The Patterson Lake Management Plan

Patterson Lake Association

of Lanark Highlands

Approved Sept 3, 2011

Executive Summary

The intent of the *Patterson Lake Management Plan* is to provide a consensus plan for the future of Patterson Lake based on input from all parts of the Patterson lake community. It is aimed at the long-term protection of the key assets and values shared by all stakeholders. Over the past five years, research has been done on what is currently known about the Patterson Lake watershed, the Lake itself, and how that information relates to the issues that are important to the people who use the lake. The key information and results of research are contained in the Patterson Lake Association website and provide a factual basis on which this Plan is based.

The Plan is based on the recommendations and input gathered from community workshops as well as from many emails, letters, phone calls and informal discussions with lake residents. The Plan includes; goals, objectives and actions that address ten issues identified by the lake community. Implementation of the actions will result in the conservation of key resources and protection of our lake through education, stewardship action and appropriate regulation.

The Patterson Lake community has identified ten goals as priorities for action on our lake:

1. **Water Quality:** To protect, maintain and improve the water quality of the lake
2. **Aquatic Vegetation:** To manage excessive aquatic vegetation growth in problem areas of the lake and to protect the lake from invasive species
3. **Groundwater Quality and Quantity:** To protect groundwater resources in the watershed particularly the springs which feed the lake and the supply of safe water for human consumption.
4. **Water Levels:** To stabilize the Lake's water levels to reduce extreme conditions which negatively affect the interests of lake residents.
5. **Development Pressures and their Impacts on the Watershed:** To protect the lake environment and ecosystem from the impacts of inappropriate shoreline development and redevelopment
6. **Fish and Wildlife Health:** To protect the lake's wildlife, terrestrial and aquatic habitats and ensure sustainable management of watershed resources
7. **Shoreline Protection and Health:** To restore and maintain a healthy 'Ribbon of Life' around the lake
8. **Mining Rights and Claims:** To protect the watershed from the impacts of all mining and other extractive activity
9. **Impacts of Boating Activity:** To minimize negative impacts of boating behaviour on the lake and on residents
10. **Safe Navigation:** To support water safety on the lake including marking of hazards

The report also addresses the **Responsibility of Landowners in Protecting Lake Health** and examines ways to encourage and promote environmental awareness, education and action and the opportunities to forge stronger **Partnerships in Lake Management.** Opportunities are reviewed with the objective of establishing, maintaining and expanding upon effective partnerships in lake management, enforcement of laws and regulations, and implementation of action strategies to achieve a more sustainable lake for all. This version was widely circulated and put on the Association Website.

It was approved at the Annual General Meeting of the Association, Sept 3, 2011.

RESIDENTS IDENTIFY PRIORITIES FOR LAKE

In the fall of 2006, a questionnaire was distributed to all lake residents. Input was received from residents of all of the roads providing access to the lake. Through survey responses, members of the lake community identified water quality, lake levels, boater behaviour, aquatic vegetation, development pressures, the need for consistent regulation and shoreline protection as the most important priority areas. These priorities were elaborated in workshop sessions held with all residents invited. During the first phases of the Plan's implementation, focus will be placed on implementing those identified objectives and actions.

Throughout the creation of the *Patterson Lake Management Plan*, (the Plan) an effort has been made to keep the lake planning process community based, and to maintain ongoing communication and education with all residents and all of the road committees representing all parts of the lake. When approved, the Lake Association will initiate the implementation phase, and will continue to inform residents and encourage community contribution and participation in the implementation work.

Our planning process has been based both on a continuing consultation process and an educational component designed to help all stakeholders better understand the lake, its value and its uses. Any initiatives will necessarily involve the lake residents, as well as the municipal and other authorities. Where education and action strategies alone may not meet goals, the plan will involve supporting suitable municipal and other regulations affecting the lake. The *Patterson Lake Management Plan*'s objectives and goals recognize the need for cooperation of all stakeholders: the actions which have been defined include both education and regulation approaches to protect the lake.

The Plan is intended to be a living document that will be revisited and revised over time, adapting to new issues as they arise. Implementation of the Plan will be the responsibility of the lake community and its partners. An ongoing process, the lake community will work in partnership with government and non-government agencies to care for Patterson Lake and its watershed on behalf of future generations. Continual monitoring of the key conditions with regard to the lake environment, uses and issues will be undertaken using specified indicators and efforts will be carried out to ensure the identified lake issues are being addressed in conjunction with the suitable authorities at all levels.

Cover Photo courtesy of Ted Manning

In Acknowledgement

The P*atterson Lake Management Plan* is based on the wealth of information collected from studies by the Association and by many bodies. This Plan represents many hours of work by volunteers and assistance from expert advisors called upon for their input and support since the beginning of the lake management planning process. The Lake Association has benefited greatly from the fact that many of its members and volunteers were able to contribute specific ideas and information to help make this Plan a reality. Many volunteers provided sections to the report. These included Doug Cross, Scott and Marianne Armstrong, the representatives of all road committees and the members of the Lake Association who have contributed to the consultation process. The writing and editing of the report was done primarily by Ted Manning, Kathleen Sullivan and Lorne Bowerman.

This Plan was created with assistance from; the Mississippi Valley Conservation Authority who provided input to several sections and reviews at different stages in the process. The township officials were also informed on a regular basis of progress.

Thanks are extended to Karen Hunt of the Otty Lake Association for her suggestions and support based on her experience with the development of the Otty Lake Plan.

It is through the hard work, dedication and commitment of these volunteers and contributors that a project such as this has been realized. It is hoped that with the ongoing implementation of the *Patterson Lake Management Plan* through the support of our volunteers and partners, Patterson Lake will be protected for years to come.

Acronyms Used

AGM	Annual General Meeting
CSW	Centre for Sustainable Watersheds
DFO	Department of Fisheries and Oceans
FLRC	Fairs Lane Road Committee
FOCA	Federation of Ontario Cottagers' Association
LMP	Lake Management Plan
MOE	Ministry of Environment
MNR	Ontario Ministry of Natural Resources
MVC	Mississippi Valley Conservation Authority
OBC	Ontario Building Code
OFAH	Ontario Federation of Anglers and Hunters
OPP	Ontario Provincial Police

Lake Map from 1961 Showing Vegetation

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1.0 Introduction

A lake management plan is a long-term action plan, developed by a lake community in cooperation with all stakeholders, to conserve and protect the health and special features of a lake. A lake plan reflects community consensus about what is needed to protect the natural, physical, cultural and economic aspects of a lake and its watershed. The lake planning process offers the opportunity for everyone with an interest on a lake (everyone who works, lives or plays within a lake watershed) to come together to discuss their concerns. The process of gathering community input is as important as the end result. Through discussions, residents identify what they value about a lake, learn about the issues affecting it, and offer recommendations on goals, objectives and actions that promote sustainable development and overall protection of a lake and its watershed.

1.1 How the Patterson Lake Management Plan was Developed

There is a long history of dedicated volunteers working to protect the health of Patterson Lake, dating from the time the Purdon orchid conservancy was first planted as an effort to enhance the natural environment. Since its first settlement, many residents have devoted their time and skill to ensure the water quality and environment of Patterson Lake has been maintained and enhanced for future generations. Recognizing the need to protect the lake's long-term sustainability, the Patterson Lake Association has acknowledged the role a lake management plan could play in the future health of the lake. In 2005, stimulated by the interest of many residents to help ensure the future of this largely natural lake, a lake management planning process was initiated.

The lake management planning process provided the Patterson Lake community an opportunity to develop a strategic, long-term plan that encouraged a co-operative and shared responsibility for the protection of the lake based on the premise that Patterson lake is a unique natural environment and that those who enjoy it are responsible for sustaining this treasure for current and future generations.

1.2 Vision for Patterson Lake

In the process of development of this plan the Patterson Lake Association developed a vision statement for the lake management planning process, based on responses to the questionnaire and feedback from the lake community and its partners:

> ***To work together to ensure that the unique environment of Patterson Lake is protected and sustained in the interests of all residents and stakeholders of the Lake and its watershed.***

Guided by the lake community's vision for the future of Patterson Lake, the *Patterson Lake Management Plan* addresses each of the ten issues that were identified through the initial lake resident questionnaire and focus group discussions. The Patterson Lake vision is reflected throughout the recommendations and actions in the Plan, outlining communication and information, resident responsibility, and community partnerships as fundamental elements in protecting the long-term health of the lake.

The *Patterson Lake Management Plan* is based on input from the lake community and others who have a vested interest in the long-term health of the lake. It has provided an opportunity for the lake community to work together with various government and non-government agencies to address identified issues and develop goals, objectives and actions that will protect the water quality and natural environment of the lake and its watershed in the years ahead.

2011 AGM

Key participatory events:

Workshops: Three workshops involving nearly half of the residents of the Lake were held on the key issues and recommended responses. The meetings were open to all with all residents informed and invited.

AGMs : The progress of the Lake Plan was a key item in all Annual General Meetings from 2006-2011

Questionnaires: A questionnaire was circulated to all Lake residents in the summer of 2006 asking them for their vision, key concerns and recommended actions. (see Annex A)

2.0 General Overview - Patterson Lake and its Watershed

Below is a summary of Patterson Lake and its watershed features and characteristics. Detailed information about the lake's features can be reviewed in the Lake Management plan section of the Lake Association website which chronicles the results of several years research into the natural systems, land use and history of the lake,. To obtain a copy of the report, please go to the Patterson Lake Association website www.pattersonlake.ca

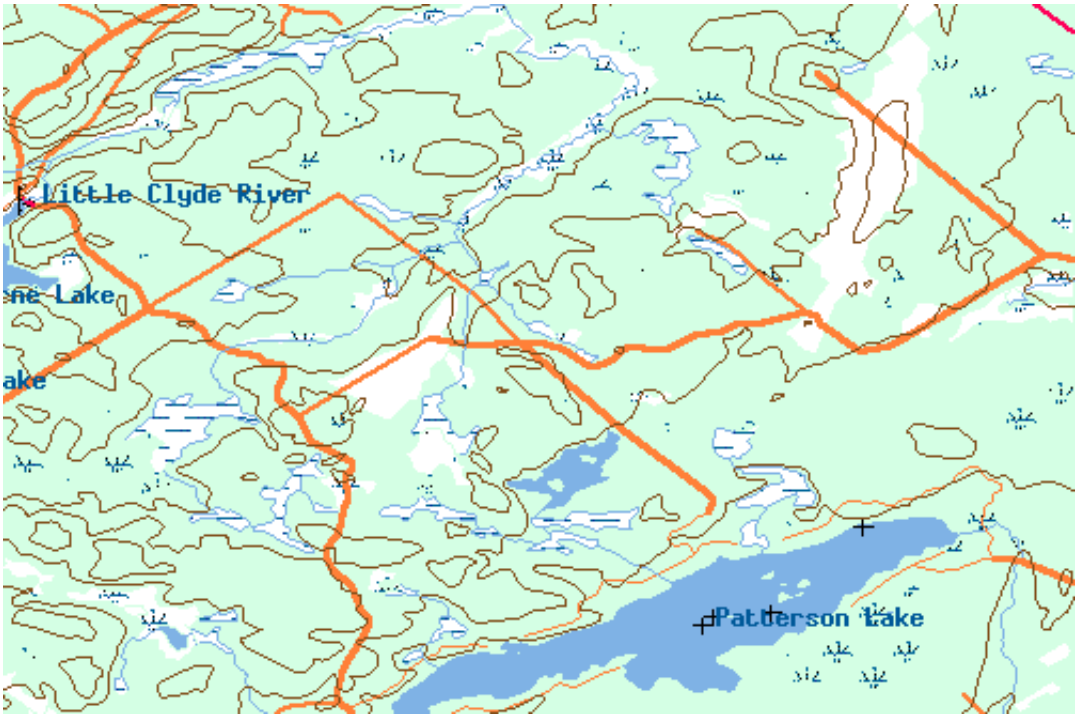
The watershed;

