

Protecting our Lakes and Watercourses: Essential to Fighting the Proliferation of Blue-Green Algae !

GUIDE FOR OUTAOUAIS RESIDENTS



**Bleu Outaouais**
Let us protect our lakes and watercourses!

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Bleu Outaouais



Summary

Message from the CRÉO president.....	3
Blue-green algae – Cyanotoxins in the Outaouais	5
CAPSULE : Every drop counts !	7
CAPSULE : On the menu: a diet low in nitrogen and phosphorus.....	8
Municipal Affairs and Regional Development: The Regulatory Power of Local and Regional Municipalities.....	9
MRC de Papineau - Initiatives and actions	10
CAPSULE : Are you a healthy navigator?	11
MRC des Collines-de-l’Outaouais - Initiatives and Actions	12
Ville de Gatineau – Initiatives and actions.....	13
MRC de Pontiac – Initiatives and actions.....	13
CAPSULE : The lake « blues »	14
CAPSULE : Does your lake have good kidneys?	15
MRC de la Vallée-de-la-Gatineau : Initiatives and actions.....	16
CAPSULE : Sceptical about your septic facilities ?.....	17
The « Réseau de surveillance volontaire des lacs de villégiature » : an indispensable tool for municipalities and lake associations.....	18
Creating a Lake Association	19
The Agricultural Dimension of the Blue-green Algae Intervention Plan.....	19
CAPSULE : The shoreline : the lake’s natural shield !.....	20
The Gatineau River Watershed Committee (COMGA) – 2008-2009 Activities	21
The Lièvre River Watershed Committee (COBALI) – Protect Water, to Protect Life.....	21
CAPSULE : A green world in a watery universe !	22
CAPSULE : Gardening : a health insurance for our lakes !	23
Adopting Sound Practices when Working in Sensitive Environments	24
For Sustainable and Responsible Use of the Region's Natural Resources	24
Restoring a Riparian Strip: Indigenous Plants and Shrubs are Recommended.....	25
Development focuses of the Outaouais region :	26
Conférence régionale des élus de l’Outaouais	27
Associated partners :	28



Message from the CRÉO president

The Conférence régionale des élus de l'Outaouais (CRÉO) is pleased to present this first publication on protecting the region's lakes and watercourses.

This reference guide is addressed to Outaouais residents, stakeholders and elected officials, and results from a concerted effort of many partners in the region. It emerged out of the consultations on the drafting of a regional action plan to counter the proliferation of blue-green algae in the region's lakes and watercourses.

In the Outaouais, lakes and rivers have for decades played a central role in the social, cultural and economic development of all the territories' communities. Enhancing and protecting our natural heritage are essential to maintaining the prosperity of communities and future generations. Current events illustrate the degree to which water protection has become a central concern of residents in the region. This is why THE CRÉO has made environmental protection and territorial development a strategic priority for the Outaouais.

Bleu Outaouais, for the protection of lakes and watercourses, is a unifying regional concept to bring regional partners together to share knowledge, expertise and resources through collective action. **Bleu Outaouais** is also a coordination structure and development approach mobilizing scientists, environmental agencies, regional county municipalities (MRCs), municipalities, government departments, watershed associations and shoreline residents associations in an integrated regional action plan to protect our magnificent region's lakes and watercourses.

CRÉO's elected officials believe that the sustainable management of lakes and rivers is a social responsibility. They are committed to taking the necessary leadership to stimulate more coordinated action and synergy among the region's principal partners and stakeholders. A regional promotional campaign is part of this commitment to regional action.

This publication, in its English and French versions, is the result of the regional synergy to which we aspire. Its objectives are the following:

- Promote good protection practices among resort owners, regional residents and elected officials; and inform the public about available resources and programs and their associated actors;
- Highlight the initiatives and actions organized by MRCs, municipalities, and departments and agencies mandated by the Québec government;
- Ensure that partners associated with the regional action plan reach out to all territories in the region;
- Support MRCs, municipalities, and partner agencies in disseminating relevant and appropriate information.

Special thanks go to the *Ministère des Ressources naturelles et de la Faune* (MRNF) and the *Ministère des Affaires municipales et des Régions* (MAMR) for their financial contributions that made this guide possible.

On behalf of THE CRÉO's board of directors and its *Commission Protection de l'environnement, Aménagement*



du territoire and Transport, I particularly wish to thank the *Conseil régional de l'environnement des Laurentides* and other associated partners, writers and contributors, for working together to create this regional reference tool to protect the Outaouais' lakes and watercourses.

Marc Carrière
President
Conférence régionale des élus de l'Outaouais

You can consult, download and distribute the guide from the CRÉO's website at :

www.cre-o.qc.ca



Our Lakes and Watercourses: A Regional Portrait – Issues and Challenges

By Ghislain Ladouceur, biologist, ABQ # 2290 and regional director for Outaouais/Abitibi-Témiscamingue of the *Association des biologistes du Québec*, ghislain.ladouceur@sympatico.ca

The Outaouais features an exceptionally rich river system comprising rivers, lakes, intermittent and regular streams, marshes, wetlands and many other phenomena. Nearly 10% of the Outaouais' land surface is water, most of which is spread over 13 watersheds, including the six largest rivers: the Gatineau, Coulonge, Dumoine, Noire, Du Lièvre and Petite-Nation. All of them empty into the Outaouais River, which we share with Ontario.

As for lakes, some people say the Outaouais has 15,000, while others claim there are over 30,000 lakes in the region. One thing is certain: the Outaouais is a lake region! These lakes and their regular and intermittent watercourses form diversified and rich habitats. As a biologist specializing in the environment (I was trained as an ecologist), I want to explain the basic premise of this scientific field. Ecology is a word originating from the Greek and it means science of the home (home in the sense of the basic unit of perception). Ecology is the scientific study of interactions that determine the distribution and abundance of living organisms. In other words, ecologists study ecosystems, which consist of the species under study and their environment.

The same could be said of lakes and watercourses. Lakes and watercourses are brimming with life of all kinds, so we can consider them as living. The ecosystem which is a lake does not stop in the water at the edge of your property, however; on the contrary, in most cases, your property is an integral part of the lake ecosystem. In fact, the lake ecosystem may extend as far as the marsh located several hundreds of metres away from the lake, or up to the intermittent watercourse that provides the marsh with a hydrological link to the lake. Any actions performed at the edge or within the marsh or along the intermittent watercourse will inevitably affect the lake

ecosystem. This is why your actions have such an important impact on the lake's evolution.

The health of our watercourses is precarious. Over 23% of our watercourses are considered to be acidic (18% in Québec) and over 39% are in a transitional process of acidification (34% in Québec). What with the pressure the region faces as a resort area and city-dwellers' dream of owning a little piece of paradise beside the water, the onslaught on our lakes and watercourses is not about to diminish.

So, you have an important role to play. Your past actions have definitely had an impact, but what you do starting today is even more important, because it will determine the future of our watercourses. Essential to this are awareness, information sharing and knowledge building. Knowledge seems to be a major shortcoming right now. Some municipalities and MRCs appear to be more advanced than others, and we're seeing more and more changes. In this

respect, we should increase the knowledge about each of our lakes at the watershed level (notion of ecosystem). To do this, I think that the procedure proposed by the *Ministère du Développement durable, de l'Environnement et des Parcs* (MDDEP), to establish management plans for the lakes' watersheds, is a crucially important action for MRCs and municipalities. Residents must be encouraged to get their lake registered in the MDDEP's resort lakes monitoring network (*Réseau de surveillance des lacs de villégiature*).

I will end by saying that we can talk to our lakes all we like, but they don't have ears and only our actions will produce change.



The Outaouais River, which we share with Ontario.





Blue-green algae – Cyanotoxins in the Outaouais

Public advice from the *Agence régionale de la santé et des services sociaux de l'Outaouais*

By **Louis-Marie Poissant, M. Sc. Environment, Environmental Health - Direction de santé publique de l'Outaouais,**
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Cyanobacteria, also called blue-green algae¹, are amongst the most ancient forms of life on earth. Our planet is approximately 4.6 billion years old; life appeared about 3.8 billion years ago, and cyanobacteria about 2.8 billion years ago. They were the first organisms to perform photosynthesis.

Since they release oxygen, they were the main reason for the increase of oxygen concentrations in the atmosphere, which took place over a period of 2 billion years and enabled animal life to appear. By way of comparison, the retreat of the glaciers from the Outaouais occurred about 10,000 years ago, when the region's lakes filled with fresh water.

There are at least 2,500 species of cyanobacteria throughout the world, only a small proportion of which (about 40) produce toxins (excluding the lipopolysaccharides, LPS). But all cyanobacteria can produce water blooms when the conditions are conducive. That is why it is so difficult to predict ahead of time whether any specific water bloom can produce certain toxins.

The toxins released by cyanobacteria are divided into three groups.

Irritant toxins: lipopolysaccharides (LPS) :

These toxins are in fact an essential component of the cell walls of cyanobacteria. As this is a molecule produced by all cyanobacteria in the cell wall itself, it is produced throughout the whole season. It acts on contact with the skin and mucous membranes (nausea, etc.). It is the only toxin that always acts in the short term. Obviously, the more cells there are the higher the risk, hence the idea of warning people against bathing when the water is blue-green.

¹ Whereas algae have a cellular core, bacteria, including cyanobacteria, do not have a cellular core. Algae, or fungi such as yeast, have a core.

Neurotoxins and hepatotoxins :

The two other categories of toxins, neurotoxins (that attack the nervous system) and hepatotoxins (that attack the liver), have several points in common, the main ones being:

- They are housed in the cells (intracellular).
- They are not produced evenly throughout the season. Little is known as yet about the seasonal variations in the production of toxins, but we know that they exist and are important. There may be variations from one dominant species to another (and even from a strain that genetically produces fewer toxins to one that produces more), depending on the year, nutrient availability (including phosphorus), luminosity, and temperature (which in turn influences oxygen levels) etc.².
- To complicate the whole issue somewhat, it is the lysis of the cells (when the cells die and open) that releases the toxins into the environment (the water).
- They attack the body through ingestion (water absorption), in both the long and the short term.

