ASSOCIATION PERKINS-SUR-LE-LAC

FAPEL'S STUDY ON THE WATER QUALITY OF BATAILLE AND RHÉAUME, 1996

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INTRODUCTION

Concerned about the future of Bataille and Rhéaume Lakes, the Association Perkins-sur-le-lac asked FAPEL (Fédération des associations pour la protection de l'environnement des lacs) Consultants to evaluate the level of over-fertilisation of the water of these two lakes and to make the appropriate recommendations.

This preoccupation stemmed from visual observations over the past few years. The proliferation of aquatic plants and the appearance of algae growths were the main symptoms noticed by the residents.

As well as covering all aspects of over-fertilisation of the lakes, this report suggests concrete steps to be taken in order to curb this phenomenon.

Tony Le Sauteur and Lucie McNeil
FAPEL Consultants

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SUMMARY

- Bataille and Rhéaume lakes demonstrate all the symptoms of over fertilised water.
- Measures to curb the inflow of fertilising elements, due to human activities, are imperative.
- It is proposed that Association Perkins-sur-le-lac undertake a five- point program to curb over-fertilisation:
  - Restoring depleted or partly depleted shorelines
  - Management of drainage networks along roadways
  - Restoring the beach on Bataille Lake
  - Educating newcomers
  - Adopting effective municipal regulations

THE LIFE OF A LAKE

To really understand what is happening at Bataille and Rhéaume lakes and, thus, comprehend the over-fertilisation phenomenon let us linger a while on the life and evolution of lakes.

During the Ice Age when the lakes were formed, animal and vegetation populations were almost non-existent. The waters were clear and pure.

Gradually, the waters became more fertile and less clear as innumerable generations of plant and animal life died and decomposed; in other words, making the waters more fertile. This cause and effect is a natural and inevitable phenomenon of water fertilisation.

With the passage of time, people, as well as lakes, age and change. The aging process for lakes usually occurs over several thousands of years and thus makes it difficult to measure the changes that they undergo.

From Fertilisation to Over-Fertilisation

Fertilisers, when present in too large quantities, no longer fertilise, they over fertilise. Human activities and habits have increased the amounts of fertilising elements, which has accelerated the aging process, particularly in the shallower waters of the bays and near the shores. Lakes that undergo drastic changes over short periods of time leads to over-fertilisation! Needless to say, over-fertilisation is a malady specific to lakes as the fertilising elements are literally trapped.

A Time Bomb

It is important to remember that the symptoms of over-fertilisation may take many years to appear, although a lake has reached a critical threshold once the symptoms are visible. That's when panic strikes the residents.

Symptoms That Do Not Lie

Symptoms of over-fertilisation are well known. They're the same as natural fertilisation except at a more accelerated rate. During the hottest part of summer, cottagers will find an excessive burgeoning of aquatic plants, including unknown species of algae.

- The water takes on the appearance of a virtual green, cloudy pea soup.
- The rocks and other submerged objects become coated with a viscous substance, i.e. slime.
- A greenish carpeting of thread-like weeds can be found on the surface of the water or rooted to rocks, especially in shallow areas.

Over the past few years, these are precisely the types of changes that the cottagers have observed in the bays and on the shores of Lakes Bataille and Rhéaume.

The death and decay of many successive generations of aquatic plants substantially increase deposits of organic matter on the lakebed. Through the activity of microbes, these deposits decay and provoke serious oxygen deficiencies.

As more sediments accrue, the lake becomes more fertile, which in turn leads to more oxygen use. As the oxygen reserves disappear, the water loses its transparency.

Transparency is a good measure to determine the level of fertilisation. In lakes with little fertilisation, transparency levels can reach 10 metres or more in depth! However, in most recreational lakes already suffering from over-fertilisation, transparency rarely extends beyond a depth of 6 metres.

- During our inspection, the transparency level on **Bataille** was measured at 6 metres, while on **Rhéaume**, the level of transparency did not exceed 4.5 metres.

Oxygen is another good reference point. The critical threshold of oxygen for fish is 5 mg/l. Lakes are considered to have reached their critical threshold when oxygen levels fall around this level.

- On **Bataille**, oxygen measurements were taken at a depth of approximately 35 metres of water. A serious oxygen deficiency was found at 20 metres. At 35 metres deep, the oxygen completely disappeared.
- On **Rhéaume**, oxygen measurements were taken at a depth of approximately 22.8 metres of water. At 14 metres there was a serious oxygen deficiency. Oxygen completed disappeared at a depth of 20 metres.