- Includes all of the land that drains into Patterson Lake
- Is located in Lanark County, 10 km northwest of the town of Lanark
- Is located wholly within Lanark Highlands Township
- Is a sub-watershed of the larger Mississippi River watershed
- Includes several unnamed and unevaluated wetlands, particularly on the south and east Contains generally poor agricultural land and extensive areas of abandoned farmland and is covered primarily in forest
- Is fed by springs and several small creeks
- Lies in the Canadian Shield

Key Facts about Patterson Lake

- Latitude N 45°00
- Longitude: W 76°32'
- Surface height above sea level : 200.86m (659 feet)
- Lake surface area: 368 acres (0.575 sq mi) or 149 hectares (1.49 sq Km)
- Watershed surface area is approximately 3000 acres (1340 hectares)
- Number of islands: 7 (8 at high water when one of the central islands is separated in two by a narrow passage) Two of the small islands are private; the others are public land.
- Lake volume: 4883 Acre feet (6 billion litres)
- Depth of Lake: The mean depth is 13.3 ft (4 metres) , and the maximum depth is 52ft (15.85 metres) which is near the centre of the lake north of Mary's Island. The bottom is deep in the western arm and central basin but very shallow in the eastern arm and southern bays.
- A total shoreline length of 7 miles (11.27 Km)
- A rocky shoreline with thin soil cover and steep slopes interspersed by wetlands
- Eleven small streams or creeks flow into the lake and there are large number of underwater springs which feed the lake,
- One slow outflow (Fairs Creek) In 1996 during a review of the Official Plan, a consultant reported that Patterson Lake has sufficient water flow to change its volume three times each year. (As a comparison, nearby Dalhousie Lake changes each week).

Topographic Map of Patterson Lake Watershed



3.0 The Lake Management Plan Process

3.1 Community Participation in the Process

The need for an Association to represent the common views and wishes of the property owners of Patterson Lake was identified when a number of property owners (about 40, including residents from all roads) assembled in the Robertson Lake Snowmobile Clubhouse on August 16, 2003 to express concerns regarding the lake, including a potential purchase by an Ottawa developer of a large tract of land on the south side of the lake. The informal group, brought together by contacting all road committees, talked about a number of issues, including lake water quality and levels and development. This led to the agreement that representatives of all road committees would meet to discuss establishing a Lake Association. The main advantage of having a Lake Association is that it facilitates quick reaction to any situation. Within the lake community, it also provides a platform to support the communication and discussion and resolution of issues that affect property owners. It can also represent lake interests to the wider community and various political levels.

The five road associations agreed that the formation of a Patterson Lake Association (PLA) would be beneficial. Whereas the road associations focus on road maintenance and snow clearing, the PLA addresses other key issues. At the first meeting of the PLA Executive, held on August 30, 2003, it was agreed that there would be five vice-presidents, each representing a road. One of the vice-presidents would be elected by the Executive to hold the position of President. The key issues at the time were water quality, lake level, commercial development, hazard marking buoys, mineral rights and the documentation of the history of Patterson Lake. Communication would be through regular newsletters and a website. The Township was subsequently notified of the formation of the Association. The Township Council indicated that it would keep the Executive informed of any developments that might affect Patterson Lake. It is beneficial for the Township to have this relationship, particularly in resolving matters that impact all the property owners.

In terms of bringing value to the community, the PLA from 2003 through 2005 assisted in the placement of hazard markers for boaters, had MVC change its water quality testing procedure to take samples from multiple areas of the lake, represented property owners at OPP meetings and participated in lake networking meetings with other lake associations where issues common to lake living are discussed.

The concerns regarding a large development project abated but lake level continued to be a critical issue. High waters that naturally occur in the spring can cause serious erosion problems. Low water levels in July and August affect the enjoyment of the lake by residents on the eastern side. The Executive ensured that the culverts were kept clear of beaver dams and debris by creating a schedule of representatives who would be responsible for taking the necessary action required to maintain the lake level at some established point. The actual method of cleaning could be to call the Township, call on local neighbours, or involve the entire lake.

For years there was a cycle of some property owners clearing debris throughout the year, blowing up beaver dams and dredging Fairs Creek in order to increase the outflow from the lake. Other property owners would purposely block the culverts with added debris and even with cement. The PLA wanted to find a sensible solution to the low water problem in July and August, one that was amenable to the majority of property owners. After much discussion with the road association representatives, It was suggested that the desired mid-summer lake level be set at ten inches above the bottom of the north culvert. Even though the majority of property owners agreed with this level, the few property owners who disagreed were invited to a meeting to express their concerns. This resulted in a compromise of eight inches. This was a tremendous step forward in finding a rational

resolution to this issue which was a true community-based solution. The results of a survey document that was sent to all the property owners showed very strong support for the PLA to manage the lake level, particularly if it could reduce the incidence of extremes of either high or low water which affected enjoyment of the lake..

The PLA Executive incorporated in August, 2006 , in order to become a more formal organization and, further, to develop a Lake Management Plan to help insure the ongoing health of the lake and to address issues identified by the lake community. In the Fall of 2006, a questionnaire was sent to every property owner with the intention of formalizing the community's vision for the lake for the next twenty years. Throughout the time since its incorporation, the PLA has continued to monitor lake levels and water quality, Communication with all property owners is done through a Newsletter three times a year (May, August and October) and at the annual General Meeting, normally held in September. Discussion of key issues relating to the lake has been on the agenda of all Annual meetings.

One example of the value of having a common voice occurred recently when the PLA worked closely with Township staff to ensure that a new culvert installed to replace the previous aging culverts was installed with no impact on lake levels or the environment. They also advised the Township which property owners might be inconvenienced during the replacement project so that they could be properly notified. Another recent example is the success of the first annual Patterson Lake picnic. Under the auspices of the PLA, it was planned and executed by a group of property owners who came together from each road and is a fine example of the importance of group collaboration.

On June 13, 2009, property owners were invited to participate in a workshop which would provide a forum for their input into the Lake Management Plan. They identified and prioritized their key areas of concern regarding the lake. This provided the basis for the LMP. Property owners were given the opportunity to provide more detail on the prioritized areas of interest at the next Annual General Meeting held on September 6 2009. As we proceed with the Lake Management Plan, input from the property owners will continue to be sought. It is critical that everyone has the opportunity to provide input.

For the complete list of key values identified by residents and for the list of suggested actions and priorities see Annex A. Throughout the lake management planning process, every effort has been made to keep everyone with an interest in the process informed and involved through community meetings, mailings, and regular updates in the Patterson Lake Association website. .As we go forward, the Patterson Lake Association will continue to encourage community input and participation in protecting the health of the lake at any point in the process.

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4.0 Addressing the Key Concerns

The consultation process resulted in the identification of ten key issue areas which the Plan is designed to address: these form the main sections of this report which follow. A brief summary of the findings for each of the twelve issues is presented and the actions identified to address these issues. The goals, objectives and actions for each of the issues are based on input from the lake community and partners and how they thought the lake community should protect the long-term health of Patterson Lake.

4.1 .SURFACE WATER QUALITY

Concern: *Nutrient loading, bacterial contamination, turbidity*

Water quality was ranked as the number one concern of survey, workshop and community meeting participants. Good water quality is integral to maintaining ecosystem health and the social, economical and recreational enjoyment of the lake.

4.1.1 The Current Situation

- Measures taken informally (using test strips) of total phosphorus, organic nitrogen and ammonia were found to be higher than in some other area lakes and indicate good growing conditions for aquatic plants and algae. (Compared to averages cited in Mackie and Taylor 2007 The Cottage Bible) Note that a new Watershed Watch Report will be done for Patterson Lake in 2011 which should provide more definitive measures on the key indicators) .
- Informal water samples taken in the lake have not shown high bacterial contamination although repeated sampling is required to make certain that the lake remains at an acceptable level.
- Secchi disk readings show good clarity throughout the season level

4.1.2 Potential Risk Factors

Water quality is influenced by many activities including nutrient runoff from farm activities and lawn fertilizers, poor septic system maintenance, shoreline and upland erosion from removal, alteration of shoreline vegetation, and development of near shore and back lot areas.

4.1.3 Goal: to protect, maintain and improve the water quality of Patterson Lake

4.1.4 Critical Success Factors

- All lake residents need to cooperate and share the objective
- It is essential that the means to prevent contamination are readily available and known
- Residents need to [participate in reducing use of fertilizers near the shore

4.1.5 Considerations:

- Without knowledge about what causes water quality to deteriorate, it will be difficult to get lake stakeholders to act to protect it
- People need to understand the urgency of actions to prevent damage

FOUR simple things you can do to protect surface water quality

1. ***Have your septic system inspected and regularly maintained to ensure proper working order. The rule of thumb is to have a tank pumped when it is one-third filled with sludge***
2. ***Protect shoreline vegetation and limit removal – this vegetation acts as a buffer keeping nutrients from running off from upland areas into the lake***
3. ***Stop the use of pesticides, herbicides and fertilizers (exception of fertilizers for farming purposes) to avoid excess nutrients entering the lake***
4. ***Start a shoreline buffer – stop mowing grass within 1 metre of the shoreline – and let nature do the rest!***

4.1.6 Solutions

Objective	Actions	Details
Monitor water quality to identify sources of water quality impairment	Continue and enhance the monitoring programs on Patterson Lake as needed to provide ongoing record of key water quality parameters Establish baselines for current levels and relate to standards	• Nutrient loading • Incoming water sources • Bacterial levels • Ph Levels • Water temperature • Dissolved oxygen levels • Phosphates • Invasive species
	Maintain partnerships between Patterson Lake volunteers, MOE, MNR, Health Unit, MVC and others in order to make available the needed supports for monitoring programs	Examples: • Participation of Patterson Lake volunteers in the: • MOE Lake Partners Program • Benthic macro invertebrate monitoring, • Watershed Watch and invasive species monitoring
	Support MVC to have active involvement in monitoring water quality at Patterson Lake through their Watershed Watch Program or similar programs	• Encourage good dialogue/working relationship • with MVC to maintain technical support of • monitoring programming. • Establish active link on Lake website to MVC website and do comparisons with other lakes
	Encourage volunteer participation in monitoring programs and provide adequate training resources on good methods of data collection	• Promote training programs/opportunities e.g. MOE Lake Partners Program
	Continue to keep the Patterson Lake community informed about the results of water quality monitoring	• Newsletter • Website • Work to establish an updatable, central and accessible water quality database available through the Lake Association in concert with MVC or other agencies as appropriate.
	Maintain regular review of trends in data and continue to modify/expand sampling locations as needed to identify sources of water quality impairment	• Create a 'Good Water Quality' program that is • geared toward responding to water quality issues as they arise • Identify wetlands, and permanent and intermittent streams within the lake watershed and work to understand the role they play (maintaining good water quality or contributing to water quality impairment)
Reduce or Eliminate sources of water quality impairment	Maintain and improve septic systems (see Responsibility of Landowners in Protecting Lake Health pg. 33)	• Encourage Lanark Highlands to become part of septic re-inspection program • Aim for 100% participation (note that this is a key to several of the main issues including vegetation and drinking water.)
	Promote awareness of threats to water quality through education and stewardship practices (see Responsibility of Landowners in Protecting Lake Health pg. 33)	• Invite experts to contribute to Lake website and to present solutions at Lake Association events

4.2 AQUATIC VEGETATION

Concern: ***Excessive weed growth and introduction of invasive species***

4.2.1 The Current Situation

- In some years, there seems to be excessive vegetation growth in parts of the lake. The varieties of vegetation are the same as those noted on maps dated from the 1960s and 1970s
- In years when the lake is low, some shallow bays fill with water plant growth
- A new species. Eurasian Water-milfoil, is now being found in the lake.
- There is some invasion of Purple Loosestrife at the lake margins.
- MVC checks every year for Spiny Water Flea and Zebra Mussels, but to date none have been recorded. However a non-native jellyfish *Craspedacusta sowerbyi* has been recently observed in the lake).

