



# THE BLUE HERON

## The Bras d'Or Stewardship Society

P.O. Box 158, Baddeck, Nova Scotia B0E 1B0

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NO.1

**T**his NEWSLETTER is full of information that should interest society members and the public regarding the on going stewardship of the Bras d'Or Lakes and its water shed. We are printing 500 newsletters of the most lengthy issue of The Blue Heron to date.

There has been much activity during the past year that has raised the signal flag higher regarding on going events that are harbingers of both positive and negative change in the Bras D'or Lakes. These will either enhance or degrade the diverse ecological systems that combine to make the lakes unique. Our "News Items" column provides the highlights of significant current events.

Included in this issue is an article covering the invasion of the MSX parasite (*Haplosporidium nelsoni*) into local oyster beds. As a result of the MSX parasite contamination all Bras d'Or Lakes oyster public harvesting was placed in moratorium on October 24, 2002. Contaminated oysters have been found in St. Patrick's Channel, Crane Cove and Gillis Cover. The latter two are areas utilized by the native community

for gathering oyster spat. St. Patricks's Channel is a navigable waterway frequented by large bulk carriers transporting gypsum. There is no way of measuring exact environmental and economic consequences at this point in time, however MSX causes 85-90% mortality of oysters grown and occurring naturally in this area. The biological and economic impact is therefore both serious and disturbing.

It is estimated that the annual oyster harvest in the Bras d'Or Lakes is a \$900,000.00 business. You may remember that our June 2002 "Blue Heron" featured an article by William Crawford on the 'three pillars' of oyster farming. This operation was the first to find the MSX virus in its oyster beds. The MSX infestation pretty well spells the end for this five-year operation. The time has come to demand accountability and face up to the current MSX situation.

We ask where are the government officials who shoulder the burden of dealing with such events as the invasion of MSX? It would appear that the officials are in exactly the same boat as we all are...concerned, but at their wits end and unable to take responsible action to prevent such events. Gretchen Fitzgerald and Susanna Fuller provide a detailed analysis of the MSX parasite onslaught and what must be done to ensure that similar invasions do not occur. Both contributors are graduate students in marine biology at Dalhousie University and are committed to protecting the environment.

As part of the effort to build our understanding of the diversity of the lakes, Clifford Paul details a research program dedicated to increasing the knowledge of the Bras D'or Lakes herring stocks through the use of scientific inquiry and traditional ecological knowledge. A photo essay of the new sewage treatment plant in Baddeck, to be completed by April 2003, will result in less pollution of the lakes. A more efficient and larger capacity plant will help to restore the waters particularly near the Baddeck area.

Finally, an update on the monitoring of water quality in three streams adjacent to the new open pit gypsum quarry in Melford is also included in this issue. These three streams feed the River Deny's Basin. We are grateful to ADI Associates for providing this information.

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# The Marine Corner

## Herring Study Confirms Mi'kmaq Observation:

If Marine biology and ecological biodiversity fascinate you, Eskasoni is the place to turn to. Just mention the word "herring" with Eskasoni Fish and Wildlife Senior Biologist, Shelley Denny-and automatically you will become mesmerized with her knowledge with the Bras d'Or Lakes version of the species.

The fascination lies within the fact that the biologist Denny weaves the traditional ecological knowledge of her ancestors with the modern scientific methods to prove things told the Mi'kmaq have been saying all along, "our elders have been telling me they have seen Bras d'Or Lakes herring under the ice," Denny told the Mik'maq and Maliseet Nation News. "That is something scientists previously argued otherwise. They argued that the herring over wintered outside of the Bras d'Or at Sydney bite and that they only entered the Bras d'Or Lakes to spawn."

Sydney bite is the area of the Atlantic Ocean between the eastern extremities of Cape Breton Island. According to the Bras d'Or Lakes Herring Study initiated through the Unama'ki Institute of Natural Resources, biologist Denny is making some surprising finds.