A Grave Warning

It is clear that both lakes have suffered from over-fertilisation and that these early symptoms should be taken as a serious warning.

Residents will have to exercise continuous surveillance of elements that may contribute to the aging process of Lakes Bataille and Rhéaume, including changing some of their habits.
Over fertilisation is a cunning phenomenon. Once these symptoms have appeared, the situation is irreversible.

No to Analyses

One of the very well known elements that triggers the phenomena of over-fertilisation is phosphates. Although phosphate concentrations play an important role in the excessive proliferation of aquatic plants and algae growths, they are by no means the only players! Algae growths are very complex phenomena and, even today, no clairvoyant can predict when, and under what conditions, algae growths will occur.

The specific analysis of phosphates on a systematic basis is not the miracle indicator we would like to believe. The over-fertilisation phenomenon is too complex for us to draw irrevocable conclusions about a lake based solely on the presence of phosphates. Furthermore, these analyses do not provide solutions to the problem. The appearance of algae growths and the rapid increase of aquatic plants remain, to this day, the best indicators of over-fertilisation of a lake. As soon as these symptoms appear, the lake has reached the critical stage.

Rather than analysing phosphate levels, it is better to channel your energies in stopping the source of phosphates.

WHAT MUST BE DONE?

Against the natural ferlilisation of the water? Nothing. Against the over-fertilisation of the water? We can stop the overloading of fertilisers caused by human activities. We must safeguard against adopting unrealistic attitudes. Lakes that have aged prematurely can never be restored to what they were. Like humans, lakes do not have the capacity to rejuvenate themselves.

REMEDIAL ACTION

1. Re-vegetate depleted or partially depleted shorelines.

2. Manage drainage networks (ditches, etc.) along roadways.

3. Restore the beach at Lake Bataille.

4. Educate newcomers.

5. Encourage the Municipality to adopt effective by-laws.

1. Shoreline Regeneration

Generally, residents own the land they occupy as far as the shoreline. Thus, they own their shoreline. However, it is a completely different ecological story.

The shorelines belong to the lakes. They even play an essential role in the lake's survival. When a shoreline is deprived of its natural vegetation, the shore becomes damaged, which in turn triggers erosion and silting, all the while contributing to the warming and over-fertilisation of the water.

Replacing shoreline vegetation with a well-tended, fertilised lawn is just as serious a problem as allowing the rain to inevitably wash these nutrients into the lake.

A regular shoreline is a 10 to 15 metre deep band – depending on the slope of the terrain – that extends back from the shoreline. Within this band, it is prohibited to destroy the natural vegetation except for a 5 metre wide access to the lake.

Remedial Action

Where the natural vegetation has been completely or partially destroyed along the shorelines of Bataille and Rhéaume, the misdeeds of over-fertilisation can be halted by simply stopping the mowing of lawns. Mother Nature will do the rest. For more information on techniques to natural restoration of shorelines, please refer to "Les Fiches de FAPEL" in the Appendices.

Remember that it is as important that the shorelines of all the tributaries to Bataille and Rhéaume be conserved or regenerated in their natural state – if possible – within the limits of the forestry frameworks.

2. Managing Drainage Networks

At the top of the list, the main sources of lake over-fertilisation are the drainage networks (ditches, or lack thereof) along roadways. These ditches carry large quantities of mud, silt, and organic waste which are loaded with fertilising elements.

However, it seems that a good part of the drainage network to Bataille and Rhéaume lakes have abundant natural vegetation that grows naturally on each side of the roadways, which effectively manages to slow the movement of the mud and silt towards the lakes.

It would seem that the policies of the Municipality of Val-des-Monts favour natural drainage through areas of vegetation rather than digging standard ditches. However, this policy applies only to municipal roads. Private roads – and there are many – do not conform to this policy. Also remember that manmade ditches fill up fairly rapidly and must be cleaned regularly.

Unfortunately, these operations contribute greatly to the silting and over-fertilisation of the lakes. In such cases we must revert to sedimentation ponds in order to trap the mud and silt before they reach the lake or by planting grassy vegetation to achieve stabilisation.

Remedial Action

In this context it is imperative that the influx of all fertilising elements through drainage routes be halted. A surveillance group should be established to identify all sources of fertilisation and report them to the Municipality and to ensure that the necessary corrective procedures be completed as quickly as possible.