The presence of scum, therefore, does not necessarily mean that the species produces toxins and, if it can produce toxins, it has not necessarily produced them in sufficient quantity at the time the specimen is taken.

It follows from the above that the toxins that constitute more of a risk for drinking water will be more abundant at the end of the summer and in the fall in a temperate zone like the Outaouais. This in fact is what has been noted in the few world-wide studies dealing with the issue.

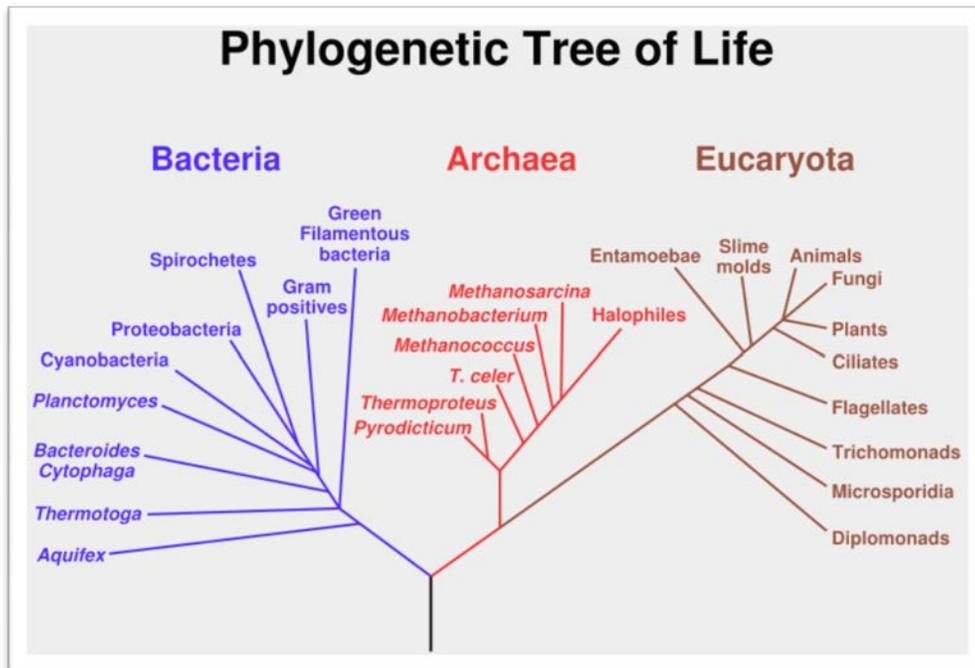
² Chorus, I and J Bartram, eds. (1999), *Toxic cyanobacteria in water: a guide to their public health consequences, monitoring and management*. E & FN Spon, London, pages 69 to 73.

Neurotoxins affect influx transmission in the nervous system. For example, Anatoxin-a (s) is an organophosphate that acts exactly like organophosphorous pesticides: it is a cholinesterase inhibitor. When absorbed, the neurotoxin can therefore theoretically have a short-term effect, but no human case has been documented. There have been virtually no studies conducted on the long-term effects of neurotoxins; it should be noted that their rapid destruction in the environment means that they are not a major preoccupation in the long term

The best-known hepatotoxin is microcystin LR. Here again, the highest risk factor is oral absorption (in drinking water).

The short-term effects of these toxins can be seen when there is a breakdown of the cell walls and of a bloom. This is when the toxins are released into the water and may be found in drinking water. Typical symptoms are gastro-intestinal. In the longer term, microcystin can act in small quantities (chronic exposure), especially by destroying the liver cells. Health Canada recommendations concerning this toxin in drinking water have been developed in relation to the long-term effects.

The presence of water blooms, and the resulting toxin management issues, are emerging problems in the Canadian Shield lakes in Québec, stemming from the phenomenon of accelerated eutrophication of the lakes that has been happening since the sixties. We are therefore in a period of assessment of this phenomenon and the risk it poses, and an attitude of vigilance and prudence is recommended.



Source : Wikipedia, http://fr.wikipedia.org/wiki/Image:Phylogenetic_tree.svg



Every drop counts!

A drainage basin or watershed is an area drained by a lake or river and its tributaries. It acts like a funnel, collecting all the water within the area and channeling it into a lake. Its limits are naturally defined heights of land and are not determined by humans, road maps or administrative decisions. Each river, lake and wetland has its own drainage basin that may also be part of a larger drainage basin.



Everyone is responsible for the environment, and it is essential that water is managed collectively. We must stop acting individually and work together. Even those who do not live near bodies of water must join in and preserve water for the health of our lakes, rivers and mankind.

Industries

Toxic emissions in air and water. Toxic particles emitted in the return to earth in the form of precipitation.

Agriculture and forestry

The spreading of fertilizers and pesticides can pollute and contaminate the water. Forest harvesting may increase runoff, nutrients and sediments losses to lakes and may accelerate the aging process.

Homes

Wastewater, phosphate based products, pesticides, domestic fertilizers and artificial shorelines can contribute to the deterioration of the health of lakes and rivers.

Tourism and holiday resorts

Certain boating activities, intensive use of fertilizers on golf courses, artificial shorelines, the use of phosphate-based products, and deficient or substandard septic systems, are all detrimental to water quality.

Watershed agencies of the Outaouais and Laurentians:

COMGA (Comité du bassin versant de la rivière Gatineau)
www.comga.org

COBALI (Comité du bassin versant de la rivière du Lièvre)
www.cobali.org

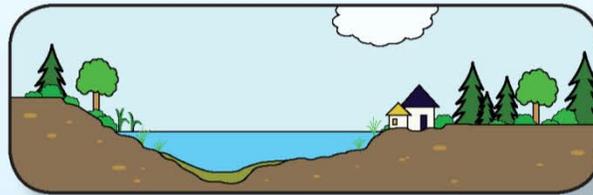
Shore dwellers are not the only ones responsible for the problems confronting lakes. ALL human activity (residential, agricultural, forestry, etc.) within the watershed may have a direct impact on water quality. Whether it is the draining of a wetland to construct a road, the clearing of trees to build a residential complex, the modification of waterways, or the elimination of a stream's natural shoreline, every action related to land use the natural flow and quality of surface waters.

On the menu: A diet low in nitrogen and phosphorus

Lakes are born, fill up and die. This **slow and natural process**, spans over tens of thousands of years. It is sometimes characterized by a surplus of nutrients, which stimulates the growth of algae and aquatic plants. Different human activities generate phosphorus and nitrogen, thereby accelerating the natural eutrophication process. The water is rapidly transformed into an unusable resource (drinking water) or a limited resource (recreational use for swimming, fishing, boating...).

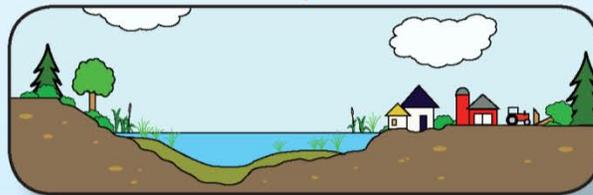
OLIGOTROPHIC lake

- Clear water
- Low nutrient concentrations
- Sparse plant and animal life



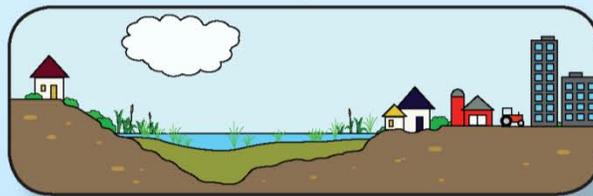
MESOTROPHIC lake

- Water of a lesser quality
- Intermediate nutrient concentration
- Increased plant and animal life



EUTROPHIC lake

- Very poor water
- High nutrient concentrations
- Excessive plant and animal life, causing effects adverse



CAUSES:

Natural

- Watershed runoff
- Flooding

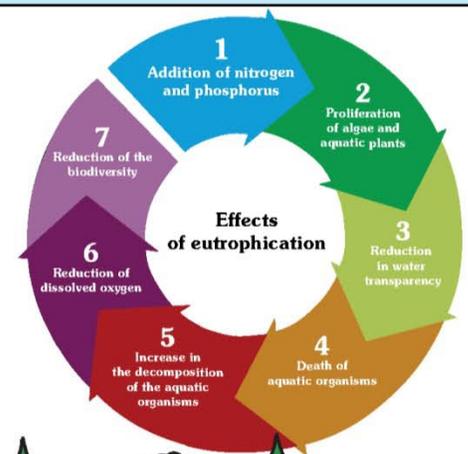
Human

- Use of fertilizers (rich in phosphorus and nitrogen)
- Using household products containing phosphates
- The discharge of waste water
- Shoreline modifications (absence of a natural shoreline, deforestation...)
- Altering waterways (cutting and filling, road ditches...)



Put your lake on a diet by limiting its supply of nitrogen and phosphorus. Some good practices to follow:

- Preserve your shoreline's natural vegetation and don't clear your land or make an artificial beach.
- Make sure that your septic system is in proper working order to limit leaks and pollution.
- Use of phosphate-free domestic products.
- Don't use fertilizers (even organic).
- Don't alter the natural course of streams.
- Practice healthy navigation! Some boating activities increase shoreline erosion.
- Make your municipality, your friends and your neighbours more aware. The environment is everyone's business!



Municipal Affairs and Regional Development: The Regulatory Power of Local and Regional Municipalities

By Yannick Gignac, geographer, *Ministère des affaires municipales et des régions (MAMR)*, yannick.gignac@mamr.gouv.qc.ca.

Under the *Act Respecting Land Use Planning and Development* and the *Municipal Powers Act*, municipal bodies can pass environmental by-laws. Here, we will present some of these powers, in particular those concerning the protection of shorelines, the protection and restoration of vegetative cover, waste water disposal for isolated residences, and finally, the use of fertilizer and pesticide on private land.



Municipalities have certain powers, including the protection of shorelines and restoration of vegetative cover.

