

Wheatley River

WATERSHED STEWARDSHIP PLAN

2007



Mill Dam Bridge

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Executive Summary

The Wheatley River Watershed covers approximately 69 square kilometres along the North Shore of PEI in Queens County, and drains into Rustico Bay. In 1998 a group of residents was organized to give voice to and address their concerns about the health and overall environmental quality of the watershed. In 2006–2007 the the Wheatley River Improvement Group embarked on a process designed to capture the concerns of people who live in or derive their livelihood from the watershed and to develop a plan for addressing those concerns.

The process started with the collection of information about the watershed in order to provide context for the plan. Then, in the winter of 2007, a group of residents with varied interests - fishing, farming, tourism, non-consumptive users - were brought together to develop a vision, principles, goals and strategies for addressing the issues that they identified as being important to the health of the watershed.

The Wheatley River Stewardship Plan is the result of that process. It should not be regarded as a finished product. Rather, its proponents intend for it to be a “living document”, which will be adapted and enhanced as time goes on, as strategies are implemented, as more knowledge is gained and as issues change.

Issues of concern for residents of the Wheatley River watershed include nutrient enrichment of surface and ground water, sedimentation and siltation caused by soil erosion, the decreased capacity of primary producers to make a living, gaps in the development and enforcement of sound environmental policy, and lack of community awareness of the extent of the watershed and the environmental issues that affect it.

The **vision** that is central to this stewardship plan is one of a watershed in which the soil, forests and water are healthy and supportive of a rich diversity of aquatic and terrestrial plants and animals. In this vision, the Wheatley River watershed is one in which farmers and fishers are able to make a living for generations to come and where all residents have access to clean, healthy water.

The plan is guided by the following **principles**:

- Promotion of a healthy and sustainable environment
- The involvement of people who live in the watershed and those who derive their livelihoods from it in developing, monitoring and adjusting the plan and putting it into action
- Recognition and celebration of stewardship initiatives that have a positive effect on the environment
- Recognition that we are part of a larger system of interconnected watersheds

Strategies have been developed to address each of the following goals:

- Support and promote positive environmental stewardship initiatives
- Influence appropriate development, monitoring and enforcement of public policy relating to the environment
- Support those residents who make their living as primary producers in the watershed
- Improve water quality
- Increase community involvement in watershed enhancement efforts
- Promote a wider sense of community within the watershed

1.0 Introduction

1.1 The Wheatley River Improvement Group

The Wheatley River Improvement Group (WRIG) was formed in the late 1990's by residents of the Wheatley River area who were concerned about the health of their watershed. The group became incorporated as a Non-Profit Agency in 2004.

The primary purpose of the group is to restore and protect the environmental quality of the Wheatley River and its tributaries. It's vision is one of a healthy watershed with a rich diversity of aquatic and terrestrial plant and animal life. Since the early years, the group has recognized the need to engage other community members, to encourage their sense of being connected and their shared responsibility for maintaining and enhancing the health of the watershed.

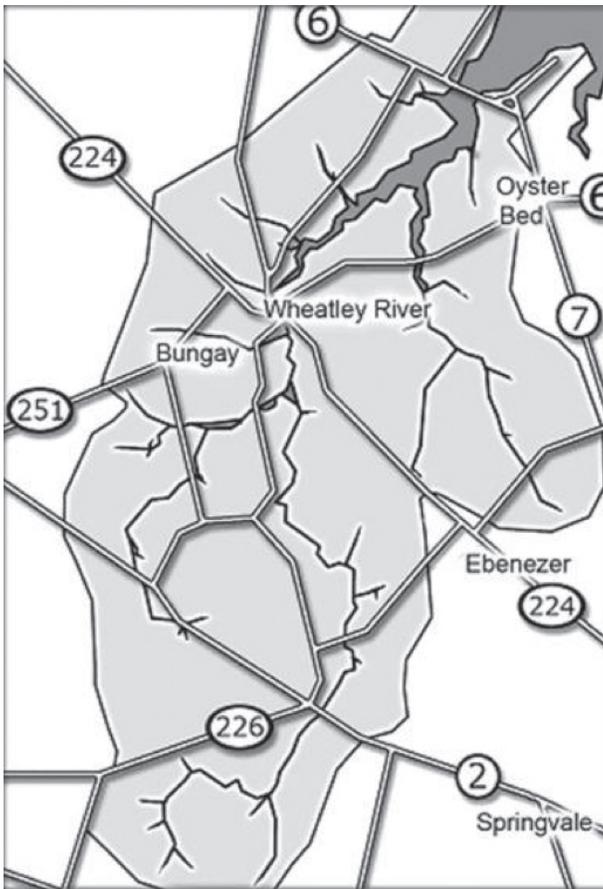
Since 1998, WRIG has hired summer field staff to carry out activities aimed at restoring streams, enhancing wildlife habitat and increasing public awareness of the environmental issues related to the watershed. With the cooperation of landowners, work crews have enhanced many of the streams within the Wheatley River watershed. They have planted over 2,500 trees, established a tree nursery, built nest boxes, and cleared two walking trails.

The intended impact of this restoration work is of course the improvement of water and habitat quality in streams and riparian zones. However, the work also provides an opportunity to communicate with landowners, farmers and other residents about some of the issues that are affecting the environment, and in particular our watershed. Despite the positive effects of the seasonal work that WRIG has undertaken, our members have always felt that to some degree our work has been aimed at treating only the symptoms of some overarching environmental problems.