3. Restoration of Bataille Lake Beach

Lac Bataille Beach is a prime example of the negative effects that inevitably occur when humans attempt to subject a lake to their whims. The case is not unique. The scenario does not vary. **We want to improve our beach.** We must rid the shoreline of its natural vegetation and replace it with a grassy lawn or sand. Unknowingly, we have condemned the beach water to become more fertile.

Consequences: The excessive proliferation of aquatic plants and the appearance of algae growths. So what! With the addition of a few loads of sand, the algae and aquatic plants will soon disappear. **Wrong!** The aquatic plants will grow through their new layers of sand and the water will become warmer. The result is a beach that has considerably deteriorated.
Although done in good faith, these actions are proof of seriously misunderstanding the workings of nature and the ecological requirements of the lakes.

Remedial Action

Concerning the Bataille Lake Beach, it is urgent that a vegetation cover be re-established (except for a reasonable few metres-wide access to the water) by ceasing the cutting of the grass to a distance of 10 metres from the shoreline. Regeneration of the shoreline should slow the warming and over-fertilisation processes.

As for the water at the beach, it is completely overwhelmed by aquatic plants, and growths of algae appear regularly. The damage has been done, but it can be circumvented to ease the situation for swimmers by installing a floating platform. Such platforms are in widespread use on lakes where there are no natural beaches. Some examples are displayed in the annex.

4. Educating Newcomers

Most newcomers are ecological neophytes and their first reaction is to cut, clear and establish large lawn areas.

It is inevitable that some trees must be cut to build your cottage, to access the road and to create an area to enjoy the sun. Too often these tasks are done carelessly so that the cleared areas are much larger than necessary. Once construction is complete, these areas usually remain bare for long periods of time. These create major sources of erosion that increase the influx of fertilising elements.

For those who purchase an already built cottage, they may not be too happy about settling into a natural paradise. When buying a cottage, newcomers may not necessarily subscribe to the previous owners' ecological philosophy nor the environmental principles extolled by their associations. Thus, after many years of this, we again see the land as the source of over-fertilisation.

In protecting the lakes there is no such thing as a lasting victory. There is no end to protection. The Association Perkins-sur-le-lac must remember this in its crusade against over-fertilisation.

Remedial Action

In all urgency, the Association Perkins-sur-le-lac must create a special committee to prepare an information kit and contact all newcomers to inform them of the principles of lake protection. This pouch will contain the complete series of "les Fiches de FAPEL". As a welcome to newcomers we can use as an example the letter in the Annex.

5. Encourage the Municipality to Adopt Effective By-Laws

The battle to stop the influx of fertilising elements will be in vain if the Municipality of Val-des-Monts does not possess effective regulations to stop the ravages of over-fertilisation. However, lake protection regulations are not entirely within the Municipality's purview. Many regulations are significantly dependent on the "schéma d'aménagement" of the MRC des Collines-de-l'Outaouais, who have just completed a public consultation process without a single intervention from lake associations. The plan will soon be approved by the Ministère des Affaires municipales. Subsequently, the Municipality will have two years to comply with the plan. We must expect that the Val-des-Monts municipal by-laws already in place will soon be modified, for better or worse.

It is important to note here that the "schéma d'aménagement de MRC des Collines-de-l'Outaouais" contains a "complementary document" that outlines the minimum norms that must be included in the municipal regulations.

Contents of the complementary document are of vital importance for the survival of our lakes for it is usually in this document that norms concerning shorelines, frontage, wetlands, flood plains, tributaries and forestry boundaries are outlined.

A summary review of the complementary document of the "schéma d'aménagement revisé de la MRC Les Collines-de-l'Outaouais" isolated two major anomalies that could seriously accelerate the over-fertilisation of Bataille and Rhéaume lakes:

- According to the existing provisions, it is forbidden to utilise the shoreline – a band extending 15 metres inward from the shore – to construct or expand the main building or to erect a secondary structure such as a garage, tool shed or a pool. Now, according to the revised "schéma d'aménagement" these structures will now be permitted under certain conditions, providing the lots were subdivided prior to June 23, 1977. In these instances, the shoreline protection band is reduced from a depth of 15 metres to a depth of 5 metres back from the shoreline.

This raises some serious questions regarding the logic behind this easing of the regulations. The principle to curb all construction that could either directly or indirectly contribute to over-fertilisation would normally be in step with the efforts of the MRC and its municipalities, as well as those of the Association Perkins-sur-le-lac.

- All equipment and structures used in aquaculture are exempt from the provisions that protect the shorelines of lakes and other waterways.