Aquatic Plants of Patterson Lake

We are very fortunate to have an excellent reference for the aquatic vegetation of Patterson Lake. David White has written *The Plants of Lanark County* and this was used extensively in the preparation of the *State of the Lake Information on Flora and Fauna of Patterson Lake and Area*. This document is on the website in the LMP section and documents in detail all of the types of vegetation found in the lake.

For the most part, the varieties of vegetation are the same as those noted on MNR reports dated from the 1960s and 1970s. However, a new species, Eurasian Water-milfoil is now being found in the lake and although it is not a real problem at the moment, it has the capacity of becoming one. It is not known how it got introduced into the lake nor do we know whether it is increasing or decreasing in quantity.

In some recent years there has been what some perceive as excessive amounts of weeds in the lake. In other years, there has not been as much. There seems to be no set pattern.

Aquatic plants made the list of concerns for the Lake Management Plan because we have had an increase in “weeds” over the past few years. In some recent years there has been what some perceive as excessive amounts of weeds in the lake. In other years, there has not been as much. There seems to be no set pattern.

What we don’t have is any long term scientific evidence about the increase in Eurasian Water-milfoil in Patterson Lake. The plant that has caused the most concern for North American lakes and rivers is the Eurasian Water-milfoil (also known as Eurasian Milfoil) It has the ability to propagate and clog waterways. (Milfoil is all over the lake, but not in sufficient quantity to clog any waterway. It can reach 3 metres so it is not limited to shallow water. The stuff in the North-most island to the shore is more pondweed that milfoil.)

Our evidence is primarily that of the informal observations of lake residents. While it is hard to control, it is not a major problem in 2010, but coping with it is likely to be a matter of concern for the Lake Association for the foreseeable future.

4.2.2 Potential Risk Factors

There is a potential risk of having Eurasian Water-milfoil become a major problem. In other waterways where this has happened, it has been very difficult to control. One of the problems with it is that if it is cut up in smaller pieces by a propeller, each of those pieces can start a new plant. The only effect control that seems to work is to remove the plant from the lake entirely and compost it away from the lake. This is difficult, expensive, and must be done regularly to have any significant effect.

4.2.3 Goal*: to prevent the excessive growth of Eurasian Water-milfoil and other “weeds” in the lake.*

4.2.4 Critical Success Factors

Like with water quality, how runoff is managed (fertilizers, pesticides, wastes) greatly impacts what grows and how much nutrient it gets. People need to reduce incoming nutrients. As well, boaters need to take care regarding draining bilges and motors when moving their boat from lake to lake, removing vegetation and making sure that foreign material does not cling to the hull.

Pickerel in Patterson Lake

Aquatic vegetation is an important aspect of a healthy lake ecosystem. It is important to understand the role aquatic vegetation plays in the health of the lake and its fish populations. We need to learn how to deal with aquatic vegetation effectively and sensitively when it interferes with recreational activities and aesthetics due to excessive growth. We need to understand what drives excessive aquatic vegetation growth and work towards managing our activities and inputs to sensibly manage excessive aquatic vegetation growth on Patterson Lake.

4.2.5 Considerations

There is a general lack of knowledge of aquatic vegetation. Anything that is in the water except for water lilies is seen by many as a "weed". Any success in keeping a plant under control must involve the majority of residents and users of the lake. The factors that are the most critical for the control of Eurasian Water-milfoil are to have lake residents and users recognize the plant, and if it is going to be removed, that it be done carefully. If other plants become a problem, they must be identified as well.

Eurasian Water-milfoil

Eurasian Water-milfoil *has slender stems up to 3 m long. The leaves are borne in whorls of four, bipinnate, with the numerous leaflets thread-like, 4-13mm long. The flowers are produced in the leaf axils on a spike 5-15cm long held vertically above the water surface, each flower inconspicuous, orange-red,0 4-6mm long. Eurasian Water milfoil has 12- 21 pairs of leaflets while North American Water-milfoil only has 5-9 pairs. (Wikipedia)*

Eurasian Water-milfoil is an invasive species to North America with most authorities giving the arrival date of early 1950s. It is mainly spread by boats and to a lesser extent by birds. Apparently to the birds it does not taste good. Regardless of how it came, we have it now. Eurasian Water-milfoil is hard to control. If you cut it, each cut part is capable of rooting. If you pull it and leave it in the water, it can root as well. Biological controls appear as undesirable as the plant itself. One thing does seem to work and that is to pull the plant up by the roots and compost it away from the shoreline. But again, we have no solid scientific data to measure how effective this method can be in the longer term. For Patterson Lake, the plant is most observed in shallow water in the bays or around the islands.

4.2.6 Proposed Solutions: To manage excessive aquatic vegetation growth in problem areas of the lake and to protect the lake from invasive species

Objective	Actions	Details
Monitor aquatic vegetation in Patterson Lake	Create voluntary monitoring program Mobilize technical help	• Create ongoing monitoring program with MVC and other partners such as the new Eastern Ontario Algae Partner project. • Seek means to accurately monitor levels and types of Lake vegetation. (note there is no formal program and may be difficult to design)
Identify and manage inputs contributing to excessive aquatic vegetation growth	Continue to monitor key indicators such as phosphorus and nitrates	
Promote actions to reduce excessive vegetative growth consistent with the sustainable management of the lake	Limit fertilizer runoff	• Provide information to all residents on how to best reduce use of fertilizers and pesticides and to control runoff
Get everyone involved in protecting the lake	Inform lake users of impacts of actions such as import of weeds or other invasive, use of chemicals near lake	• Continue to provide key information via the Lake Association website and newsletter
Control septic leaks at source	Eliminate septic leaks and runoff from drainage fields	• Ontario to introduce compulsory program likely in 2012
Keep residents informed of state of the lake and of threats	Annual report on key indicators on Lake website	

Common Aquatic Plants of Patterson Lake

Common Plants
The twelve most common plants (in, on, or close to the water) of Patterson Lake are (from David White) :

Stonewort (Chara species - an algae),
Eurasian Water-milfoil (*Myriophyllum spicatum*),
Sweet Gale (*Myrica gale*),
White Water Lily (*Nymphaea odorata*),
Yellow Water Lily (*Nuphar variegata*), Smartweed (*Polygonum amphibium),*
Curly-leaf Pondweed (*Potamogeton amplifolius*),
Narrow-leaf Pondweed (*Potamogeton natans*),
Bulrush (*Scirpus cyperinus*), Cattail (*Typha latifolia*),
Bladderwort (*Utricularia vulgaris*),
Tape Grass (*Vallisneria americana*)

Of these, the most interesting is the Chara species. It forms the large clumps in shallow waters near the islands and in MacCrimmon Bay, which in time float to the surface bringing large amounts of the bottom with it. It is just a part of the natural plants of the lake.

For a complete list of all aquatic plants found in Patterson Lake, see the list by David Whyte on the Lake Association Website. www.Pattersonlake.ca David White, the author of Plants of Lanark County has a full list on his own site relating to Patterson Lake . David's website is http://www.lanarkflora.com).

WETLANDS: SPECIAL ECOSYSTEMS

The wetlands which abut Patterson Lake are a special case – having a key role in both water quality and plant and wildlife health. Patterson Lake has many peripheral wetlands. Nearly half of the southern shore consists of permanent or seasonal wetlands. The outlet of the lake is through a large wetland and there are several other small wetland areas on the north shore. As well, the small streams which enter the lake pass through wetlands upstream en route to the lake. Protecting and rehabilitating key wetlands areas throughout a lake's watershed can provide excellent benefits to the overall watershed health and water quality.

Wetlands provide many services to the watershed and its environment.

- Slowing runoff and retaining water – buffering extremes of flow
- Cleaning water as it flows into the lake
- Serving as fish habitat, in particular for breeding of many species
- Rich habitat for other life such as frogs, turtles, otter, beaver, etc
- Habitat for many birds – both local and migratory
- Sinks for carbon and for other contaminants – helping to keep lake water clean and safe
- Reducing shoreline damage from storms and wakes – acting as a buffer to waves which might otherwise erode shores.
- Help control flooding

Wetlands are not just "swamps" but instead are a critical element in keeping the lake clean and natural and supporting the integrity of the entire ecosystem

4.3 GROUNDWATER QUALITY AND QUANTITY

Concern: Activities may contaminate the groundwater on which the lake and its residents depend.

Many people take clean water for granted and don't realize that the quality of water below the ground is directly linked to their activities above ground. The majority of lake residents rely on aquifers (deep reservoirs of groundwater) and drilled wells for their water supply. The risk of contamination of groundwater depends on types of land management in the groundwater recharge area, well contamination, fertilizer application, poorly stored or spilled chemicals and paints and poorly maintained septic systems. Contaminants can enter the groundwater system some distance away, as oil spills, septic overflows, chemical runoff etc., and may take months or even years to work their way through the system.

4.3.1 The Current Situation

The majority of lake residents rely on aquifers (deep reservoirs of groundwater) and drilled wells for their water supply. Others draw water from the lake which is spring fed from these aquifers. Although there have been few reported problems with the quality of the water, many people take clean water for granted and don't realize that the quality of water below the ground is directly linked to their activities above the ground. A majority of residents obtain their household water from wells. While there is little farming or other industry with significant risk of contamination in the watershed, vigilance is still warranted to prevent costly degradation of the aquifers. Most lake properties are on septic systems (a few outhouses remain). Inspection and maintenance of septic systems is not consistent. Some residents maintain lawns and may use fertilizers.

Normally, surface contamination (primarily wild animal waste,) is filtered as it passes through various layers of soil and is clean once it reaches the underground supply. There is not much waste, and the ecology can handle the waste loadings. Nevertheless, it is useful to regularly test any well water to make sure that it has not become contaminated.

4.3.2 Potential Risk Factors

The main risk to the groundwater comes from the actions of local residents. While surface water can normally be filtered in its passage through the soil, where there is concentration of wastes or spills these can enter the aquifers. The risk of contamination of groundwater depends on types of land management in the groundwater recharge area, well contamination, fertilizer application, poorly stored or spilled chemicals and paints and poorly maintained septic systems. Contaminants can enter the groundwater system some distance away, as oil spills, septic overflows, and chemical runoff, etc, and may take months or even years to work their way through the system.

The concentration of waste produced by residents can be much greater than that normally in the system from wildlife. While good functioning septic systems are able to reduce the contaminant levels to the point where nature can handle the rest, any non-functioning systems can overload the natural capacity to clean. Also, wherever there is seepage from filter beds or spillage, this can get directly into clean supplies and to the lake.