Increasingly we have felt that in order to have any significant effect, we must take action to address the root causes of the deterioration of environmental quality of the watershed. Aware of efforts by other watershed groups in the province to develop stewardship plans, we decided that the first step for WRIG must be to engage in a planning process. Such a process, we agreed, needed to be firmly rooted in the community, that is, directed by residents and landowners who have a clear stake in enhancing and protecting the water, land, trees and animals of the watershed.

Through a series of meetings held over the winter of 2007, residents of the Wheatley River Watershed were asked to articulate their concerns for the watershed and to work towards developing a plan to address these concerns. They met on a bi-weekly basis over a period of two to three months at the Wheatley River Hall. Heather Anderson MacEwen organized and facilitated the meetings and assembled the output from these sessions as a basis for the strategic sections of this document. Prior to the meetings, Heather had also collected background material on the biology, sociology and geography of the watershed. This forms the first part of our stewardship plan.

This plan is meant to be a "living document". The intent is for WRIG members and other members of our community to use it to guide our conservation efforts, to evaluate and re-evaluate our progress and adjust the plan as necessary.



1.2 The Wheatley River Watershed

What is a watershed?

A watershed is a natural division of land; an area where all the water drains into a common basin (Figure 1). It includes streams, rivers, ponds and lakes (surface water) and all the water flowing under the ground (groundwater). On a large scale, Prince Edward Island is part of the Atlantic watershed which extends through to the Great Lakes region. PEI itself may also be considered a single watershed since all the water drains into the Gulf of St Lawrence and the Northumberland Strait. There are over 250 smaller watersheds draining into the estuaries and bays of the Prince Edward Island, one of which is the Wheatley River watershed.

Where is our watershed?

The Wheatley River Watershed covers approximately 69 square kilometres along the North Shore of PEI in Queens County, and drains into Rustico Bay. It includes the communities of Wheatley River, Oyster Bed Bridge, Ebenezer, Bungay Rd and the Darlington Rd.

The tidal area of the Wheatley River Estuary extends between the Oyster Bed Bridge causeway on Route 6, south to the Wheatley River Bridge on Route 224. Streams feeding into the Wheatley River extend to the Confederation Trail in Darlington, near Route 225. (Figure 2)

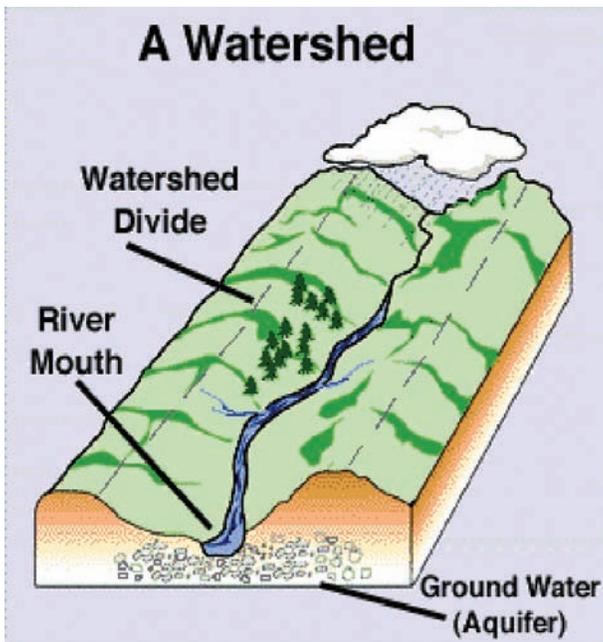


Figure 1: Simplified illustration of a watershed. Precipitation that falls on the watershed moves toward a common outlet either on the surface via runoff and streams, or through the ground water. Within the Wheatley River Watershed, the common outlet is the Wheatley River Estuary, which empties into the Rustico Bay and then the Atlantic Ocean. Kentucky Watershed Management Branch - Diagram of a generic watershed. Available at: <http://www.water.ky.gov>

*Figure 2: Wheatley River Watershed
© P John Burden*

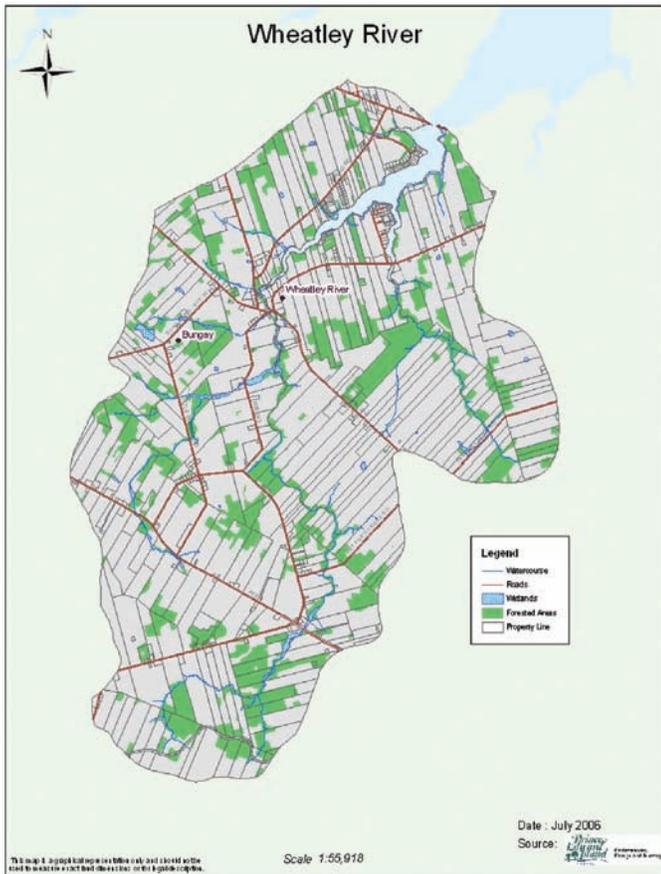


Figure 3: Boundaries of the Wheatley River Watershed
Courtesy of PEI Department of Environment, Forest and Energy.

