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A Chapter of the North American Lake Management Society (visit www.nalms.org)

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NORTH AMERICAN LAKE MANAGEMENT SOCIETY CONFERENCE 2004 - VICTORIA, BC

BCLSS proudly co-hosted the North American Lake Management Society's (NALMS) 24th Annual Conference, held in Victoria, BC, from November 3 – 5, 2004. This was only the fourth time the yearly symposium has been held in Canada! The conference was titled “Lakes: Habitat for Fish, Habitat for People”.

A special thank you goes to the following BCLSS directors who contributed countless hours organizing the conference: Dr. Rick Nordin, Don Holmes, Kevin Rieberger, Eric Bonham, and Irene Calbick. Congratulations, it was a great success!

The conference was host to many valuable and interesting presentations focussing on a variety of topics, including: invasive species, aeration issues in lakes, lake restoration, stewardship, integrated watershed management, education

and outreach, climate change, assessing lake trends, managing aquatic plants and algae, and many more.

BCLSS staff member Dawn Roumieu presented on the BC Lake Stewardship and Monitoring Program. BCLSS group members who presented included: Glen and Jenia Blair of the Tabor Lake Clean-Up Society, Lionel Dallas of the Osoyoos Lake Water Quality Society, and Ian Maxwell of the Lakelse Watershed Stewards Society. All presentations were extraordinary; great work everyone!

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Host Committee - (from left to right) Rick Nordin, Irene Calbick, Kevin Rieberger, Alec Dale, Don Holmes, Kristi Carter, Dawn Roumieu, and Eric Bonham



Canada versus U.S. hockey competition - BCLSS Directors Norm Zirnhelt and Don Holmes participated.

LANGFORD LAKE - PAST, PRESENT & FUTURE

By Kevin Rieberger

Langford Lake is located on southern Vancouver Island approximately 15 km west of Victoria. It is a kettle lake, formed by the melting of an isolated block of glacial ice more than 10,000 years ago following the Vashion glaciation. Langford Lake has a surface area of 61 ha, a perimeter of 4,510 m and lies at an elevation of 62 m. Its mean depth is 6.4 m and the maximum depth is 16.7 m. Langford Lake flows from south to north through a single inflow and a single outflow to the Goldstream River. The water residence time of Langford Lake is 3.3 years.

Langford Lake provides a number of recreational opportunities including fishing (rainbow and cutthroat trout, smallmouth bass, yellow perch and pumpkinseed), swimming, canoeing, and hiking. The lake also provides significant wildlife habitat and aesthetics for lakeshore residents.

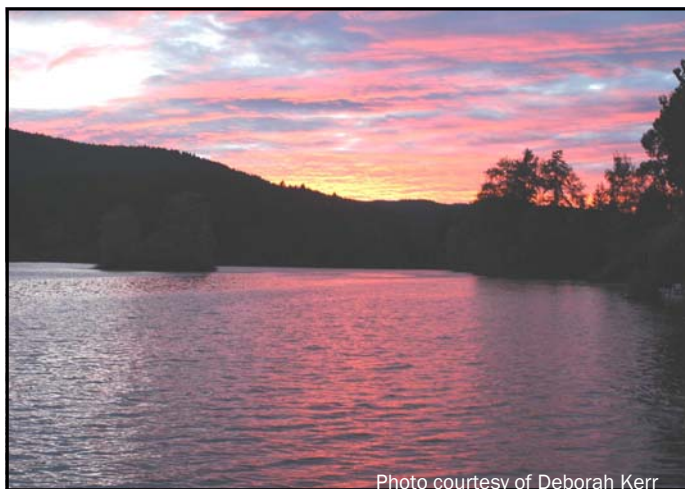


Photo courtesy of Deborah Kerr

Langford Lake originally flowed south to Esquimalt Lagoon through Glen Lake before the outlet was cut off when an embankment was built along the western shore for the E&N Railway. In 1932, a drainage ditch to the Goldstream River was built at the north end of the lake to prevent flooding of lakeshore homes and a culvert was installed under the railway to allow drainage from agricultural area known as Hull's Field to south of Langford Lake. When Hull's Field became flooded, the water was actually pumped to the lake.