Protection of shorelines, littoral zones and floodplains:

The land use and development plan (known by the French acronym, SAD) includes a rules section obliging municipalities whose territory is situated within the MRC to adopt regulatory provisions to protect riverbanks and lakeshores, littoral zones and floodplains (section 5, *Land Use Planning and Development Act*). These rules should be at least as binding as those of the *Politique de protection des rives, du littoral et des plaines inondables* (Policy for the protection of lakeshores, littoral zones and floodplains). Local municipalities may also adopt regulations to protect lakeshores and riverbanks, littoral zones and floodplains (section 113, *Land Use Planning and Development Act*).



www.mamr.gouv.qc.ca

In the following pages you will find a summary of the initiatives and actions undertaken by the regional county municipalities (MRCs) and the city of Gatineau.

MRC de Papineau - Initiatives and actions

By Alexandre Richard, environment coordinator, MRC de Papineau environnement@mrcpapineau.com

Thankfully, the erroneous impression that water is inexhaustible and unalterable is fading in the MRC de Papineau. And that's a good thing! The harmful effects of inappropriate human activity on the quality of this common asset are increasingly apparent and unsettling.

In this region of "green gold" that could also be characterized as a region of "blue gold" (the MRC boasts over 3,000 lakes and numerous rivers), various stakeholders are working to enhance the protection of lakes and watercourses. Environment committees are forming in many of our municipalities, and shoreline residents associations are mobilizing to sensitize people to lake eutrophication, the human behaviour that has caused it, and the required changes.

Some municipalities have assumed responsibility for periodically draining the septic facilities located in their territory or adopt codes of ethics governing pleasure boating on their watercourses. Others have implemented by-laws to restrict the spreading of fertilizer and pesticides on their territory. In fact, the MRC de Papineau is drafting a model by-law on this matter, that can be improved and adopted by each of the 24 municipalities between now and next summer.

In its 2007-2012 strategic plan, the MRC de Papineau committed to becoming a leader in environmental protection and sustainable development. With the projected completion of Highway 50 and ensuing increased traffic, it is crucial that we institute the means to preserve the integrity of our lakes and watercourses and natural landscape.

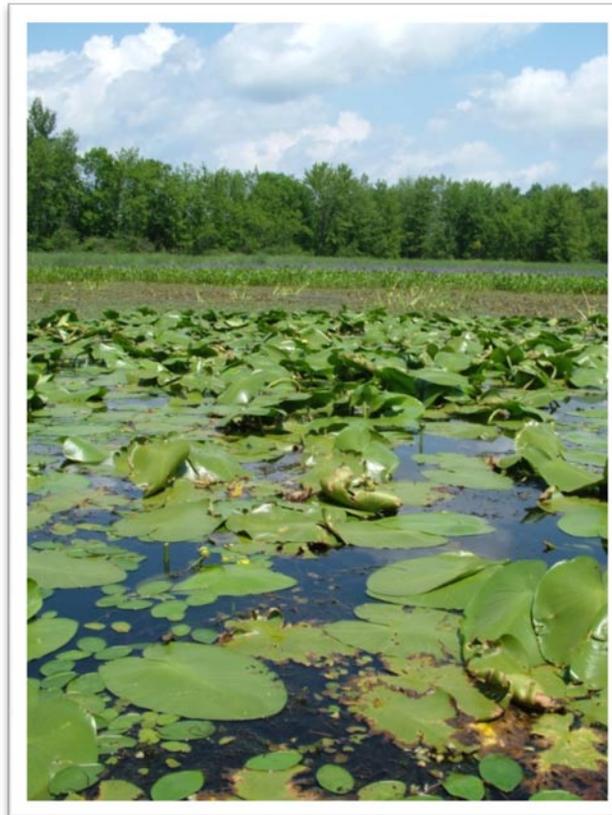
They represent not only a major economic vector for the MRC, but also wealth that will be passed on to our children's children.

The MRC has hired a full-time permanent employee dedicated to environmental matters. The first forum on the preservation of lakes and watercourses was held in June 2008, uniting stakeholders and decision-makers from different sectors to share information and establish the basis for joint coordinated action. A committee made up of municipal officers will develop

ways to increase the application of by-laws and standards compliance with respect to barrier strips, septic facilities, etc.

And this is just the beginning. The MRC will adopt a variety of measures to counter the eutrophication of watercourses. Plans are in the works to implement structuring projects that will draw on the expertise available in the territory to sensitize the public, build knowledge on the state of our lakes, etc. Further, the MRC will reinforce minimum standards with which all 24 municipalities in the MRC must comply to standardize applicable regulations and develop a common vision of the protection of watercourses.

There is still a lot of work to be done. But we must all participate in doing this work because every action taken in a watershed has an impact on water quality. Now that we have seen the risks of the proliferation of cyanobacteria with respect to our quality of life, we have no choice but to act.

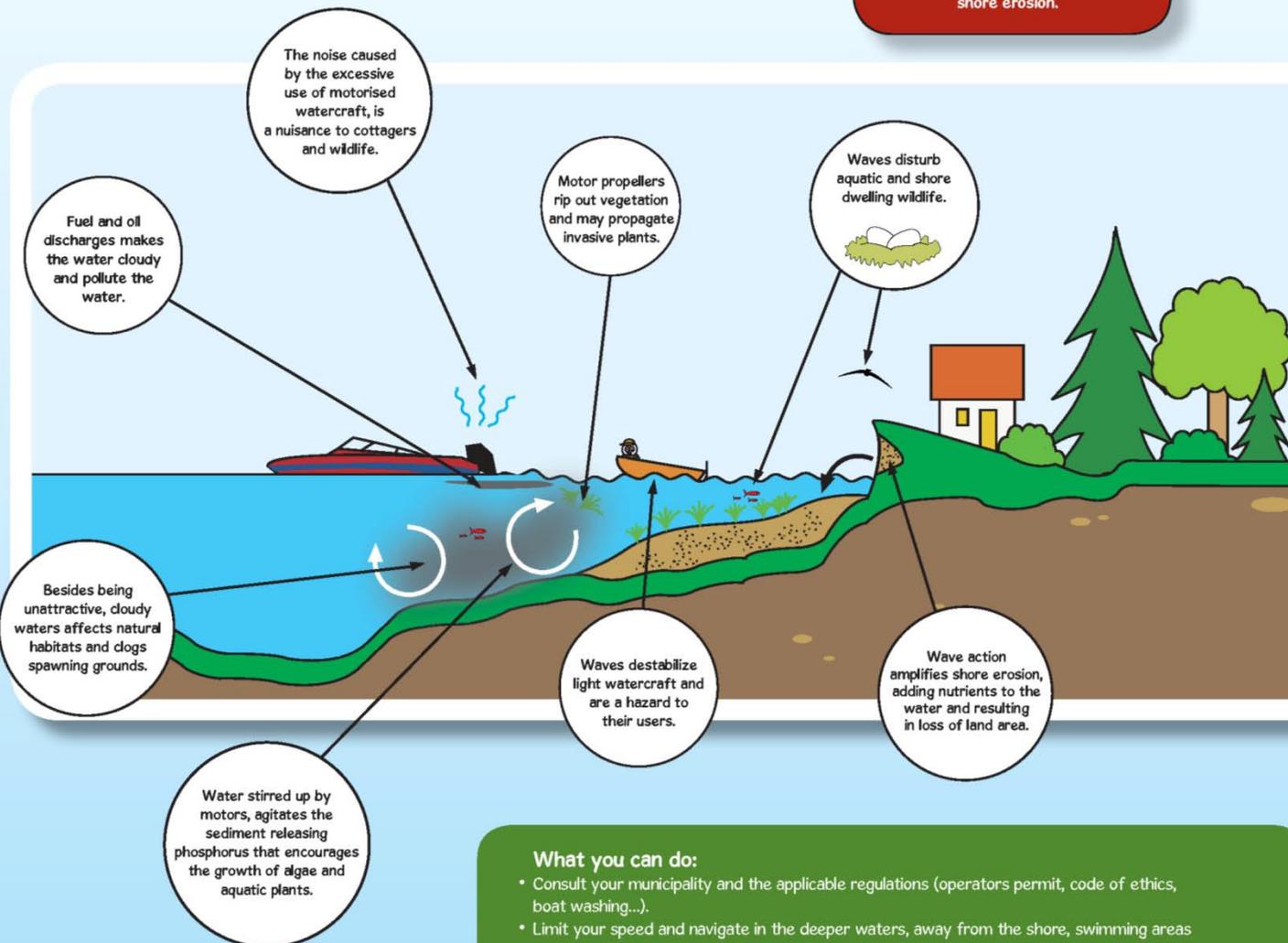
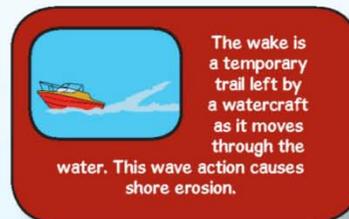


These spectacular marshes, home to a multitude of plant and animal species that are central to maintaining the balance of the Outaouais River ecosystem, are now protected in the Parc national de Plaisance.



Are you a healthy navigator?

Boating allows us to see the world from another angle, but this recreational activity can have a negative impact on the lake. Everyone must take responsibility for protecting wildlife, plants and the quality of lake water.



Kill two birds with one stone!

Practise environmentally friendly recreational activities like swimming, kayaking, pedal-boating... This way you will preserve YOUR health and that of your lake.

What you can do:

- Consult your municipality and the applicable regulations (operators permit, code of ethics, boat washing...).
- Limit your speed and navigate in the deeper waters, away from the shore, swimming areas and other boats.
- Opt for four-stroke engines, they pollute less than two-stroke engines.
- Switch to an electric motor.
- Properly maintain your motor and avoid spills when adding fuel and oil.
- Distribute passengers uniformly in your boat, too much weight in the rear increases the height of the wake.
- Put your boat in the water at a designated boat ramp.
- Don't throw away your garbage – take it with you!

MRC des Collines-de-l'Outaouais - Initiatives and Actions

By Marie-Josée Casaubon, land use specialist, MRC des Collines-de-l'Outaouais mjcasaubon@mrcdescollines.com

The mayors' council of the MRC des Collines-de-l'Outaouais is happy to join the CRÉO and its partners in this initiative. Land occupancy and human activity in lake watersheds leads to lake eutrophication.