to 1,572. This growth rate is **eight times** that of the province. Over the same period approximately 370 new residences were constructed in the census area, including cottages and year-round homes. Between 1996 and 2001, the median age of the population in the watershed shifted from 35.7 yrs to 42.4 yrs. According to the 2006 census, the language profile of the community is English (94%), French (4%). The majority of residents have lived in the area for more than five years (73%) and the remainder of the population are those who have moved to the area from another part of the Island (23%) and from off-Island (4%). The migration within the Island into rural areas is reflected in the movement of people out of Charlottetown for the same census period. Most residents in the watershed work

in the tertiary industries (health, education, retail, and business) indicating that many commute to Charlottetown or other areas outside of the watershed for employment. Between 1996 and 2006 there was a nearly 43% decline in the number of people involved in agriculture in the watershed.

1.3 Ecological Footprint

An “ecological footprint” is the total amount of land used for the production of food, energy and material consumed by an individual and for the disposal of the waste that results. Since almost everything we do consumes energy and materials and produces waste, we can use the idea of an ecological footprint to demonstrate the effect that our activities have on the environment. Commuting by car contributes to the size of our footprint, as does buying food from distant countries rather than buying locally-grown food, because of the large amount of energy that is used to transport goods. The footprint varies enormously among regions of the world. In 1999 the average, worldwide was 2.3 hectares. On the African continent the average was 1.36, in Western Europe it was 4.97 and in North America it was 9.6 hectares. At the same time, the average ecological footprint in PEI was 8.98 hectares. We would need almost five planets Earth to provide the necessary resources if all of the world’s people consumed at the same rate as people living in Prince Edward Island. In order to sustain our “Island lifestyle” for any length of time, we would need a land mass 2.2 times the area of the province. Clearly, something needs to change.

In fact, there are ways in which we Islanders could easily reduce our ecological footprint without compromising our quality of life. We can for example, buy local produce, consider car-pooling, advocate for public transport, and support organic and sustainable agriculture. Given the link between the size of our footprint and the environment, it is clear that by reducing our collective ecological footprint we will have a positive effect on the health of the watershed.

The Wheatley River Watershed Stewardship Plan 2007



2.0 Issues of Concern in the Wheatley River Watershed

2.1 Eutrophication & Anoxia

For the past number of years, anoxic events have become almost annual occurrences in the Wheatley River. On certain days in the summer, the estuary turns a milky white and gives off a disagreeable smell.

The depletion of oxygen is due to the decomposition of large masses of aquatic vegetation. Nutrient loading in the estuary causes rapid growth of various algae, in particular sea lettuce (*Ulva*). As the sea lettuce grows it uses the abundant nitrogen and releases oxygen. But sea lettuce has a short life cycle; within a matter of weeks from its initial bloom it begins to die. When it is present in large quantities, the dead sea lettuce floats on the surface of the water and effectively stops sunlight from reaching any algae remaining on the bottom of the estuary. These plants die and are not able to produce oxygen. As the dead sea lettuce begins to decompose it uses more oxygen. As levels drop, the fish and bivalves who need the oxygen die.

Sampling of Nitrogen in the waters of Rustico Bay and the Wheatley River Estuary in 2002 found that levels were highest upstream of the Oyster Bed Bridge Causeway, and that the further from the causeway the samples were taken, the higher the levels were. The higher Nitrogen levels upstream could be due to three main factors: proximity to areas of increased agricultural activity, high levels of aquatic plant growth (nitrogen is released as plants die and decompose) and reduced flushing of the estuary.

Levels above 3.0 are considered detrimental to aquatic life.

Sample	Nitrate ppm 26/07/2007	Nitrate ppm 07/08/2007	Location
1	3.8	3.9	Crooked Creek, immediately downstream of concrete bridge on Walter Andrews/Stewart MacRae's land
2	3.5	3.5	Rackham's Pond next to blown out gabian (box of rocks) at the mouth of bypass stream
3	3.2	3.1	Church Road Trib. Immediately upstream of culvert underneath Church Rd on Cecil Hurry's land
4	0.5	0.3	Allan Ling Trib. Immediately upstream of final culvert before entering river down the hill from Wheatley River Community Hall
5	2.9	2.7	Millboro Road Trib. Immediately upstream of culvert at old fish ponds
6	3.6	3.3	Art Ford Cross Rd. immediately upstream of road crossing
7	3.4	3.3	Route 2 (Brookfield) immediately upstream of road crossing on Ralph Cruwys's land
8	4.1	4.2	Little Bungay (South) downstream of road crossing on Norma Waye's land

Figure 6: Nitrate levels in Wheatley river, 2007

2.2 Sedimentation & Siltation

In PEI over 14 tonnes of topsoil per acre are potentially lost to erosion every year. The fate of these soils is usually movement to waterways where it disrupts the natural state of the waterway through sedimentation and siltation. Compounding the effects of sedimentation and siltation is the fact that nutrients, pesticides and bacteria also move into the water along with the soil.

Sedimentation is the deposition of soil on the bottom of bodies of water. This soil covers the natural bottom of the waterway, changing the habitat of aquatic species, often interfering with their spawning.

Siltation refers to the fine silt and clay that remains suspended in the water. Siltation affects wildlife in many ways including blocking the gills of filter feeders and reducing light for aquatic plant life.