We are wondering why they, the herring, are wintering here, Denny asked. "Some have been caught in spawning conditions under the ice." That alone has raised a few eyebrows.

"We are proving that the Bras d'Or Lakes herring (*Clupea harengus harengus*) are genetically a distinct species," Denny indicated. This is determined through an elemental fingerprinting procedure in the examination of the tiny ear bones in the

skull of the herring. Known as ostoliths, these tiny bones are collected and analyzed for elemental analysis at the Bedford Institute of Oceanography. "This is the first elemental fingerprinting project using adult herring ostoliths."

Since 1999, the Bras d'Or Lakes spring herring fishery was closed to commercial fishing due to a decline in population. There were intensive fishing activities on spawning grounds and a notable absence of larvae during ichthyoplankton surveys. Furthermore, elders from the community of Eskasoni spoke up after observing a lack of spawning herring in the spring in traditional spawning areas of the Bras d'Or. The elemental fingerprinting of the species is further designed to better understand the migration patterns of the Bras d'Or Lakes herring. The Eskasoni Fish and Wildlife Commission, through the Unama'ki Institute of Natural resources has a keen interest in protecting this spawning component for traditional and cultural purposes.

Denny noted that she and her colleagues are dedicated to increase their understanding of the herring population dynamics, as it relates to the fishery. Through the efforts of the Eskasoni Fish and Wildlife Commission, the St. Andrew's Biological Station, and the Bedford Institute of Oceanography, the research effort will continue to gather evidence of the spring and fall spawning populations so that reasonable fishery management decisions can be determined. Consequently, a methodological approach is being utilized through map surveys, length frequency, sampling egg bed surveys and observations.

*Clifford Paul, Eskasoni Fish and Wildlife Commission*

## Bras d'Or Watch

**It has been brought to the attention of the Society that finfish aquaculture nets remain submerged in the Bras d'Or Lakes and Dina's pond after the bankruptcy of former Scotia Rainbow. This aquaculture entity had millions of taxpayers dollars invested only to fail to survive.**

**We have been told that caged fish went unfed for months. There were no funds to pay for food or labor to feed. When the time arrived to clean up the nets holding residual fish, it is rumored that some nets were just cut and allowed to sink to the bottom. Two locations specified were near the old wharf in Nyanza Bay and in Dina's pond, which is contiguous, to the Little Narrows Channel.**

**To date, it has not been easy to verify the exact number of nets severed from their floating bases. Nor, is there any word about the dollar value of malnourished fish and their unfortunate demise. Hopefully, these fish escaped to greater lakes and now serve an enhanced recreational fishery.**

**The fact is that those responsible 'stealthily' evaded their stewardship duties. Their deliberate methods of expediency to deal with a problem of redundant nets and starved fish were most cowardly acts, a blatant defilement of the environmental integrity of the Bras d'Or Lakes. Enough is enough. Who is responsible?**

## **NEWS ITEMS:**

### **Baddeck Sewage Treatment Plant:**

In August 2002 ground was broken for the new sewage treatment plant to replace the out of date treatment system that could no longer handle the current Baddeck sewage load. This new plant will increase the capacity and treatment level of Baddeck's waste management. Hopefully, other municipalities will work to upgrade their treatment plants using Baddeck as an example. This project is a 2.4 million dollar effort with funds coming from 3 levels of government. It is hoped that the plant will be ready for trials in April 2003.

### **Bras d'Or Lakes Designation:**

Work continues to obtain 'designation status' for the Bras d'Or Lakes with regards to having the lakes designated a "no dumping" zone. The five First Nations communities and the five municipalities of Cape Breton are working together to see that the "no dumping" rule becomes a reality. The process is long and involved. Karen Malcolm has been hired to assist in moving the application through the required stages. Hopefully, in September 2003 the application steps and public consultation required will have been completed. Obtaining 'designation status' is an important step in protecting the Lakes from future contamination.