Resort development in the territory must be guided by a vision of land use and respect for the environment, particularly water quality and sensitive natural habitats.

As part of the review of its land use and development plan, the MRC des Collines-de-l'Outaouais initiated three projects that are directly related to the protection of water resources and the sustainable management of the territory.

1- **The *Modélisation des lacs en vue d'un développement judicieux du territoire* (Lake modeling for judicious territorial development) project :**

The aim of this project, carried out in partnership with the *Fédération des lacs de Val-des-Monts* and ATINO (*Agence de traitement de l'information numérique de l'Outaouais*), is to characterize, classify and assign sensitivity indexes to all lakes larger than one hectare. The project's partners include Natural Resources Canada and the *Direction du Patrimoine Écologique et des Parcs*, a division of the *Ministère du Développement durable, de l'Environnement et des Parcs* (MDDEP).

The project will make it possible to assess a lake's sensitivity to phosphorus and will be an essential tool for identifying the support capacity of lakes in the context of territorial planning. The modeling project will also provide local municipalities and lake associations with extremely useful information for understanding the lake system and future protection issues.

2- **The *Programme de surveillance et de gestion de l'eau dans un contexte de développement durable : H2O des Collines* :**

Water management in Québec involves multiple players. Water-related issues are well known to water stakeholders, but they are not reflected in land use tools. The coordination of all the stakeholders (watershed committees, MRCs, lake associations, regional environment council and the MDDEP) has become necessary to facilitate integrated management by all partners and enhance the protection of this resource.

Building on experience, knowledge transfer and expertise developed since 2003 under the municipal program, H₂O Chelsea, the MRC des Collines-de-l'Outaouais, together with its constituent municipalities and principal partners will deploy, starting in autumn 2008, a program for the monitoring and management of water in a sustainable development context.

The first mandate of this program, known as **H₂O DES COLLINES**, will be to institute a community-based process of monitoring, research and awareness-raising with regard to water resources (surface and sub-surface). The program will be an exemplary model, incorporating the notion of watershed-based management into the MRC's revised land use plan (*Schéma d'aménagement et de développement révisé-SADR*).

The mayors' council is proud to join with its partners in launching this ambitious program and is extremely pleased that it figures among the MAMR's "rural laboratory" projects initiated under Québec's *Pacte rural*. Not only will water management become a high priority, but the MRC will be a Québec leader in incorporating the watershed-based territorial development approach into territorial planning tools.

3- **A wetlands characterization project and passage of a barrier strip protection by-law :**

Wetlands are very productive habitats that represent ecological diversity of inestimable value. They are part of a vast river system in which they act as natural filters. Heightened awareness of their function will without a doubt ensure their survival and that of many species. The MRC has launched a conservation and protection initiative entitled *Étude de caractérisation et de classification des milieux humides* (wetland characterization and classification study). This will serve as a springboard for the creation of a regional regulatory framework based on the principles of protection and recognition of wetlands' role in our environment.

The MRC's mayors' council will soon pass an interim control by-law to strengthen measures for protecting lakeshores and riverbanks. The aim of this by-law will be to control vegetation in a re-vegetated barrier strip of at least five metres. Within this strip, all cutting of lawns and herbaceous plants, tree felling and bush clearing will be prohibited. The regulation stipulates that restoration work must be undertaken within the 24 months following the regulation's coming into effect.





Ville de Gatineau – Initiatives and actions

By Dave Cassivi, project manager, *Module urbanisme et développement durable*, City of Gatineau, cassivi.dave@ville.gatineau.qc.ca

The Gatineau, Blanche, Lièvre and Outaouais rivers have played in the past, and still play today, a major role in the development of the City of Gatineau. To ensure that these watercourses remain sources of natural wealth for everyone for generations to come, the city has committed to the creation of an environmentally-friendly development framework.

The City of Gatineau passed a series of by-law amendments to enhance watercourse protection measures. These include extended application of protection measures for riverbanks and littoral zones to include all watercourses, both regular and intermittent. The new municipal by-laws also establish more comprehensive protection standards, with the imposition of a 15-metre barrier strip along either side of watercourses.

In association with the National Capital Commission and the City of Ottawa, the City of Gatineau has commenced Phase II of the Integrated Development Plan (IDP) of the Outaouais River. The goal of the IDP is to establish a unifying vision and common principles to enhance both sides of the river. These will serve as a basis for creating a variety of projects and initiatives to promote renewed use of the river in a sustainable context.

Shortly, the City of Gatineau will launch a vast project to inventory the wetlands and watercourses in its territory; this will involve counting the wetlands, defining their ecological characteristics, and determining their distinctive qualities and long-term viability. The City will also define strong criteria for identifying the watercourses for which it holds responsibility with a view to strengthen protection efforts.

MRC de Pontiac – Initiatives and actions

By Pierre Duchesne, land use specialist, and André Pellerin, environment project manager, MRC du Pontiac, p.duchesne@mrcpontiac.qc.ca - a.pellerin@mrcpontiac.qc.ca

On June 18, 2008, the MRC de Pontiac and the CRÉO held a forum on the environment aimed at raising public awareness of watercourse eutrophication and the importance of preserving the quality of the MRC's lakes and watercourses. The forum provided elected officials, lakeshore residents and resort associations and residents with a description of the problem and information on the available environmental protection tools. The meeting was also an opportunity for local decision-makers and stakeholders to start working together and to establish a list of action priorities. One of the invited speakers, Jean-François Girard, a lawyer and biologist, addressed the topic of blue-green algae, emphasizing legislation and citizens' rights with respect to the protection of their lakes from eventual eutrophication due to damaged shorelines and non-compliant septic facilities.

This talk was followed by a panel discussion with representatives from concerned government departments (MDDEP, MAMR and MAPAQ).

The forum gave rise to a blue-green algae awareness-raising campaign that will last several months. The MRC will also publish a directory of organizations connected with the MRC's watercourses, including lakeshore residents associations. The long-term plan is to institute watershed-based integrated water management in Pontiac.

Since the MRC's lakes and watercourses have not been affected much by blue-green algae, elected officials and the public are not very concerned about the phenomenon. Resorts and recreational tourism are important to our MRC because they make it possible for municipalities to maintain their taxation base and public services and generate additional revenues. At the same time, vacation resorts increase the risk of blue-green algae proliferation. Prevention measures do exist: riverbank and lakeshore restoration and the regular drainage of sludge in septic tanks could ensure the continued attractiveness of our MRC as blue-green algae free.



The Lake "Blues"

Cyanobacteria or "blue-green algae" are aquatic microorganisms. When they die, some species release natural poisons called cyanotoxins. Cyanobacteria are naturally present in lakes; and become a nuisance when they reproduce rapidly and in great numbers. Forming a mass, or bloom that is visible to the naked eye. This phenomenon is a symptom of deteriorating lake health.



There are no magic products or techniques to prevent cyanobacteria blooms. Any type of intervention must be approved by the Ministère du Développement durable, de l'Environnement et des Parcs (MDDEP), and requires a certificate of authorization. It is extremely important that we change both our own individual behaviour and the practices of our community.

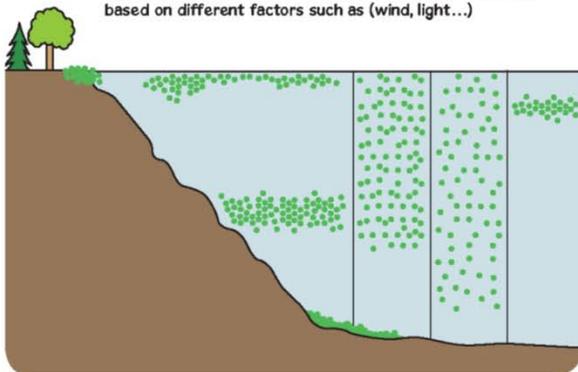
We cannot predict when a bloom will appear; however, the main contributing factor is an excessive amount of phosphorus due to:

- Effluents from septic systems
- Fertilizers (organic and chemical)
- Products that are phosphate-based
- Deforested or artificially developed shorelines
- Certain activities such as agriculture, fishing, and forestry...
- The modification of riverbeds and the draining of wetlands

Stagnant or barely running water and elevated temperatures are other contributing factors.



The possible distributions of cyanobacteria in a deep lake, based on different factors such as (wind, light...)



Adapted from the MDDEP, 2005

Cyanobacteria blooms can affect:

- Human health (irritations, diarrhea...)
- The appearance of the lake (greenish colour, odours...)
- The lake's ecology (harmful to wildlife)
- Recreation and touristic activities (limiting swimming, fishing, drinking...)
- Property values and a decrease in seasonal commercial activities



Blooms generally have an olive-green color but may sometimes develop a reddish or purple blue. Learn to recognize cyanobacteria by reading the MDDEP's identification guide (www.mddep.gouv.qc.ca/eau/eco_aqua/cyanobacteries/guide.htm). If you think you think you have cyanobacteria in your area, take photos and notify your regional MDDEP office and your municipality. Important! Boiling water does not destroy cyanotoxins. On the contrary, it kills all the cells and releases the toxins.

Good practices to limit phosphorus loading:

- Make sure that your septic system is adequate and empty it regularly.
- Avoid using fertilizers (even organic).
- Use of phosphate-free domestic products.
- Preserve your shoreline's natural vegetation by avoiding urban style landscaping such as lawns, retaining walls, concrete...
- Encourage environmentally friendly activities.



Does your lake have good kidneys?

Wetlands are **transition areas between aquatic ecosystems (lakes and rivers) and land ecosystems (fields and forests)**. There are various categories of wetlands: marshes, ponds, peat bogs and swamps, and all wetlands share the following three characteristics:

- The presence of water for varying lengths of time.
- Shallow water, with levels varying from year to year.
- Plants that have adapted to oxygen-poor soil.

In the populated regions of Canada, due to urban development, 70% of wetlands have disappeared. **Yet, they continue to be the best natural filtering system for lake and river water.** In addition to their role as nature's "kidneys", they have a variety of other important functions.

Leisure and interpretation areas:
Wetlands, like lakes and rivers, are places where people can enjoy outdoor activities (canoeing, hiking...) and they are wonderful places for observing the flora and fauna.