The effects of sedimentation and siltation are easily seen within the watershed. Just below the Wheatley River bridge is located a collection of new “islands” that are the result of sedimentation. This is probably due in part to erosion of the bank opposite the old dam at Rackham’s Pond each spring. This erosion is both weakening the bank and putting large amounts of soil into the estuary.

Even in the small streams above Highway 2 there is significant sedimentation. Since 1998, teams of summer students have worked at mitigating the effects of sedimentation and siltation in the streams by installing brush mats and stabilizing stream banks. Streams where the students have worked are returning to their natural stony bottoms.

Within the Wheatley River Watershed there are large areas of agricultural land where the slope is greater than 9%, some of which has been taken out of rotation in recent years. Current provincial regulations require that land in this category should not be used for row crops due to the increased risk of soil erosion.

Another factor is the loss of hedgerows on agricultural land. Growers say that in the past, government provided incentives to remove hedgerows, in order to make larger and more easily-worked fields. But with the loss of the windbreaks that had been provided by the hedgerows, more soil was lost to wind erosion.

Many of the farmers in the Wheatley River area are concerned about the loss of topsoil, and have adopted soil conservation methods; including developing hedgerows and buffer zones, and using cover crops for protection in the off season.

Clay roads, including Heritage Roads are also sources of erosion and siltation and sedimentation within the Wheatley River Watershed. Roads of particular concern are the Little Bungay Road and the Parker Cross Road. Despite being graded, the Little Bungay Road erodes significantly after summer rainfalls. Soils from the road overflow the roadside ditches and flow into creeks and streams. Road construction provides further opportunity for erosion. Throughout the Hunter River area in 2006 while Route 2 was being widened, streams ran red whenever it rained.

2.3 Faecal Coliforms (FC)

Research in 2002 (Melcher, Heather A. 2002. Concentrations of Faecal Coliform Bacteria in the Wheatley River Watershed, Prince Edward Island – Draft Report) showed high levels of faecal coliform bacteria, due to general human (agricultural and residential) activity in the watershed. The levels of FC tend to peak at agricultural sites with livestock. Of 14 sites studied in the streams, all had levels high enough to cause shellfish closures, and four had levels high enough to be considered unfit for swimming. In 2002 the mean FC mpn/100ml was 336 at the Wheatley River Bridge, and 52 at the stream crossing on the Millboro Rd. National limits for FC concentrations (in mpn, or “most probable number”)/100ml are 14 (to cause shellfish closures) and 200 (to close an area for swimming).

2.4 Oyster Bed Bridge Causeway

Some residents of the Wheatley River Watershed remember when the main roads of the watershed were not paved, and although there was much greater erosion than there is today, sedimentation and siltation were not as noticeable. They wonder if decreased estuary flushing due to the Oyster Bed Bridge Causeway has contributed as much to water quality issues in the watershed than runoff and erosion. The causeway has been a topic of much discussion since it was constructed in 1956. Although the results of government studies over the years suggest that removal or widening of the causeway would have little positive effect on the flushing capacity of the estuary, concerned residents question this conclusion.

The government argues that widening the passage will decrease the velocity of water during the tides which will in turn decrease the amount of suspended sediment that would be flushed out with tidal action. Many residents feel that the natural opening of the channel was not reflected in the design of the causeway, and that if the passage were moved to reflect this channel, flushing would be improved. Most of the previous studies have concentrated more on the effects of the Little Harbour Causeway that links Robinson’s Island with Brackley Beach than on the Oyster Bed Bridge Causeway.



2.5 Shell Fisheries

The Wheatley River Estuary upstream of Rustico Bay has been closed for several years to shellfish fishing (oysters, mussels, and clams) due to (Faecal Coliform) bacterial contamination (Figure 7).

Downstream from the Oyster Bed Bridge causeway there are 10 off-bottom mussel leases. A concern for the mussel growers near the causeway is an increase in predation of mussel seed by sea ducks. At one time this was just a seasonal issue, but as the water near the causeway has stayed open year round in recent years, the sea ducks have also become a year-round problem. A combination of warmer water temperatures into the late fall, reduction of depth due to sedimentation, and mussel and duck excrement at this point have contributed to the lack of ice in the immediate area of the bridge.

There is also a fall oyster fishery in the outer estuary near Robinson's Island.



Figure 7: Red areas indicated shellfish closures. The Wheatley River Estuary upstream of Rustico Bay has been closed to shellfish harvesting. This closure is due to high levels of Faecal Coliforms in the water.

2.6 Aquatic Invasive Species

The introduction of non-native species to an ecosystem has the potential to disrupt the natural balance, potentially favouring the development of the non-native species over that of the native species in the ecosystem. In PEI the provincial and federal governments are monitoring the spread of seven Aquatic Invasive Species (AIS) which can potentially be detrimental to PEI's aquaculture industry. As of 2005, two of the identified AIS had been found in the Wheatley River Branch of the Rustico Bay: the Oyster Thief and the Violet Tunicate.

The Oyster Thief, (*Codium fragile tomentosoides*), a green algae native to Japan, is present throughout the Wheatley River watershed. It affects the oyster fishery in three main ways: by interfering with feeding, by causing attached oysters to float away, and by increasing harvesting costs due to the need to remove the algae before shipping. The algae can also displace native kelp species, the habitat of native echinoderms (sea stars, sand dollars) and crustaceans (crabs, lobsters).