### **Unima'ki Institute of Natural Resources:**

On September 6, 2002 the \$3,000,000.00 dollar Unima'ki Institute of Natural Resources was officially opened in Eskasoni. This center is a real bricks and mortar showpiece dedicated to enhance

research and accumulate knowledge regarding the Bras d'Or Lakes and its ecology. The center sits overlooking the water in Eskasoni with labs and meeting facilities. Interested parties are encouraged to visit the center. To arrange a tour contact George Paul-Public Relations at 902-379-2024.

co-ordinates provides an accurate and detailed topographic profile of the Bras d'Or Lakes under water geography. Survey data provides information regarding how the lakes were shaped through glaciation. As well, ancient riverbeds and valleys can be discovered and mapped.

### **2002 Membership Campaign:**

This year's membership campaign proved to be another successful event. A total of just over \$13,000.00 was raised from over 220 contributors. The society is a membership-based entity, which requires members to sustain it. We are very appreciative of the support received, especially in a year when economic uncertainty was the major theme. Thank you for your generous support.

### **Eskasoni Conference:**

On November 6, 2002, the Society helped sponsor a one-day conference on environmental issues pertaining to the lakes. Inka Milwesky, presented by conference phone, an overview of the history of oyster production along the Mirimichi shore in New Brunswick. Her presentation provided a historical account of the oyster fishery in N.B. which was most timely, given the MSX parasite invasion and its potential adverse consequences to all maritime Canadian oyster growers. The MSX parasite has reared its ugly head in Prince Edward Island.

### **Hydrographic Mapping:**

During the past three years, The Canadian Hydrographic Service has been mapping the bottom of the Bras d'Or Lakes. The twin hulled Canadian Coast Guard ship, Frederick G. Creed, has been operating in the Lakes using multi-beam echo sounders to determine the bottom contours. Combining this information with GPS

### **CBC PRESENTATION:**

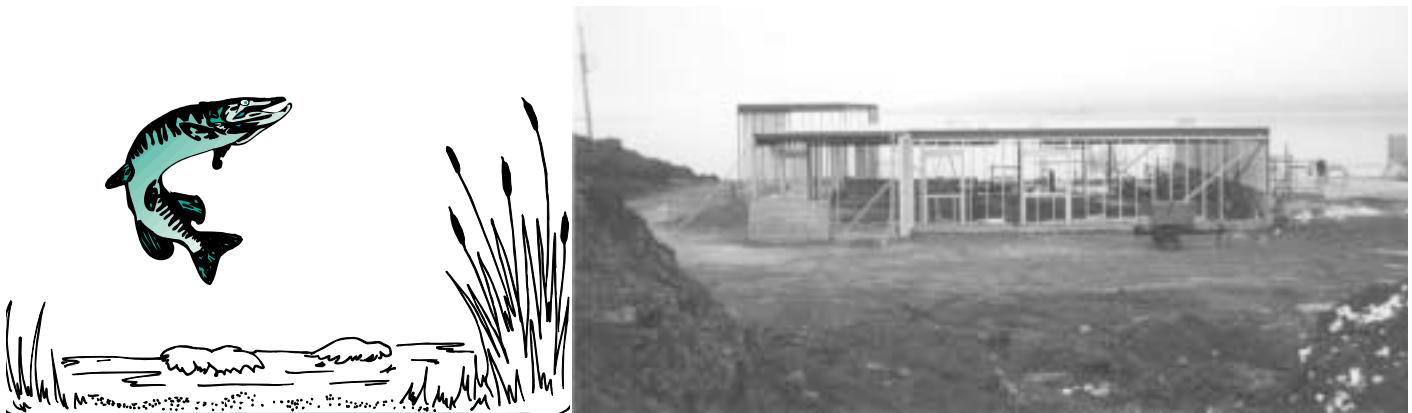
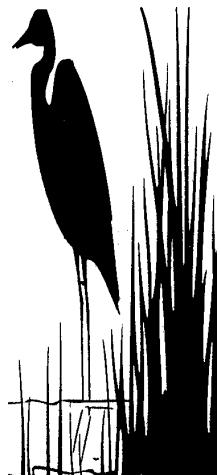
In November, CBC Radio Sydney produced a three hour segment that focused on the Bras d'Or Lakes and its watershed. This program was a feat of organizational wizardry. Bill Doyle and his crew from CBC spent many hours interviewing the participants. Ian MacNeil also provided his expansive talents to the interview process. The results produced a well-rounded verbal documentary regarding the many issues that concern the public, as to the future stewardship of the Bras d'Or Lakes. The Society is most grateful for the CBC effort. Such events continue to raise the level of public awareness regarding the special place the Lakes hold for Cape Breton. A tape is available if you missed this fine program.