Purifiers:
As water flows through lakes, it is naturally filtered. In the wetlands, vegetation, bacteria and animals eliminate many harmful impurities. These areas act as a barrier against sediments and chemical substances; filtering the water and eliminating fecal coliform, among other things.

Regulators:
Wetlands, like sponges, absorb water (rainwater, runoff) and release it during dry spells. In this way, they reduce flooding and the effects of drought, and replenish the water table.



The benefits of wetlands are varied, supplying us with important resources. They play an important role in various commercial activities (harvesting wild berries...) and help maintain the wildlife populations necessary for hunting and fishing.

Despite the diversity of their functions and their ecological and environmental benefits, wetlands continue to disappear due to the pressures of agricultural and urban development. It is essential and urgent that we preserve these natural "kidneys" of our lakes by adopting stricter conservation measures and sustainable development policies.

Stabilizers:
Wetland vegetation acts in the same way as the shoreline vegetation around lakes. It stabilizes the banks and reduces erosion.

Fauna and floral areas:
Wetlands are rich in biodiversity. They supply rest, shelter, food, and areas of reproduction for wildlife, particularly the more vulnerable species. By destroying these areas, you are contributing to the elimination of endangered species. One-third of the species recognized by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) live in these areas.

MRC de la Vallée-de-la-Gatineau : Initiatives and actions

By Catherine Lussier, environmental health manager, MRC Vallée-de-la-Gatineau, clussier@mrcvg.gc.ca

The territory of the MRC de La Vallée-de-la-Gatineau encompasses 13,594 km², including nearly 3,200 lakes. In our MRC, 97% of the 12,000 homes (houses and cottages) are not connected to a sewer system. Realizing that the regional economy depends in large part on its resort potential, the MRC's elected officials decided to institute an integrated septic sludge management system to ensure the quality of our watercourses. The 16 participating municipalities instituted an organized drainage system so that all septic tanks would be drained at the frequency stipulated by the *Regulation Respecting Waste Water Disposal Systems for Isolated Dwellings (Q-2, r.8)*.

Moreover, the MRC has set up a state-of-the-art sludge treatment centre to process this sludge. Summer 2008 marks the Centre's fourth season of operations. Construction costs for the centre: \$4.5 million. The Federation of Canadian Municipalities (FCM) helped us to finance the project through the Green Municipal Funds, but the Centre's debt and operational costs are paid for by home and cottage owners through their taxes (roughly \$200 per drainage).

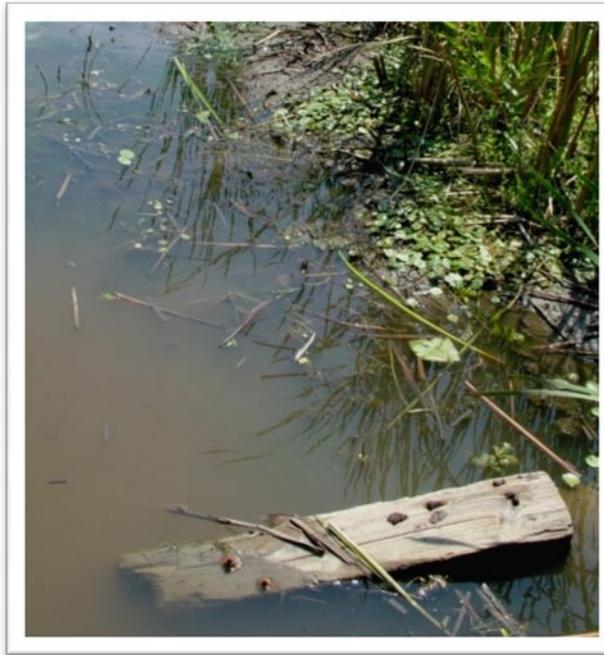
There are four components of the project: septic tanks drainage, sludge dehydration, wastewater treatment and solids recovery.

Every municipality that signed the intermunicipal agreement on integrated septic sludge management (*Entente intermunicipale concernant la gestion intégrée des boues*

septiques sur le territoire de la MRC de La Vallée-de-la-Gatineau) is responsible for septic tank drainage operations. Some of them take direct responsibility for the operation, while others hire a private contractor, either on an individual basis or as a group. They agree to follow a schedule prepared by the MRC for the spreading of sludge, in keeping with the treatment and storage capacity of our processing centre. The MRC's environmental health department manages the Centre, which was designed to treat 12,500 m³ of sludge annually, or the contents of nearly 4,500 septic tanks. Once dehydrated, the sludge is combined with forest waste for composting. The filtrate is

treated in an aerated pond system. The resulting compost will probably be redistributed to the municipalities and residents or used in silviculture.

Our systematic septic tank drainage and inspection program will enable municipal inspectors to make an accurate inventory of the treatment systems in their respective municipalities. In the long term, they will be in a position to reinforce the application of Q.2 r.8 by obliging homeowners who have no system to install one and by backfitting outdated systems.



The collection and treatment of septic sludge, through an intermunicipal integrated management system, contributes significantly to preserving the quality of waterways.

Sceptical about your septic facilities?

Untreated or improperly treated wastewater threatens the lake's biological equilibrium and represents a risk to the health and quality of life of humans. Septic systems may discharge contaminants like phosphorus and pathogenic microbes. Excessive phosphorus supply is harmful to lakes and rivers because it promotes the excessive growth of algae and aquatic plants. Here are some suggestions that are simple to implement and will preserve YOUR health and that of the lake.



Respect the capacity of your septic system by managing water consumption and allowing for "down times" so oxygenation can take place. The bacteria that purifies water need oxygen to work effectively.

Spread out your consumption over the day and the week. Don't waste water:

- Repair leaks.
- Take showers instead of baths.
- Turn off the tap when brushing your teeth and washing food.
- Install water saving devices.



The toilet should not be used to **dump substances that do not get rid of decompose naturally** (or that break down extremely slowly) like cigarette butts, medicines, paint, sanitary napkins. Some chemical products (Javel, Borax...) can actually destroy the useful bacteria in your septic system.

Pump it out!

Every 2 years for permanent residences.

Every 4 years for seasonal residences.

Use **phosphate-free domestic products.**




Acquired rights?

Some older facilities do not conform to current standards. You may have a sump and no drainage field. You are permitted to maintain this type of facility only if it is not a source of pollution or contamination to drinking water. It is recommended that you install a newer system that meets provincial regulations. Did you know that the lifetime of a well-maintained septic system is 20 years? How old is yours? Have you had it inspected recently? Check with your municipality.

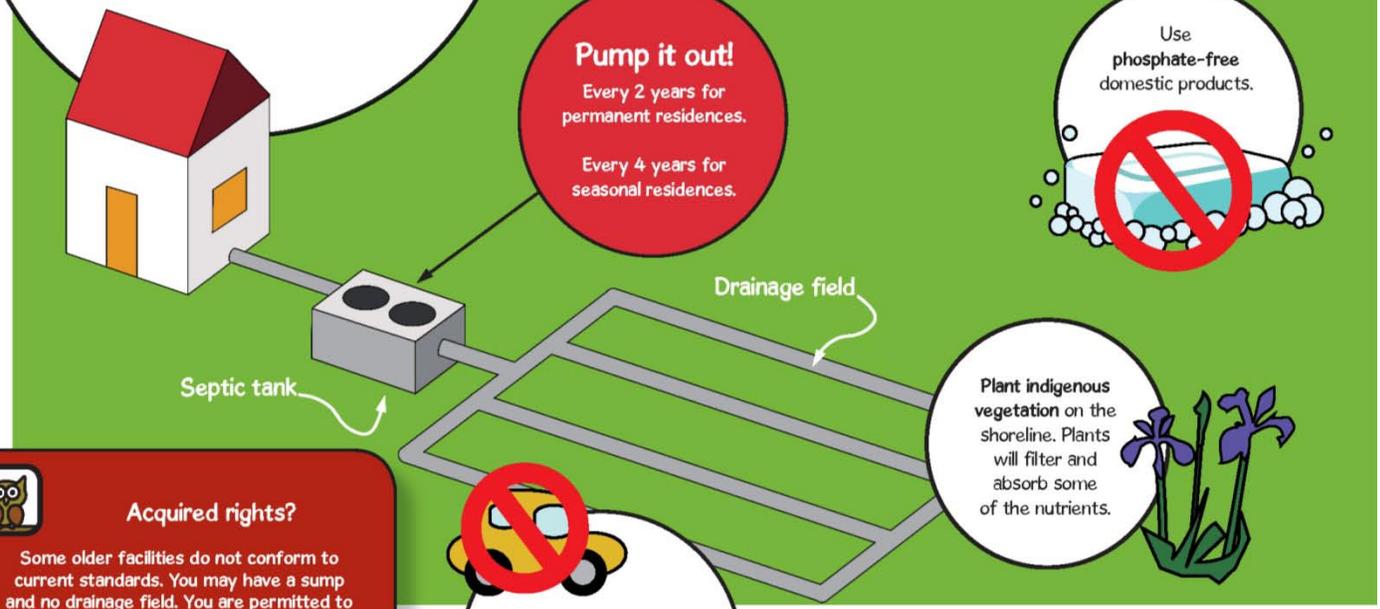


Do not compromise the aeration of your drainage field with asphalt or tiles, and don't park vehicles, make a playing field or plant trees in this area.