Cultural eutrophication has been a long standing issue for Langford Lake. In the early 1960's it was thought that the main cause of nutrient enrichment

was residential septic systems and detergents in grey water. The Division of Public Health Engineering concluded from their test results that there was no difference between the water being pumped from Hull's Field and the lake water and therefore, pumping Hull's Field was not contributing to the eutrophication problem. In 1963, the Pollution Control Board passed a resolution to the effect that excessive algae growth in Langford Lake was a natural phenomenon and beyond their control. By the late 1960's and early 1970's, the role of phosphorus (P) in lake productivity was more clearly understood and by the 1980's it had been determined that Langford Lake's eutrophic conditions were caused by extensive P loading from agricultural lands and internal P loading. To address these problems, agricultural runoff was diverted and, in 1984, an aerator (which is still in operation) was installed to prevent internal P loading.



The Ministry of Water, Land and Air Protection has been collecting water quality data on Langford Lake since 1973. Prior to 1984, Langford Lake had high nutrient levels and consequently low dissolved oxygen levels during summer stratification. Most chemical and physical water quality parameters measured in Langford Lake are now at acceptable levels; however, some issues have been identified. There have been exceedances of the aquatic life guidelines for total phosphorus concentrations at spring overturn and periodic algal blooms which may be cause for concern. Lakes with high nutrient levels are more

productive, resulting in abundant plant and algae growth (see photo below). High algal productivity results in low water clarity and decreases a lake's recreational appeal. In addition to phosphorus, the most recent monitoring efforts have shown summer surface water temperatures to be approaching the upper limit for salmonids (25° C) and hypolimnetic dissolved oxygen concentrations below the target (6 mg/L) previously established.



The majority of shoreline development has taken place on the north and east shorelines of Langford

Lake, however there are plans for significant future development within the catchment. Local concerns have been expressed regarding potential future water quality issues and, given the recreational values of Langford Lake, the Ministry of Water, Land and Air Protection is planning a thorough water quality assessment to be undertaken in 2005. This assessment will include the physical, chemical and biological aspects of the lake and document the current condition of Langford Lake's water quality. The Langford Lake Area Protection Society (LLAPS), a non-profit organization, incorporated in October 1995 and dedicated to protecting Langford Lake and the semi-rural ambiance of the community of Langford, has volunteered to assist with this monitoring under the BC Lake Stewardship and Monitoring Program. In addition to a formal MWLAP report documenting the results of the 2005 water quality assessment, the ongoing monitoring results collected by LLAPS will be summarized in future lake-specific brochures written for residents of the watershed.

Working in partnership, the BC Lake Stewardship Society, Langford Lake Area Protection Society and Ministry of Water, Land and Air Protection hope to promote long-term local stewardship of Langford Lake and protect water quality for generations to come.



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Welcome BCLSS's Newest Director!

Bio by Reg Whiten

We are pleased to announce that in December 2004, Reg Whiten officially joined the BCLSS Board of Directors as the representative for the Peace Region.

In addition, Reg has been a Director on the Moberly Lake Community Association on and off for several years, including Chair of the Watershed Committee. This group

Reg Whiten, is a registered professional planner, and land-resource agrologist with a B.Sc from the University of Guelph (1982) and a Masters in Environmental Design from the University of Calgary (1991). He has worked as a range agrologist with the Gov't of Alberta, and upon completion of graduate studies worked as Land-Use advisor to the Treaty 8 Tribal Association. His principal interest stem from work in south-east Asia and northern BC, that have focused on integrated community development, conservation-based enterprise and watershed stewardship. For the past 10 years, he has operated his own consulting firm InterraPlan Inc., and implemented a range of



has been busy with various watershed planning, lakeshore stewardship education and demonstration initiatives. Reg oversaw the VLMP (risking life and limb at times on treacherous Moberly Lake in his words!) with MoE from the mid 1990's-2003. Last year, they participated in the BCLSS (re) training of community members and had 4 complete years of results documented in an EPD Brochure publication 2004). After a year of persistent requests to Bruce's shop, Reg got support to undertake a bacteriological sampling of the Lake and Upper Moberly, and will continue with a winter sampling effort this year. Through a partnership with the Peace River Watershed Council,

land-use and community development initiatives with all levels of government, First Nations, community associations and industry. In recent years, Reg has been principal technical advisor to the Peace River Watershed Council and is very active with various community volunteer initiatives.