The Violet Tunicate, (*Botrylloides violaceus*), fouls fishing gear. It was confirmed present on a few mussel socks in the Wheatley River Branch of Rustico Bay in 2005 and removed. The tunicate was not found in the Wheatley River Branch of Rustico Bay in 2006, but was confirmed present in the Hunter River Branch of Rustico Bay in the fall 2006 on a mussel sock.

2.7 Fisheries

Recreational (trout) fishing is popular in the Wheatley River estuary and eels are fished at many sites upstream of the causeway. Other small fish species are present in the estuary, including several species of sticklebacks, Mummichog, Atlantic Silverside, Flounder spp, Atlantic Mackerel and Banded Kilifish (P. MacDonald, UPEI).

2.8 Groundwater

Groundwater is the body of water that moves through the water table, generally following the same watershed boundaries as surface water. Due to the soil characteristics of PEI, water moves quickly downwards from the surface, and then moves slowly laterally at the rate of a few metres per year. This means that the effects of improved nutrient management - reduced Nitrate levels - will be seen within a few years of reductions taking place. The deeper levels of ground water, the source of our well water, will take several decades to reflect a reduction in nutrient application (Dr Mac Quarrie, UNB Civil Engineering - Watershed Group. Personal communication). During the growing season, the majority of Nitrates in PEI groundwater come from the following sources: fertilizers (~65%), manure (~ 25%), decomposing plant materials (~5%), and the atmosphere (~ 5%). Over the winter, nitrate from the application of fertilizers is greatly reduced, but the nitrate released by decomposing plants is greatly increased to the range of 60-85% of the nitrate released.

Figure 8 illustrates the typical Nitrate sources for PEI in both summer and winter. Nitrates are not only moving to the groundwater when applied as fertilizer, they leach out of manure piles and are released in the process as plant materials (natural and agricultural) break down. Through the process of nutrient management, the amount of nutrients applied to a field may be reduced, taking into account not only the nutrients applied to the fields in chemical and manure form, but also the nutrients released by plants as they break down. Well water nitrate data from 2000 through 2005 were selected by either having coordinates within the Wheatley River watershed or by being within a community centred in the watershed. Where a community straddles more than one watershed, some well analyses from outside the watershed may be included. The average nitrate level in the wells tested in the Wheatley

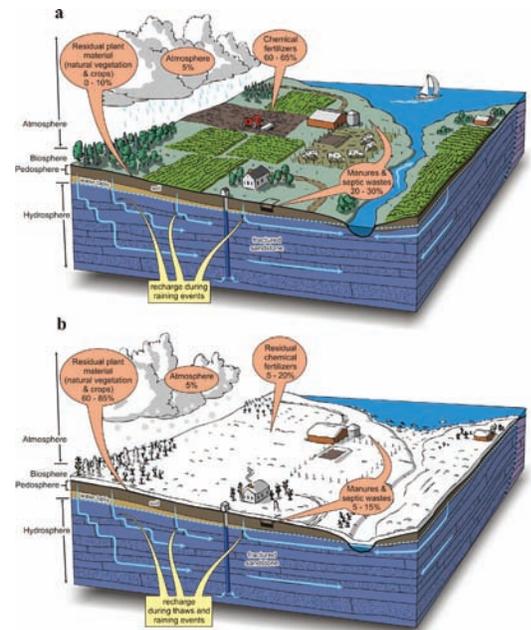


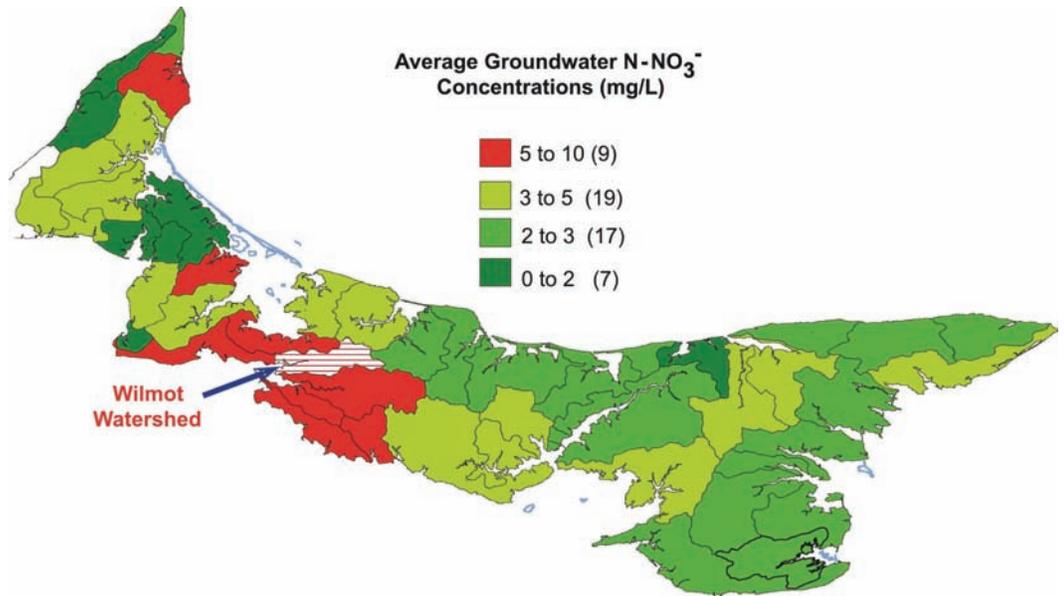
Figure 8 (a & b): Seasonal sources of Nitrate in a typical PEI watershed. It is important to note that the greatest inputs of Nitrate into the watershed are from chemical fertilizers, and the breakdown of these fertilized crops. Since septic systems are also notable sources of Nitrates it is imperative that home owners insure that their systems are working properly. Illustrations from Savard, M., and Sommers, G.Ed. 2007.