### **Potential Shell Fish Closures:**

It has been brought to the attention of the Society that two new areas may be closed to shell fishing because of high counts of fecal coliform. MacNab's Cove and Soldier's Cove at the entrance of St. Peter's channel are being monitored. A decision will be made in the spring of 2003.



*Photos of the*  
**NEW SEWAGE  
TREATMENT PLANT**  
*In Baddeck*



## **MSX HIGHLIGHTS NEED TO PROTECT BRAS D'OR FROM BIOINVASIONS**

### **The Issue**

Oyster farmer and member of the Bras d'Or Stewardship Society, Jim Crawford first noticed in the fall of 2001 that his oysters did not look as they should. By the summer of 2002, many of his oysters were dying. He sent samples to be tested at DFO laboratories in Moncton in August and was told two months later that his oysters were infected with MSX, a lethal parasite. Subsequent testing has found MSX in Eskasoni, Aspy Bay and at two sites in PEI.

MSX, also known as *Haplosporidium nelsoni*, is a single-celled parasite that first attacks the gills of the oyster. It then moves on to other parts of the oyster, eventually killing the animal. It is not known how the disease is transferred from oyster to oyster, but it is believed that there is an intermediate host that spreads the disease. The fact that MSX attacks the gill area first suggests that the infective stage is water borne, sticking to the gill area as the oyster filters water for food. MSX does not have an effect on humans, so the consumption of infected animals is not a human health concern.

MSX was first recorded in 1957 in Delaware Bay, and spread to oyster populations in Chesapeake Bay in 1959. Since that time, it has spread as far north as Maine. The discovery in the Bras d'Or Lake is the first outbreak ever recorded in Atlantic Canada and could have serious consequences for native and farmed oyster populations.

So a new species comes to town – what is the big deal? Things in nature are always changing, moving, growing. The problem stems from the fact that introduced species like MSX can play a different role in their new home than they do in their native environment. For instance, MSX does not kill oysters in its native range, but can cause 80-95% mortalities in American oysters. The introduction of MSX is an example of a biological invasion. Such invasions are listed as the second greatest threat to biodiversity in the world, second only to habitat alteration. Other marine bioinvaders of the Atlantic region include the green crab, the clubbed tunicate, and the seaweed *Codium* sp. (see Table 1).

### **How did MSX get into the Bras d'Or Lakes?**

***MSX was first noticed in Delaware Bay in 1957. It is thought that the parasite was brought to the region by the transfer of Pacific oysters, which carry MSX but are not negatively affected by the disease. The spread of the parasite along the Atlantic seaboard may be due to the transfer of oysters or shipping.***

***Its introduction to Atlantic Canada, along with several other species, was predicted by experts who gathered in Halifax at a workshop hosted by the Ecology Action Centre to address the issue of marine bioinvasions in May 2001 (see Table 2 for a partial list).***

It is possible that the MSX outbreak at Little Narrows was caused by the transfer of infected oysters from the US. However, there are no records of such transfers taking place in the recent past. Alternatively, fouling organisms attached to the hulls of ships could have transferred the disease or its intermediate host. However, all evidence gathered so far by DFO officials points to ballast water carried in ships as being the source of the disease.

