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Inside this issue:

FBWHT salutes WRWEO's achievements	2
FBWHT and WRWEO 's joint & coordinated work	2
Impact of development on water quality	3
Ecosystem approach to watershed management	3
Sheldrake Lake hypolimnetic aeration project	3
PCB cleanup at Five Island Lake	4
CABIN water testing	4
HRM watershed advisory board	4

Digital Mapping

The FBWHT Scientific Advisory Committee and the WRWEO Water Quality Committee are planning a pilot project to build a geographic database that will enable the two organizations to provide a cohesive method of storing and portraying data collected through their various scientific activities. The Pilot will include the development of a topographic base to which all future collected data will be spatially linked. FBWHT has applied to the Shell Environmental Fund for financial support of this project.



The Bridge

Maintaining Ecosystem Health in Our Lakes

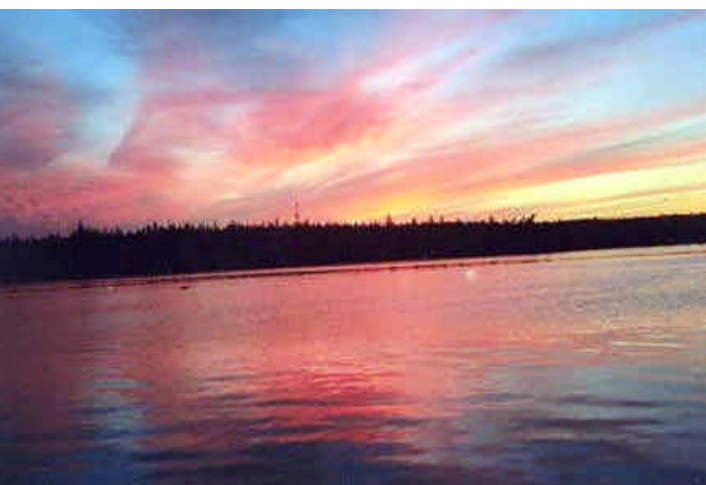
Pat Lane, WRWEO Water Quality Committee

The Woodens River watershed is endowed with 19 lakes. Each one is a valuable resource for our communities and contributes to the overall quality of our environment. This brief article examines the concept of "ecosystem health" and what planners and managers can do to maintain a "healthy" aquatic ecosystem. By maintaining aquatic ecosystem health, we can ensure that all stakeholders, both human and non-human, enjoy these resources and have optimal benefits of their use.

What is ecosystem health? It is far more than "clean water." Leading proponents of ecosystem health borrow analogies from human health and apply it to ecosystems.

Robert Costanza, one of these proponents writes that "an ecosystem is healthy if it is stable and sustainable—that is, if it is active, maintains its organization and autonomy over time, and is resilient to stress."

James Karr another leading proponent of ecosystem health states that "a biological system can be considered healthy when



its inherent potential is realized, its condition is stable, its capacity for self-repair when perturbed is preserved and minimal external support for management is needed."

There are several aspects of the analogy:

Absence of disease. A healthy ecosystem is free of disease such as the PCBs that once polluted our lakes.

Homeostasis. Ecosystems need the capacity to resist change when stressed and to maintain ecological balance. For example, we do not want our lakes to become acidified from acid rain or eutrophic from too much nutrient enrichment.

Vigor and scope for growth. Healthy ecosystems have a diversity of living things with healthy food webs

that are neither too productive or underproductive.

Negative impact protection. A healthy ecosystem can anticipate and avoid or minimize negative impacts that impair its ecosystem balance.

Ecosystem managers develop indicators to measure ecosystem health and track progress toward environmental, social, and economic goals and values. Increasingly, local citizen groups such as WRWEO and FBWHT are playing significant roles in data gathering and monitoring activities. Such volunteer work, informed by the collective experiences learned from many other freshwater ecosystems around the world, will become increasingly important to the health of our lakes in the years ahead.



Richmond Campbell, Chair of WRWEO, has been a driving force in all of the organization's many accomplishments since its founding in 1995.