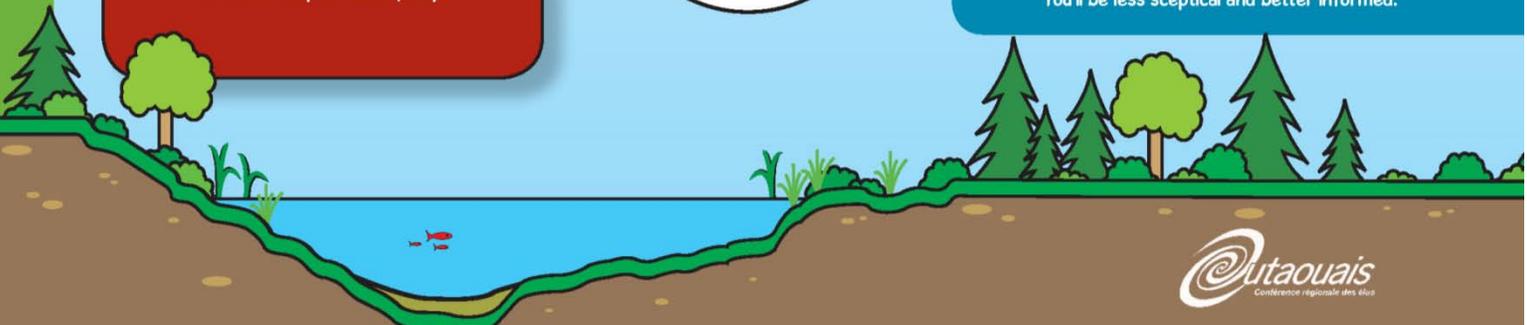
Plant indigenous vegetation on the shoreline. Plants will filter and absorb some of the nutrients.



If you're planning to build a septic system, be sure to respect the installation regulations (minimum distance from a well, lake or property...). Consult your municipality and the government Regulation Q-2; r-8. You'll be less sceptical and better informed.



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The « Réseau de surveillance volontaire des lacs de villégiature » : an indispensable tool for municipalities and lake associations

By Chantal Picard, biologist – Ministère du Développement durable et des parcs (MDDEP), chantal.picard@mddep.gouv.qc.ca

In the adoption of a 2007-2017 action plan regarding blue-green algae, the Quebec government has demonstrated its active role in acquiring greater knowledge on its lakes and watercourses, and on the implementation of improved means of protecting these. Several studies concerning these issues have been published and are readily accessible on the website of the MDDEP.

There are programs available to those involved in water resource use and management, for example, the programs « Environnement-Plage » and the « Réseau de surveillance volontaire des lacs de villégiature » (RSV-lacs). These two programs allow beach operators and lake or river associations, respectively, to better follow water quality of a beach or water body, and thus manage these accordingly. The interpretation of results for participating beaches or lakes is also available on the Ministry’s website.



The involvement of the general population is essential in assuring the sustainable management of our water resources.

The RSV-lacs program involves the participation of local groups who take water samples for analysis of biological and chemical properties, such as chlorophyll *a*, total phosphorus and water transparency. The interpretation of the results allows for the determination of the productivity of a lake, in other words, its capacity for algae or aquatic plant growth. Thus a lake association or municipality participating in the RSV-lacs program plays an active role in learning more about their lake

and in its conservation. For more details on the RSV-lacs program, please visit the following link (in French):

<http://www.mddep.gouv.qc.ca/eau/rsv-lacs/description.htm>.

In addition to the programs mentioned above, there are numerous guides and tools available to the public. These guides serve to facilitate the management and planning of development around water bodies, of the proper installation and maintenance of septic systems, and of the protection of shorelines in opting for practices that have minimal negative impact on the aquatic ecosystem.

In harmony with the Quebec information campaign, the Quebec Government invites all citizens to make even simple gestures towards taking action in the protection of our lakes and watercourses (www.alguesbleuvert.gouv.qc.ca). The involvement of the general population is essential in assuring the sustainable management of our water resources.

Other useful links (Information in french) :

Technical guide for the installation of docks and the management of aquatic plants and algae:

www.mddep.gouv.qc.ca/eau/rives/fichestechniques.htm

Guide for the creation of a lake watershed management plan and the adoption of good practices:

www.mddep.gouv.qc.ca/eau/eco_aqua/cyanobacteries/guide_elaboration.pdf

Beaches of the Outaouais region participating in the program Environnement-Plage:

www.mddep.gouv.qc.ca/regions/region_07/liste_plage07.asp

Important Facts for the Gatineau River :

www.mddep.gouv.qc.ca/eau/bassinversant/bassins/gatineau/FS_Gatineau.pdf

Important Facts for the du Lièvre River:

www.mddep.gouv.qc.ca/eau/bassinversant/bassins/dulievre/FS_DuLievre.pdf

Technical guide for the treatment of waste water in isolated residences :

www.mddep.gouv.qc.ca/eau/eauxusees/residences_isolees/guide_interpretation/index.htm



Creating a Lake Association

By Nicole Desroches, director, *Conseil régional de l'environnement et du développement durable de l'Outaouais*, nicole.desroches@creddo.ca

There are many reasons for creating a lake association, some of them practical, others more social in nature. In the first case, people get together to raise shoreline residents' awareness of different issues and good practices and disseminate this information. In other words, people take collective responsibility for a collective asset: water.

The aim of such an association is to update general knowledge and act as a united voice in dealings with the municipality. Specifically, it works to improve or maintain the health of the lake, water quality, quality of life and the quality of the environment. A priority goal is communications between permanent residents and cottage owners with a view to setting common objectives.

You will need to create a directory of owners, register with the municipality, meet municipal representatives as needed, form links with other lake association, and, depending on the situation, register with the MDDEP's voluntary lake monitoring program (*Programme de suivi volontaire des lacs*).

This means setting up an "executive" or coordinating committee that will draft an information distribution plan, organize meetings, produce a short information newsletter, etc. You



should also discuss the possibility of forming a non-profit organization (NPO). The fee for registering with the *Registraire des entreprises du Québec* is \$32. A legally constituted group can help to ensure stability, provide eligibility for grants and facilitate transactions with credit unions and banks. There are obligations, however, like drafting by-laws, forming a board of directors, convening an annual general meeting, keeping meeting minutes, etc. If people prefer a more informal structure, you can register the association, possibly for the same fee, and operate with a coordinating committee whose job it is to organize one or two meetings per year to share information.

Once you have created your group, the next step is to draw up an action plan based on your initial assessment of the situation. For example, does the situation call for prevention or improvement? Do you need a more detailed diagnosis? You can include the following items in your action plan: awareness-raising, prevention, improvement, partnerships, expected outcomes, etc. You will need to call on the expertise of your members or certain professionals to perform water tests, organize re-vegetation campaigns, write a best practices guide, etc.

On the field : The agricultural dimension of the intervention plan

The Agricultural Dimension of the Blue-green Algae Intervention Plan

By Jean-Jacques Simard, agronomist, and Marc F. Clément, agronomist, jean-jacques.simard@mapaq.gouv.qc.ca ; marc-f.clement@mapaq.gouv.qc.ca

In September 2007, in response to the proliferation of blue-green algae in Québec's lakes and watercourses, the government announced a 10-year intervention plan aimed at resolving the problem throughout Québec. Like other sectors of activity, the agricultural sector must assume its share of responsibility and improve its practices to reduce the impact on the environment and watercourses.

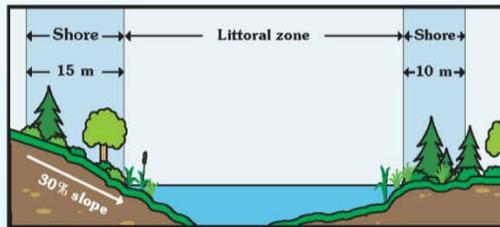
In the Outaouais, agriculture is distinguished by numerous extensively farmed grasslands and pasturelands, in which a balance has nevertheless been attained between livestock and the soil. This helps to guarantee the quality of water in the region's watercourses.



However, even though there was little or no farming activity in the watersheds of most of the lakes affected by blue-green algae in past years, some farms located near sensitive zones will be asked to assess their agricultural practices with a view to protecting water quality. To achieve this, the agricultural component of the government's intervention plan features professional support and increased financial assistance for farming operations.

It is interesting to note that from 2002 to 2007, 157 Outaouais farms invested over \$2 million to install over 300 livestock watering sites set back from watercourses, and some 200 kilometres of fencing to prevent animals from gaining access to watercourses, thus protecting barrier strips and water quality.

The shoreline: the lake's natural shield!

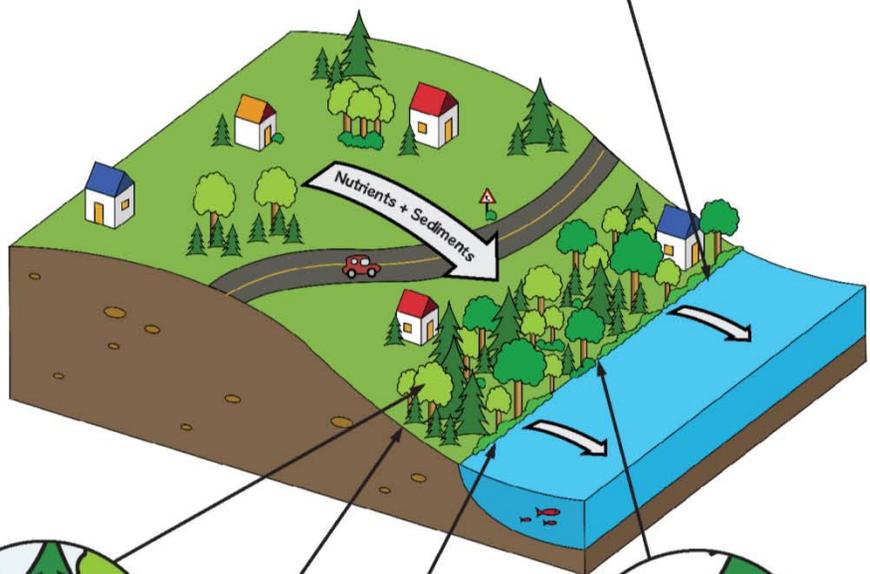


The width of the natural shoreline is determined by the slope of the bank.



The shoreline is a 10 metre-wide strip of natural vegetation or 15 metres-wide if the slope is equal to or greater than 30%. It represents the transition between the aquatic and land environments and ideally is composed of indigenous herbaceous plants, shrubs and trees.

Shorelines are regulated by the *Politique de protection des rives, du littoral et des plaines inondables*, consequently, any changes must comply with your municipal regulations.



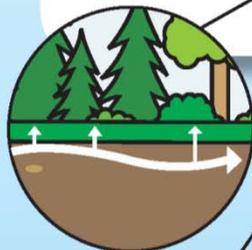
Shade

Shoreline vegetation prevents excessive warming of littoral areas.



