

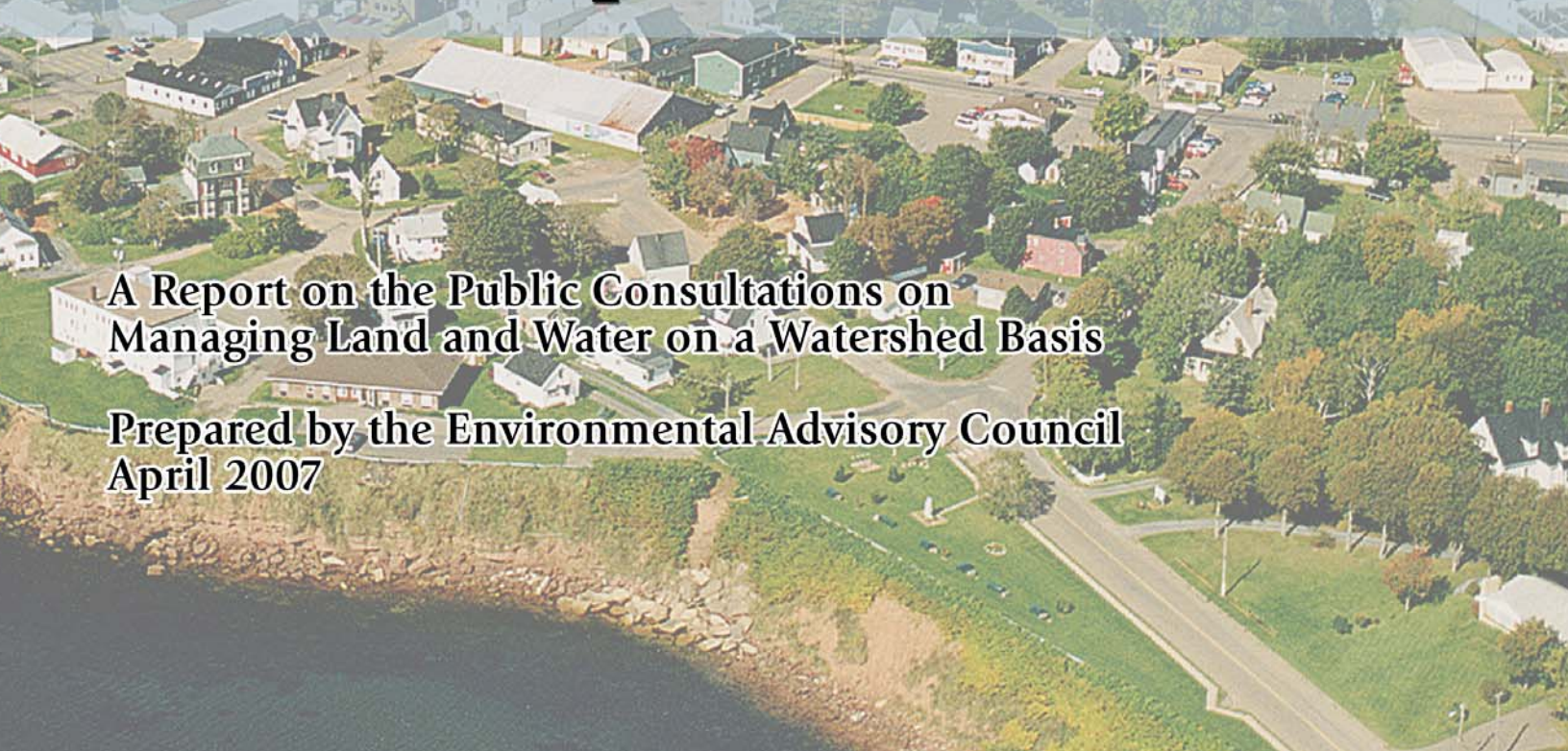


**We are all downstream  
We are all upstream**

**We are all part of a watershed**

**A Report on the Public Consultations on  
Managing Land and Water on a Watershed Basis**

**Prepared by the Environmental Advisory Council  
April 2007**





**We are all downstream  
We are all upstream  
We are all part of a watershed**

A Report on the Public Consultations on  
Managing Land and Water on a Watershed Basis

Prepared by the Environmental Advisory Council  
for the Minister of Environment, Energy and Forestry

April 2007

# Table of Contents

<b>Introduction</b> .....	<a href="#">Page 1</a>
<b>Background for the Consultations</b> .....	<a href="#">Page 3</a>
<b>Findings on Major Issues</b> .....	<a href="#">Page 5</a>
Reflections in the Water – Major Environmental Issues in Watersheds .....	<a href="#">Page 5</a>
Contributing Factors to the Major Environmental Issues in Watersheds .....	<a href="#">Page 8</a>
The Value of Watershed Management Planning .....	<a href="#">Page 13</a>
Experiences of Watershed Groups .....	<a href="#">Page 14</a>
<b>Needs and Ideas for Watershed Management Planning</b> .....	<a href="#">Page 21</a>
Visions/Paradigms .....	<a href="#">Page 21</a>
Ongoing Needs of Watershed Groups .....	<a href="#">Page 22</a>
Level and Sources of Funding .....	<a href="#">Page 23</a>
Research and Technical Support .....	<a href="#">Page 25</a>
Structure/Organization .....	<a href="#">Page 26</a>
New Programs .....	<a href="#">Page 28</a>
The Role of Government .....	<a href="#">Page 31</a>
<b>Governance on a Watershed Basis</b> .....	<a href="#">Page 37</a>
<b>Recommendations</b> .....	<a href="#">Page 39</a>
Governance on a Watershed Basis .....	<a href="#">Page 39</a>
Policies, Regulations and Programs .....	<a href="#">Page 39</a>
Education/Awareness .....	<a href="#">Page 42</a>
Research and Technical Support .....	<a href="#">Page 42</a>
Organization and Structure .....	<a href="#">Page 43</a>
Funding .....	<a href="#">Page 44</a>
<b>Conclusion</b> .....	<a href="#">Page 47</a>
<b>Appendix A</b> .....	<a href="#">Page 51</a>
List of Presentations at the Public Consultations .....	<a href="#">Page 51</a>
Other Written Submissions .....	<a href="#">Page 52</a>
Supplementary Materials and References Submitted .....	<a href="#">Page 53</a>
<b>Appendix B</b> .....	<a href="#">Page 55</a>
Map of PEI Watersheds .....	<a href="#">Page 55</a>
<b>Appendix C</b> .....	<a href="#">Page 57</a>
Environmental Advisory Council Membership List 2007 .....	<a href="#">Page 57</a>

# Introduction

(All italicized quotes are drawn directly from the presentations and submissions of consultation participants unless otherwise indicated.)

*“Watersheds are a basic natural unit for understanding what keeps the Island alive and healthy. If they’re in good shape, then we can build our human economy on top of them and have a good quality of life.”*

*“The public perspective is that our river system is in trouble.”*

*“ Water quality is deteriorating as we speak.”*

*“Following current guidelines will not improve the watersheds.”*

*“PEI is at a crossroads in environmental history. We are at a point where we can decide to join many parts of the world in making the environment a priority, or we can wait to see what happens – most likely with disastrous results.”*  
(Fred Cheverie & Rob Sharkie, *Guardian*, February 12, 2007)

There is a growing feeling of urgency, a sense that we are at a tipping point, a critical moment for addressing the range of environmental issues that come to be reflected in our watersheds, and in the quality and quantity of our water. It is increasingly clear that the issues that Islanders face are serious ones, requiring innovative ideas and committed attention, and that *“there is a limited window of opportunity to focus concerns into meaningful actions.”* As if to emphasize the seriousness of the issues we face, a big wind blew during the last week of our consultations, covering whole parts of the Island with red soil in a way few have ever seen before, giving the appearance of a *“sad, bleeding land.”* (David Weale, *Guardian*, February 26, 2007)

Based on these consultations, it is apparent that the participants we heard from are deeply concerned about and deeply committed to the watersheds of Prince Edward Island. This was evident in their thoughtful and thorough presentations, grounded in broad knowledge of their watersheds and the issues they face, and in the tremendous work of the many watershed groups across the Island. We heard a great deal about ongoing efforts to restore streams, to improve habitat, and to educate and engage members of their communities. There appears to be considerable satisfaction in such successful watershed work that corrects and mitigates some of the problems in the water.