The Five Bridge Wilderness Heritage Trust Salutes WRWEO's Achievements

The Five Bridge Wilderness Heritage Trust expresses thanks and appreciation to the Woodens River Watershed Environmental Organization (WRWEO) for its work protecting the watershed improving its water quality, and making the pristine lands in the Halifax Urban Wilderness more accessible to hikers to enjoy Nova Scotia's unspoiled beauty.

Richmond Campbell outlined these achievements in

a recent message to the WRWEO membership:

"WRWEO has accomplished the four main goals that I wanted it to achieve.

The proposal to swap Crown land in the vicinity of Paradise Cove has been resolved through a democratic vote with the cooperation of its proponent, David Bryson.

The Trust (FBWHT) and WRWEO are cooperating effectively in their joint efforts to understand, con-

serve, and enhance the Crown Land wilderness in and east of our watershed.

The Water Quality Committee now headed by an internationally respected limnologist is working on new projects jointly with the Trust and is sufficiently robust to be able to build on the important data previously gathered by Bob Chambers.

Finally, the first stage of the Bluff Trail is virtually complete.

WRWEO and FBWHT both made detailed submissions to HRM with regard to the Water Resource Management Strategy and the HRM Smart Growth planning initiative.

Common Goals unite FBWHT's & WRWEO's work

We are often asked questions about the relationship between FBWHT and WRWEO. Here's a summary of the current status:

Both organizations are committed to understand, conserve, and enhance the the natural habitat in the Northwest part of the Chebucto Peninsula.

The two organizations have mutually agreed to form an association that involves joint membership, joint projects, coordinated funding applications, and joint meetings on topics of common interest.

The two organizations seek now to extend and deepen this relationship.

FBWHT recognizes WRWEO's lead and supports its work

- developing and managing the Bluff Trail acting under a letter of agreement issued by DNR

- improving water quality through through the Sheldrake Lake Aeration Project
- sampling and analyzing-water in the upper lakes of the Woodens watershed under contract by the Dalhousie/Dal Tech Centre for Water Resource Studies (CWRS)
- monitoring the environmental impact of twinning Highway 103

In turn, WRWEO recognizes and supports FBWHT in its lead role

- negotiating with DNR and DEL to grant various community organizations management and stewardship roles in protecting and conserving public lands
- Coordinating the work of community-based environmental groups through both direct communication and the

- Council of Community Organizations (COCO)
 - mapping scientific data
 - establishing the Friends of Lewis Lake Park
- WRWEO and FBWHT are working jointly

- on a comparative study of the upper lakes of the Woodens River Watershed
- on the ecological impact of twinning Highway 103
- on the digital mapping information base for the western sector of the Chebucto Peninsula
- on the Canadian Aquatic Bio-Monitoring Network, an Environment Canada program that that is undertaking counts of benthic macro-invertebrates such as mayfly larvae, to assess the health of aquatic environments.



Pat Lane, Chair of the WRWEO Water Quality Committee, has done extensive research world-wide on topics relating to the nature of sustainable societies and how developing countries can become sustainable.

Impact of Development on Water Quality

Human activity affects water quality in two significant ways: it increases levels of nutrients and it introduces chemical and biological pollutants.

Paradoxically, a pristine lake is aesthetically pleasing for the very reason that it does *not* have sufficient nutrients to support active growth of plants (algae) and fish. Indeed, in some jurisdictions, nutrients are deliberately added to selected water bodies to promote growth of the fish population. On the other hand, too many nutrients can have a detrimental effect resulting in noxious algae blooms, shoreline accumulations of algae mats, and losses of fish habitat through oxygen depletion.

Human activity can also degrade water quality by introducing biological pollutants, such as coliform bacteria. Poorly designed or maintained septic systems and inadequate sewage treatment plants are therefore cause for concern, not only because of the threat posed to human health but also because of the nutrient burden they impose on nearby lakes.

Introducing man-made chemical pollutants into the watershed poses an additional threat to human health, either through direct exposure or by ingestion and bioaccumulation up the food chain. In this regard, there is still a Public Health Advisory in effect ad-



One of many breath-taking views from a lookoff on the Bluff Trail

vising against eating fish from the Woodens River Watershed because of residual levels of PCBs in the lake system, notwithstanding concerted efforts by the Provincial Government (costing over \$8 million) and local residents to remedy the situation.