Ballast water is carried by ships to increase their stability when they are not carrying a full load. The MSX outbreak occurred in St. Patrick's Channel, adjacent to a gypsum loading facility. Ships coming to the channel commonly travel from Baltimore, a port in Chesapeake Bay where outbreaks of MSX are common. Bulk carriers such as those that dock at Little Narrows commonly discharge water in volumes of 8000 cubic metres (the equivalent of 8 Olympic-sized swimming pools) and occasionally discharge three times as much water.

Ballast water reporting forms submitted to Transport Canada show that some of these ships do not exchange their ballast in the open ocean. Ballast water exchange is a practice recommended by the International Maritime Organization to replace low salinity water rich in potential bioinvaders with high salinity, open ocean water low in invasive species.

Further evidence that ballast water is the source of the MSX outbreak has been obtained by DFO scientists who have tracked the spread of the parasite. Aside from oyster farms on the Bras d'Or Lakes, MSX has been identified in Aspy Bay, and two sites in PEI, St. Peter's Channel and Hillsborough. All sites where MSX has been found are linked to sites in Cape Breton by the transfer of oysters. These secondary sites all show that the disease is in its early stages, whereas the disease was much more advanced at St. Patrick's Channel, also suggesting that the outbreak started there and was spread to other regions.

### **What is being done?**

DFO is working hard to contain MSX by asking infected growers to take their oysters out of the water and bring them to market. Transfers of shellfish from one site to another have been halted in the region. Surveys are planned for this summer to

By Gretchen Fitzgerald and Susanna Fuller

track the spread of the disease.

However, in spite of the Herculean efforts on the part of DFO in response to MSX, not enough is being done to address the probable source of the problem: ballast water. Current Canadian guidelines ask ships to exchange their ballast in the open ocean in order to reduce the number of potential invaders they are carrying. However, studies commissioned by Transport Canada, the body that regulates ballast water in Canada, have highlighted the need to protect special areas such as the Bras d'Or Lakes from bioinvasions. One of these studies specifically identified the introduction of MSX as a potential threat that needed to be addressed.

### **The Broader Context**

The MSX invasion occurred in the context of events that highlight the need for the Canadian government to do more to prevent bioinvasions. Firstly, a recent report from the office of the Auditor General squelchers Environment Canada, Transport Canada, and DFO for not taking measures to address the issue, which is estimated to cost the Canadian economy billions of dollars per year. Secondly, ballast water reporting forms indicate that not all ships are carrying out recommended measures. Lack of standards and monitoring of ships' ballast means that Transport Canada and DFO have little means to even identify and stop invasion threats, or even estimate the level of compliance with recommended treatment measures.

As stated earlier, government agencies were aware of the threat of the introduction of MSX. In spite of this information, it took over two months for the disease at St. Patrick's Channel to be identified as MSX. Continual monitoring for bioinvaders must become a priority for DFO if further introductions are to be contained or prevented.

Finally, stalling tactics on the part of the shipping indicate that this industry is unwilling to change its practices to protect local industries from the kind of damage MSX and other invaders can cause. The Atlantic Sub-Committee for the Management of Ballast Water has been meeting for the past two years to come up with voluntary guidelines for ships travelling to ports in this region. The draft of these guidelines identifies Little Narrows as an area of special concern, and asks ships to take extra care not to discharge their ballast in this port. Without the stalling tactics on the part of the shipping industry, these guidelines would now be in place, and the

*cont'd on page 6*

Bras d'Or Lakes would have a modicum of protection from bioinvasions.

This lack of co-operation from industry is inappropriate since the industry was consulted throughout the process of drafting these guidelines. It is especially galling given the implications of the MSX outbreak. The ability of industry to de-rail the regulatory processes of Transport Canada is exasperated by a lack of a coherent, national policy on ballast water. Regional in-fighting such as this has enabled the Great Lakes region to endorse a ballast water exchange zone in the Gulf of St. Lawrence in spite of scientific evidence that this exchange zone represents a significant threat to fisheries and aquaculture industries in the area.