However, there is also considerable frustration when the waters run red as they increasingly do, when the work of such watershed groups is undone by rain and wind that bring siltation and worry about the consequences of what that silt carries into the water. It is imperative to find “upstream” solutions to our environmental issues to prevent the problems that these groups work so hard to correct and mitigate.

People approached these consultations with a combination of hopefulness and skepticism. They were hopeful that the results of this process would bring perspectives and actions that will truly address the root causes of the pressing environmental issues that watersheds face. But they were also wary, bringing to our attention previous consultations and the considerable body of excellent reports (e.g. *the Royal Commission on the Land, the Roundtable on Resource Land Use and Stewardship*) where they perceived that recommendations have gone unimplemented. They were skeptical about the short time frame the current consultations provided for such important issues, speculated about political motives, and even raised the question of whether elected politicians can ever be stewards of the environment.

The members of the committee feel that Islanders are at a critical juncture, that this is a time when implementing actions to produce significant environmental change is both necessary and possible. We resonate with ideas we heard about the need for a new perspective toward our watersheds that is more holistic and ecological: an approach that involves and considers all members of the community, human and nonhuman; an approach that recognizes that we all live in interdependency with the land and water. Our health and well-being are inextricably connected with the health and well-being of our land and our water.

In one sense, we are all “downstream.” Each of us experiences the consequences of a degraded and disturbed watershed. We are all “upstream” as well, each with our own profound ecological footprint. We are all responsible, each of us part of the problem, and each of us part of the solution. The path to a sustainable future requires us each to accept our dual roles and to join together in an inclusive, community based planning process.

Our intention is that the views of Islanders expressed in this report, along with our recommendations will provide an ecological vision to guide us in taking actions to ensure the health and well-being of our watersheds, our Island, and ourselves.

## Background for the Consultations

In November 2006, the Minister of Environment, Energy and Forestry tasked the Environmental Advisory Council (EAC) with conducting public consultations across PEI on managing land and water on a watershed basis. Four members of the EAC were selected to conduct these consultations: co-chairs Sherra Profit, a Summerside lawyer, and R. Elmer MacDonald, a potato and beef farmer from Augustine Cove; Dr. Jim Kemp, a UPEI biology professor from North River, and Don Matheson, retired teacher and Christmas tree grower from Oyster Bed Bridge. The EAC selected Dr. Don Mazer, a retired UPEI professor of psychology and environmental studies from Suffolk, to facilitate these consultations and to assist in the preparation of the report.

The purpose of these consultations was to hear the views of Islanders and provide recommendations to the Minister on a variety of key issues in watersheds including, but not limited to:

- Priority environmental issues related to watersheds
- Public support for community-led watershed planning and management
- Levels of financial support that would be necessary to implement watershed planning and management on PEI
- Suggestions on sources of funding
- Technical support required by watershed groups
- Structure of watershed groups
- Governance on a watershed basis

The EAC held five meetings across the Island:

January 29 – Charlottetown, West Royalty Community Centre

January 31 – Kinkora, Kanata Club

February 5 – Poole's Corner, The Whim Inn

February 13 – Elmsdale, Westisle Composite High School

February 19 – Miscouche, Centennial Rec Centre

A press conference that included Premier Pat Binns and Minister of Environment, Energy and Forestry Jamie Ballem, along with members of the EAC, formally announced the consultations. To raise awareness and encourage participation in the process, key stakeholders (e.g. watershed groups and other organizations) were notified by letter, ads were placed in all Island newspapers, and several articles from diverse perspectives (the Canada Research Chair in Environmental Science at UPEI, two watershed co-ordinators, the Minister) were submitted to Island newspapers discussing the importance of watershed issues. Those interested in presenting at meetings were encouraged to call the Department of Environment, Energy and Forestry in advance and to submit a written brief. All written submissions were posted on the consultations website: [www.gov.pe.ca/go/watershedconsultations](http://www.gov.pe.ca/go/watershedconsultations) (*One contributor requested that their letter not be posted on the website because it discussed a personal experience. We honoured that request.*) A number of people who did not present briefs at the meetings chose the option to submit their ideas for posting on the website.

We conducted a transparent process, where all Islanders had access to the information being presented. No private meetings were held, and all written and oral presentations were a matter of public record.

The committee was pleased by the degree of public involvement in this process. There were 30 to 100 people at each meeting and each was a full night of briefs and discussion. There were 39 presentations at the meetings, and an additional 26 individuals or groups made written submissions. We heard from 23 of the approximately 34 watershed groups on the Island, as well as representatives of farming, fishing, aboriginal and municipal organizations and a diverse group of other Islanders. A list of participants is presented in Appendix A.

# Findings on Major Issues

## *Reflections in the Water – Major Environmental Issues in Watersheds*

*“Why is the pond red after every rain?” “Are there any fish in the pond? I don’t see anyone fishing anymore.” “How deep is the water? I don’t remember being able to see the bottom before.” (Wright’s Creek Watershed )*

*“Less than two centuries ago, large sailing ships were built in and launched from here. Last year, one of the landowners along the river in proximity to where these ships used to be built, sold her canoe because the thick aquatic vegetation and low water level prevented her from launching it.” (Wheatley River Watershed)*

*Trees that were planted 40 feet from the river at the Bunbury nursery in the 1960s are now beginning to topple over.” (Hillsborough River Watershed)*

*“We have as much stage 1 [lobster] larvae as the North side of PEI; when it comes to stage 4, we have hardly any.” (Central Northumberland Strait Fisherman’s Association)*

*“ All other living organisms in our environment do not have this option of having their water treated so that it attains an acceptable quality.” (PEI Shellfish Association)*

*“In 2002, we were involved in a large cleanup involving over 12,000 dead fish from three separate fishkill events on the Wilmot River. This had a profound effect on our group, agriculture and society in general.” (Prince County Flyfishers)*

The large range of environmental problems that are experienced in watersheds seem to be reflected in our surface and groundwater. Many presenters told us that *“Water quality is the first issue.”* The examples provided above are just several of the many provided to us that illustrate the problems with our water. Water quality is reflected in both what we can see and sense (e.g. siltation, algae blooms, sea lettuce, dead fish, shellfish contamination, noxious odours, anoxic conditions) and what we cannot see (e.g. nitrates, phosphates, rising temperatures). While each watershed is unique, there was broad agreement about the major environmental issues they all faced, and the key sources that contribute to these problems. Many of the other issues participants identified on the land (e.g. loss/degradation of



forests, urban and strip development) seem ultimately to be connected to and reflected in the quality of water. Water quality seems to be a good reflection of, and barometer of the health of a watershed.

The amount of water in our watercourses and water tables was also addressed as an issue. In the last century, normal household water use on PEI has gone from 23 litres a day to 1,100-1,800 litres a day (*Water on PEI*, information booklet). We heard of rivers that regularly have only 30-35 centimetres (12-14 inches) of water, shallowness in the bays, and concerns about the levels of the rivers that provide water for the cities, as the Winter River does for Charlottetown. Future growing demands for clean water will only exacerbate this concern.

The following key issues are seen as the major problems in the degradation and contamination of streams, ponds, estuaries and groundwater.

**Siltation** was a problem that was addressed by a large majority of the contributors. Even with attempts to prevent runoff (e.g. buffer zone legislation, required crop rotation, efforts by the Department of Transportation and Public Works), many streams continue to have problems with the infilling of silt. Many of the efforts of watershed groups have been focused on preventing or minimizing this problem and reducing its impact.

*“Rivers like the Dunk and the Wilmot are red or discoloured up to 25% of the year.”*

*“With an average heavy rain, Andrew’s Pond turns mud red for a week ... and the area of open water is now significantly smaller.”*

Among the major consequences of such siltation are loss of fish habitat and rise in the water temperatures. The loss of topsoil due to wind and rain erosion is a concern. We are more familiar with the effects of rain and runoff from fields because it is apparent in our streams and ponds and has such a direct impact on the work of watershed groups. However, the *“loss of topsoil due to wind erosion has been largely ignored, and until very recently denied by many across the Island.”* We were all made very aware of the effects of wind erosion when a major wind storm occurred during the time of our consultations.