and others, Reg's firm was contracted this summer to initiate community watershed planning with workshops and surveys, completing 5 shoreline soil-bioengineering projects, as well as landowner clinics and public signage. Their plans are to continue collaborating with EPD on their watershed characterization initiative, and the community watershed planning work.

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Unidata

BC LAKE TRIVIA QUIZ

1. What is BC's biggest lake (in terms of surface area; that is completely inside the political boundaries of BC; and that is a natural lake not a reservoir)?
2. What lake has a larger surface area than the answer to #1, but is not completely inside BC?
3. What is the water body that is the largest surface area in BC – but is a reservoir not a lake – they are different.
4. What is BC's deepest lake?
5. What Fraser basin lake produces the highest number of sockeye salmon?
6. How many lakes does BC have (realizing that it depends on how a lake is defined)? What is the most accepted number?
7. There are two lakes that are claimed by local residents to be BC's "warmest" – however that is measured. Name one of them.
8. What lake is the source of the Fraser River?
9. What lake is on the watershed divide between the Peace (Arctic) drainage and the Fraser (Pacific) drainage and flows in both directions (or did at one time)?
10. There are several BC lakes where the bottoms are substantially below sea level. Name one of them.

Bonus: Reservoir question. What is the tallest

dam in BC (tallest in all of Canada!)?

Send your answers to the BCLSS office (mail or email) to win one of five prize packages, which include a backpack and pocket umbrella. Contest closes February 18, 2005.

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HINT: Online, use the Google search engine to look for answers to any of the trivia questions.

Winners will be posted in the March edition of the Loonie News.

BCLSS WELCOMES OUR NEW LAKE GROUPS - FALL AND WINTER 2004

- ⌘ Heffley Lake Community Association
- ⌘ Langford Lake Area Protection Society
- ⌘ Logan Lake Fly Shop
- ⌘ Ruth Lake Property Owners Association
- ⌘ Salt Spring Island Water Preservation Society

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LakeLife: The Diatoms

By Kevin Rieberger

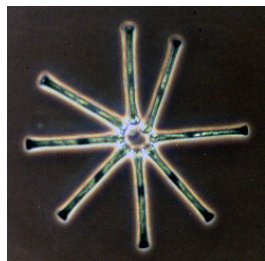
At the base of our aquatic ecosystems are the primary producers which provide the link between the sun's energy and other organisms higher in the food chain. These include free-living algae (phytoplankton), attached algae (periphytes) and aquatic plants (macrophytes).

The diatoms (*Bacillariophyceae*) are single-celled algae that comprise a large portion of the phytoplankton in both fresh and marine waters. Diatoms range in size from a microscopic two microns to a few millimetres, just visible to the naked eye. Though small, these tiny plants play a huge role - it has been estimated that diatoms are responsible for approximately $\frac{1}{4}$ of the earth's primary productivity! There are more than 10,000 diatom species identified with about the same number named in the fossil records. Their abundance also makes them an important component of the diets of zooplankton and invertebrate larvae.

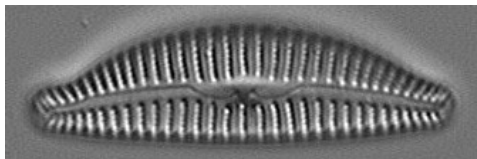
Diatoms are also one of the most beautiful organisms in the phytoplankton community. They consist of two glass-like silica shells called frustules and the shape and patterns of the shells are used to identify the species. The two frustules



Cyclotella



Asterionella colony



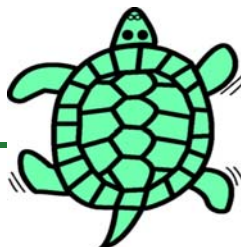
Cymbella

fit inside one another like a pill box and come in two general forms: pennate (elongated) and centric (round). Most freshwater diatoms are pennate. Diatoms usually reproduce asexually through cell division; the halves separate and a new shell is laid down in each of the parent frustules to produce two new cells. As a result, a population of diatoms will get progressively smaller over time. Eventually, after a minimum size has been reached, the diatoms begin to reproduce sexually and a larger cell size is achieved.