In summary, lakes within the Woodens River Watershed are losing their natural integrity, their aesthetic appeal, and property values under the pressures of development. These pressures can greatly accelerate the natural process and change the nature of a pristine lake to a body of water that is completely unsuited for recreational use in a matter of years. Protection of the natural environment within

the Woodens River Watershed therefore demands regulation of future development in keeping with the aspirations of local residents. In this regard, the first step in developing an effective long-term management plan for approval by residents, requires the establishment of a comprehensive data-base to inventory the resource and act as a repository for baseline water quality data for use in monitoring change. FBWHT and WRWEO are working together to compile such a digital data-base.

Frank Hope



Ecosystem Approach to Watershed Management

Community concern over the ecological impact of twinning Highway 103 has prompted Dr. Pat Lane to submit a detailed proposal to the Department of Transport and Public Works for a cooperative approach between government and the WRWEO Water Quality Committee to manage major projects within watersheds. Dr. Lane's proposal suggests using the Eco-system approach described in the lead article of this issue (page 1) to managing the cumulative impact of human activity in watersheds. The Nova Scotia Department of Transport and Public Works is now reviewing the proposal.



John Matthews, Chair of the FBWHT Scientific Advisory Committee and active member of the Joint Water Quality Committee.

FBWHT values your membership, welcomes your comments, and needs your help. You can play an active role in Canada's National Stewardship Agenda by becoming involved in one of the Trust's many projects. For more information, contact
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Frank Hope, Administrative and Development Coordinator for both WRWEO and FBWHT and active member of the joint Water



Conserving public lands on
the Chebucto Peninsula



We're on the web!
www.fivebridgetrust.ca

November COCO Meeting

The Council of Community Organizations meets next at the Tantallon Public Library on Thursday, November 27, at 7:00 p.m. Brian Craig of the Wildlife Division of the Department of Environment will explain how volunteer community groups can become involved in community-based stewardship of Canada's natural heritage through the work of the Ecological Monitoring Assessment Network (EMAN).

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Sheldrake Lake

Hypolimnetic Aeration Project

Based on an earlier (1985) recommendation by the Halifax Soil and Water Conservation Society of Metro Halifax, WRWEO has embarked on an ambitious project to restore the fish habitat in Sheldrake Lake which becomes anoxic each summer due to external nutrient loading. This Hypolimnetic Aeration Project is based on a design specially configured to match the characteristics of the lake that was developed by Dr Ken Ashley of UBC and the BC Dept of the Environment.

The project has involved extensive WQ data gathering and analysis, construction, by volunteers from the local community, of a shed to house the equipment, purchase and assembly of the oxygen generation equipment as well as deployment of the weighted air hose and diffuser. These efforts have been led by Tim McGee, John Matthews, Dale Conrad and Frank Hope.

The \$40,000 budget for this project was raised by generous donations from a variety of government agencies, including in particular ECO ACTION and HRM, and private sector agencies, including in particular the Bronfman Foundation following an intensive fundraising effort led by Tim McGee

CABIN Testing

In collaboration with Five Bridge Wilderness Heritage Trust, WRWEO has collected data in support of the Canadian Aquatic Bio-Monitoring Network, an Environment Canada program that relies on counts of benthic macro-invertebrates, such as mayfly larvae, to assess the health of aquatic environments. This effort is being led by John Matthews who has undertaken special training for the project.

PCB Clean up at Five Island Lake

Richmond Campbell has represented WRWEO on the Citizens liaison committee which was formed to provide community participation in the efforts to deal with the PCB contamination of Five Island Lake.

HRM Watershed Advisory Board

Frank Hope is the WRWEO and Don Arnold the FBWHT representative on the HRM Watershed Advisory Board, which has taken action to address a variety of concerns raised by WRWEO such as the effluent from the sewage treatment plant which flows into Five Island Lake near the Sir John A MacDonald High School.

The Watershed Advisory Board has also been instrumental in supporting fund-raising efforts of WRWEO's Water Advisory Committee.