**Nutrient enrichment** and nitrates in surface and groundwater was a source of considerable concern to many participants. Nitrate levels were seen by many as being dangerously high, “*an all-time high in both surface and groundwater,*” and “*while much has been made of the potential hazards of increased nitrates in our drinking water, almost nothing has been done to reverse the problem.*” Nitrate concentrations in wells were problematic in some areas. Nutrient enrichment poses serious problems in watercourses, contributing to the growth of sea lettuce and algal blooms and to potentially anoxic conditions that are destructive of habitat and produce a foul odour. While “*filtration systems can help a household water supply, you can’t filter a river system, let alone a watershed.*” The principal sources of nutrient enrichment appear to be agricultural chemicals and manure. The problem is highly related to the siltation of waterways resulting from runoff from fields and other types of erosion. There is also concern about the role of faulty and outdated septic systems, and disposal of untreated sewage in watercourses.

**Decreased biodiversity** was also a major concern. Participants from many areas told us about the marked decline of fish in the streams and in the ponds. Several contributors spoke about the fishkills in their areas, and of shellfish closures. Others noted the decline of growing lobster larvae in certain areas, and fewer oysters, clams and eels. Habitat alteration of streams has had an impact on vertebrate and invertebrate communities and the proliferation of sea lettuce in estuaries has had a marked effect on those aquatic habitats. Diversity of forest ecosystems is also in decline with few remaining old growth species and domination by rapidly growing conifers with little intrinsic ecological value. The marked decline in forest cover has intensified with recent clearcutting, and its impact on wildlife habitat was identified as an important problem by a number of participants.

**Other key problems** identified include, but are not limited to:

- **Pesticides in the air and water** – A number of participants raised concerns about the impact of high levels of pesticide use on health and water quality.
- **Poor tidal exchange** – This was seen as an important contributor to the decrease in the quality of water and fish habitat.
- **Local impacts of climate change** – This concerned several participants – e.g. erosion and the subsequent siltation in watercourses will be influenced by milder winters with less snow cover and by more variable and extreme weather events.

## ***Contributing Factors to the Major Environmental Issues in Watersheds***

*“As water is a common resource required to sustain humans, we all have a moral responsibility to maintain the quality and quantity of this precious resource for future generations. It seems only appropriate that those who have more impact on the water resource need to take more responsibility.”*

### **Agricultural Practices**

PEI is a land of intensive agriculture. In other places, farming occurs “out in the country,” far from the view of most people. But on PEI, due to its small area, high population density and increasing “suburbanization” of rural areas, agriculture is a visible activity that takes place within many of our communities. Farmers are our neighbours, and what takes place on the land is salient and important to Islanders.

Agricultural practices were consistently identified as a source of many of the major watershed problems. Many participants linked the levels of fertilizer and pesticide use, limited crop rotation, insufficient buffer zones, the absences of hedgerows, improper nutrient storage, plowing practices (on sloped land, too close to watercourses, fall plowing and the absences of cover crops) to the issues they experienced with siltation, nutrient enrichment and other problems. Concerns about deep irrigation wells were mentioned by a number of participants as a factor in water levels.

While participants were very clear in their identification of agricultural practices as a major source of environmental issues, they were also clearly supportive of the farming community, particularly the changes that many farmers have made to implement environmentally sustainable practices. In recent years, the provincial government (“government”) has enacted legislation on buffer zones, crop rotation, and plowing on sloped land. We learned that PEI has the highest rate of endorsement of Environmental Farm Plans in Canada and increasing numbers of farmers are developing Nutrient Management Plans. Farmers are initiating their own organizations, such as Agri Conservation Clubs to move toward more sustainable practices. Participants expressed a clear acknowledgment and appreciation of those farmers who were accepting these changes, complying with these regulations, and enrolling in these useful programs.

But a paradox concerning agriculture seemed to emerge. Along with recent progressive measures, there is also the perception that the state of the environment is getting even worse. Many participants were deeply concerned “*water quality is deteriorating as we speak.*” We heard concerns that normal practices in agriculture have moved to a more unsustainable “industrial model.” Even recommended maximum levels of nitrates for humans may have a negative effect on aquatic life and there are major areas of PEI that have levels far exceeding this. The policy signals to produce as much food as cheaply as possible have not changed and this is a significant barrier to sustainable practices. There are also more farmers who lease land in communities outside their own, who may be less connected to this leased land. There are more large farms, and many farmers must work within the demanding requirements of the processing industry. Participants also noted that there were still farmers who would not comply with regulations, or would seek ways around them.

## **Regulations and Enforcement**

There is a widely shared perception that existing government regulations are unevenly and sporadically enforced, that penalties may be inadequate and that prosecutions are rare. This is a source of considerable frustration to watershed groups, and they urge government to address the problems that groups work to mitigate and correct so that they do not recur.

*“As our field crew was working upstream, diligently cleaning up and making yet another brush-mat to catch silt, a major anoxic event was occurring downstream ... Dead fish were found along large stretches of the river ... We were left wondering about the purpose of our group. How could our field crew feel that their work was worthwhile?”*

Participants commented about problems with enforcement of crop rotation regulations, and pointed to the fact that there were a variety of acceptable reasons for shorter than three year rotations. We heard reports of farmers plowing near the watercourses and of inadequate buffer zones.

*“The lack of enforcement of existing laws is very frustrating, not only to our group, but to other members of society, including farmers who try to abide by the rules of law but see other members of their profession blatantly disregard the law with no punishment.”*

In some cases, participants pointed to inadequate (“*bare minimum requirements*”) or unclear regulations; e.g. how do you figure the percentage of allowable cuts in riparian areas? In other cases, there are no regulations. For example, when members of the Wright’s Creek group traced the siltation problems in their pond to acres of unseeded, open clay left from development projects in Sherwood, they learned that there were no regulations to address this.

Public concern about the lack of effective regulation and enforcement was one of the stronger findings of these consultations. Participants have expressed that without such effective regulation and government leadership, they have serious concerns about the ultimate value of watershed planning and work.

## **Deforestation**

Loss of forest cover and degradation in the quality of the forests is both a major environmental problem for watersheds and a contributing factor to the previously mentioned problems. Trees provide a variety of valuable ecological goods and services. The reduction of these services through increased harvesting and clearcutting clearly impacts upon siltation and nutrient levels in our watercourses. The reduction in forest cover threatens habitat and biodiversity, and puts undue pressure on existing buffer zones which are often inadequate. When there is replanting, it is often focused on a small number of rapidly growing species which can all be subsequently harvested together.

A major focus of watershed groups is reforestation. Many groups have tree nurseries, and spend considerable time and effort in planting to enhance buffer zones. “*Over our history, we have established over 100,000 new trees and shrubs in the Dunk and Wilmot watersheds.*” As in other examples, practices that are happening “upstream” seem to jeopardize the good “downstream” work of watershed groups.

## **Development**

The landscape of PEI has changed dramatically over the past 30 years. Between 1971 and 1996, the amount of land on PEI identified as urban increased by 144%, the largest increase in Canada (PEI Federation of Municipalities). “Urban sprawl” is now an element of the rural areas of the province, as cities reach out farther in the countryside, and less expensive land in unincorporated surrounding



communities is taken up for strip development. The siltation in Wright's Creek, mentioned previously, only began with the residential and commercial development in Sherwood in the 1970s. A range of construction practices can impact on the watershed. The increasing "suburbanization" of rural life also impacts on water quality with more septic systems, and with the use of pesticides on our lawns and gardens. The diversity of interests in such rural/urban communities can contribute to conflict and pose significant issues for community watershed planning. As one farmer put it, "*We always farm in the view of others ... I'm always aware of it ... I feel like a nuisance sometimes.*"

Development in tourism and recreation can also contribute to watershed problems. Some participants were concerned about the role of the many golf courses on the Island in nutrient loading. The impact of septic systems, particularly older ones, on groundwater was also raised as an issue by several participants.

## **Land Use Planning**

Related to development issues is the lack of clear land use planning and policies in PEI. Many participants commented on the need for a broad vision of land use as a necessary ingredient of any community based watershed management planning. As one person put it, government needs to engage in the same kind of planning process for the whole Island that watershed groups are currently being asked to do by government for watersheds.

## **Municipalities**

Municipalities contribute to watershed problems through the extraction of large amounts of water, and by untreated sewage. The two major cities are among the largest water users in the province, and extraction of water by the city of Charlottetown from the Winter River was identified by its watershed group as their first issue. Water levels in that river are frequently quite low and the impact of the city's water usage is a concern for watershed workers and other residents.