Diatoms are so abundant that the frustules of dead organisms form large, economically significant deposits in both lakes and oceans. The diatomaceous earth, as it is called, is used in a number of applications including water filters, insecticides, paints, toothpaste, soil amendments and thermal insulation.

Diatoms can also be used in the practical management of water resources. The silica shell is a very durable and provides a useful indicator for investigating past water quality conditions. Diatom communities are influenced by water chemistry (e.g., phosphorus, nitrogen, pH, alkalinity, salinity) and so examining diatom assemblages in lake sediment cores can provide clues to historical changes in water quality.

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Helping Lake Groups with Shoreline Stewardship

By Sarah Kipp

With the trend towards increased local responsibility to implement “best management practices” when making development decisions, *The Living by Water Project* (LbyW) has a number of shoreline stewardship tools to help local communities. Lake groups can benefit from several LbyW products and services.

On the Living Edge. This 144 page illustrated book for waterfront residents is full of tips about living by water in a shore-friendly way. Written in a reader-friendly style by two shoreline residents, the book makes a great gift for new lakeshore residents in your community. Realtors and even developers have purchased bulk quantities for use as gifts to clients. *On the Living Edge* is available from either the BC Lake Stewardship Society office, the LbyW office or can be ordered online (www.livingbywater.ca). Bulk rates are available. Wholesale consignment orders can also be provided to lake groups.

Workshop-in-a-box. A variety of LbyW images of shoreline development have been incorporated into this colorful and useful workshop. With six modules, the workshop covers topics from “What is a Healthy Shoreline”, to landscaping, erosion, septic systems, recreation, and “What You Can Do”. The workshop is in PowerPoint format, on CD, and comes in a crate with a selection of resource materials and a manual. The workshop can be shipped anywhere in British Columbia. Groups are asked to cover shipping charges.

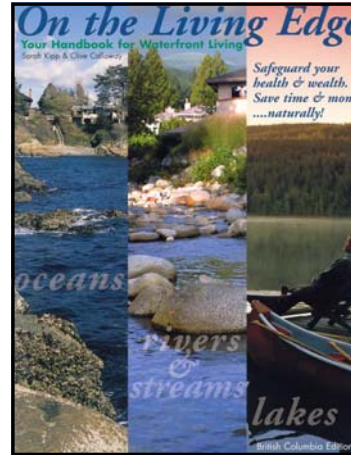
Custom Presentations and Services. Through the Community-based Action Program for Shorelines, LbyW can help community groups with outreach within their communities. Whether the audience is realtors, developers, elected officials, shoreline residents, or an entire community, there are a variety of tools available:

- ⚡ Customized presentation – LbyW staff work with you to bring a speaker to your community, to do a presentation that meets your needs for your audience.
- ⚡ Training – LbyW staff can work with a small number of trainees to demonstrate outreach tools, and assist your group in developing communication and marketing skills for approaching others in your community.
- ⚡ Display materials, brochures and handouts – handouts include the popular “Waterfront Living” brochure, “Shoreline Makeover” posters, and a variety of fact sheets on topics such as “West Nile Virus” and “Tips for your Watershed”.

LbyW has recently developed a customized presentation for two lake-based Area Planning Commissions, to provide support for lake management and planning questions.


For further information, contact the LbyW project office.

Often there are opportunities to piggyback events to enable cost-efficient travel and use of time; this can reduce the cost to your group.