Filtration

Shoreline vegetation captures a large part of the sediment and nutrients (phosphorus and nitrogen) that could be washed into the lake. This helps limit excessive growth of algae and aquatic plants.



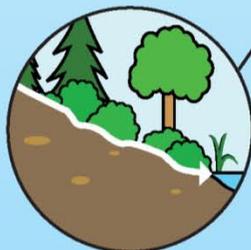
Erosion

Shorelines stabilize the banks and thereby limit erosion and landslides.



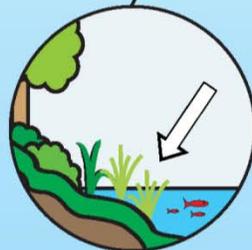
Retention

Shorelines reduce run off velocity and facilitate water seepage into the soil.



Habitats

The shores of lakes and rivers provide essential habitat, food and shelter for wildlife.



The Gatineau River Watershed Committee (COMGA) – 2008-2009 Activities

By Giorgio Vecco, COMGA coordinator, giorgio.vecco@comga.org

The 2008-2009 season will be busy for COMGA. First, we will continue our population education work to inform the public, especially shoreline residents, about practices aimed at restricting phosphate loading of watercourses as a means of limiting cyanobacteria blooms. The Mont Ste-Marie meeting on the health of lakes and rivers was a great success in this respect. COMGA publicizes a barrier strip reforestation course designed specifically for lake associations that is given in different municipalities in the watershed. COMGA has also helped to distribute 9,000 trees to municipalities that have registered with the MDDEP's reforestation program.

The IDEAUX project (*Intégration des politiques de développement, de l'eau, d'aménagement et d'urbanisme en faveur des milieux aquatiques*), a study being conducted with France, will begin in autumn 2008. The project relies on the participation of developers in watershed MRCS and representatives of several government departments. The study

will focus on Canada's water management policy. The goal of IDEAUX is to identify and evaluate all current water management mechanisms. It will enable the development of water governance tools for use by concerned stakeholders. These tools will be used to manage water resources in times of crisis, due especially to climate change.

COMGA is also working with Pollution Probe to develop an online interactive databank of all the information required for water management. COMGA has also begun working with the University of Ottawa on a remote supervision project.

In addition to these activities, COMGA works mostly on its main mandate, the *Plan directeur de l'eau* (water master plan). In 2008-2009, COMGA will address itself to setting goals and indicators for the development and follow-up of its action plan and watershed contracts.



The Lièvre River Watershed Committee (COBALI) – Protect Water, to Protect Life

By Janie Larivière, director, COBALI, info@cobali.org ; www.cobali.org

COBALI was born in November 2003 out of the community's desire to work together to protect the territory's water and the quality of lakes and rivers. COBALI advocates watershed-based integrated water management and examines all usages that have an impact on the territory's water resources. Its mission is to protect, improve and enhance the water resources of the Lièvre River watershed and associated flora, fauna and habitats.

The Lièvre River watershed is a sub-watershed of the Outaouais River. The river's source is Lake Orthès and it flows over 330 km before emptying into the Outaouais River. Its watershed covers a surface area of nearly 10,000 km², of which 13% is in the Outaouais region, specifically, the municipalities of Bowman, Val-des-Bois, Mulgrave-et-Derry, Lac-Ste-Marie, Denholm, Notre-Dame-de-la-Salette, Val-des-Monts, L'Ange-Gardien and Gatineau (Buckingham and Masson-Angers sector). Anyone who lives or works in the territory can become a COBALI member, free of charge.

In 2007, COBALI implemented its mission by tabling the watershed master plan, the *Plan directeur de l'eau du bassin versant*. This tool presents numerous actions that must be undertaken to ensure the effective management of water and aquatic ecosystems. Already underway, it is being carried out by the concerted action of all local and regional water stakeholders, in particular, the citizens.

COBALI deploys the means necessary to help the territory's residents acquire knowledge and develop tools for protecting water resources. Through its promotion of good practices, support of municipal actions, restoration of sensitive lakeshores and riverbanks, documentation of water quality, educational campaigns and other practical activities in the field, COBALI is acting, from a sustainable development perspective, to preserve aquatic ecosystems.

On behalf of this natural wealth, or blue gold, we must **protect water to protect life!**



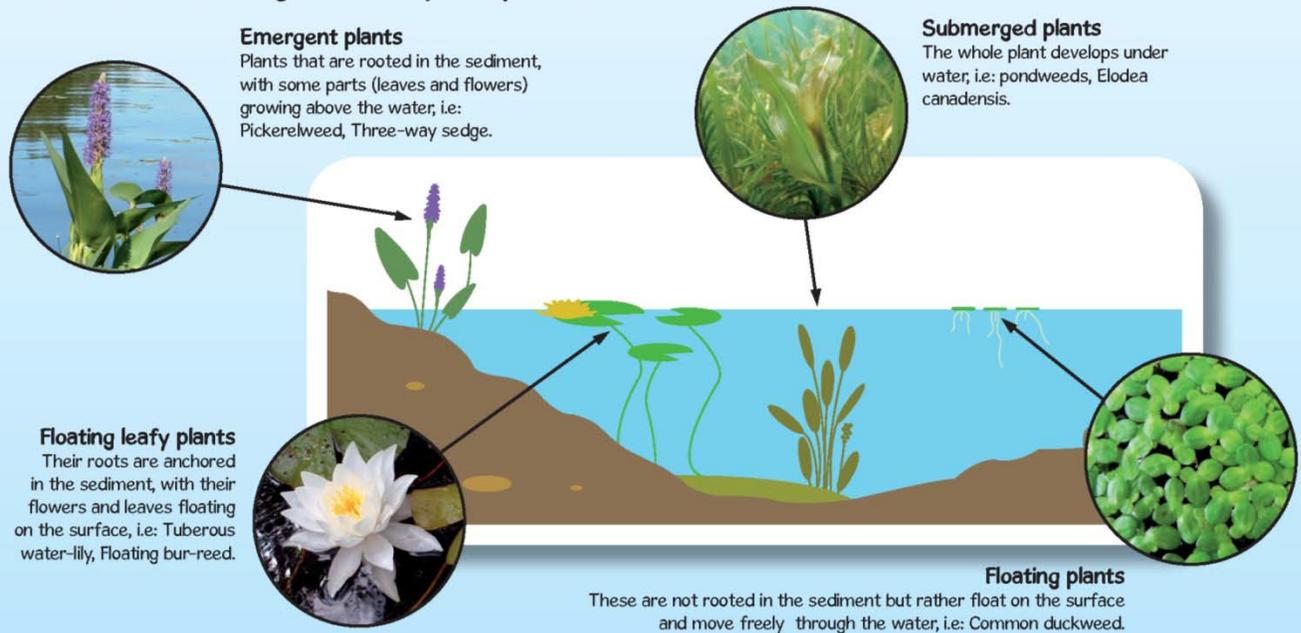
A green world in a watery universe!

Normally, the plants growing in lakes are not harmful. We can identify two life forms that contribute to the health of a lake, algae and aquatic plants. Algae are usually microscopic organisms with no roots, while aquatic plants are visible to the naked eye, living under water or near the shore.

Aquatic vegetation contributes to the smooth functioning of the ecosystem:

- Provides shelter, food and areas for reproduction for aquatic wildlife.
- Filters water by absorbing excess nutrients.
- Buffers wave action and protects shorelines from erosion.
- Stabilizes sediment with their root systems.

There are four categories of aquatic plants:



Harmful invasive species:
Eurasian watermilfoil is a submerged species that is not native to Québec. It has adapted to our environment and has few natural predators. It can invade lakes and hamper native species.

Be careful not to confuse it with Whitish watermilfoil, which is a native species that represents no danger to the environment.



More than 12 segments

Eurasian watermilfoil
(*Myriophyllum spicatum*)



11 segments or less

Whitish watermilfoil
(*Myriophyllum sibiricum*)



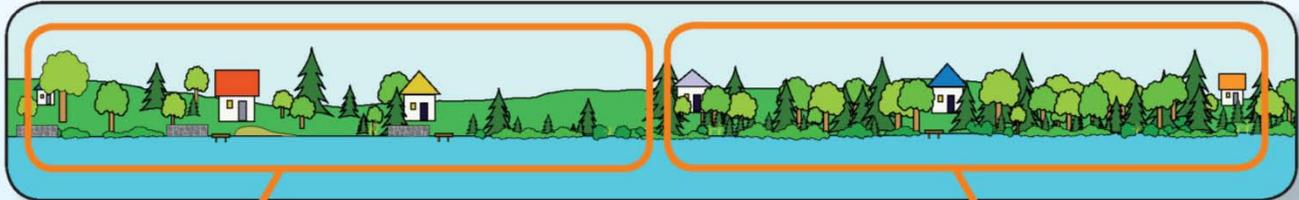
It is normal for the growth rate of aquatic plants to fluctuate from season to season and year to year. To prevent their proliferation, nutrients (nitrogen and phosphorus) must be limited.

There are a number of simple suggestions:

- Preserve your shoreline's natural vegetation.
- Avoid using fertilizers (even organic).
- Make sure that your septic system meets regulatory requirements and have it emptied regularly.
- Use of phosphate free domestic products.

Gardening: a health insurance for our lakes

One of many ways to ensure healthy lakes is to preserve or restore the shoreline.



Urban style landscaping

If your shore is deforested or has been artificially developed with lawns and stone walls, regeneration is essential. You can do this two ways.

1

- **Let nature take its course;** this is the easiest and most economical method.
- **Stop mowing the lawn near the shore** and let the shoreline regenerate (check your municipal regulations).
- **After only 2 or 3 years,** plants that are well adapted to shore areas will grow up naturally. Be patient!

2

- **Plant indigenous species** that are well adapted to our climate and to a lakeside environment in **mid-June or late August**, preferably in the early morning or evening.
- **Don't use fertilizer or compost.** Fertilizers are bad for a lake's health and contribute to the proliferation of algae and aquatic plants (eutrophication).