Our committee was disappointed that neither Charlottetown nor Summerside chose to present their ideas about watersheds and watershed planning at the consultations. Considering that they are major water users in the province and have sewage systems, we hoped they would take a more active role in this

process. This was evidence of the state of disconnect that comes with a “consumer” mentality toward resources, where individuals and organizations see themselves principally as “users” with little knowledge of or responsibility for the source of their water.

It is encouraging that, in recent years, there has been more dialogue between the city of Charlottetown and the Winter River watershed group, and that the city has offered some support for the group’s work. The presentation we heard from the Federation of Municipalities also indicates their recognition of the importance of the health of watersheds for their municipal water needs. *“We must ensure that there continues to be an abundant supply of clean water to supply these water systems by taking appropriate steps today.”* But the Federation brought no examples to the committee of municipalities that were actively working to take responsibility for the health of the watersheds that supply their clean water. Cities and municipalities and their many residents need to see themselves more as “stakeholders” than users, and take an active role in protecting water by such means as promoting conservation and partnering with watershed groups.

## **Ponds**

We heard a number of reports from groups describing the negative impact of beaver activity on habitat. These effects remained even after beavers had abandoned the area. End of life ponds were also mentioned as an important contributing factor to silt entrapment and raised water temperatures.

## **Public Works**

While a number of participants noted the significant improvements in the practices of the Department of Transportation and Public Works, there were still those who identified highway construction as an important contributing factor to siltation in their areas. There were also concerns raised about the effects on brooks and streams of the amount of sand and salt used on provincial roads.

The impact of causeways on water exchange has been an ongoing issue. When one watershed group sought to revisit this issue with government officials recently, they were quickly told that there was adequate water exchange and the causeway was not an issue, based on studies done almost 10 years before. This response had a negative impact on the group, and impeded their ability to act on what had

emerged as a key issue through their community based process. In a post meeting discussion, a government official told one of us that public perceptions about the sources of particular problems is not always supported by scientific data, and used the example of a causeway. This incident raises important issues about the relationship between “local” and “expert” knowledge, and how to integrate them most effectively in the service of watershed groups.

### ***The Value of Watershed Management Planning***

There was strong support for community based watershed management planning from almost all participants. It was perceived that a range of benefits could emerge from this process. As one group that had completed a watershed management plan said:

*“This exercise, if done slowly and properly, will lead all stakeholders to finding common ground. Stakeholders will realize that a healthy, sustainable community will be based on environmental, economic and social values. Watershed planning can and will lead to citizens of various occupations attaining respect for each other through dialogue.”*

The planning process raises awareness about human environmental impact, and fosters stewardship, consensus building and communication. The importance of inclusiveness of the full range of interests, opinions and backgrounds in the planning process cannot be overemphasized, and the success of the process was seen as being jeopardized if it is dominated by any particular interest.

Participants believed that watershed management planning could play a major role in addressing the key environmental issues in watersheds. There are also things that watershed planning and work cannot do, even with the most successful planning process. It is government that needs to provide the clear and consistent policy and the leadership to support watershed groups. Community based planning needs to be carried out in conjunction with the government, which could provide “*watershed benchmarks including water quality, forest cover, protected areas and nutrient use.*”

*“What government should be doing more of now is providing the kind of protection that local watershed improvement groups can’t”* (Guardian, January 24, 2007). Government leadership, vision, and commitment to existing and necessary regulation can provide the framework of environmental protection

within which watershed planning can operate most effectively. With sufficient funding and technical assistance added, most watershed groups would regard this as the kind of support they require from government.

There were some cautions raised about such a community based process. The major concern was the potential for planning to “*produce counterproductive animosities between groups engaged in the process.*” From the perspective of one participant involved in many planning initiatives, “*Planning processes work well when they are conducted within a clear policy framework and with some level of government commitment to the process.*” Such a caution can help us to recognize some necessary conditions for successful community based planning that only government can provide.

It was also recognized that many watershed groups are not at a stage, or may not be large enough, to engage in watershed planning, or to even obtain funding. These groups were seen as deserving support for their valuable “on the ground” work; the full watershed planning process just may not be appropriate for all groups.

### ***Experiences of Watershed Groups***

We heard from a broad range of groups in the 250 watersheds, from those whose focus was a single pond (e.g. Arsenault’s Pond Improvement Committee, Leard’s Pond Environmental Committee) to others that encompassed large areas (e.g. Bedeque Bay Environmental Management Association). There are groups just forming (e.g. DeSable River Enhancement and Activity Management) and others that are well established and have completed watershed management plans (e.g. Souris River Watershed Management Committee, Trout River Environmental Committee). Most watershed groups began their work with a focus on stream and watercourse restoration and enhancement, and this task remains at the centre of the efforts of those groups.

The following list provides examples of the impressive range of activities of watershed management groups:

- digging out spring
- building brushmats

- building check dams
- constructing trails
- cleaning debris and deadfall from streams
- developing tree nurseries
- planting trees
- enhancing riparian zones
- fencing cattle from streams
- enhancing of recreational activities
- measuring/monitoring the quality and depth of watercourses
- having educational and awareness activities to increase involvement and participation of community members
- organizing recreational events (e.g. walks, skates)
- involving and raising awareness of key organizations and agencies
- publishing and distributing newsletters
- hosting invited speakers
- conducting roadside cleanups

Members find this work very satisfying and there is a broad consensus that such work is having a very positive impact on our watercourses. There are also the frustrations that arise when the conditions that groups correct and mitigate are not addressed: *“We spent four years doing the right stuff but there was no improvement in fish habitat due to soil erosion.”*

While watershed groups have memberships of varying size, it is typical for a small number of members to take on the bulk of the responsibilities, and they work with limited budgets. Most people seem to have a long period of involvement with their watershed groups, and the issues of burnout and how to involve more members of the community were very common concerns at our meetings. Watershed groups typically make multiple applications to secure the funding for their projects for the year. With limited money to support these projects, not all groups get funding, contributing to an unwelcome sense of competitiveness among groups. Even those rare persons that are paid as co-ordinators and supervisors appear to do a great deal of work on their own time.



## Guiding Principles

Many groups develop some vision statement, mandate or goals to guide their activities. Several examples are:

*“A healthy sustainable community, based on environmental, economic and social values, with special consideration for resource-based industries including agriculture, tourism, fisheries, forestry, and aquaculture.”*

Souris River Watershed Management Committee

*“To preserve and protect the Winter River watershed in a healthy, pristine state; to develop projects and activities that will maintain or restore the river to such a state; and to promote an appreciation and respect through public awareness and education for the beauty, importance and environmental diversity of the watershed.”*

Winter River Environmental Committee

*“To restore the environmental quality of the watershed and to enhance the diversity of plants and animals contained within it, for the social and economic well being of people who live and work in the area and for those who benefit from its natural resources. Protection of the environment will remain at the forefront of the activities of this organization.”*

Wheatley River Improvement Group

## Issues/Frustrations for Watershed Groups

*“It is clear that there is a serious disconnect between upper levels of government and the on-the-ground work that environmental groups do.”*

There was considerable frustration with aspects of these consultations among watershed groups. *“If government truly wanted to hear the opinions of Islanders and environmental organizations there would be more time allotted to prepare for and to speak on this very important topic. To be given only a few minutes to present is insulting.”* Organizations were also concerned about the timing of the consultations which concurred with the time when the applications for funding that groups rely on for their work were due. Our consultations also overlapped with a series of meetings held by several watershed organizations directly related to their own community watershed planning process. The committee learned that some watershed groups did not make presentations because of insufficient time to meet together to consult about their briefs. Watershed groups wondered why they were finally being consulted at this point, and why they were not asked about the issues of which they wished to speak.

Such frustration was accompanied by expressions of skepticism with this process due to the lack of meaningful action on key issues like nitrates, sporadic enforcement of environmental regulations, and unimplemented recommendations from thoughtful and thorough previous reports on land use. *“One of our main concerns with this process is that the provincial government appears to be absconding from its role in the overall protection of our watersheds, while superficially, at least, giving the appearance that they are consulting the public about what needs to be done.”*

Watershed groups brought a number of key issues to our attention that are barriers to their effective operation:

***Funding issues*** – In addition to needing considerably more funding to do their work, the process of applying for funding is cumbersome and time consuming. Watershed groups need to file multiple applications to different funding sources each year to obtain support for their work. By the time that funding generally arrives (usually in June), groups have lost access to many university students, who may also be seeking up to 16 weeks of work compared with the eight to 10 weeks allowed by most provincial and federal agencies. The different wages paid to people doing the same work by different funding sources contributes to stress and morale problems among work crews. Since a portion of the grant is generally withheld until the end of the project, groups often have to operate on an overdraft basis.

