TOWARDS A STRATEGIC APPROACH FOR IMPROVING ECOSYSTEM HEALTH IN ELK /BEAVER LAKE CAPITAL REGIONAL DISTRICT PARK by Mick Collins and Robert McConnell, Co-Chairs Elk/Beaver Lake Initiative, Victoria Golden Rods and Reels Society www.goldenrodsandreels.com

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INTRODUCTION

On October 29, 2015 over 200 people attended a public forum at the University of Victoria co-hosted by Victoria Golden Rods and Reels Society (GRR) and the UVic Environmental Law Centre (ELC). The purpose was to update participants on water quality issues in Elk/Beaver Lake and discuss potential remediation measures. Ten stakeholder organizations set up booths to highlight their activities and three speakers gave presentations and fielded questions, moderated by Calvin Sanborn, ELC Legal Director.

This event marked the culmination of two and a half years of collaborative scientific research between governments, academic and non -profit organizations. A video of the event, speaker PowerPoint presentations, and reports is located at http://colquitzcoalition.com/publications-and-data

The purpose of this brief report is to contribute to the ongoing process of comprehensively addressing how the health of the Elk/Beaver Lake ecosystem and its watershed can be improved.

The report is designed to outline and facilitate discussion on science based steps which can be taken in both the short and longer term.

The Five Elements of Ecosystem Health for Elk/Beaver Lake

There is now a general consensus that a holistic, integrated approach should focus on five **inter-linked** topics. We are advocating increased, collaborative**, ENVIRONMENTAL MANAGEMENT**. Before a problem can be effectively managed it must be understood to the fullest extent possible by qualified scientists, engineers, etc., bearing in mind that lake ecosystems are inherently complex and can be unpredictable.

1. WATERSHED MANAGEMENT

   Numerous studies and projects around the world demonstrate that controlling nutrient inputs to eutrophic (enriched) lakes is beneficial. Although annual external nutrient loadings to Elk/Beaver Lake are estimated to be no more than 15% of total loading, reducing these loadings is important. They are concentrated in the winter months and contribute to seasonal blue-green, toxic algae blooms and the instability of the unbalanced lake ecosystem.

A relatively inexpensive practical project which could be undertaken immediately is to inspect and upgrade (as necessary) about a dozen culverts which carry storm water from the Pat Bay Highway and elsewhere into the lake. Even directing storm water through buried metal containers of porous material can be effective in reducing nutrient inflows. Other measures can be identified when producing a **WATERSHED MANAGEMENT PLAN for both the lake itself and its incoming drainage area**.

http://www.seattletimes.com/seattle-news/environment/whats-killing-coho-study-points-to-urban-road-runoff/?utm_content=buffer54337&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer

2. WATER QUALITY REMEDIATION

Further work on costing and detailed feasibility analysis of specific remediation options to control phosphorous will likely be necessary once the report by Freshwater Research www.fwr.ca is completed, and updated Provincial water quality objectives are available. Eighty five percent of the annual phosphorous load is from internal loading, released from sediments under low oxygen conditions.

3. AQUATIC WEED MANAGEMENT

Large scale removal of aquatic weeds using a new weed harvester will have many ecological and recreational benefits. Removal reduces rotting biomass which contributes to serious summer oxygen depletion. Removing excessive weeds from the lake is imperative.

Conducting an annual weed inventory/ mapping project will assist in determining priority areas and impacts. The heaviest weed concentrations are currently south of the Rowing Centre, through "the narrows" and into Beaver Lake.

Considerable annual expenses will be incurred in harvesting, transporting and disposing of /recycling huge volumes of materials. Partial cost recovery from the sale of the harvested organic material can be investigated.

Once the weeds are controlled (year 3 or 4?) the harvester could potentially be used in other lakes during parts of the summer harvesting season. Some cost recovery may be possible through a rental program in the longer run.

GRR will continue to study the feasibility of installing boat washing facilities at the two boat launch sites to reduce transfer of weeds, etc. between lakes.

4. FISHERIES MANAGEMENT

The World Fisheries Trust www.worldfish.org has offered to work with Victoria Golden Rods and Reels Society and other partners to secure funding and conduct a scientific study to gain a clearer understanding of the current fish population and its role in the water quality /lake ecosystem health. The concern is that invasive species such as carp, yellow perch and pumpkinseed sunfish are taking over and having deleterious impacts. Information from this study will determine what, if any, management steps should be taken, e.g. netting and disposing of undesirable species. Given that carp are now established in two important Vancouver Island habitats ((Elk/Beaver and Sproat Lakes) greater knowledge of this species and its effects is paramount.

5. PUBLIC INVOLVEMENT IN STEWARDSHIP

There will be a continuing need for environmental monitoring and public education and involvement as further investments are made to improve the condition of the lake ecosystem. This monitoring/management should include not only the watershed, aquatic weeds, fisheries, and water quality, but also the overall environment. Bullfrogs, geese, invasive terrestrial plants, etc. may also pose threats to the Elk/Beaver Lake Regional Park and require science-based management.

A stewardship group (Friends of Elk/Beaver Lake Regional Park?) should be established to work with the various government organizations that share jurisdiction of the lake and its watershed.

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- Freshwater Fisheries Society of BC
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- Colquitz Watershed Stewardship Coalition
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- Victoria Fish & Game Protective Association
- Environmental Law Centre University of Victoria
- Victoria Golden Rods and Reels Society