Table 1: (below) Average Nitrate Data for 192 Water Tests in the Wheatley River Watershed (PEI Dept.).

	NITRATE (mg-N/l)
N of cases	192
Minimum	0.200
Maximum	12.900
Mean	4.047
Standard Dev	2.229

River Watershed was 4.047 mg N/l. There were 2 wells that had nitrate levels in excess of the 10 mg N/l. The data is of limited value for assessing the health of drinking water as we do not know why or where the samples were collected.

In a survey across the 52 main PEI watersheds published in 2007, the Wheatley River Watershed rates as having low to medium nitrate levels, while the more intensively potato cropped areas of the Island are rated as being high (See Figure 9).



2.9 Soils

Soils in the Wheatley River Watershed belong to the Pictou Group of soils, specifically the “PEI Red Beds”. The bedrock is mainly sandstone with no fossilized plants. The upper soil strata in the watershed are of four main groups; Culloden, Gowanbrae, Charlottetown, and Alberr; with very similar characteristics. All the soils are strongly acidic, with coarse texture, and a deep water table. These soils are also susceptible to erosion.

2.10 Forests

Historically the forests of Prince Edward Island were predominately hardwoods, including Red Oak, Sugar Maple, Yellow Birch and Beech with some associated conifers: Spruce, Balsam Fir, Pine and Hemlock (within the watershed, there remains a substantial hemlock stand off the Little Bungay Road). Today the forests are mainly comprised of Spruce, Balsam Fir, and White Birch. Less than 25% of the watershed is forested, and there is no provincial forest land. Large tracts of land have been cleared for homes, roads, agriculture, and in the past, ship-building. Early in the 1900’s, fields were smaller and had shelter belts between them. As farming became more mechanized the province offered incentives for growers to remove their shelter belts to increase efficiency. Unfortunately, this also resulted in the loss of habitat for small animals and the loss of windbreaks for the fields.

2.11 Land Use

The Wheatley River Watershed is approximately 20% forested and 5% surface water. The remaining 75% has been cleared for roads, homes, businesses and agriculture (Figure 3). Agricultural land within the watershed is being sold and subdivided and new residences and cottages are being built. This is evidenced in the number of new homes recorded in the census data. Nearly 15% of the land within the Wheatley River Watershed falls into the PEI Sloped land inventory. Much of this land is adjacent to waterways.

2.12 Species at Risk

Environment Canada identifies two species at risk within the Wheatley River Watershed.

Piping Plover – Charadrius melodus melodus

The Piping Plover, the only endangered species in Prince Edward Island, is a migratory bird species that nests in the coastal areas of PEI. The Piping Plover has been the focus of conservation efforts since 1991. On PEI the Island Nature Trust monitors Piping Plover Nests to collect data regarding dates for nesting, laying, hatching, and fledging. The population estimate for the entire species as of 2005 was 444 adults.

Monarch Butterfly – Danausplexippus

A butterfly of “special concern” status across Canada, it is thought that the numbers of Monarchs in Eastern Canada has declined due to increased useage of herbicides which reduce the wild flowers that the Monarchs depend on for food, the loss of habitat through logging, and similar issues in Mexico where they overwinter.

2.13 Climate Change

The Atlas of Canada, Natural Resources Canada, classifies the whole of Prince Edward Island as being highly sensitive to climate change. A report released in 2007 concentrated on the effects of climate change on Nitrate levels in PEI groundwater. Natural Resources Canada has produced a series of maps illustrating predictions for sea level change, and effects on sensitive areas. The report indicated that the most significant climate change for PEI will be a change in temperature and that there would not be a significant change in the amount of precipitation received on PEI.

3.0 Wheatley River Stewardship Plan

3.1 Vision Statement

The vision that is central to this stewardship plan is one of a watershed in which the soil, forests and water are healthy and supportive of a rich diversity of aquatic and terrestrial plants and animals. In this vision, the Wheatley River watershed is one in which farmers and fishers are able to make a living, for generations to come, and where all residents have access to clean, healthy water.

3.2 Guiding Principles

The following principles will guide our stewardship efforts:

- *Promotion of a healthy and sustainable environment is the basis for this plan.*
- *This is a community-based plan. The people who live in the watershed and those who derive their livelihoods from it must be involved in developing, monitoring and adjusting the plan, as well as putting it into action.*
- *Stewardship initiatives that have a positive effect on the environment must be recognized.*
- *The Wheatley River watershed is one of many closely connected watersheds in Prince Edward Island. We recognize that we are part of the larger watersheds of Rustico Bay, PEI and the Gulf of the St. Lawrence.*

3.3 Key Issues

3.3.1 The deterioration of ground and surface water quality:

Anoxic events and fish kills are symptoms of larger issues of nutrient enrichment and run-off of chemicals and soil from fields and roads. The visible signs of decreased surface water quality include increased siltation and sedimentation, large blooms of sea lettuce, anoxic events, fish kills, and shellfish closures.



3.3.2 The need to identify and address the root causes of the water quality problems within the watershed:

There is great value in the kind of stream restoration work that WRIG undertakes each year. The planting of native trees and shrubs to stabilize banks, and the clearing of sediment through the installation of brush mats have had positive effects on the quality of stream water. Yet, the streams still run red during heavy rains and the estuary becomes anoxic in the summer. There is a need to address the root causes of the problems, and look at what is happening upstream to cause sedimentation and nutrient loading.