Some funding sources will support only specific yearly projects, rather than the core funding required to maintain and develop an organization with the capacity for long term planning. Furthermore, priorities for supportable projects may change from year to year (*“a project of the day”* approach), another barrier to effective planning. For example, one watershed group told of receiving support from one agency to develop a tree nursery, but no support the next year when they applied for money to transplant these trees from the nursery to the watershed. These projects were regarded as being too similar by the agency. The group gave the trees away to area residents.

***Accounting and paperwork*** take up an undue amount of time and energy. Watershed groups experience a sense of distrust from government when not allowed to manage their small budgets in what they see as a reasonable manner. *“We find it interesting that the government appears to trust community-*

*led groups sufficiently to let them undertake long-term planning as well as short-term remedial activities in their watersheds, yet do not trust the same groups enough for them to manage in a responsible manner what amounts to a few thousand dollars every year.”*

***Attracting volunteers*** and finding ways to involve more members of the community is an ongoing challenge for most watershed groups. There are very dedicated workers who eventually burn out and others who may come to feel entrapped in their positions with organizations because there is no one else to take their place.

***Technical assistance*** – All watershed groups reported a very high level of satisfaction with the valuable help they receive from the provincial watershed coordinators. They also feel that these coordinators are overextended and that more people are needed in these positions: some recommend twice or three times as many co-ordinators.

## **Key Ingredients of Successful Watershed Planning**

In hearing about the experiences of a range of watershed groups at different stages in the planning process and in their development, several ingredients emerged as required aspects of a successful planning process:

***An inclusive community based process*** – Planning is a group activity requiring the ongoing involvement of a broad spectrum of interests and perspectives from the community at every step of the process. All stakeholders must be included, and participants reminded us that “*we are all stakeholders.*” People need to be included in this process from different identifiable sectors such as fishing, tourism, farming, business, landowners, aboriginal peoples, and anglers. Equally important are all those individual Islanders who live on and appreciate the land – walkers, children, and those who value the waters for their solitude, wildlife and beauty. We all need to feel a shared responsibility for the well-being of our watersheds, and that our voices will be heard.

Watershed planning is also an exercise in community development. During the course of meeting to develop a model of a healthy watershed, environmental issues become connected to the social and

economic life of communities. Many people are needed to contribute their diverse visions of a healthy watershed, and then to take the time to find common ground to generate a sense of collective ownership and broad support for the plan.

*If differences aren't worked through, the political cost of action is very high for politicians and they tend to cherry pick the easier recommendations and pass on the hard ones."*

Ongoing consultation is needed with the broader community to ensure that those most directly involved in planning have “*got it right*” and reflected a vision that most people will actively support and work to achieve. The stronger and more cohesive communities that can emerge from such an exercise in communication and co-operation should be in a better position to effectively work together to protect their watersheds.

Promoting inclusiveness and “buy in” to watershed planning is a major issue and challenge for watershed groups. It is evident that many users of water are very disconnected from the watersheds that supply it, and from the planning process, as was noted earlier in reference to cities.

The recently released manual, *A Guide to Watershed Planning on Prince Edward Island* (Department of Environment, Energy and Forestry), provides helpful ideas for developing a community based and inclusive planning process.

***A special kind of leadership*** – Successful watershed planning and work often seems to have revolved around one particular person with special qualities, a person with a deep commitment and love of the watershed, one who can and will go out and talk to virtually everyone in the community with interest and respect, a tireless worker and organizer, persistent and committed, and not easily discouraged. It is widely acknowledged that such people are rare, and they are deeply respected and appreciated in the watershed community. Dave Biggar was such a person and, sadly, he passed away during the time that these consultations were being conducted.

It is not surprising that these types of leaders are susceptible to burnout. It becomes increasingly important that there are strong groups around them to share the work and the responsibility, all moving toward the collectively developed vision for the watershed.

***Government support*** – For watershed planning to be successful, groups need financial and technical support from government to help implement the plans they develop to address the environmental issues that they face. The development of needed regulations and their consistent enforcement, as well as clear government policies and visions to address the “upstream” sources of watershed problems are required.

***Public education and awareness*** – As stated, a successful inclusive community based process requires a high degree of public involvement. It is important to engage a broad range of people to participate in the planning process and to have volunteers interested in direct watershed work. An equally important aspect of involvement is better informed citizens who take an active interest in issues related to watersheds, who discuss these issues with others, and support and encourage the measures needed to promote watershed health. Public education is a key to such involvement. It is important to help people increase their awareness of their local watersheds, to understand the importance of watersheds more generally, and to learn about how different policies and practices affect the health of watersheds.



# Needs and Ideas for Watershed Management Planning

## *Visions/Paradigms*

*“Effective watershed management must begin with the political will for change. The courage of our elected officials to strive toward creating a new and improved vision for our watersheds is a vital first step.”*

We heard from many persons about the need for an overarching vision for healthy watersheds and for a healthy and sustainable Island. This vision could guide the process of planning for individual watershed groups, and help us to evaluate the desirability of different policies and practices. What is our vision of PEI watersheds in 10 years? In 25 years? In 50 years? In 100 years? What kinds of policies and practices in our watersheds and on the land now will help us to achieve this vision? What kinds of policies and practices will negatively impact upon such a vision? How can we reward and support desirable practices and discourage and deter those that threaten the environmental health of watersheds and of PEI? This suggests a planning process for the entire Island similar to the planning process suggested for watershed groups – *Community Based Island Management (Stewardship) Planning*, perhaps.

There is a useful distinction between the “micro” issues (e.g. siltation and nutrients) and the “macro” issues (e.g. our role in the world and our collective responsibility to address environmental issues). We need a paradigm shift to guide our vision, and to help us address these issues. We can draw upon “*the aboriginal ecocentric worldview as an ethos for managing ecosystems, and admit that the status quo of ‘dominion over natural life resources for the sole creation of wealth’ is fundamentally flawed logic.*” Such a paradigm would recognize the interdependencies among all living things, and that our human health and well-being are intimately connected with the health and well-being of our watersheds, this Island and this Earth. We would acknowledge the many ecological goods and services that natural systems provide for humans. “Systems thinking” can help us to better understand how all things are connected, and to appreciate the “downstream” consequences of our actions, even though they might not be visible to us.

As a guide to evaluating actions, one presenter suggested that, like the Hippocratic oath, we should “*above all do no harm.*” Another writer suggested the old Boy Scout maxim, “*Always leave the campground better than you found it.*” This would be a useful and challenging criteria for assessing and guiding policies and practices. We have been accustomed to addressing environmental issues from more of an illness/risk perspective. For example, we try to determine just what level of nitrates we can allow before it endangers health. Our tendency has been to operate as close as we can to the margins of safety. We usually only study something (e.g. a particular chemical) in isolation and evaluate its effects without acknowledging the difficulty of predicting the effects in interaction with all the other ingredients in a system (“the cocktail effect”).

If we left our “ecological campground” better than we found it, we would be focusing on practices that contribute to the health and sustainability of a watershed, rather than the degree of risk we would be willing to tolerate in our hopes of avoiding illness. We would place an emphasis on developing means of quickly identifying issues so that we can prevent problems from arising. Importance needs to be placed on the outcomes of practices, and not solely the practices themselves. One group of writers suggested that we develop “benchmarks” of ecological health (e.g for nutrient use, buffer zones and water quality) with the aim of exceeding these levels in watershed work and other practices. We need clear indicators of whether we are at least sustaining, and hopefully enhancing the health of our watersheds through our actions. Programs could be developed to support and reward these desirable outcomes.

### ***Ongoing Needs of Watershed Groups***

Watershed groups have consistently identified a number of important needs including, but not limited to:

- Core funding on an ongoing basis.
- Increased funding.
- Funding for a full time staff person for each group to develop and follow up on watershed plans.
- Funding for longer periods of employment for summer workers.
- A streamlined process for obtaining funds – one application for all agencies.
- Funding needs to be in place much earlier for hiring university students and getting on the land at a better time for project work (e.g. tree planting).

