon area
- Promote environmentally protective land uses

## Background

**The Esquimalt Lagoon Stewardship Initiative (ELSI) is a broad coalition of community and environmental groups, institutions, government and First Nations working together to protect, enhance and restore the Esquimalt Lagoon and Coburg Peninsula.**

After its founding in 2001, ELSI developed a Stewardship Plan for Esquimalt Lagoon which provides the framework for a coordinated approach to environmental management. ELSI creates opportunities for collaboration on environmental projects and outreach activities, and provides a forum for exchange and sharing of information.

ELSI is led by a consensus-based steering committee responsible for guiding the implementation of the Esquimalt Lagoon Stewardship Plan. ELSI is chaired by the Capital Regional District (CRD) Harbours and Watersheds Coordinator. A part-time assistant coordinator, funded through the CRD, initiates and manages projects, seeks funding and coordinates ELSI.

## 2012 Accomplishments

In 2012, the CRD installed a flow monitor with water quality probes on Colwood Creek and completed Year 2 of water quality sampling in Esquimalt Lagoon and several tributaries, focusing on Colwood Creek, the largest freshwater input. Once analyzed, the data will aid in establishing water quality objectives for these harbour areas.

Through volunteer and staff time, 2012 accomplishments included:

- Publication of UVic MSc. thesis focusing on harmful algal blooms within the lagoon
- Broom pulls by community volunteers, surveys for beached-birds and coastal waterbird populations, continued fish monitoring, propagation of native dune grass for restoration work and continued restoration of Bee Creek
- 5th year of dune habitat monitoring with Camosun College
- Development of a 5-year Harbours work plan

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## ELSI Committee

- Canadian Wildlife Service
- Capital Regional District
- City of Colwood
- City of Langford
- Esquimalt Lagoon Enhancement Association
- Local residents
- Parks Canada
- Royal Roads University
- SeaChange Marine Conservation Society
- Victoria Natural History Society

## Advisory Members

- BC Ministry of Environment
- Department of National Defence
- Environment Canada
- Esquimalt Nation
- Fisheries and Oceans Canada
- Songhees Nation



Colwood Creek (Fall 2012) Investigating potential locations for flow monitoring.

## Water Quality & Flow Monitoring

To support the development of water quality objectives, CRD staff measured surface water quality in Esquimalt Lagoon, Esquimalt Harbour and Victoria Harbour in 2011 and 2012. Sampling was conducted during the wet and dry seasons to quantify stormwater runoff: the difference between rainy and dry conditions. Sample analysis includes fecal coliform and enterococci bacteria, dissolved oxygen, pH and salinity, some metals, nutrients and PAH (polynuclear aromatic hydrocarbons) a potent atmospheric pollutant. The results will be compared to BC Ministry of Environment water quality guidelines (WQG).

Water quality in Esquimalt Lagoon was generally good. Copper, enterococcus bacteria and fecal coliform bacteria exceeded WQG in the rainy season and were associated with input from Colwood and Selleck Creeks. Fecal coliform bacteria met guidelines for recreational contact (200 CFU/100 mL) but exceeded guidelines for shellfish harvesting (14 CFU/100 mL). High zinc levels were found along the inner lagoon nearshore of Ocean Boulevard. High nitrate at several locations is likely due to waste from birds in this migratory bird sanctuary.

Colwood Creek's health is assessed because it is the largest input to Esquimalt Lagoon. Fecal coliform exceeded recreational guidelines in wet and dry weather, indicating that sewage is infiltrating the creek. Dissolved oxygen levels were low which can cause adverse effects on fish and invertebrates. Copper levels were high in the wet season, possibly due to rainwater runoff from roadways. In late 2013, after a year's continuous flow, turbidity and pH monitoring, analytical results from the collected water quality data will contribute to the development of water quality objectives for our harbours.

## Lagoon Water Quality Research

University of Victoria student, Arielle Kobryn, successfully defended her MSc. Biology thesis entitled "Development of harmful algal blooms in a coastal lagoon: the influence of physicochemical processes and phytoplankton ecophysiology" (2012). Arielle conducted research at Esquimalt Lagoon (2009-2011) and concluded that the two major factors contributing to oxygen depletion (and subsequent fishkills) were high microalgal biomass and reduced tidal flushing in the late summer and fall. The study recommended that streams entering the Esquimalt Lagoon be tested for elevated nutrients as a potential source of human impacts in the watershed and, given appropriate action.