4.3.3 Goal: To protect groundwater resources in the Patterson Lake watershed, particularly the springs which feed the lake and provide the supply of safe water for human consumption.

4.3.4 Critical Success Factors

- The property owners must work as a community to ensure that all are minimizing their impact on the quality of the groundwater.
- Property owners need to understand their responsibility to control their impacts on the shared groundwater resource
- Everyone should understand how to have an effective and well maintained sewage system.
- Systems should be regularly cleaned and inspected.
- No-one should dump wastes on the ground anywhere near the lake or areas upstream from any well system. This specifically includes gas, oil, pesticides or any other chemical products.

4.3.5 Considerations

A program to require regular septic inspections is likely to be put in place by Ontario in 2012. All property owners are stakeholders and are impacted by groundwater contamination.

4.3.6 Proposed Solutions

Objective	Actions	Details
Protection of our groundwater resource	Raise the awareness level of all property owners of the importance of maintaining the current level of water quality and that they must be vigilant at both an individual and community a level.	• Set up a ground water monitoring program in order to track the water quality over the years and provide a means of identifying potential problems at an early stage so that they can be addressed quickly. • The PLA Executive needs to identify an individual(s) who will be responsible for the creation and delivery of an awareness program and for the establishment of the appropriate metrics so that progress can be tracked.
	Have regular inspection and maintenance of septic systems	• To be official in 2012
	Enforce suitable placement of septic fields relative to wells and the lake	• Need to lobby municipal authorities to enforce bylaws and construction codes
	Involve the key authorities more in protection of our lake. Note vulnerable status of Paterson Lake watershed as it is mainly on Shield rock	• Work with MVC on the source water protection initiative to ensure that their findings and recommendations are adopted by the lake community.

Bass in Patterson Lake

4.4 WATER LEVELS

Concern: Whenever water levels become excessively high or low, the ability of many residents to fully enjoy the lake and its experiences is reduced and property may be damaged.

Water levels on a lake can be a source of concern for lake residents. Water levels fluctuate naturally through the seasons and years based on weather, precipitation, inlet streams and springs, evaporation, the condition of outlets, and obstructions to inflow or outflow (like beaver dams or forms land development and use in the watershed). These fluctuations can cause property and building damage and damage to shorelines and habitat. Actions to slow runoff or to remove natural barriers can cause harm to property, eliminate recreational values or access, or damage shorelines and wetlands and remove recreational opportunities. Better understanding of lake levels and fluctuation patterns is key to understanding impacts on lake health and the interests of all stakeholders.

4.4.1 The Current Situation

Patterson Lake has a normal annual cycle. It is usually high in spring as the snow melts and runs off. It is normally lowest in late summer due to evaporation and lower inflow from springs and streams. In years with high summer precipitation, the lake may remain relatively high and continue to flow out through the Fairs Creek outflow as surface and underground water continues to flow into the lake. In years which are very dry, the incoming streams and groundwater may virtually cease, and the lake level may drop below the bottom of the outflow. The factors which also affect the lake level include the presence or absence of beaver dams both above and below the outlet, and the volume of flow through the outlet.

The outlet of the lake flows through a culvert under the Fifth Concession road at the eastern extremity of the lake. The culvert was replaced by the Township in the late summer of 2009 at the same level as the old smaller culverts. The new single oval culvert replaced two former smaller culverts with one of the same volume and capacity. While there has always been some controversy over the lake level, and some issues over the placement of the outflow and their maintenance, for several decades, residents have operated with a lake level at approximately 659 feet and a normal range of plus or minus. about 5 inches (one standard deviation based on 1995-2009 data although in some wet or dry years more extreme values have occurred.)(See the Lake Association website for a graph of lake levels.)

When levels exceed this range, those with structures and assets near the lake edge can have flooding and erosion and those with shallow water can lose lake access or have boat use and swimming impeded. The Association has a long term record of lake level readings which documents the history of the lake. Recent readings can be found on the Lake Association website along with some historic readings from photos and surveys.

4.4.2 Potential Risk Factors

- The flow of water out of Patterson Lake is rapid each spring due to snow melt runoff and slows during the rest of the year unless there are significant rain events.
- The lake level fluctuates naturally depending on precipitation and air temperature

although obstruction to the water outflow can also raise lake levels (sometimes leading to flooding in spring) and also contribute to greater water retention which can prolong the high water levels in spring and/or maintain more useable water levels later in summer.

- Beavers have often had a major impact on the lake level. They can block all outflow at times and also flood the downstream wetland east of the outflow.
- The beaver population in the lake has traditionally been trapped, although there has been less trapping in recent years
- On several occasions, dams (on both incoming and outflow streams) have been removed unofficially or have broken naturally causing rapid lowering of the lake and potential damage to fish and to property downstream. On other occasions individual actions at the culvert have also caused blockage of the outlet.
- When lake levels are very high, some properties have flooding in low parts along the lake, may lose beach sand or plantings, and in extreme years damage to lakeside property may occur.
- When lake levels are very low, some docks are not useable, properties in the east part of the lake lose boat access, and levels of water in the east part of the lake and the south bay are not sufficient for many water sports.
- The wetlands which are found in many parts of the shore are sustained by the annual fluctuation. In return, they buffer both extreme high and low water events.

4.4.3 Goal: To stabilize the Lake's water levels to reduce extreme conditions which negatively affect the shoreline, fish habitat and the interests of lake residents.

4.4.4 Critical Success Factors

- The lake level needs to be maintained wherever possible at a range which is acceptable to all and does not damage property or ecological functions.
- Any alterations of the lake level, and/or actions which may affect it need to be done collectively – to defend the interests of all. Independent alteration of the level of the lake should not occur.
- In most years, nearly everyone is satisfied with the lake level; it is mainly when extremes occur, and harm someone's interests and enjoyment of the lake that the level becomes contentious.

4.4.5 Considerations

- There is no present ability to actively manage lake levels. Levels are de facto controlled by the amount of water arriving via rain and runoff and by the amount of flow through the culvert and by amount of evaporation. The culvert replaced in late 2009 seems to allow more rapid outflow of water(than the previous small culverts) when the lake is high – as its widest point is near the normal spring high water point. It is not clear whether a control structure is necessary independent of the culvert to help limit extreme levels, or would work.

- The installation of a light grating at the upstream entrance to the culverts has the effect of trapping debris and keeping it out of the culvert. It both discourages beavers and makes that debris which is left by beavers easier to remove.

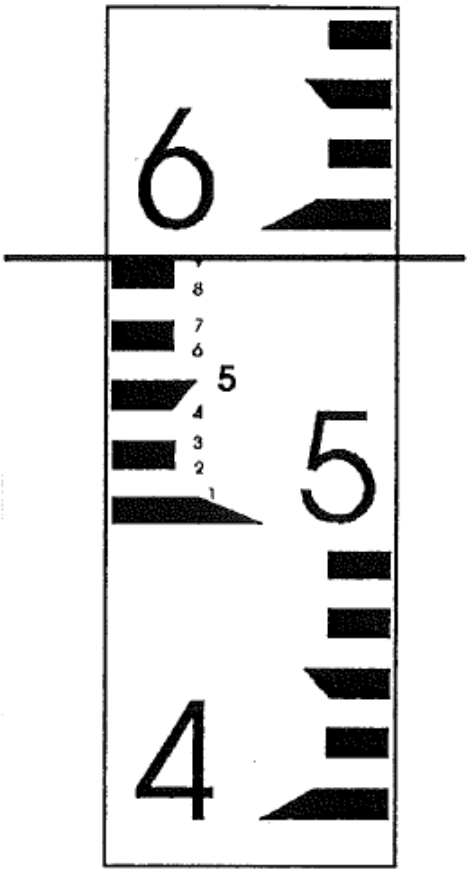
- Some fluctuation in lake level is needed to sustain the wetlands and fish breeding habitat adjacent to the lake.

- The height of the lake is controlled primarily by the amount of incoming rainfall which falls on the lake or anywhere in the watershed: this varies greatly each year and is beyond any influence

4.4.6 Proposed Solutions

Objective	Actions	Details
Effectively monitor lake levels to establish a common baseline and better understanding of the water regime	Continue to monitor lake levels on a regular basis (as shown on website) Install with MVC a more formal monitoring process using a staff gauge to officially measure levels regularly.	• See picture below of a staff gauge in use now in a lake in Eastern Ontario.
Prevent excessively high water in spring and after heavy rain events	With the Township, keep the culvert clean and open, particularly in Fall and Spring and after any major rain events.	• Work with township to make sure culverts are clear when high water occurs or when they become blocked.
Conserve water in the lake so that excessively low levels can be mitigated.	Allow some build-up of debris from beaver damming in mid and late summer in years when water is low to slow the outflow once the spring high levels are over. Then fully remove it in Fall.	• Consider some form of control weir or other means to more actively manage water levels if warranted.
Prevent individual actions which affect the lake levels	Work with MVC to and the Township to establish an agreed lake management regime. Work to define the acceptable range of high and low water conditions and obtain concurrence (in the past a general understanding was identified that the ideal lake level in summer should be about 8 inches above the bottom of the culvert - note that some residents want it lower, others higher – this is a rough compromise which seems to serve most intererests).	• Continue to monitor lake levels on a regular basis (see above) • Keep residents informed of issues and lake level status

WATER LEVEL AND PRECIPITATION MONITORING (MVC)



Lake levels are measured using a metric staff gauge and recorded to the closest centimeter. An average level should be recorded when experiencing wave action.

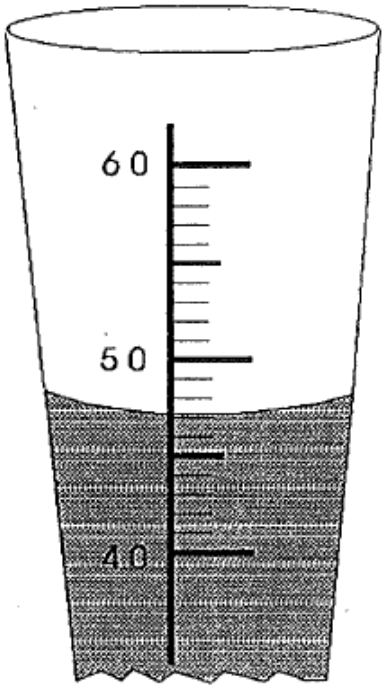
Lake water levels should be monitored at a minimum of once a week, when no ice is on the lake. During spring, when lake levels are changing quite rapidly, levels should be obtained daily or every other day.

General conditions, such as when the lake freezes over or the ice leaves the lake should also be noted.

Authority staff will install the gauge plate and will inspect it annually to ensure accuracy.

The figure on the left illustrates a water level of 0.59 meters.

Rain gauges can be installed by the volunteer. Make sure that they are in an open area and relatively vertical. Gauges should be removed around the end of October and reinstalled about the beginning of April (depending on the temperature). Gauges will crack in extreme cold.



Rainfall should be recorded on a twenty-four hour basis (when rain occurs).

The measurements will be recorded in metric to the closest half millimeter. Rainfall measurements should be read to the lowest line of the water level inside the gauge.

These observations should be made at the same time every day, if possible in the morning.

The figure to the right illustrates a measurement of 47.0 millimeters.