Meanwhile, ships at Little Narrows continue to discharge untreated ballast water – reports show that 22,000 m<sup>3</sup> of ballast water from the port of Baltimore was discharged at Little Narrows on December 2nd - increasing the probability that other invaders will be introduced. This should be of special concern to oyster growers because, while US oysters developed a resistance to MSX, the introduction of a second oyster parasite called dermo has prevented the recovery of the oyster industry in Chesapeake Bay. If dermo is

allowed to creep in, the oyster growing industry in Atlantic Canada may be shut down.

#### **Where do we go from here?**

The Bras d'Or Lakes ecosystem is fragile – flushing of the lakes is very low, so that pollutants and organisms discharged in the lakes may be contained in the system for a long time. MSX may be here to stay and will affect a multi-million dollar industry in Atlantic Canada. Not just any industry – but one that was sustainable, lucrative and had low impact on the environment. It was also an industry with a huge potential for growth: recent listing of Canada's best restaurants in Calgary – Catch – cited oysters from Cape Breton as part of the dining fare.

The MSX bioinvasion emphasises the need for the Canadian government to do more than react to invasions once they are detected. Not only does Canada have an obligation to prevent biological invasions as a signatory of the Convention on Biodiversity, DFO is obliged by the Fisheries Act to protect fish habitat and fish food, an obligation it has clearly neglected in the case of MSX.

According to the precautionary principle, activities that are thought to represent a significant threat to the environment should

be regulated in such a way that this threat is reduced or halted completely. With increased trade, the threat of new invasions also increases. Steps must be taken to ensure that the shipping industry takes responsibility for the risk it incurs to local ecosystems and industries. We need regulations rather than voluntary guidelines for ballast water, and regulators must ensure that ships' ballast meet standards for treatment before this ballast is discharged in Canada.

Responding to invasions on a crisis management level will get us nowhere. Pre-emptive management, risk assessment and conscientious monitoring must be part of Environment Canada, Department of Fisheries and Ocean and Transport Canada's ballast management plan. In dealing with bioinvasions, the age-old adage, an ounce of prevention is worth a pound of cure, could never be more apt.

*Gretchen Fitzgerald* is on the Atlantic Subcommittee for Management of Ballast Water as a representative of the Committee on Marine Bioinvasions of the Ecology Action Centre and is completing a Masters Degree in Biology at Dalhousie University. *Susanna Fuller* is a Biology PhD. Student at Dalhousie University.

**Table 1:** Five biological invaders present in Atlantic Canada.

COMMON NAME (Scientific Name)	DATE OF INTRODUCTION TO ATLANTIC CANADA - ORIGIN	INTRODUCTION MECHANISM	ABUNDANCE / ECOLOGICAL ROLE
<b>MSX</b> <i>(Haplosporidium nelsoni)</i>	2001 - Asia (via Atlantic US)	likely ballast water	parasite causing 80-95% mortality in American oysters
<b>Dead Man's Fingers</b> <i>(Codium fragile ssp. tomentosoides)</i>	1989 - 1990 Asia (via Atlantic US)	packaging products for shellfish or ship fouling	replacement of native kelp beds, habitat alteration
<b>Green Crab</b> <i>(Carcinus maenas)</i>	1950s - Europe (via Atlantic US)	shipping and range expansion	carnivore / omnivore which preys on natural and cultured bivalves
<b>Kelp Moss Animal</b> <i>(Membranipora membranacea)</i>	1990s - Europe	ballast water	encrusts blades of kelp and other seaweeds causing breakage
<b>Clubbed Tunicate</b> <i>(Styela clava)</i>	1998 - Asia (via Europe)	ship fouling	fouling organism, affecting bivalve aquaculture