  These operations usually cause serious over-fertilisation problems. According to the "Canadian Resources Section" of the American Fishery Society, an aquaculture installation, which under ideal conditions, produces 100 tonnes of trout per year, spews out as much phosphate as an untreated sewer serving a population of 850 people. Such an industry should be completely prohibited on resort lakes.

On their own, these two provisions completely contradict the efforts by residents to curb the influx of fertilising elements that could seriously threaten the survival of Bataille and Rhéaume lakes.

APPENDIX

Shoreline Regeneration

Search no more! · Where to find plants? · Where to plant?
How to plant? · What price? · What types of plants and when?
Mother Nature takes care of it for free!

If nature has survived until this day, it is because it has developed effective defence mechanisms. Lake survival, for example, is assured by the natural cover of vegetation along the shores to form a veritable natural shield against the damages of erosion and warming of the water. It's a proven system. Mother Nature does not make mistakes! Unfortunately, we thought we could do better by removing the natural vegetation along the shores to replace it by grassy lawns – like a city place. Results: We have imperilled our lakes.

Your shorelines are depleted. You want to save your lake.
Let Mother Nature do the work. She has 10,000 years of experience.
Take the first step – stop cutting the grass. Mother Nature will handle the next step.

Grasses

At the very moment you stop mowing your lawn, Mother Nature swings into action to prepare the future forest floor. Her first step is to favour the growth of indigenous grasses to stop erosion. In a few short weeks, your lawn will change into a magnificent meadow of wildflowers and herbaceous plants, the most effective method of halting erosion.

Bushes and Shrubs

As early as the second or third year, the bushes and shrubs will arrive, just like that! At no cost! And they are the types of plants already adapted to your lake. So, with a bit of patience, your shoreline will regenerate by itself and return to its natural look! Next come the birds, insects and smaller shoreline fauna. In this way, the lakes naturally defend themselves against aggressions.

Trees

At the same time as the bushes, trees will take root. But they will take much longer to mature. And this is good! Were they to take hold too rapidly, they could hinder the growth of the grasses and bushes. Trust Mother Nature. She knows how!

One Metre at a Time

Natural shoreline regeneration requires a serious change in attitude. It's not easy to abandon your lawn! Still, it is your lake's survival. If you're still hesitant, adopt Mother Nature's rhythm. Go slowly! One metre at a time. The important thing is to take the step. Let the brave hearts advance

more resolutely and let Mother Nature do her renaturalisation in one fell swoop – over the whole 10 metre depth!

APPENDIX

If You Love Your Lake, Think Dock

Swimming in a lake is one of summer's great joys. However, in Québec, beaches where you can swim and stretch out on the sand to enjoy a bit of sun are few and far between. More often than not you go directly from the shore to the lake. This is a far cry from Miami.

Some will try to build an artificial beach by chopping down shoreline vegetation in order to clear an area where they can then spread a few loads of sand. In so doing they have destroyed the natural barrier that protects the lake from erosion and silting. Are cottagers thus confined to their bathtubs? Certainly not! If you don't have a sandy beach in front of your cottage you can always swim from your dock, or from your boat. Better still, why not build a floating platform that can be anchored out in deeper waters, away from aquatic plants. The sky's the limit. You can add a diving board, a slide, benches, all the comforts you can dream of, right near your cottage. Think about it. A platform provides a fun way of swimming, while respecting your lake's ecology.

APPENDIX

Outline of a Letter Welcoming Newcomers

I am pleased to greet you and wish you a warm welcome. The arrival of new owners to the Perkins-sur-le-lac shores is a happy occasion.

Our lakes have not always had an easy life. They have been under a lot of pressure and show some signs of aging.

Fortunately, owners understand that you can't settle along a lakeshore as you would in the city, and if they continue to modify the natural aspect of the lake and to pollute the water, they are harming themselves. For these reasons, property owners have formed an Association to assure protection of the lakes.

I invite you to join our association, the Association Perkins-sur-le-lac. All pertinent information regarding the Association's objectives and activities are included in the kit.

I also invite you to acquaint yourself with the FAPEL files (Fédération des associations pour la protection de l'environnement des lacs). FAPEL is an organisation that was created to provide information and resources to all the lake associations in Québec. FAPEL's clout and expertise provide the information needed to halt water pollution and the depletion of the natural character of our lakes.

Finally, I would like to advise you that prior to beginning any work that could disturb the lakes' ecological equilibrium; you should contact the Municipal Inspector.

The Association Perkins-sur-le-lac is at your service for any additional information. The Association can be reached at info@psll.ca.