Reports can be made by phone, mail or e-mail. These should be made at least once a month, but preferably once a week. When information is reported please provide the observer's name, location, date recorded, and the level and precipitation amounts.

Annual reports of the data will be made available to gauge readers or the Cottage Association upon request. (from MVC)

4.5 DEVELOPMENT PRESSURES AND THEIR IMPACTS ON THE WATERSHED:

Concern: Inappropriate shoreline development can harm the lake and the interests of all stakeholders

4.5.1 The Current Situation

Most current development on the lake is compatible with the natural limits and capacities of the lake and is in compliance with current laws and regulations. A development profile of the Patterson Lake watershed, as of August 2010, is as follows.

(These are not official numbers.)

- Total Shoreline Length:11.27 km (7 miles)
- Total land area of properties in the watershed:1340 hectares (3000 acres)
- Total area of Crown- owned land:172 hectares
- Total number of properties:116
- Total number of developed properties:101 plus one commercial property
- full-time residences 20
- seasonal residences 81

As early as 1976 there was concern for the capacity of the lake to support more intensive use. The lake's capacity for sustainable housing was calculated as 116 homes or cottages and this figure was used in the official plan. This was based on the Ministry of the Environment's Lake Carrying Capacity Model that was in effect at that time. This maximum was posted in the Dalhousie Township Official Plan but was dropped when the township was amalgamated into the Lanark Highlands Township. Concern about intensity of use still exists, and more sophisticated means of analysis have shown that carrying capacity is dependent on many factors, including phosphorus loadings (used in that study), levels of use and management, sensitivity of specific species, and levels of control or management.

- Approximately 80% of the shoreline appears natural. (no formal classification has been done) The most developed portion is on the southeast side of the lake.

- The lake and ground water quality are very high, although at times in the past there was a pollution problem which seems to have been resolved. (from (a 1980 study

which assessed the impact of the first 59 “cottages” and 5 resort cabins as of 1979 when compared with 1961 when there were only four cabins registered)

4.5.2 Potential Risk Factors

There are concerns that the current natural characteristics of the Patterson Lake watershed could be negatively impacted by increased development, including some effects from the upgrading of seasonal residences into permanent residences as the population ages and retires. Overdevelopment could impact water quality and shoreline erosion. It can also cause a loss of or degradation to wildlife habitats, quality of life of the residents, and privacy.

There are some different visions among the property owners. For example, some seasonal residents are likely to be more interested in the recreational aspects of the lake while permanent residents are more likely to want to maintain the peace and quiet. Those using the lake seasonally may be more likely to want to retain a rustic environment while some permanent residents might prefer a more suburban look. Finding common ground can be a major challenge.

The current owners of undeveloped land will likely want to develop it at some point. In the case of very large parcels of land, this could result in the partitioning of the land into multiple lots for the purposes of building new homes or cottages. In some cases, back lots could be developed with the intention of providing deeded lake access. This could result in exceeding the maximum number of residences/people/boats that the lake can safely support.

The owners of undeveloped land may not necessarily plan to live at the lake and therefore may not share the community’s vision of the future of the lake. All property owners, including those who upgrade their cottages to permanent homes, are not necessarily aware of or in agreement with the current community’s vision of the lake.

4.5.3 Goal: To protect the lake ecosystem from the impacts of inappropriate shoreline development and redevelopment including back lot development.

4.5.4 Critical Success Factors

- The consensus desirable characteristics of the lake should be documented and clearly supported by the community.
- The Lanark Highlands Official Plan and zoning by-laws need to support the special requirements of waterfront and back lot development. Enforcement of the by-laws is also critically important.
- The Township must be on board and communication with the Lake Association Executive must be open and timely.
- MVC and MNR and other government bodies are already involved and supportive and effort is needed to keep them informed and involved.

4.5.5 Considerations

- There are many formal and informal planning processes taking place in Eastern Ontario, and the Lake Association will need to keep up to date with these and ultimately set up a process where we are notified whenever anything occurs which can affect the Lake and its residents.

- The development approval process is complex and involves many organizations.

- The current township plan has some influence on what is permitted and controlled

4.5.6 Proposed Solutions

Objective	Actions	Details
Make sure that all new development receives due review	Become active in the township planning process Stay current with all new plans and changes	• Appoint a Lake rep to act on development matters (a standing committee)
	Act to get a firm upper limit on levels and densities of development on or near the lake (consistent with other lakes and limits)	• Actively lobby to get the lake capacity limits retained in the Township plan.
Get automatic notice and review of changes which may affect the lake	Establish improved links to the township and other key bodies	• Make sure the Lake Association receives notices of plans of subdivision zoning change or major adjustments – so it can respond
Become more knowledgeable about the planning and development approval process	Lake Association Committee to study and link with MVC on planning issues	• Create planning committee to keep abreast of plans and changes

4.6 FISH AND WILDLIFE HEALTH:

Concern: Sustaining the fish populations in the lake and conserving watershed wildlife populations

4.6.1 The Current Situation

- The lake and much of its watershed are in good condition and habitat for a broad range of species.
- Patterson Lake has excellent fishing and this has continued undiminished for decades, according to fishermen and other lake residents.
- There have been no systematic surveys of fish populations
- The species reported in earlier studies generally seem to be present.
- The watershed currently supports a broad range of wildlife
- The lake is home to many migratory birds, the most visible of which are the Loon and the Great Blue Heron. Many smaller species ranging from hummingbirds, to phoebe, various sparrows and jays, grebes, ducks and many other species which frequent the lake and its surroundings. (for a more detailed list, see the website http://en.wikipedia.org/wiki/List_of_birds_of_Ontario which also provides help in identifying birds common to our area.)
- The lake has a robust population of frogs which are generally considered to be a key indicator species for ecosystem health. Similarly the frequent turtles are considered a measure of good lake water and overall health
- There is some hunting for deer, wild turkeys and game fowl in season, and beaver are occasionally trapped.
- Less commonly observed are mink, muskrat, and wolf, coyote and bears. Very common mammals include raccoon, small rodents including various kinds of mice, squirrels, chipmunks, and voles.
- A non-native form of jellyfish *Craspedacusta sowerbyi* has recently been observed in the lake. Crayfish eat them.

Fish and Wildlife Species Found in and around Patterson Lake

Fish in Patterson Lake

- Northern Pike
- Smallmouth Bass
- Bluegill
- Yellow Perch
- Pickerel (Walleye)
- Rock Bass,
- Pumpkin Seed (Sunfish)
- White Sucker
- Minnows

These have been consistently listed since the 1960s

4.6.2 Potential Risk Factors

The main risks to the apparently stable fish populations are contamination and overfishing. While contamination has been a significant risk in the past, more recent data shows the lake to be in good condition. Similarly, the level of fishing on the lake has been relatively stable with much catch and release. There has not been a thorough study of fish populations in the lake for some years.

4.6.3 Goal: To protect the lake's wildlife, terrestrial and aquatic habitats and ensure sustainable management of watershed resources

4.6.4 Critical Success Factors

All fishermen between the age of 18 and 64 are required to have a valid Ontario Fishing Licence and carry it with them when fishing. Fishing regulations are governed by the Fish and Wildlife Conservation Act and the federal Fisheries Act. These include information on seasons, limits and size restrictions, to ensure a sustainable fish population. The 2010 regulations for Patterson lake (in Zone 18), are listed in the table below. The latest information can be found on the Ministry of Natural Resources website at www.mnr.gov.on.ca.

Fishermen need to handle fish with care and release them as quickly as possible. It is illegal to attempt to catch fish during closed season, even if you plan to release them**.** Closed seasons help to ensure a healthy fish population for years to come by protecting fish when they are spawning or protecting their young. Only resident anglers with a valid Ontario fishing license may capture their own bait-fish for personal use, and may have no more than 120 bait-fish in their possession at any time. It is illegal to release live bait or the contents of a bait bucket into waters other than the water body where the bait was originally captured.

Boaters need to be aware of their impact. Be courteous to other lake users including other anglers, boaters and swimmers by maintaining a safe distance and being aware of the wake your boat creates.

Seasons and Limits (2010)

Fish	Open Seasons	Limits
Walleye	Jan 1 to Mar 1 & 2nd Saturday in May to Dec 31	S – 4, not more than 1 greater than 46 cm (18.1 in) C-2, not more than 1 greater than 46 cm (18.1 in)
Smallmouth bass	4th Saturday in June to Nov 30th	S-6 C-2
Northern Pike	Jan 1 to Mar 31 & 2nd Saturday in May to Dec 31	S-6 C-2
Yellow Perch	Open all year	S-50 C-25
Sunfish	Open all year	S-300, only 30 may be greater than 18 cm (7.1 in.) C- 15

S – Sport fishing licence
C- Conservation fishing licence

4.6.5 Considerations

While most fishermen on the lake are lake residents and their guests, it is also necessary to ensure that visiting fishermen are aware of the rules. Similarly, visiting hunters may affect local wildlife or cause problems for local residents – and need to obey hunting seasons and rules.

4.6.6 Proposed Solutions

Objective	Actions	Details
Sustain the natural fish populations of Patterson Lake	Make local fishermen and visitors aware of the fishing regulations.	• Post regulations at key entry points and provide direct link to them on website • Approach authorities for fish census or equivalent
Keep the natural wildlife around Patterson Lake and in its watershed	Inform residents of the regulations which apply to our area	• Post regulations at key entry points and put on website. • Post link to hunting regulations on Lake website • Remind residents periodically of hunting regulations particularly near residences
Enlist fishermen to help monitor and protect species	Ontact those who do fish in the lake and engage them in protecting the fish	• Create link on website for fishermen to post information or concerns

The Importance of the 'Ribbon of Life':

The riparian area or shore zone is a narrow strip of habitat that is home to many wildlife and vegetation species. This shoreline transition zone can vary in structure and composition but is generally made up of trees, shrubs, herbaceous and emergent plants that are tolerant of wet to moist soil conditions, along with an interface of rocks, plant roots, other organic material, fallen logs, and soils along the water's edge. Along with their adjacent littoral zones (shallow water area by the shoreline) riparian habitats are valuable resources which provide numerous social, economic and environmental benefits.

The benefits of protecting the shoreline or a healthy 'Ribbon of Life' include::

- enhances the beauty a shoreline
- shades and prevents the heating of water
- dissipates wave and current energy
- provides habitat for a variety of aquatic organisms including fish, to reproduce, feed and seek protection from predators
- protects water quality by filtering the run-off of pollutants like fertilizers and pesticides from land
- provides preferred habitat for many species
- stabilizes banks and controls soil erosion

4.7 SHORELINE PROTECTION AND HEALTH:

Concern: Protection of the shoreline of Patterson lake and where possible retaining or restoring natural characteristics.

4.7.1The Current Situation

- A majority of the shoreline of Patterson Lake is in a natural or near natural condition; rock faces, wetlands, approximately 80% of the shoreline appears to be natural (no formal classification has been done)
- In most parts of the lake, the shoreline is rich in wildlife – fish, reptiles, amphibians and mammals use this as one of their preferred habitats.
- Most docking structures on the shore are relatively low impact; most are removed in winter.

- In some areas, lawns and beaches have been created
- Most residents are knowledgeable about the value of the shore zone
- In all but a few sites, the vegetation of the shore zone is primarily native species, although there are some invasives, (e.g., Purple Loosestrife).and other non native species including planted wildflowers and grasses.
- In a few sites, the shoreline has been hardened or buttressed with rock, cement or wood structures, often related to measures to limit shore erosion.