Select plants that are best suited to your shore. They should be fast-growing, with a hardiness of 2 to 5 and have a root system capable of stabilizing the soil. Choose flowering and fruit-bearing plants. Not only will they brighten up your shore, but they will also attract insects and birds.

To the right are plants adapted to different environments, but there are also other species that will suit your property and your tastes (colour, flowers, size...).

Nature friendly landscaping

If your shore is in its natural state, congratulations! Keep it up. Your experience could be useful to your neighbours and lake associations. Get involved!



A visual guide can be useful as you work. Download this poster at www.crelaurentides.org/capsules.shtml



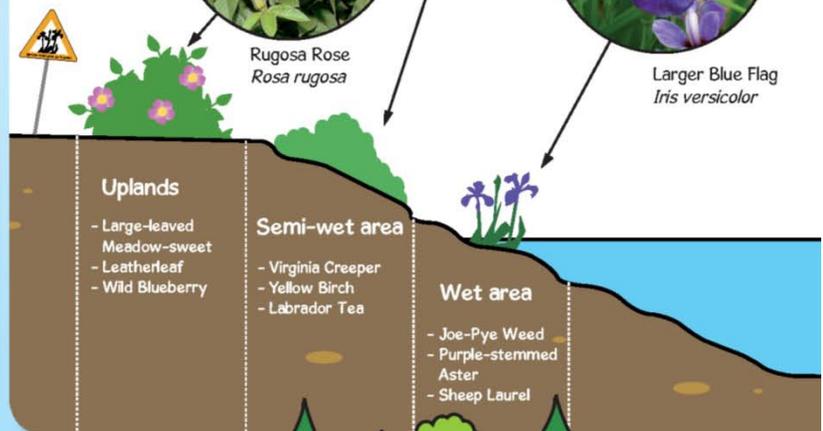
Sweet Gale
Myrica gale



Rugosa Rose
Rosa rugosa



Larger Blue Flag
Iris versicolor





Adopting Sound Practices when Working in Sensitive Environments

By Victor Brunette, director, *Agence régionale de mise en valeur des forêts privées outaouaises* (ARMVFPO), vb.afpo@qc.aira.com

Forestry operations are essential if we expect to continue benefitting from the multiple forest products that ensure our quality of life, and ensure that the forest can generate economic benefits for landowners. The forest harvest requires a solid access network and most operations depend on mechanical equipment.

Well developed woodlots provide a sustained yield by guaranteeing periodic harvests and protecting the biodiversity associated with species that depend on forest cover. Sound management practices protect resources like soil and water. Road construction and logging operations represent more risk to the environment and water than any other forest activity. The following points are important in all harvest operations: pesticide-free strips, absence of water sediment, free movement of fish, and prohibition of the physical modification of watercourses.

In sensitive environments, it is essential to maintain woodlot borders on watercourses and refrain from conducting operations causing soil denudation, and felling trees in watercourses or allowing machinery to traverse watercourses is forbidden. With respect to road construction and drainage, it is important to thoroughly plan the network and ensure adequate drainage.

Lakeshores, stream banks and wetlands are sensitive forest ecosystems. Before planning your operations it is recommended that you contact a forestry consultant and seek technical assistance to properly assess the impacts of the work. Often, it is preferable to avoid interventions in wetlands and riparian strips to preserve and leave intact these exceptional wetlands and forest ecosystems.

Trade unions and lumber producing boards are now certifying forest entrepreneurs who commit to comply with a code of sound practices. Additionally, ARMVFPO encourages good practices and subsidizes, based on established standards, the creation of forest development plans, forest road system projects, the construction of bridges and culverts, tree-planting and forest harvesting.

Get in touch with your union, forest producers board, forestry consultant or ARMVFPO to find out about certified entrepreneurs and grants for forest development and projects. Find out about good forestry practices in the guide, *Sound Woodlots Operation Practices*, which you can find on our website at www.afpo.ca.

For Sustainable and Responsible Use of the Region's Natural Resources

By Charles Blais, director, *Commission régionale des ressources naturelles et du territoire public de l'Outaouais* (CRRNTO) cblais@cre-o.qc.ca

The goal of ecosystem-based territorial management is to ensure the sustainable utilization of natural resources by maintaining the productivity and capacity for adaptation and renewal of ecosystems that produce the resources we all use every day. The government of Québec and our regional stakeholders are committed to making the shift to ecosystem-based management for the integrated management of natural resources in the public territory of the Outaouais.

Ecosystem-based management is the best means of attaining fundamental social aspirations such as quality of life, quality of our living environment and wealth creation, and protecting the environment: quality of the air, water and soil. In this regard, the CRÉO, through the CRRNTO (regional committee on the natural resources and public territory of the Outaouais)

is currently examining what needs to be done in the area of knowledge and know-how development so that, in the short term, we can achieve genuine ecosystem-based management of the Outaouais' public territory.

In the autumn of 2008, the Outaouais will have an action plan for the ecosystem-based management of natural resources in the public territory that will involve the concerted action of numerous stakeholders, notably from the Aboriginal communities, municipalities, universities, environmental groups, resort owners associations, wildlife association, and the energy, forest, mining and recreational tourism industries.

Restoring a Riparian Strip: Indigenous Plants and Shrubs are Recommended

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We propose indigenous or native species or extremely naturalized plants and shrubs. They will adapt well to almost all types of soil and require no fertilizer.

Planting

You can plant directly on the existing vegetation, whether it is lawn or another ground cover. If the soil is constituted of pure sand or gravel just throw a couple of shovelfuls of earth into the planting hole. Maintain a distance of one metre between shrubs. Add water before placing the plant in the hole and after filling it in. Make sure the soil is well watered in the two weeks following the planting.

Maintenance

If the transplanted shrubs are small, place a simple band around the base during the first year to prevent "choking" by tall grasses. You can also seed white clover around the base. This short legume is better than mulch because clover will absorb soil nutrients while preventing the growth of tall grasses.

Shrubs can be clipped in spring or autumn if desired; clipping will stimulate clumping while keeping them at the desired height.

A wooded shore makes an attractive natural feature and a healthy lake !

Willow
Salix spp.

- Elongated leaves with sinuous contour, dark green on top and silver underneath
- Rapid propagation from only a few branches planted in humid soil
- Resistant plant due to very flexible stems



Humidity	Exposure	Size	Height
Withstands flooding and short-lived droughts	Sun, semi-shade	1,5 m	2-3 m

Sweet Gale
Myrica gale

- Large bushes with branches that hang over the water
- Withstands flooding



Humidity	Exposure	Size	Height
Cool and humid	Sun, semi-shade	1,5 m	1 m

Canadian Elder
Sambucus canadensis

- Forms bushes or hedges
- Large white flowers in summer
- Black fruits in autumn



Humidity	Exposure	Size	Height
Cool and humid	Sun, semi-shade	2 m	2-4 m

Large-leaved Meadow-sweet
Spirea latifolia

- Forms dense bushes
- White flowers tinted with rose, forms a conical bouquet in summer
- Vigorous and does not require lots of care
- Well adapted to difficult conditions



Humidity	Exposure	Size	Height
Dry to semi-dry	Sun, semi-shade	1 m	1,25 m

Larger Blue Flag
Iris versicolor

- Quebec's flower emblem since 1999
- Large perennial plant that emerges from a rhizome
- Flowers from mid-June to mid-July



Humidity	Exposure	Size	Height
Humid, withstands flooding and short-lived droughts	Sun, semi-shade	0,5 m	0,5 m

Red-stalked Aster
Aster puniceus

- Blue flowers at the end of summer
- Herbaceous plant
- Attracts butterflies



Humidity	Exposure	Size	Height
Humid	Sun, semi-shade	0,5 m	1,25 m

Rugosa Rose
Rosa rugosa

- Forms bushes or hedges
- Single rose flowers in summer
- Red fruits in autumn
- Thorn-covered stems



Humidity	Exposure	Size	Height
Dry to semi-dry	Sun	1,5 m	1 m

Virginia Creeper
Parthenocissus quinquefolia

- Adheres easily to many different surfaces
- Crawling and climbing vine
- Covers fences, trellis, rocks and small walls
- Leaves turn red in autumn



Humidity	Exposure	Size	Height
Dry to semi-dry	Sun, semi-shade, shade	2 m	Crawling and climbing

Red-osier Dogwood
Cornus stolonifera

- Rapid growth
- Reddish wood and bark
- White or bluish fruits
- Flowers in spring



Humidity	Exposure	Size	Height
Humid, semi-dry	Sun, semi-shade	2 m	2 m

Source of plant information and photos: **Conseil régional de l'environnement des Laurentides**

Development vision for the Outaouais region :



The Outaouais is a border region—egalitarian, inclusive and innovative, it is conscious of its identity, diversity and potential—a place where urban and rural areas develop in complementarity through their dynamic occupation of the territory and responsible utilization of its resources.

The Outaouais offers all its citizens a quality of life that corresponds to the aspirations of its communities and is supported by sustainable development.

Development focuses of the Outaouais region :





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The Conférence Régionale des Élus de l'Outaouais (CRÉO) is the Québec government's preferred interlocutor for regional development. It has been mandated to stimulate coordinated action of regional partners and brief the Government of Québec on the development of the Outaouais region.

The CRÉO must establish a five-year development plan for the Outaouais region. With a view to sustainability, the plan will set general and specific regional development goals that reflect the priority of fostering democratic participation in the region by young people and—based on principles of equality and parity—women. The plan must take into account regional workforce and employment strategies and goals determined by the Conseil des partenaires du marché du travail.

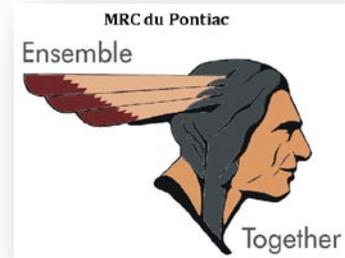
The CRÉO's mandate is to evaluate local and regional planning and development agencies that are either entirely or partially funded by the Government of Québec. The CRÉO may conclude specific agreements with the Government of Québec to exercise the powers and responsibilities that are vested in it.





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