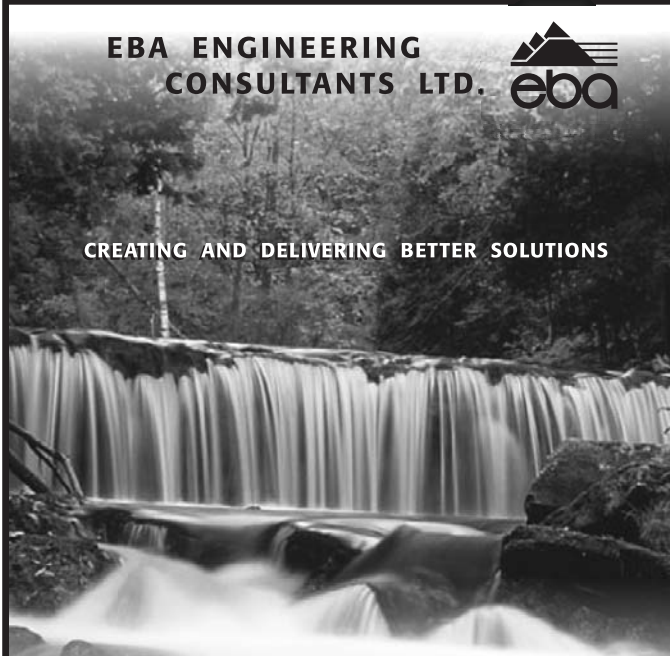


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Peace River Watershed Council Takes Action for Community-Based Stewardship

By Reg Whiten

Created in the fall of 2000, the Peace River Watershed Council (PRWC) is a non-profit organization based in north-east B.C with a mandate to promote watershed stewardship in the Upper Peace River drainage basin of B.C. It's Board of Directors provide representation from conservation groups, local government, First Nations, private sector and the general public. The central focus of the PRWC is to serve as a regional forum for the protection of water quality and aquatic ecosystems through education, research and extension initiatives. The group first served as the regional delivery partner for Fisheries Renewal in north-east BC – work that supported significant projects like a regional fish passage and habitat assessment, an integrated watershed management plan for the Kiskatinaw River, education and stewardship projects with the Charlie Lake Conservation Society, and other organizational capacity-building activities.

During its initial operation, the Council also focused on development of a program called "Community Outreach in Watershed Stewardship" with pilot extension activities in the south Peace area. Initiatives included shoreline property assessment, support for water quality monitoring, workshops on watershed and shoreline management, completion of a community extension plan, and First Nations lakeshore stewardship projects.

In recognition of the United Nation's International Year of Freshwater in 2002, the PRWC then launched "The Peace River Watershed Stewardship Demonstration Project" with primary support coming from Environment Canada's Eco-Action Program. Four program thrusts have been, or are in the process of being implemented. They include:

- a *shoreline tree planting* program at the West Moberly First Nations that was sponsored by both Chief and Council, and 25 individual households;
- six *shoreline and creek restorations* using soil bioengineering on eroding slopes of properties at Moberly Lake and Windrem Ck., Chetwynd;
- community participation in *urban stream management* through introduction of training in the Streamkeepers Program;
- education on *water quality and shoreline protection* in partnership with the Living By Water Project (Community-based Action Program for Shorelines) and promoting of the "Watershed Pledge" program in the region.

This community-based stewardship project led to several demonstration activities, and training for 'watershed residents' on how best to take local action for protecting water quality and aquatic ecosystems in rural, and Lake communities around the Peace. Other events have included rural water quality clinics, school presentations

and media events aimed at educating the public about water quality protection and water, and promoting best practices for watershed stewardship.

A range of community partners have supported the PRWC's objectives including West Moberly First Nations, the Moberly Lake Community Association, Swan Lake Enhancement Society, the Charlie Lake Conservation Society, and the Peace River Regional District. From the organization's establishment, the Saulteau & West Moberly First Nations have recognized the value of the watershed-based approach for addressing shared concerns about land-use management and development. A few key agencies like the Ft. St. John and Prince George offices of BC Water Land & Air Protection (Fisheries, & Environmental Protection Division) continue to be strong supporters of the Council's work, as have the federal Departments of Fisheries & Oceans (Habitat & Assessment Branch), and Agriculture & Agri-Food (Prairie Farm Rehabilitation Administration).