4.7.2 Potential Risk Factors

One issue is use of fertilizers and pesticides on the areas which are not in natural cover (see the section on lake water quality)

In some areas wake erosion has become an issue (see the section on impacts of boating activity). See also the box which follows on *how shore erosion works*.

Without good understanding of how the shore works, and how erosion occurs, actions to counter erosion can often make it worse, or shift erosion pressures along the shoreline.

4.7.3 Goal: To restore and maintain a healthy 'Ribbon of Life' around the lake

4.7.4 Critical Success Factors

Landowners need to understand how they can protect their shoreline by good management and where possible naturalization.

Landowners need to better understand how the shore provides habitat and how natural vegetation contributes to erosion protection.

4.7.5 Considerations

The shore is affected both by what is done on the land and in the water. Shores have always been dynamic and this challenges any measures to try to fix things on the shoreline.

The MVC and other organization provide a great deal of information on how to construct docks and other structures successfully without harming the shore zone and in ways which will also ensure that the structures are not undermined by storm or wakes or shifted easily. MVC has regulatory authority for shore works and can permit (see MVC website)

4.7.6 Proposed Solutions

Objectives	Actions	Details
To maintain the natural shorelines on Patterson Lake	Monitor shoreline state on Patterson Lake and report to stakeholders	• Work with MVC to ensure ribbon of life zoning is effectively enforced for new developments
To encourage landowners to restore natural shorelines where possible	Provide good information to Lake residents on how to restore shorelines	• Work with MVC to educate and convince landowners to respect the ribbon of life • Participate in the shoreline naturalization program (MVC can help)
To help landowners better understand how to maintain a stable and natural shoreline	Provide links for Lake residents to good advice on how to maintain their shores and docks Get more involved in MVC shoreline naturalization and planting program	• Work with MVC and others to provide best practice examples • Get owners to contact MVC before any shore works

How Shore Erosion Works

What causes shores to erode? The main causes of shore erosion are wave action and runoff. Wave action is caused by winds and by passing boats. Runoff comes from rainfall events, or from other sources such as sewage spills or overwatering.

How does erosion happen? All materials are affected by gravity, and will naturally tend to move down slope until everything is level (*law of entropy*). "Solid" material, like the Canadian Shield rock, will move much more slowly than less dense material, taking millennia to erode (even so, it does erode due to wind and water, freeze and thaw cycles). Other materials will flow more rapidly, seeking their *angle of repose.* This is the slope where they will tend not to move unless disturbed. Materials like sand or mud will flow much more readily than rock or more consolidated materials seeking to achieve a near flat profile.

How does water erode shores? The energy in lake water is mostly in the wave zone. That means that the greatest erosion at the shore will take place where the waves actively hit the shore. When water is high, most of the erosion energy is therefore higher up the slope. When the water is low, the energy is directed at the lower area. Where shores are shallow or vegetated (such as wetlands) the energy is dissipated across a larger area and the ability to erode is reduced.

What about walls or constructed shorelines? Where cement, rock or other walls or berms are constructed on the shoreline, these are intended to absorb the wave energy, reflecting it back at the water body and eliminating its impact on the shore materials behind. Ideally, they cover the entire wave zone, from the top of the waves in highest water to the bottom of the wave zone in lowest water. Where they do not cover the entire wave zone, they are subject to enhanced erosion, sometimes deflecting the wave energy to concentrate it on other parts of the shore or even where it will undermine the structure.

What about high water? During high water events, the zone of impact and therefore the zone of erosion is raised, and may subject shore areas not normally subject to erosion to wave action. This may mean that, for example, structures built close to the shore, shoreline trees and bushes, or walkways can be eroded. On Patterson Lake, the picturesque trees which hang over parts of the shore do so primarily because the soil around their roots was removed during storm events in the high water season.

What about low water? When water is low, the impact of erosion occurs lower down the shore. Low water events can focus the wave action at the bottom of walls or retaining structures undermining them. According to the Great Lakes Water Level study, by far the greatest amount of damage to docks, retaining walls and stone berms occurs during low water, mainly because the wave energy is directed at the foot of the structures, and often below them, taking out the footings. Low water also has the greatest impact on sand beaches, eroding the bottom of beach areas and causing the sand to flow more rapidly downhill and also allows wave action to cause disturbance and turbidity when it moves bottom material in shallow areas. This can have both positive and negative effects on plant growth and fish breeding, depending on depth and on species.

How does sand behave on a beach? Natural beaches are the epitome of an erosion laboratory. Geomorphologists refer to the beach as a *river of sand* which is constantly in motion. Sand is constantly being swept away – usually in the direction of flow of the water or wind – but on natural beaches it is constantly replenished from erosion upstream (cliffs, other beaches). Where sand beaches are not natural, they must constantly be replenished by loads of new sand. Sand

migrates with each wave which hits, being moved up the beach by the incoming wave (and along the beach in the direction of the wave) and back down by the retreating water. More is moved down than moved up by each wave (except in very violent storms).

What about boats? Boat wakes impact the shore just like waves created by wind. While they may be less frequent, large wakes can send waves which are larger than most storm driven waves towards a shore, Again, the impact zone of the wave will be where it hits the shore. Most of the energy in a two foot wave will be in the area one foot above the water level to one foot below the water level. When this is high, it can overflow walls and other structures; when water is low, it can undermine the bottom of such structures. Both cause damage. Because the power of wake waves diminishes rapidly with distance from where they are created, keeping large wakes away from shore can substantially reduce the impact on the shore.

Does planting help? Planting a shoreline with deep rooted vegetation can help slow downslope *soil creep.* But planting is most effective when a slope is near its natural *angle of repose*. The objective is to dissipate the wave energy as it hits – and this may take a large area of water vegetation a shallow slope and/or a very dense shoreline planting. Planting also helps reduce erosion from rain events, slowing the rapid flow of water off the land and allowing it to seep into the soil. Wetland areas also absorb wave action and disperse its effects.

Shore naturalization Shore naturalization means trying to return a shoreline which has been altered in the past back towards its natural state. The objective is to stop fighting nature and instead allow nature to stabilize the shore. This will often mean restoration of something resembling the original slope, and extensive use of natural vegetation to help in the stabilization. It also usually means using materials which are the same or close to what was there – rock, local soil and native plants. If successful, naturalized shores seldom need maintenance and retain their slope and configuration themselves.

Patterson Lake Shorelines Most of Patterson Lake's shores are natural. Some are rocky, (like much of the northwest shore) and do not exhibit much erosion or change. The wetlands as well are reasonably stable although their extent can change in very wet or very dry periods. Areas of steep shoreline where the rock is not on the surface are undergoing erosion and down-slope creep of soils (this is very evident in the southwest shore and in parts of the northeast shore– one of the most visible indicators of down-slope soil creep is tilted trees.) Less than ten percent of the shoreline of the lake is altered significantly from its natural state. Even so, all but the most low and flat of properties will have some natural down-slope erosion occurring, particularly during extreme rain events.

Patterson Lake Association Sept 2008

4. 8 EXTRACTIVE AND INDUSTRIAL ACTIVITY

Concern: Protection of the Watershed and Lake from negative effects of mining and other industrial or extractive activities.

4.8.1 The Current Situation

- There is consensus for the protection of the watershed and lake from the negative effects of mining, forestry, and other industrial or extractive activities.

- There is no current extractive or heavy industrial activity occurring in the watershed of Patterson Lake. As well there is no large scale forestry being done, although there is forestry in the lake watershed. Some tree clearing has been done close to the lake for cottage development. It is not a major problem in 2010.

- The subsurface rights of landowners have been an issue throughout Ontario for years. Recent changes in the Mining Act have greatly reduced the possibility of prospectors staking unwanted claims on unsuspecting property owners in Southern There is no current extractive or heavy industrial activity occurring in the watershed of Patterson Lake, although there continues to be mining exploration and development in Eastern Ontario.

- There are no current proposals for such development in the watershed

4.8.2 Potential Risk Factors

Under much of Eastern Ontario a range of commercial minerals can be found. Residents are not necessarily advised when exploration or extractive activity is proposed. Similarly, there is no systematic notification for clear cuts or other potential industrial activity in the watershed.

The potential risk of greatest concern is the contamination of the lake, either through mining or clear cutting of forest. Either case allows the build-up of sediment or other by-products that could affect lake water quality. As well, there are concerns about damage to the forest and general aesthetics of the watershed and noise and traffic from any potential industrial development. Lanark County does have a tree cutting bylaw.

4.8.3 Goal: to prevent contamination of the lake water and any other damage to the watershed from industrial activity such as mining and forestry.

Mineral Rights

There is little doubt that mineral rights are a passionate issue for cottage owners. This is fuelled by reports of some quiet spot being staked for some mineral deposit then quickly the large machinery arrives and destroys everything and the property is left with tailing ponds and mud. Anyone who owns property likes to think that they hold exclusive rights to their land. But in Ontario surface rights and subsurface rights may be separated. Some properties may have them combined; other properties may not. It all started with land transfers that took place back when the land was being colonized by settlers from Europe. To encourage immigration, land grants were made to land companies. Because these land companies were unsure what was under the land, most retained the rights to any sub-surface minerals. As well, some colonial governments retained mineral rights. The end product was great confusion that exists to the present day.

Recent changes to the staking of property for minerals should reduce greatly the possibility of mining related problems for Patterson Lake. With no prospecting licenses being granted for Southern Ontario now, no prospector has the right to enter or stake a claim on your property. Because the changes were only done in 2009, the Lake Association should continue to monitor the subject for the next twenty year.

Anyone who wishes to check out whether their property has separate surface and sub-surface rights can contact the Land Registry Office in Almonte.

4.8.4 Critical success factors:

Area residents need to know when activities are proposed which may affect their properties or the lake, so that they may participate in the review process.

4.8.5 Considerations

The Lake Association has been active in the current township planning process and is monitoring events relative to surface and subsurface rights.

4.8.6 Potential Solutions

Objective	Actions	Details
To stay current with regard to major initiatives which may impact the watershed.	The Lake Association will keep abreast with any plans and applications and inform lake residents	• Establish a situation where the Lake Association is informed automatically of any new proposals
To continue to inform residents of their rights and issues associated with them	The Association will inform residents via the website and the AGM of any changes in the status of development in the watershed	• Lanark County has a tree cutting bylaw which may be applicable

4.9 IMPACTS OF BOATING ACTIVITY

Concern: Some boating activity can have negative impacts on the lake, the shoreline and the interests of other users of Patterson Lake.

When one pictures being at a cottage, certain images come to mind; one is sitting peacefully at the dock, another is boating around the lake and a third is swimming in the lake. On occasion these activities can come together and clash. For instance, boaters can interfere with those sitting on docks and with swimmers. Swimmers can interfere with boaters. Anyone doing these activities must be mindful of others on the lake, and be responsible for their own safety as well as others.

4.9.1 Current Situation

- Most who boat on the lake are responsible boaters and do not undertake activities which negatively impact others. Boaters are required since 2009 to carry a boaters' licence. Most safety regulations are part of the course leading to the licence.

- Boating while intoxicated is considered an offense in the same category as driving while under the influence.

- An informal survey was done in 2008 resulting in the following findings. There were approximately 100 non-motorized watercraft around the lake (including paddleboats, canoes, kayaks) which works out to about 1 per cottage property. There were 53 fishing boats, 33 larger fishing/pleasure craft , 6 pontoon boats, 4 sailboat/sailboard and 2 personal watercraft.