- A streamlined process of reporting.
- Greater control/discretion over the use of their funds.
- A movement away from yearly, project-based funding that may have changing yearly priorities, toward more stable multi-year funding. This would facilitate planning and implementing more extended projects, and reduce pressures of the yearly funding/project cycle that takes so much energy. Long term approaches are needed. *“If there is to be a sustained effort to improve watersheds on PEI, they cannot be projects with a three year life span.”*
- Support for the diverse range of groups involved in different activities. Funding should not be limited to those groups engaged in watershed planning.
- More provincial watershed co-ordinators.
- Easier access to a broad range of information related to other watersheds, Island-wide. Many groups supported the idea of a regular (annual, semi-annual) meeting of watershed groups, or a council that met regularly.
- More research and technical support.
- Better methods of attracting volunteers.
- Greater ownership from residents and other stakeholders. This is a key need mentioned by almost all groups, and as with attracting volunteers, there are few clear directions about how these needs might be met. This could be a useful focus for the kind of meeting of watershed groups suggested above.
- Enforcement of existing regulations.
- Input with government on projects that will have an impact on their local watersheds and on all watersheds.

### ***Level and Sources of Funding***

Two key questions that were posed in the consultations concerned:

- the level of support necessary to implement watershed planning and management across PEI;
- suggestions on where this funding might come from.

One suggestion that came from several sources provides a useful context for reflecting on financial support for watershed management: we should conduct a full cost accounting of the **costs of not doing**

**anything** at this time taking into consideration the social, cultural and environmental losses we will suffer if we do not take action now. This cost could be compared with the cost of addressing these issues presently, helping to frame the question of how much government might feel we can afford. What are the costs of dealing with extensively contaminated groundwater compared with the costs of preventative measures that we can take presently?

Generally, these questions about funding were not particularly useful to consultation participants, and many chose not to address them at all. But those who did offer opinions believed that it would require a substantial financial commitment far above existing levels available for watershed work. One brief noted that although environmental issues now seem to be at the forefront of public concern, only 1% of the provincial budget is allocated to the Department of Environment, Energy and Forestry. This amount must be reconsidered in light of existing priorities and in light of the fact that each department of the provincial government affects and is affected by the health of our watersheds. The co-ordinator of a watershed group that had been through the planning process provided a sample itemized budget with an estimate of \$97,000 per year for core costs; project funding would be additional. Two other contributors suggested \$250,000 to \$333,000 per year for larger groups or smaller groups that had consolidated. One of these briefs estimated \$2.5 million per year would be needed for watershed groups across PEI.

On the sources of funding, most participants felt that it was a public responsibility, and a number suggested cost sharing between the federal and provincial governments. In support of such public funding, one presenter suggested that:

*“Government consistently subsidizes large private organizations because of real or imagined economic benefit, often with no or little direct benefit to Islanders ... Funding environmental groups would be a win-win situation since you are employing Islanders to work on the Island to improve the Island for everyone, tourists included.”*

Participants also suggested seeking private sources of funding. They strongly believed that all stakeholders should contribute and that corporations and companies should support volunteer environmental organizations. One brief suggested that those whose products were detrimental to the environment should provide even more in funding programs. It was also noted that if government

supported full time co-ordinators for watershed groups, a key duty of such co-ordinators should be to find additional funds outside of government.

Some specific suggestions for generating funding were:

- Earmarking the funds generated by the Wildlife Conservation Fund Licence attached to Island angling licences for watershed enhancement and restoration activities. Government should match these funds.
- Each and every government department must commit a percentage of its budget to go toward supporting healthy watersheds.
- Community fund-raising events.

### ***Research and Technical Support***

There were a variety of suggestions about useful research and technical support for watershed groups. It was evident that there was a very high degree of satisfaction with the level and quality of technical support provided by the three provincial watershed co-ordinators. Participants felt that they were very overextended and strongly advocated hiring more co-ordinators, perhaps three times as many.

There was also considerable support for monitoring water quality by regular testing for nutrients in the streams. Well trained students and volunteers have done water sampling successfully and support from government for the analysis for these samples would be of great assistance to watershed groups. Several participants suggested that the results of such testing be published on the government website. Another wanted to see data on the number of contaminated wells made available.

Access to information is important for watershed groups. In water testing, watershed groups have been aided by access to the government's geographical data base, enabling them to see where different crops are grown in their watersheds. Groups would benefit from access to government, university and independent research, and through information exchanges with other groups.

A variety of interesting technical ideas related to key watershed issues were brought to our attention:

- Species specific planting of buffer zones with plants that have a higher nutrient uptake.

- “Silt fences” to control erosion.
- Zero runoff storm management techniques.

A number of contributors posed research and information questions, including how to access relevant information, that they felt were important in addressing watershed issues and facilitating the work of their watershed groups:

- Issues related to pond dynamics: e.g. what oxygen levels are needed, depth of water needed for trout, how to achieve the correct water temperature, what kinds of trees should be planted and where?
- Research related to general issues faced by watersheds: e.g. methods of silt control; improved crop rotation with innovative crops; better means of applying, supplementing or replacing nitrates; and improved pest management.
- Very specific research questions: e.g. What is the relationship between water quality and property values on PEI? What are the effects of different types of geothermal heating systems?
- What is the impact of end of life ponds on watershed health (e.g. ponds created by beavers and then abandoned; ponds infilled with silt)?

### ***Structure/Organization***

The principle of inclusiveness needs to guide watershed planning by bringing together a diverse group of stakeholders, including the general public. The negotiation required within such a broad range of interests is more likely to result in a plan with greater collective ownership.

There are issues posed by the fact that there are so many watersheds on PEI (about 250), and such a range in the areas covered by different watersheds – some are very small. Furthermore, the watershed groups themselves vary in size and are at different stages of development. In our consultations, we heard strong endorsement of the idea that all watershed groups deserve support for their work. The question then arises whether there should be consolidation or integration of groups.

At one end of the spectrum are those who feel that *“this should not even be debated yet. Each group has its own specific origins and group of volunteers dedicated to their work.”* One of the strengths and

values of watersheds as an organizing idea is their local quality, that people are working close to home on the land and in the water with which they are most deeply connected, and with members of their own communities. *“Each watershed group needs its own identity.”* A key issue is whether the groups themselves have control over decisions to join with other watersheds or community organizations. After two unsuccessful attempts to work with adjacent groups, one member concluded *“unless my group is forced into amalgamation as the only way to survive, we’re not for it. . .we wish to keep our individual identity.”*

But members of watershed groups, especially small ones see the value of joining with other groups for particular purposes (e.g. administration, specific projects) or with groups in adjacent areas to work on common concerns. One group with a limited membership joined with surrounding community councils and municipalities and invited representation from their councils onto their board. One contributor suggests 12-15 groups could be organized around the major rivers and estuaries on PEI, and proposed a more centralized approach to the structure and organization of watershed groups in contrast to the grassroots origins of existing groups. Another participant suggests a very centralized approach where the Department of Environment, Energy and Forestry would serve as the planning, information management and administrative centre for watershed issues, prioritizing the watersheds requiring work, and facilitating interdepartmental and stakeholder involvement.

One contributor suggested the Canadian Rivers Heritage System (CRHS) as a useful model for watersheds. The CRHS program offers a comprehensive system of river management based on national minimum standards for natural, cultural/human and recreational values. The Hillsborough and the Three Rivers (Montague, Brudenell and Cardigan) were selected for the CRHS program. Surrounding communities develop a management plan for the river to maintain and enhance these three values. While the process and aims are somewhat different from those recommended for watershed planning, the CRHS program does offer another model of community involvement and planning focused around our watercourses.

There is considerable interest in the idea of some type of watershed management committee, which could meet regularly, and could be composed of representatives of watershed groups, relevant government departments and municipalities. Such a group would provide a useful context for sharing information and provide mutual support for ongoing work. There were also suggestions that such a

group could be a forum for ongoing consultations needed between government and watershed groups on all issues and policies that have an impact on watersheds. One brief recommended that this group become the organization to oversee watershed enhancement and restoration efforts on PEI, and be mandated to disperse government funds to watershed groups based on their watershed management plans.

## *New Programs*

Much attention has been focused on agriculture during these consultations. Because PEI is a place of intensive agriculture, agriculture takes place within the view of all of us and is present in most communities, including the increasingly suburban ones as the cities extend their reach. Agriculture is a major industry on PEI with a large social, economic and environmental impact on the Island. The well-being of farmers and their practices concern and affect all Islanders.