In each of the past three years, the PRWC has also hosted an annual, regional public conference aimed at bringing the public and resource managers together to share information about watershed extension, research and management initiatives. In 2002/03, it successfully hosted two regional forums at the Moberly Lake Lodge with over 60 people attending each year. Conference presenters discussed various issues ranging from the state of regional water quality in the Peace Region, use of groundwater for gas well development, wetland protection, watershed restoration, stream protection, and shoreline stewardship. This past fall, the PRWC joined in organizing and sponsoring the North-Central Chapter of Planning Institute of B.C.'s conference "Innovations in Watershed Management". The one-day event registered about 80 participants who were practitioners in various related professional fields.

Following the conference, the PRWC held its annual dinner and awards presentation recognizing leadership in watershed stewardship. Pengrowth Corp. received the industry award for its proactive work during its oil/gas well development operations by negotiating groundwater protection with an affected landowners near Ft. St. John. Charlie Lake Conservation Society received the group award for many years of leadership in addressing water quality issues through various projects with residents and affected stakeholders. An individual award went to Murray Clark, of Ducks Unlimited who has worked tirelessly for many years to protect the region's diminishing wetlands. At the function, keynote speaker Joan Chess, Regional Coordinator for the Fraser Basin Council presented on the development of that organization, and ways in which similar groups could strengthen their role and capacity.

The PRWC has demonstrated considerable success in a very short time. By replicating the watershed council model used

in other areas of B.C. and western Canada, it is trying to show that organizational capacity can be built with a strong vision, combined with cross-sectional representation, and practical programs that address priority public/landowner interests like water quality, habitat protection and property maintenance. Over the next while, efforts will be aimed at further strengthening organizational governance, and partnerships so that the PRWC can long serve as an effective grass-roots force for "interest-based" resource stewardship in the region.

The following photos are courtesy of Reg Whiten:

1. Demonstrating soil-bioengineering techniques to restore shorelines on Moberly Lake
2. Youth constructing live palisade to restore eroding slope on Windrem Ck., Chetwynd
3. Interplanting live stakes with rip-rap for bank stabilization on Medicine Woman Ck., Moberly Lake



Photo 2



Photo 1



Photo 3




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LAKES AS INDICATORS OF CLIMATE CHANGE

By Steve Leaver
University of Victoria Biology Co-op Program
Ministry of Water, Land and Air Protection

limate change - we've all heard the debates on whether or not it is actually happening. By now, most major governments and scientists agree that climate is indeed changing, but there are still many unknowns. How much of what we see is long-term trends, how much is short-term warming and cooling cycles? How fast is it changing? What can we expect in the future? Regardless of the cause, how do we adapt?

Adequate monitoring of our weather is necessary to help answer these questions. This fall, a report was prepared by the BC MWLAP's Water, Air and Climate Change Section on the use of lakes as indicators of climatic conditions in British Columbia. The report explored two methods that utilize aspects of lakes: ice-on/ice off dates and maximum summer heat content.

Ice-on/ice-off dates have been widely used by researchers to analyze and interpret climatic variability. Changes in ice-on/ice-off dates reflect corresponding changes in local climate and are easy to record accurately. Interested lake stewards can help researchers collect important data from many locations with a minimum of time and effort.

Over a season, daily and weekly air temperature patterns are highly variable. Lakes, on the other hand, heat and cool quite slowly integrating the temperature fluctuations

into one consistent measurement: the maximum summer heat content. While this measurement involves a little more work than ice-on/ice-off dates, it is not difficult with the right training and equipment. The BCLSS level 3 monitors currently collect temperature profiles that, while useful for other purposes, can also be used to calculate heat content.

The report also identified some lakes with historical ice-on/ice-off dates and temperature data, some of which are BCLSS members (Charlie Lake, Nukko Lake and Lake Kathlyn). Because these lakes already have good baseline information, their continued monitoring is very important. The monitoring of other lakes (even those without historical data) is also very valuable. Increasing the coverage and diversity of sampling sites throughout the province yields a more thorough understanding of regional climate trends while monitoring several sites in a close geographic area allows for a greater understanding of local climate trends.