**Sources:** Collated and modified from Carleton 2000, unpublished manuscript, and A.S Chapman, pers. comm.

**Table 2:** Five potential biological invaders of Atlantic Canada.

COMMON NAME (Scientific Name)	SOURCE REGION	MEANS OF TRANSPORT	ECOLOGICAL ROLE
<b>Dermo</b> <i>(Perkinsus marinus)</i>	origin unknown, now as far north as Maine	ballast water or oyster transfers	parasite causing 40 - 90% mortality of American oysters
<b>Bonamiosis / Microcell Disease</b> <i>(Bonamia ostreae)</i>	origin unknown, found in Maine	oyster transfers, possibly ballast water	parasite causing ~ 100% mortality of European oysters
<b>Veined Rapa Whelk</b> <i>(Rapana venosa)</i>	Northwest Pacific, now in Chesapeake Bay, Virginia	ballast water	predator of clams, mussels, and oysters
<b>Asian Shore Crab</b> <i>(Hemigrapsus sanguineus)</i>	Asia, now most abundant shore crab from New Jersey to Cape Cod	likely ballast water	competes with native crabs, affects growth of intertidal organisms
<b>Botrylloides violaceus</b> (a colonial tunicate, no common name)	Northwest Pacific, now as far north as Maine	likely hull fouling	fouling organism

**Source:** Paul Fofonoff, pers. comm.

## DID YOU KNOW?

**T**hat you have to comply with federal laws even if you hold provincial or municipal licenses, permits, or authorizations? It's the law.

The Canadian Constitution does not deal expressly with the protection of the environment. The courts have determined that the protection of the environment is a jurisdiction shared between the federal Parliament and the legislatures. Here is one example of why "deleterious substance of any type in water frequented by fish". The penalties for such offences are set out in subsection 40(2) of the Fisheries Act and can be significant.

The release of pollutants into the environment is registered by both orders of government. A provincial or municipal permit or other approval does not exempt you from complying with federal laws.

important to you. The Fisheries Act is important federal legislation for the conservation and protection of fish and fish habitat, to provide for sustainable utilization of Canada's fishery resources. All discharges and releases to "water frequented by fish" from activities or operations must comply with its provisions. Under subsection 36(3) of the Fisheries Act, it is an offence to directly or indirectly deposit or permits the deposit of a

This information is provided as general information. If you require more information, call the Environment Canada office nearest you. For specific legal advice, it is recommended that you consult your own legal consul.

[www.ec.gc.ca/enforce/homepage](http://www.ec.gc.ca/enforce/homepage)

***The Bras d'Or Stewardship Society is interested in contributions from our members. If you have something to contribute to the Newsletter or would like to work with the society's board, please let us know. The society is an all volunteer organization that welcomes input from individuals interested in promoting the conservation, protection and restoration of the Bras d'Or Lakes and its watershed.***

## NOTICE

**The Annual General Meeting of The Bras d'Or Stewardship Society will be held at the Alexander Graham Bell Museum on Saturday, March 23, 2003.**

**This meeting will review Society business for year end December 31, 2002. We urge that all interested members to attend. You are welcome to bring a guest.**

**The time of the meeting is 2PM time.**

# ***The Bras d'Or Stewardship Society***

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**Bras d'Or Watch**  
to report any observed acts,  
incidents and violations that  
threaten the integrity of Bras d'Or  
Lakes please call:

**1 800 565 1633**

Our Email: [stewardship@baddeck.com](mailto:stewardship@baddeck.com)

2003

## **BRAS D'OR STEWARDSHIP SOCIETY**

MEMBER	<input type="checkbox"/>	\$15.00
FAMILY	<input type="checkbox"/>	\$25.00
CONTRIBUTOR	<input type="checkbox"/>	\$50.00
SUPPORTER	<input type="checkbox"/>	\$100.00
LIFETIME MEMBER	<input type="checkbox"/>	\$500.00

Yes, I am in favour of conserving and restoring the  
Bras d'Or Lake and watershed through  
responsible stewardship.

Name

Address

*Mail check or money order along with your  
name and address to:*

**Bras d'Or Stewardship Society**  
**P.O. Box 158**  
**Baddeck, Nova Scotia, B0E 1B0**

Phone

e-mail

Fax