3.3.3 Development and enforcement of public policy as it relates to issues affecting water quality in PEI:

In 2005 there were 18,000 building lots created on PEI. Within the Wheatley River Watershed there were over 350 new homes built between 1996 and 2006, while the number of people involved in agriculture decreased by almost half. Within the watershed, aerial photos from 2001 show that as little as 20% of the land is forested, with no provincial forests within the watershed.

Residents are concerned that there is no apparent government vision for the development of rural areas, including the area covered by the Wheatley River watershed. There is a sense that existing planning regulations are not applied and enforced consistently. Land is subdivided into small cottage lots that will result in many septic and well systems in a relatively small area. There is a concern that much of the waterfront will be developed, leaving no natural areas and eliminating habitat for many species.

There is also concern about the lack of regulation and monitoring in terms of agricultural land use. For example, the Crop Rotation Act of Prince Edward Island suggests that potatoes may only be grown on a particular field in a 1 in 3 year rotation, which is to be approved by the department of agriculture. The reality, is that there are loopholes in the act that allow for regulated crops to be grown on the same field in a 2 in 5 rotation, provided the grower can show their management practices will have the same impact as a 1 in 3 rotation.

3.3.4 The growing trend of primary producers (specifically small-scale, family farmers) leaving their industries due to inability to derive a livable income:

It is increasingly difficult for a small family-run farm to be economically viable. As industrial-style farming has become more prevalent, the number of family farms has decreased drastically over the past few decades. Increased costs of production often leave small growers feeling trapped, in a state of perpetual crisis management. Many are forced to sell their land in order to survive. When farmers retire their land often goes out of production as none of their family is in a position to take over the farm. Consequently, land is bought by developers, who without adequate policy and enforcement, are developing with what is felt to be little environmental consideration.

3.3.5 A lack of awareness in the community of the extent of the watershed and of how it connects residents:

Within the Wheatley River Watershed there are many vibrant communities, with a strong sense of social cohesion. But residents may not be conscious that they are also members of another kind of community, based on watershed divisions. They may not perceive the ways in which they are connected with others living within the same watershed.

3.4 Goals

The overall goal of this stewardship plan is to restore the environmental quality of the Wheatley River watershed; to enhance the health and diversity of its plants and animals. In order to address the specific concerns that have been identified, a set of related goals has been developed:

1. **Support and promote positive environmental stewardship initiatives**
2. **Influence appropriate development, monitoring and enforcement of public policy relating to the environment**
3. **Support those residents who make their living as primary producers in the watershed**
4. **Improve water quality**
5. **Increase community involvement in watershed enhancement efforts**
6. **Promote a wider sense of community within the watershed**

3.5 Strategies

Goal #1: Support and promote positive environmental stewardship initiatives

Strategy A. Create opportunities for landowners to learn about what they can do to protect and enhance the environmental quality of their land.

- i) Distribute newsletters and make presentations to interested groups, focusing on topics such as:
 - Alternatives to pesticides;
 - Organic Lands Registry – The Certified Organic Producers Co-op (COPC) has established an Organic Land Trust Registry. The purpose of the registry is to make land readily available to new organic farmers or conventional farmers seeking organic certification
 - Well testing;
 - Nutrient management;
 - Landowners' responsibilities when their land is being rented for agricultural purposes.*
- ii) Identify vulnerable areas within the watershed, and assist landowners in protecting these areas*
- iii) Recognize those who are improving their land use practices through articles in the WRIG newsletter, and community newspapers.*

Strategy B. Promote activities for residents of the watershed to reduce their ecological footprint.

- i) Support initiatives for car-pooling and ride –sharing within the watershed;*
- ii) Encourage landowners to use the WRIG nursery to reforest their land;*
- iii) Create awareness among residents and businesses of the potential effects of the cosmetic pesticides;*
- iv) Promote the concept of “buying locally – produced foods.*

Goal #2: Influence appropriate development, monitoring and enforcement of public policy relating to the environment

Strategy A. Create an organized way in which the community can voice its concerns about public policies relating to land use and the environment.

- i) Investigate ways in which the community members can work together so that they are consulted by government when future planning and zoning issues arise, for example, by establishing a Community Improvement Committee, or by Incorporation*
- ii) Research strategies that have been used successfully in other communities.*

Strategy B. Work together with other organizations to advocate for improved public policy.

- i) Participate in the development of a network or coalition of watershed groups*

Goal #3: Support those residents who make their living as primary producers in the watershed

Strategy A. Investigate the concept of compensation for ecological goods and services

Goal #4: Improve and protect drinking and surface water quality

Strategy A. Collect water quality data

- i) Encourage residents of the watershed to have their water tested and to share the results with WRIG on an annual basis.*
- ii) Develop a systematic basis for comparison of water quality in the Wheatley River watershed with other PEI watersheds and disseminate the results.*

Strategy B. Promote and support nutrient management techniques

- i) Encourage and assist growers in the watershed to use nutrient management techniques to limit excess application of nutrients.*
- ii) Share results of nutrient management projects that have been undertaken in other areas of PEI.*

Strategy C. Advocate for the reinvestigation of the effects of the Oyster Bed Causeway

- i) Establish a sub-committee of interested residents to further address this issue.*

Strategy D. Stream restoration work by summer students

- i) Continue seasonal work focused on stream restoration.*

Goal # 5 Increase community involvement in watershed enhancement efforts

Strategy A. Create public awareness of issues affecting watershed health

- i) Make presentations to inform and engage community groups*
- ii) Publish and distribute newsletters on a regular basis*
- iii) Organize public meetings with guest speakers*
- iv) Hold regular meetings and encourage members to participate*

Strategy B. Explore possible recreational activities, such as "River Days", kayaking or walking tours

Goal #6 Promote a wider sense of community within the watershed

Strategy A. Document the history of the watershed.

