

ASSOCIATION PERKINS-SUR-LE-LAC
SUMMARY OF FAPEL'S STUDY ON THE
WATER QUALITY OF BATAILLE AND RHÉAUME, 1996

Over the past few years, cottagers observed that the water quality of the lakes had visually deteriorated and that there was now a proliferation of aquatic plants and algae growth on Bataille and Rhéaume Lakes. In response, Association Perkins-sur-le-lac hired FAPEL Consultants to evaluate the situation and to provide recommendations.

To better understand what is happening at Bataille and Rhéaume Lakes – and to better comprehend the phenomena of over-fertilisation – it is best to know the natural evolution of lakes.

During the Ice Age when the lakes were formed, animal and vegetation populations were almost non-existent and thus the waters were clear and limpid. Gradually, the waters became more fertile and less clear as generations of plant and animal life died and decomposed. This cause and effect is a natural and inescapable wonder of water fertilisation.

With the passage of time, humans, as well as lakes, age and change. However, the aging process for lakes usually occurs over several thousands of years which makes it difficult to determine the level of aging that has resulted.

Fertilisers found in large quantities no longer fertilise – they over fertilise. Over fertilisation occurs when lakes undergo profound changes over a short period of time. Shallow bays and shorelines are highly susceptible. Humans have contributed immensely to the fertilisation of the lakes and as a result humans have accelerated the aging process.

Symptoms of over-fertilisation can take several years before appearing. However, a lake has reached a critical threshold once the symptoms are visible.

THE SYMPTOMS

The symptoms of over-fertilisation are well known; they are the same as the natural fertilisation process but at an accelerated rate. During the hottest part of summer the water becomes less clear and cottagers will find an excessive burgeoning of aquatic plants, including unknown species of algae.

- ☐ The water takes on a greenish tinge.
- ☐ Rocks and other submerged objects are coated with slime.
- ☐ A carpeting of filamentous weeds can be found on the surface of the water or rooted to rocks 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 Bataille and Rhéaume Lakes.

The death of successive generations of vegetation and algae substantially increases the level of organic matter deposited on lake beds. The organic deposits are decomposed by active microbes which in turn depletes the oxygen in the water. As more sediment increases, oxygen levels decrease and the water becomes less transparent.

Transparency is a good indicator of fertility within a lake. In lakes with little fertilisation, transparency levels can reach 10 metres or more in depth. But, in the majority of lakes affected by over-fertilisation, the level of transparency does not go beyond the depth of 6 metres.

On **Bataille** the transparency level is 6 metres deep, whilst on Rhéaume the level of transparency does not go below 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 completely disappeared at a depth of 20 metres.

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

One of the very well known elements that trigger the phenomenon of over-fertilisation is phosphates. The appearance of algae growth and the rapid increase of aquatic plants is one of the best indicators of the level of over-fertilisation. However, once these symptoms appear a lake has reached its critical threshold.

WHAT SHOULD WE DO?

A lake will never be the way it was once it is prematurely aged. But what should we do about the natural fertilisation process? Nothing. But we can stop human's contributions towards over-fertilisation of lakes.

MEANS OF ACTION

- ☐ Restore the cleared and partially cleared shorelines.
- ☐ Manage the roadway drainage systems.
- ☐ Restore Lac Bataille Beach.
- ☐ Educate new arrivals.
- ☐ Encourage the Municipality to adopt effective by-laws.

RESTORE THE SHORELINES

The shore belongs to the lake and plays an essential role in its survival. Shorelines become damaged if they are deprived of their natural vegetation which leads to soil erosion and silting, which in turn contributes to the warming of the water and over-fertilisation.

Depending on the slope of the shoreline, regulations state that shorelines must have a strip of 10 to 15 metres of natural vegetation. In addition, it is forbidden to destroy or remove any plants within this strip although the rules do allow clearings of 5 metres for access to the lake. To stop the ruinous effects of over-fertilisation, the shores of Bataille and Rhéaume should be restored where they are completely or partially cleared.

MANAGE THE ROADWAY DRAINAGE SYSTEMS

Roadway drainage is one of the major culprits of over-fertilisation because ditches can and do carry vast quantities of fertile mud and organic matter.

Along a good portion of the roadways surrounding Bataille and Rhéaume there appears to be abundant natural vegetation to efficiently stop the run off of fertile organic matter.

It also appears that Municipal policies favour natural vegetation along its roadways. However, these policies apply to the Municipal roads only. Private roads – of which there are many – are exempt from these policies.

RESTORE LAC BATAILLE BEACH

The development of Lac Bataille Beach was done with good intentions. However, the beach is a prime example of human's underestimating the ecological impact of their actions. It has now become urgent to restore the natural vegetation at the beach. All grass cutting should cease within a 10 metre protection zone from shore except for an access of a few metres wide. These preventive measures should stop the warming of the lake and over-fertilisation.

EDUCATE NEW ARRIVALS

The majority of new arrivals are ecological neophytes. Their first reaction is to usually clear the trees and put in lawns. When buying a cottage, new arrivals do not necessarily buy the ecological attitudes, nor the environmental principles, of the seller.

A special committee should be struck to develop an information kit for new arrivals. The kit should focus on the environment and the protection of lakes.

ENCOURAGE THE MUNICIPALITY TO ADOPT EFFECTIVE BY-LAWS

By-laws that protect the environment and lakes are not necessarily written by the Municipality. Many of the Municipal by-laws are part of the MRC les Collines-de-l'Outaouais' development plans, which are in the process of being revised. Approval is expected from the Ministry of Municipal Affairs in the near future.

The present *By-Law* states that it is forbidden to erect or enlarge a principal building or to construct a secondary building within 15 metres from a shoreline. But according the revised MRC By-Law, building will be permitted under certain conditions and the protection zone will be reduced from 15 metres to 5.

The Municipality should adopt stricter by-laws or at the very least maintain the current *By-Law*.