- Even though there are no public access points to the lake, boats not belonging to residents use the lake; ie, renters and visitors.

- There have been reported incidents of unsafe boating, such as excessive speed near shore or near small boats and swimmers, noise, and excessive wakes which could cause shore erosion.

- Zebra mussels have not been found in Patterson Lake, nor have other invasive species such as the spiny water flea but boats are the main way these could enter the Lake.

- Swimmers are not always close to shore and clearly visible to boaters.

4.9.2 Potential Risk Factors

Renters and visitors bringing boats onto the lake may be bringing invasive species such as zebra mussels into the lake. They may also have oversized boats for the size of this lake. For all, unsafe boating is a risk to all and can also contribute to shore erosion. Swimmers who are far from shore or not clearly visible are also a risk to themselves and boaters.

4.9.3 Goal: To minimize negative impacts of boating behaviour on the lake and on residents

4.9.4 Critical Success Factors

Protecting against invasive species; renters and visitors must ensure that their boats are properly cleaned - no invasive species welcome here! We do not want to inherit this problem. Zebra mussels have a nasty habit of attaching themselves to dock footings and clogging water intake pipes. Boating is the main culprit when it comes to the distribution of zebra mussels. They came to this country in the ballast of freighter ships. Now they can be transported via bait buckets, live wells, bilge pumps, boat transoms and boat motors

.

***Safe Boating Habits*;** The National Boating Safety School has a course for all Canadian boaters operating a powered watercraft for recreational reasons in Canada. A Pleasure Craft Operator Card is required or risk a fine. The operator card can be obtained either on-line or by taking a three hours classroom course. www.safeboatingcourse.ca

Shoreline Protection; cut down on size of waves by being mindful of the size of the wake your boat creates. Wakes are waves caused by a boat moving through the water. Excessive boat wakes have a negative effect on the aquatic environment. A wave that is 25 centimetres high causes five times more damage than one than is only 12.5 centimetres tall. See below for tips.

Safe Swimming Habits*;* buddy up, stay close to shore and make yourself as visible as possible. Be aware of your surroundings!

4.9.5 Considerations

It is important for all cottage owners to buy into a safety first policy when out on the lake and also remember that an ounce of prevention is worth a pound of cure when it comes to protecting **our** lake.

Wake Tips

Avoid travelling at transition speed, with the stern dug in and the bow high - you're making the most damaging wake in this phase. (Wake Up Slow Down, Muskoka Watershed Council)

Boat as far away as possible from shore, docks and other boats. (Wake Up Slow Down, Muskoka Watershed Council)

The standard boat speed limit in Ontario is 10 kilometres an hour or less, anytime that a boat is operating within 30 meters of the shore. (Ontario Boating Regulations)

Note: zebra mussels can flourish in any water body which has high levels of calcium. The levels in Patterson lake are sufficiently high to support them if they are allowed to be introduced.

4.9.6 Potential Solutions

Objective	Actions	Details
Protect against invasive species	Advise all to clean boats and bilges before putting them in lake Keep monitoring for key invasives	• Place signs at all entry points – one for each road. • Ask owners to remind all visitors of the need to clean boats before putting them in Patterson Lake • Participate in the Invasive Species program with MVC and Ontario Anglers and Hunters
Safe boating	Remind all boaters of rules and need for licence	• Regular reminders on website • Signage at entry points
Shoreline protection	Remind boaters of speed limits	• Signage at entry points
Safe swimming	Encourage swimmers to use bright coloured headgear and or buoys when swimming far from shore	• Regular reminders annually on Lake website and in newsletter

Boaters and Anglers - You can Help!

1. **Inspect** your boat, motor, trailer, and boating equipment such as anchors and fishing gear, centerboards, rollers, and axles. Remove any zebra mussels and other animals and plants that are visible before leaving any water body.

2. **Drain** water from the motor, live well, bilge and transom wells while on land immediately before leaving the water body

3. **Wash or dry** your boat, tackle, downriggers, trailer, and other boating equipment to kill harmful species that were not visible at the boat launch. Some aquatic species can survive more than two weeks out of water . Therefore, it is important to:
   - Rinse your boat and equipment that normally gets wet with hot tap water (greater than 50°C), or
   - Spray your boat and trailer with high pressure water (250 psi), or
   - Dry your boat and equipment in the sun for at least 5 days before transporting them to another body of water.

4. **Empty your bait bucket on land** before leaving any body of water. Never release live bait into water, or release aquatic animals from one water body into another. **It is illegal to use gobies, ruffe or rudd for bait!**

Learn how to identify exotic species, if you believe they have spread to a new location in Ontario, please call the province-wide Invading Species Hotline at 1-800-563-7711.

Details at www.invadingspecies.com

4.10 SAFE NAVIGATION:

Concern: Making the lake safer for users : Part of safe boating is knowing what is happening on top of the water as well as what is under the water.

4.10.1The Current Situation

- There are several submerged or semi submerged rocks which can be hazards to navigation. These vary in level of risk to navigation depending on the lake water level
- Each season there are floating logs and semi-submerged logs and other hazards in the lake. Many residents have made efforts to remove those near their properties but to date there is no more systematic removal.
- For several years, the Lake Association has tried to coordinate the marking of the known hazards, and some individuals have independently marked rocks or shallows near to their properties. Most years, the major rocks in the middle of the lake (notably that near the surface west of Mary's Island and the large submerged rock near the east entrance to the main channel through the western islands have been marked by local residents.
- Because of the many small craft and swimmers, there are risks associated with any fast powered craft or inattention while boating. (see boating behaviour above)

4.10.2 Potential Risk Factors

- Shoals and rocks not marked can cause serious boat damage.
- Floating logs are a potential danger because they can appear when not expected.
- Docks and rafts without proper reflective markings.
- A cottager reported hitting a 10 foot two by four which went right under the boat and kicked up the motor.

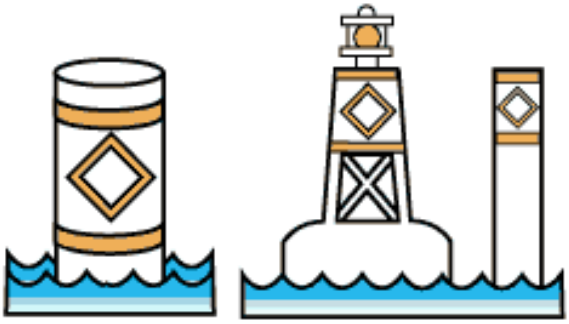
4.10.3 Goal: To support water safety on the lake:

4.10.4 Critical Success Factors

- An approval from the majority of the lake association members that it is a worthwhile exercise for the lake association to identify and properly mark all hazards on the lake.
- Make residents aware that they are responsible for the removal of their own floating debris such as rafts that have floated away.

4.10.5 Considerations

- Need to determine the responsibility and liability of the lake association in putting up buoys on the lake.
- Need to follow the Private Buoy Regulation Guidelines (see attached document) for marker design.
- Need to make an inventory all shoals and rocks that are a potential hazard.



Responsibilities of Private Buoy Owners

As an owner of a private buoy YOU are responsible to make sure that:

- It meets all legal requirements, standards and guidelines of the PBR, the *Canadian Aids to Navigation System* (TP 968) and Transport Canada directives.
- It is built and maintained so that it remains in position.
- Anchors are used, built and installed in a way that will keep the buoy in position.
- You have a monitoring and repair schedule for checking that the buoy continues to meet all legal requirements, stays in position and remains in good working order.
- You use recommended retro-reflective material (as a minimum).
- Any lights comply with the *Canadian Aids to Navigation System* (TP 968).

4.10.6 Proposed Solutions

Objective	Actions	Details
Prevent boating accidents from hidden hazards	Mark significant hazards on the lake	• Place compliant markers on the key rock hazards each year and monitor them regularly to make sure they remain in place.
	Remove floating and semi-submerged hazards from the lake	• Organize voluntary removal of any floating and semi-submerges hazards
Educate those who use the lake about hazards	See safe boating above Stop floating material from entering the lake	• Remind boaters that licences are required • Remind residents of need to try to keep floating material from entering the lake (website)

5.0 Responsibility of Landowners in Protecting Lake Health

This plan is designed to be a vehicle for all stakeholders in Patterson Lake to work together to protect their common environment, economic interests and values. The goal is to encourage and promote better understanding of the lake and full participation in protecting our common interests and values.

Patterson Lake is an important part of the economy and society of Lanark Highlands. If the ecosystem of the lake declines, so too will property values and the overall health of the community.

It is the responsibility of the lake residents and users within the lake watershed to ensure their investment is protected, their quality of life is preserved, and the health of the lake is maintained for generations to come.

What We Know:

Despite our shared interests in the lake, many people are not aware that some of their activities can harm or are harming the lake. While individual impacts may be small, it is the cumulative impact of human activities around the lake that can cause deterioration in the quality of the water, a reduction in the fish and wildlife and a decline in the overall quality of life in the watershed.

Nearly all those who have participated in the process have agreed that it is important to try to sustain the qualities of Patterson Lake which attracted them to the lake in the first place; the clean, green, natural environment , friendly community, and recreational opportunities.

Working Together

This document has been designed to involve everyone in identifying their concerns and in defining what we can together do to address them.

The Lake Association will work with all lake residents to:

- Make certain that everyone receives a copy of this document
- Keep the document current by periodic updates as new information becomes available or as conditions change.
- Work on implementing the actions defined in the above sections, in concert with concerned Lake residents and with appropriate agencies (see section below)
- Maintain a current status report on the Association website reporting progress
- Report annually to the AGM on the State of the Lake and of the progress relative to each of the plan goals
-

Pike in Patterson Lake

6.0 Partnerships in Lake Management:

Goal: To establish, maintain and expand upon effective partnerships in lake management and enforcement of laws and regulations, and implementation of action strategies

The complexity of jurisdictions and powers, lack of apparent coordination, lack of understanding of laws and regulations and how to deal effectively with the myriad institutions involved in and affecting the lake has been a factor both in the development of this plan and in efforts by the Association and its members to address current and emerging problems. One of the main reasons for this planning exercise has been to try to establish better relationships with the key agencies and potential partners who will hopefully in future work with us to sustain and protect Patterson Lake.

The Lake Management Planning process has provided an opportunity to discover all of the dozens of institutions who are implicated at local, regional, Provincial and Federal levels with any plans or actions affecting the Lake. As well, it has fostered linkages with the many NGOs and other institutions involved in watershed, wildlife, fish, community, nature and other planning in Eastern Ontario.

What We Know

- For any actions to protect the Lake, there are many players at all levels of government and volumes of regulations, standards, procedures
- The lake residents want to work with the appropriate institutions to realize the goals elucidated in this plan, and to establish ongoing collaboration in the actions to sustain the lake.
- Initial contact with MVC, the Township of Lanark Highlands and the Ministry of Natural Resources has identified promising contacts who are prepared to work with us, both on the finalization of this plan and on carrying out a number of the actions

Working with Partners

The Lake Association will actively seek to identify and collaborate with current and potential partners in the implementation of this Plan.

The Association will begin to actively recruit partners and allies in activities to protect the lake and seek participation in ongoing programs which may be available

7.0 Conclusions and Future Actions

The Lake Plan is only the first step in the process to safeguard the lake and to try to protect the interests of all those who live on, holiday on and use the lake and value its environment. Work will continue on the action items which have been suggested in each section. One of the first steps will be to set up a more formal process in concert with key agencies to monitor the health of the lake and to serve as an early warning system for any threats to the common goals identified in the plan.