Many participants told us clearly that “finger pointing” is a barrier to community based watershed management planning. Participants were also very clear that agricultural practices are a major contributing factor to the degradation of watersheds, and that it is imperative to have policies and programs that effectively address the negative impact of agriculture. There was a high level of appreciation for the many farmers who had made positive changes in their practices on the land: adhering to guidelines for crop rotation, buffer zones, sloped land; and developing Environmental Farm and Nutrient Management Plans. Participants believed that farmers’ efforts to change their practices need to be widely supported – by government, by industry and by the general public. Most participants believed that if we regard watersheds as a collective responsibility, the responsibility for the changes needed in agriculture should be collectively supported, and that the costs should not be borne by the farmer alone.

Changes in agricultural practices are needed, and there needs to be a public willingness to share in the responsibility for these changes. Suggested paths to change are: regulation and enforcement; and the development of programs that promote sustainable agricultural practices.



Much of what we heard about such programs came from members of the agricultural community. Several ideas came from watershed groups who encouraged the development of incentives, tax credits and low interest loans for landowners instituting changes. Most participants felt that it is essential to find ways for watershed groups and farmers to work collaboratively, and to integrate farmers into the planning process.

Two programs were brought to our attention by the agricultural community: Agri Conservation Clubs, introduced by the PEI Soil and Crop Improvement Association; and Alternative Land Use Services (ALUS), presented by the Federation of Agriculture and a representative of a Manitoba farm organization. Both are grassroots programs organized by farmers for farmers that promote a high level of ownership among participants. They reflect a proactive stance toward environmental stewardship, where farmers recognize that their practices have a profound impact on the health of the environment. Both programs seek to engage farmers in helping them move toward sustainable practices that can provide the ecological goods and services from which all of us benefit. Pilot projects with these programs have had high rates of participation because they “*present things to farmers in ways they will readily understand.*” Farmers, even those reluctant to change their practices, are more likely to be responsive to their own colleagues than to the appeals of other groups, and more engaged in a process over which they feel considerable ownership.

Involving farmers in the work and planning process of watershed groups is important and these programs address this in several ways. Both have been successful in recruiting and influencing the practices of the high percentage of farmers required within a watershed to preserve or enhance its environmental health: an ALUS pilot project in Manitoba attracted 70% of the district farmers who owned 75% of the land, while an Agri Conservation Club in the Souris River area accounted for 45-50% of the cleared land in that watershed. In ALUS, local watershed groups identify the environmentally sensitive lands that are designated for alternative use. Members of Agri Conservation Clubs joined local watershed groups and served as board members.

While there are common benefits of these programs, each has its own unique features. Agri Conservation Clubs use a “social marketing” approach to help participants identify barriers to and benefits from improved practices. Incorporating leaders in sustainable agriculture into clubs is one

means of establishing norms for environmentally beneficial practices. Members work with a club coordinator, and with the group, to develop means of implementing solutions to issues identified in their Environmental Farm Plans. The aim of this program is to promote behavioural change and enhance environmental awareness and the Clubs seem to be quite effective in achieving these goals. For example, there were dramatic increases in testing manure for nutrients and keeping proper field records among members, and high percentages developed Nutrient Management Plans while all club participants developed Environmental Farm Plans. As a Club and as individuals, they are guided by the strategic goals they develop on key environmental issues; for one group, the goal was “*to reduce nutrient loading of streams and groundwater.*” Agri Conservation Clubs reflect a means for farmers to take responsibility for their environmental behaviour and for implementing meaningful change toward more sustainable practices. Since the pilot project that funded two local clubs has ended, this program would require government support to be widely implemented.

ALUS contributes to the health of watersheds through offering incentives for positive agricultural practices that provide ecological goods and services. Farmers are paid a locally determined rate per acre to engage in more environmentally beneficial alternatives to their traditional agricultural practices on land that is identified as more likely to contribute to watershed problems. Such lands could be identified by local watershed groups. This approach attempts to reduce environmental impact while retaining full working farms, in contrast to the more costly approach of setting land aside. In addition to changing land use practices, ALUS can potentially have an important impact on the perspective of farmers. As one participant in the program said, “*This is the first time I’ve looked at a wetland and didn’t think of how to drain it.*”

This program requires substantial financial investment, but it was suggested that “*there’s a huge cost in not doing this.*” The Federation of Agriculture has estimated a yearly budget of \$7.5 million to implement ALUS across the Island (\$5 million for providing ongoing ecological goods and services and \$2.5 million for one time capital costs for changes to farms). The Federation of Agriculture, along with the Department of Environment, Energy and Forestry, and the Department of Agriculture, Fisheries and Aquaculture is currently developing an ALUS pilot project. If approved, it will be implemented in the Souris and Trout River watersheds, and local watershed groups would participate in identifying the land designated for alternative use.

Along with the very positive responses from a number of participants who heard about ALUS, some concerns were raised about the idea of rewarding farmers for delivering ecological goods and services. Of concern was the idea of paying farmers not to engage in practices that are harmful to everyone as this would set a poor standard; *“Do we pay people not to litter, not to vandalize?”* It was suggested that any rewards need to be for activities that are beyond those that are legislated: people should not be paid for keeping the law. The concept of ecological goods and services is a very important and useful idea, but also a complex one. Farmers deliver ecological goods and services through sound agricultural practices on their own land. These services are unavailable when farmers engage in practices that do not reflect such sound stewardship. While public financial support of good agricultural practices was widely endorsed, there is concern with the idea that good stewardship should *require* such support or reward.

During our consultations, a number of farmers spoke about the demands of the major costs they incurred in implementing changes to adhere to recent environmental regulations. *“It is getting to the point where it is cost prohibitive for farmers to introduce some of these principles into their operations.”* They indicated that they could not recover these costs through their products and that they need assistance. The *“cost of protecting our environment ... should not be the sole responsibility of the farmer.”* The challenge is to find ways to incorporate the concept of ecological goods and services without contributing to the idea that farmers cannot afford to implement sound stewardship practices *unless* they are paid.

## ***The Role of Government***

*“Politicians seeking reelection have not proven to be good stewards of the land.”*

*“With all due respect, the questions posed by your committee will not lead to improved watersheds unless we can move politicians to protect watersheds like they protect unsustainable economies.”*

*“What is the government’s true commitment? What is the policy framework to guide a planning process?”*

We believe that one very meaningful outcome of this report would be to clarify what watershed groups can and cannot do to restore and enhance the ecological health of watersheds.

- What are the meaningful roles and responsibilities for watershed groups in watershed stewardship?

- What is it that a watershed group cannot do?
- What are the needed roles and responsibilities of government in watershed protection and stewardship?
- What is required of government so that community based watershed management planning and work meet the desired goals of restoring and enhancing the environmental health of watersheds?

Even though there have been a number of measures adopted that are widely recognized as useful in addressing watershed problems, there is still considerable skepticism about the government's commitment to environmental issues. Participants were concerned that environmental issues do not seem to have a high priority with government, and that the seriousness of the problems with our land and water has not been squarely faced by government. All provincial government departments need to develop an understanding of their "upstream" and "downstream" roles in watershed issues: how their work and the areas of their jurisdiction have an impact on the environment and are affected by environmental problems. One observer pointed out that there had previously been a person appointed in each department to deal with environmental issues, but that these positions have been eliminated.

The sources of our watershed problems are highly connected to the way that we live and make our livings on PEI. Participants wondered if the issues that need to be addressed are too sensitive or contentious for politicians to address directly. Given the sense of urgency that many felt, they questioned why there seems to be a lack of political will to take the actions needed to protect the Island environment and wondered how such a political will can be developed. Participants are looking for strong leadership from government in the promotion of the environmental health of their watersheds.

In addition to providing the direct financial and technical support watershed groups require to do their planning and work, participants identified other key aspects of government roles and responsibilities:

**Protect watersheds through regulation and enforcement** – *“What government should be doing is providing the kind of local protection that environmental groups can't”* (Guardian, January 24, 2007). There was a very strong consensus and expectation that government must address problematic practices by consistently enforcing existing regulations, prosecuting offenders with meaningful penalties, and regularly monitoring the practices that are regulated.