- i) Have the summer students interview and record the histories of residents who have relevant stories to tell.*
- ii) Collaborate with the Women's Institute, 4H and other organizations in the area to access and catalogue relevant historical information.*

Strategy B. Create public awareness of the geographical extent of the watershed

- i) Seek support for erecting signage to identify watershed boundaries.*
- ii) Distribute brochures and newsletters with maps and other information about the watershed.*

Strategy C. Identify flagship projects that will advance WRIG goals and strategies.

- i) Explore further the desire of residents to reclaim Rackham's Pond.*
- ii) Develop a plan to reclaim the pond and seek necessary financial political support to put it into action*



Data Sources

- Anderson, Carl. 1998. Sediment Stability in Rustico Bay and Hunter River, PEI. For PWGSC Contract No. 23420-7-M367/001/HAL
- Department of Fisheries and Oceans Canada - Shellfish Monitoring Network – map of Rustico Bay. Available: https://www.glf.dfo-mpo.gc.ca/pls/secure/smn_bays?langE=en&bay_cdE=24#map
- Department of Fisheries and Oceans Canada. Shell Fish Closures – Gulf Region : Order: g02019-11 Online. Available: <http://www.glf.dfo-mpo.gc.ca/shellfish-coquillages/map-carte.asp?panmap=n&Language=en>
- Environment Canada - Species at Risk. Online. Available: http://www.sis.ec.gc.ca/ec_species/ec_species_e.phtml
- Kentucky Watershed Management Branch - Diagram of a generic watershed. Available: http://www.water.ky.gov/NR/rdonlyres/79062A6F-90B9-4E5A-BCDF-A63251706704/0/what_is_a_watershed.gif
- Ledwell, J. 2003. ENVIRONMENTAL POLICY FORUM: SUMMARY DOCUMENT - Prepared on behalf of the Institute of Island Studies, University of Prince Edward Island. Online. Available: http://www.upei.ca/islandstudies/rep_env_1.htm
- MacDonald, P. 2005. Inshore fish communities of Prince Edward Island's north shore estuaries. BSc Biology Honours Thesis, Department of Biology, UPEI.
- MacDougall, J.L., C. Veer, and F. Wilson. 1998. Soils of Prince Edward Island – Prince Edward Island Soil Survey – Research Branch, Agriculture Canada.
- MacFarlane, R. 2006. Are we there yet?: The status of river restoration on Prince Edward Island. Presentation at WRIG AGM
- MacQuarrie, K. 2007. UNB Civil Engineering – UNB Groundwater Studies Group. ktm@unb.ca. Personal communication.
- Parks Canada - Computer Modelling of Rustico Bay Hydrodynamics. 1998. Prepared by W.F. Baird and Associated Coastal Engineers Ltd.
- PEI Department of Fisheries and Environment, and Environment Canada. 1996. Water of Prince Edward Island: Understanding the resource, knowing the issues.
- PEI Department of Transportation and Public Works - A Study of Water Quality Issues at Selected Prince Edward Island Causeways. 1986. Prepared by P Lane and Associates Ltd, and Jacques Whitford and Associates.
- PEI Department of Environment, Forestry, and Energy. 2006. Map of Wheatley River Watershed.

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InfoPEI - Office of the Premier - Regulating the use of Resource Lands. Online. Available: Strip Development - www.gov.pe.ca/roundtable/index.php3?number=69475&lang=E; Rural Land Zoning - www.gov.pe.ca/roundtable/index.php3?number=69477&lang=E; Measuring Progress - www.gov.pe.ca/roundtable/index.php3?number=69488&lang=E

Savard, M., and Sommers, G. Eds. 2007. Consequences on Climate Change on Contamination of drinking water quality by nitrate on Prince Edward Island. Online. Available: http://adaptation.nrcan.gc.ca/projdb/pdf/109_e.pdf

Smith, A. 2007. Aquatic Invasive Species Coordinator, Department of Fisheries & Oceans Charlottetown. Personal Communication.

Statistics Canada 1997. 1996 Community Profiles. Online. Available: <http://www12.statcan.ca/english/Profil/Details/details1pop.cfm?SEARCH=BEGINS,BEGINS&ID=2115&PSGC=11&SGC=1102044&DataType=1&LANG=E&Province=11&PlaceName=lot%2024&CMA=0&CSDNAME=Lot%2024&A=&TypeNameE=Township%20and%20Royalty&Prov=>

Statistics Canada. 2002. 2001 Community Profiles. Released June 27, 2002. Last modified: 02/01/2007. Statistics Canada Catalogue no. 93F0053XIE. Online. Available <http://geodepot.statcan.ca/GeoSearch2006/GeoSearch2006.jsp?resolution=H&lang=E&otherLang=F&census=Yes&DisplayData=Yes&NewImage=yes&layer=csd&IdentName=Lot24&IdentUID=1102044>

Statistics Canada. 2007. Lot 24, Prince Edward Island (table). 2006 Community Profiles. 2006 Census. Statistics Canada Catalogue no. 92-591-XWE. Ottawa. Released March 13, 2007. Online. Available: <http://www12.statcan.ca/english/census06/data/profiles/community/Details/Page.cfm?Lang=E&Geo1=CSD&Code1=1102044&Geo2=PR&Code2=11&Data=Count&SearchText=Lot%2024&SearchType=Begins&SearchPR=01&B1=All>

<http://www.gpiatlantic.org/pdf/ecofoot/pei-ecofoot.pdf>