## Bee Creek Restoration

Sustained by dedicated community volunteers, the Bee Creek restoration (started in 2005) has continued to take root. Meandering through the Essencia property, the restoration has steadily improved the health of both fish and riparian habitats. Phase one involved removing the large dam that was historically used to generate hydro-electricity and constructing a naturally-shaped channel through the area. Phase two involved replanting riparian vegetation along

the stream banks in the lower section of the stream and removing the small dam near the estuary. Currently, phase three is focusing on removal of invasive plant species, propagation of native plants, preservation of wildlife habitat (bird nesting areas, otter habitat, trout and salmon habitat) and education.

### Fish Monitoring

Since 2004, ELSI volunteers have run a Community Fish Monitoring Program in the creeks that flow into Esquimalt Lagoon. The goal is to determine what types of fish use the creeks during different seasons and identify any changes in this pattern over time. Monitoring confirms that there are resident populations of cutthroat trout throughout Bee Creek and Colwood Creek. As well, coho salmon fry are regularly found in Colwood Creek. Low summer flows may be a concern for these populations.

### Stewardship and Outreach Events

ELSI volunteers continued to host broom pulls on Coburg Peninsula and shoreline clean-ups around the lagoon. These events always bring out a wide range of volunteers and are a great way to build awareness in the community. ELSI's participation in the Canada Day celebrations at Fort Rodd Hill National Historic Site is another opportunity to educate and connect with

residents. ELSI volunteers continued their regular on-going beached-birds survey and, in partnership with Canada Wildlife Services, also conducted coastal waterbird surveys.

### Pilot Dune Habitat Restoration Project

In 2012 ELSI volunteers collected Native Dune Grass (*Elymus mollis*) seeds and propagated them in a local green house for transplanting into degraded areas of the dune habitat.

Initiated in 2007, the ELSI Dune Habitat Restoration Pilot project work is to restore native dune habitat by establishing and monitoring demonstration restoration plots, realigning benches with beach access points and promoting stewardship and awareness of dune habitat. Since then, David Blundon, a professor in the Camosun College Biology Department, has brought over 300 ecology students out to the Coburg Peninsula to monitor the sites. The goal is to determine if habitat restoration can be achieved simply by keeping people and dogs off the dune or if supplemental planting of native plants is also necessary. Thus far, results show that the planted native species, silver burweed and dunegrass, are now the dominant cover and are doing well in the planted areas, however, no better than in the unplanted areas. Trampling remains a strong factor in deterring plant growth. Erosion of the dune habitat along the peninsula has increased since the closure of the gravel pit.

## Thank you!

Many thanks go to the dedicated volunteer members of ELSI and the community who gave many hours of their time to help accomplish the major projects undertaken in 2012.

Bee Creek - Regular Thursday morning volunteers, Judy Nault, Helen Martin and Bob Sibbald. Volunteers remove invasive plants, plant and care for native plants. Over the years, volunteer time and energy has made Bee Creek an exemplary riparian restoration.





Esquimalt Lagoon, bridge and DND degaussing house.

### CRD Harbours Environmental Action Program - 5-Year Work Plan

In 2012, after a multi-year, inter-municipal review, the CRD Board adopted amendments to the CRD Harbours Service Establishing Bylaw, updating the original 2010 bylaw. This review included development of a 5-year work plan, to which ELSI provided input. The CRD will continue to support ELSI and other initiatives which contribute towards meeting their goals under the Core Area Liquid Waste Management Plan.

The 5-year Harbours Environmental Action Program work plan laid out the following key service components:

- Flow Monitoring and Contaminant Loading;
- Development of Water Quality Objectives for the CRD core area harbours;
- Habitat Inventory and Protection;
- Consultation for development of 50-year plan for the harbours; and
- Initiative Coordination and Participation

For more information, contact:

**ELSI Coordinator**

T 250.360.3299  
F 250.360.3047  
E [info@elsi.ca](mailto:info@elsi.ca)

625 Fisgard Street  
PO Box 1000  
Victoria, BC V8W 2S6

[www.elsi.ca](http://www.elsi.ca)



## What's Next?

In 2013, ELSI will focus on:

- working with our partners to improve water quality in the lagoon and investigating nutrient sources entering the lagoon and its tributary creeks
- working with the Ministry of Environment and the CRD Integrated Watershed Management Program to establish water quality objectives for Esquimalt Lagoon as part of the Harbours Environmental Action Program
- conducting flow monitoring of Colwood Creek
- working with Songhees and Esquimalt Nations, and the Municipality of Colwood to install the interpretive signs and cedar mural, and hold a dedication ceremony to bless them
- promoting activities that engage the community in stewardship of the Esquimalt Lagoon watershed