If you are interested in collecting this data on your lake, please contact the BCLSS office for more details. With your participation we can help decipher the direction and magnitude of climate change and, in turn, determine how best to adapt.



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Phone: (250) 862-5412
Fax: (250) 862-5600
Email: ouccoop@ouc.bc.ca

EcoStar Award for Conservation & Restoration

On December 3, 2004, the Highlands Stewardship Foundation received the EcoStar Award for Conservation and Restoration. BCLSS Director Eric Bonham is the chair for the Highland Stewardship Foundation and was able to attend the banquet and accept the award on behalf of the Foundation. **Congratulations!**

As noted by the EcoStar Awards Program: "The Highlands Stewardship Foundation is a non-profit society formed in 1996 to promote environmental stewardship. Its efforts were initially focused on conserving and restoring the natural habitat around Fork Lake. The group's interests have since expanded to include seven of the ten lakes in the Highlands."

The group has now expanded its work further to include both land and water stewardship and its most recent initiative is a proposal to develop a water conservation plan for the District of Highlands that addresses water conservation/energy conservation at the individual household level. Given that all households in the District are on individual wells and sewage disposal systems and that the water source is groundwater, there is good reason to encourage conservation.

For more information on this and other EcoStar Awards, visit: <http://www.crd.bc.ca/ecostar/index.htm>

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Kevin Rieberger, Victoria (250) 387-1188

Share Your Information With Us!!

One of the primary objectives of the BC Lake Stewardship Society is to provide a public forum to discuss information on specific lakes and watersheds, lake conservation issues/concepts and educational programs relevant to British Columbia's freshwater resources.

The BC Lake Stewardship Society Board of Directors welcomes written submissions, whether short articles, advertisements, or photos/figures relevant to British Columbia's lakes from both BCLSS members and the community at large. If you have information on BC's lakes, please forward it to us for publication in our quarterly newsletter. The BC Lake Stewardship Society Editor will be pleased to assist you with your submission upon request.

Please send articles and lake information to:

Kristi Carter (staff)
kristic-bclss@shaw.ca
Dawn Roumieau (Staff):
dawnr-bclss@shaw.ca

#4-552 West Street
Kelowna, BC
V1Y 4Z4
Phone: (250) 717-1212
Fax: (250) 717-1226
1-877-BCLAKES



How to Become a BCLSS Member

Benefits of Becoming a Member:

- ☞ Steward of BC lakes
- ☞ Quarterly newsletters
- ☞ Monthly e-newsletter, the *Loonie News*
- ☞ Water quality monitoring brochures for your lake
- ☞ Training and support
- ☞ Assistance from director in local region
- ☞ Insurance for active volunteers
- ☞ Annual Conference and Workshops
- ☞ Part of an extensive network of lake stewards

Don't delay—sign up today!

Sponsorship Information

Corporate sponsorship of the BCLSS has many benefits! Donations will be gratefully acknowledged with tax deductible receipts as well as through the following:

Class I-Gold-More than \$250

- Advertisement in quarterly newsletter-reaches over 1000 people via mail & email
- Logo and link on new BCLSS website
- Exhibition space at BCLSS Conference
- Listing at events attended by BCLSS

Class II-Silver-\$250

- Listing in quarterly newsletter
- Logo on BCLSS website
- Exhibition space at BCLSS Conference
- Listing at events attended by BCLSS

Class III-Bronze-\$50

- Listing on BCLSS website
- Listing in newsletter

To become a BCLSS member or sponsor, fill out this form and return it to BCLSS with a cheque or money order, payable to BC Lake Stewardship Society: \$10 student, \$20 individual, \$40 group or your sponsorship amount.

Name: _____

Mailing Address: _____

Phone: _____

Fax: _____

Email: _____

Other information: _____

THANK YOU TO OUR GENEROUS FUNDERS...