The next steps are identified in some detail in each of the sections of this plan. In more general terms, the next steps will involve continuing work to keep all stakeholders involved and informed, to make certain that all residents, permanent or seasonal are kept up to date on anything which may affect their interests, and to work to obtain further input from key players who can help us in achieving the goals of this plan.

The Plan should be considered a living document. That is, as new issues arise it can be a catalyst for constructive discussion and cooperation in solutions. While the official approval of this plan (anticipated for September 2011) will indicate general acceptance of the plan, the Association will revisit the Plan annually and inform the Lake Association at the AGM whether any changes, updates or modifications are needed. The Association will also inform the members of the state of the Plan annually, both at the AGM and in the newsletter.

The current version of the Plan will be available on the Lake Association website, as will any suggestions for modification.

ANNEXES

Annex A: Results of the Consultation Process

What do you Value about Patterson Lake?

In the initial stages of the Patterson Lake Management Planning process, residents were asked what they valued about Patterson Lake. Below is a summary of responses gathered from the questionnaires, focus group discussions, and participatory workshops. At two discussion sessions all participants were divided into small groups and asked to discuss the following questions. All comments were accumulated on large flip charts and nothing lost. Participants were then given stickers to place on the sheets to show which values had the broadest support. The overall question of what do you value about Patterson Lake was clarified to include:

- What do you want Patterson Lake to be like in 20 years?
- What current features/characteristics of Patterson Lake would you like to retain over the next 20 years?
- What new features or characteristics of Patterson Lake would you like to see or have reinforced?

The following list summarizes the collective wish list from stakeholders for the future of Patterson Lake. We hope that in twenty years:

- Patterson lake has excellent water quality
- Septic and water systems are all effective and maintained
- Weed problems have been reduced and are under control
- Groundwater around the lake is safe to use as a drinking water source
- Lake water levels are stable and do not have extreme high levels or low levels
- Shore development is appropriate and complies with setbacks and regulations
- Fish stocks are sustained and fishing remains high-quality
- There is a healthy 'Ribbon of Life' around the lake
- Birds and other wildlife are plentiful
- The watershed is protected from the impacts of all mining and other damaging activity
- Boating is enjoyed by all on the lake with minimal negative effects on wildlife or other users
- Navigation is safe on the lake and all major hazards are marked
- The lake retains its quiet natural ambience
- Users of the roads to and around the lake respect safety of residents
- Stakeholders are environmentally aware and have access to information on suitable actions to sustain the lake ecosystem.
- Patterson lake residents have effective partnerships in lake management and enforcement of laws and regulations, and implementation of action strategies are producing the intended results.

Concerns for Patterson Lake

In the context of the vision and the values identified above, stakeholders were asked: *What long-term issues of concerns for Patterson Lake and the lake community are most on your mind? That is, what do you see as possible weaknesses or threats which may affect the ability to achieve the future you want for Patterson Lake?*

The results of the questionnaire and consultation sessions are summarized below:

- How can we best protect lake water quality
- How can we limit increased weed growth
- How can we reduce extreme high water levels which may damage properties and shorelines
- How can we reduce wake impacts which may damage properties and shorelines
- How can we limit extreme low water levels which may remove water access for some residents and cause
- How can we protect the lake from exotics which may damage the ecosystem such as zebra mussels and Eurasian milfoil
- How can we ensure effective regulations re: shoreline development and try to maintain or restore as much of natural shoreline as possible
- How can we establish an effective septic re-inspection program
- How can we make certain that road management (township and private) continues to best serve the interests of all stakeholders
- How can we ensure good access for emergency vehicles
- How can we ensure good boat/motor use regulation
- How can we ensure that we have an ongoing strong effective lake association with full representation to continue to respond to situations as they arise

What Actions should the Patterson Lake Community Take?

Throughout the community discussion and community input opportunities, lake residents were also asked to identify action items they felt should be undertaken to protect the health of the lake. They were asked to identify specific concrete actions which they felt to be critical to take immediately. They were also asked to identify potential actions which the Lake Association could take or develop with other levels of government or other partners to address lake issues? The following is a list of the suggestions received in the consultation process and which fed into the plan sections which follow.

Summary of suggested actions from consultations:

How to ensure regulations are enforced:

- Participate in drafting new official Plan to ensure that the special needs and concerns of lakeside communities are included (see plan in Township Office)
- Enhance enforcement of the building bylaws pertaining to the lake properties
- Build better working relationships with local politicians/political action
- Raise awareness with Council of the need for meaningful enforceable by-laws to preserve the quality and character of the lake
- Respect for neighbours regarding noise and lighting

How to maintain the environment including shore zone and buffers:

- See also ideas under boating behaviour
- Control boat wash to reduce erosion
- Educate lake residents on all kinds of issues
- Convince landowners to undertake good shoreline management

How to keep safe boating on the lake (speed wake noise etc)

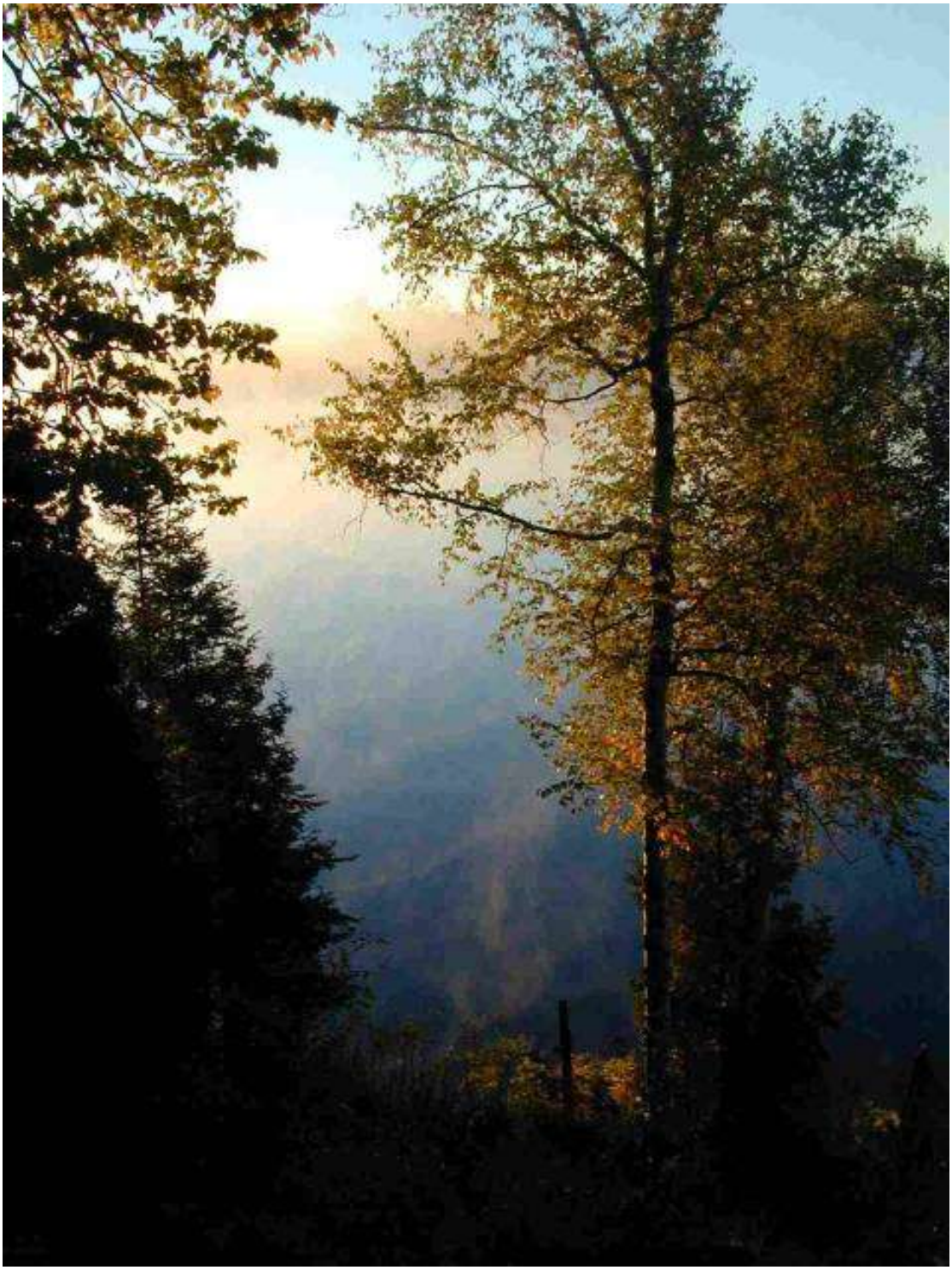
- Limit size of boats and motors on lake Explore boating limitations, horse power/no wake zones/restrictions on personal watercraft
- Keep safe distance from docks and swimmers
- If swimmers cross lake they should be accompanied by boat or canoe
- Encourage smaller or slower boats when the water is very high early in the year (large wakes do damage particularly at that time)

How to avoid extreme high and low lake levels and reduce hazards

- Keep culverts clean
- Replace culverts with bridge or other alternative structure
- Control lake level with weir structure (like Clayton Lake or similar)
- Take action to reduce extreme high and low water levels
- Manage level of culverts
- Use beaver baffles
- Remove dead logs from lake

How to maintain good lake water quality including fish habitat, weed control etc)

- Establish fixed number of residences or homes which the lake can support without damaging the ecology
- Build fixed limit into the new official Plan
- Investigate sources of aquatic vegetation growth and methods of management
- Have program of mandatory septic inspections
- Make sure that township officials and lake residents firmly committed to 30 m set back for septic systems
- Do monitoring/testing of lake in an organized manner and effective use of the data collected
- Use signage and information to inform all users of the lake of invasive species and the need to clean boats



Annex B: Glossary of Terms

Aquifer: an underground layer of permeable rock, gravel, sand, silt, or clay from which groundwater can be extracted using a well

Benthic invertebrates: animals without backbones that live in association with streams and lake bottom habitats

Canadian Shield: an area of granite rock dating to the Precambrian Era with thin-soil cover found in eastern and central Canada and adjacent portions of the United States

Carrying capacity: The maximum population size that can be regularly sustained by an environment

Groundwater: water from underground aquifers.

Indicator: A measure which is used to show change and is useful to show the state of the lake. Indicators such as number of frogs, level of phosphorus in the lake, coliform counts in the lake and in groundwater are common indicators know to relate to the overall health of the lake.

Invasive Species: plants or animals which are not native to the ecosystem but which are introduced. In some cases, they can take over the ecological niche of native species or are harmful to them. Some can damage the existing system so that it can no longer support the same range of species or human activities.

Invertebrates: animals that do not have a backbone, including insects, worms, mollusks, etc.

Species at Risk: wild plants and animals that have been assessed by an independent body, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and found to be at some risk of disappearing from the wild in Canada

Species diversity: the number of different species in a particular area

Stewardship action: taking responsibility for the survival and well-being of something that is valued, such as a natural resource

Submergent plants: aquatic plants which live for the most part under water

Surface water: water in streams and lakes

Total Phosphorus (TP): a measure of all the forms of phosphorus in a sample

Water clarity: measured by lowering a black and white disk (Secchi disk) into the water

Watershed: a geographic area of land that drains water to a shared destination, in this case, all of the land around the lake that drains water into Patterson Lake