**Develop educational and awareness programs** to increase knowledge of watershed issues and watershed management programs. Broad public knowledge about watersheds and about environmental issues more generally is a necessary aspect of a provincial approach to watershed management planning. Watershed groups are particularly well positioned to develop programs to help people learn about their local watersheds. Participants would like to see government lead educational efforts to raise the level of awareness of these issues among all Islanders, and a number suggested that watershed education be integrated into the public school system. Government should also organize Island-wide events to promote awareness of watersheds (e.g. Rivers Day).

**Accept the seriousness of the problems with water quality** and in our watersheds, and the urgent need for effective action. Participants believed that there was a “*limited window of opportunity*” for addressing key issues. At each meeting, there was a Department of Environment, Energy and Forestry water pitcher on the table reading “*Clear from the ground to the glass.*” While all would regard this as a desirable goal, the many participants who have concerns about nitrate levels and the contamination of groundwater would hope that the government would recognize that this is not the current state of water on PEI. It may look clear, but it may not be safe.

**Take leadership in developing an ecological vision for PEI** that will lay the groundwork for meaningful policies, actions and programs. There should be “*consistent government policy, complete with vision statement, goals, objectives and specific targets and timelines.*” Many participants regard an Island-wide planning process or a provincial land use policy as a necessary ingredient for effective watershed planning.

**Develop more effective policies and regulations** in key areas of environmental concern. Some suggested that one valuable source for such policies were unimplemented recommendations from previous reports concerning land use (e.g. *Royal Commission on the Land, Roundtable on Resource Land Use and Stewardship*).

Key areas for action include:

**Nitrates** – *“It is inconceivable that the problem has been allowed to reach this state and further delays in implementing sound farming practices may be catastrophic.”* Suggestions included requiring Nutrient Management Plans from all farmers and industries (e.g. golf courses), strictly enforced three or four year crop rotations, and regular testing of watercourses across the Island.

***Enlarged buffer zones, stronger protection for riparian zones and increased forest cover*** –

The 10 metre buffer zones required by existing legislation were seen as insufficient as a means of dealing with issues of siltation and nutrients. It was suggested that buffer zones be extended to anywhere from 25 to 100 metres, and that landowners be compensated through reduced taxes, a yearly fee, or government purchase of the land. Regulations about harvesting in riparian zones are difficult to interpret and enforce. Government should consider further restriction of cutting in these areas, and retaining riparian zones before divesting crown land. Many participants also emphasized the importance of increasing forest cover and woodland biodiversity.

**Erosion control** – In agriculture, there were suggestions to develop policies, regulations and programs on fall planting and cover crops as a means of dealing with soil erosion, and it was suggested that ground not be left open in the winter. For commercial development and highway work, policies and regulations for unseeded dirt piles and bare ground were seen as needed.

**Develop benchmarks of ecological health** (e.g. for nutrients, water quality, biodiversity, forest cover) with the requirement that these standards be met or exceeded in watershed work and other practices.

***Develop policies and programs to assist farmers in their transition to sustainability*** –

Participants expressed that it is important to find ways of rewarding environmentally beneficial practices: government assistance should be contingent upon such sustainable practices and we should *“end all subsidies that negatively impact on our watersheds.”* This idea could be adapted for other sectors (e.g. forestry). Such programs for farmers can be useful ways of getting the agricultural community more actively involved in the work of their watershed groups.

Initiate programs to protect and restore biodiversity in riparian zones, rare and diverse forest ecosystems and natural wetlands. Participants suggested that government should consider ways to purchase these lands to ensure their preservation and enhancement, and to identify and protect other ecologically sensitive and important lands.

***Involve a broad range of government departments in the support of watershed planning and work.*** Optimally, all provincial government departments would be involved. This would be an important means of raising awareness of the diverse range of activities that are connected to watersheds and water quality, and promote collective responsibility for the environmental health of watersheds. It was suggested all provincial government departments contribute a fixed portion of their budgets to the support of watershed work.

***Establish a water council or ombudsperson*** to deal with issues related to water. Currently, there is no means of dealing with conflicts or complaints and no recourse if one's well becomes contaminated.

## Governance on a Watershed Basis

Many participants were unclear about what was meant by the idea of “governance on a watershed basis.” Some viewed the concept as meaning that watershed groups would be responsible for governance in their watershed. While a number of participants found some elements of this idea attractive, the general opinion was that it was premature to implement it at this time. Concerns were raised about how passing regulatory responsibilities from government to watershed groups could contribute to conflict among neighbours, and that *“regulation is and should remain a government responsibility.”*

The idea that the provincial government manage our Island on a watershed basis was widely supported. It was also suggested that organizing electoral boundaries on the basis of watersheds was a valuable idea that would facilitate governance on a watershed basis. Issues affecting watersheds (e.g. water quality, land use) are best dealt with on a watershed basis, while still looking at the Island as a whole.

There was considerable interest in the idea of enhanced consultation between different levels of government and watershed groups. Ongoing consultation provides the opportunity for input into the decision making process for developments and proposals that impact on the watershed. This process would be particularly valuable in unincorporated areas where such proposals do not pass through any community council. One group reported an inadequate process of consultation by the Island Regulatory and Appeals Commission (IRAC) about subdivision development in their area. Another group supported the idea of the need for such ongoing consultation since *“all residents that live within a watershed are connected, and what happens upstream affects the downstream environment.”* They suggested local watershed councils with representatives from watershed groups, municipalities and local industries that could review documents and proposals and provide feedback to government.



# Recommendations

The following recommendations have been developed by the subcommittee tasked with conducting the consultations on managing land and water on a watershed basis and approved by the EAC. These recommendations are based upon government continuing to do what it is already doing in the area of watershed management and protection, where it is not recommended otherwise. In addition to the implementation of these recommendations, it is very important that there is a change in mind-set on this issue and that the people of PEI and our government switch to a proactive and preventative approach rather than a reactionary approach.

## *Governance on a Watershed Basis*

1. Government accept the responsibility for developing, enforcing, and managing land use policy and regulation on a watershed basis. Watershed groups must be supported in the very necessary work that they do. However, watershed groups need autonomy to run their programs.
2. A Watershed Management Committee be established with representatives of watershed groups and all provincial government departments (representatives to be at the Deputy Minister level), to provide a means for sharing information and to function as a liaison between watershed groups and government. This committee to have an independent chair, and meet a minimum of four times per year.
3. An environmental ombudsperson be hired to resolve issues arising from practices that occur in watersheds. The committee sees this as a benefit to government and Islanders.

## *Policies, Regulations and Programs*

4. Each department of the provincial government have an environmental representative to deal with environmental issues. We recommend that these persons be the Deputy Ministers, similar to section 5 of the *Environmental Protection Act*.

5. Government and the agricultural industry develop policies to encourage and reward sustainable practices on the land, that help prevent watershed problems, and contribute to environmental health.
6. All subsidies connected to activities that negatively impact on watersheds be ended and only sustainable practices that are monitored be eligible for provincial or federal government support.
7. Government redirect funding toward practices that result in demonstrable improvements to environmental health (e.g. increased soil quality).
8. Municipalities and the provincial government develop and clearly enunciate a policy with respect to timely seeding exposed land in areas of development, to prevent runoff.
9. Government monitor the effects of the current watershed consultation by conducting a similar Island-wide process of hearings within five years.
10. Government strictly enforce all regulations relevant to watersheds.
11. Nutrient management plans be mandatory in the agriculture and other (e.g. golf) industries as a tool in controlling nitrate contamination of surface and groundwater.
12. Row crop production be no more than one in three years, with no exceptions, and these rotations be monitored for compliance through ground truthing. Strict enforcement is necessary to reduce nitrates and siltation in surface and groundwater.
13. Government meet with agricultural organizations to develop policy to enforce the use of winter cover crops or mulch in vulnerable areas. This issue must be resolved within one year.
14. All watersheds be assessed to determine areas requiring additional buffering and/or other protection. Where runoff is still a problem, the original buffer zone be increased to an adequate distance that prevents further runoff. This is not a uniform increase, but it will be applied to areas that need it.

15. A program be developed that compensates landowners for alternative uses of their lands, including but not limited to additional buffers mentioned above, to provide enhanced ecological goods and services. Only lands in production and not subject to existing legislation would be eligible. These lands would be identified in consultation with local watershed groups.
16. Ecological goods and services be identified for which a landowner can receive compensation.
17. Woody, native plant species most effective in enhancing biodiversity, nutrient uptake, and controlling runoff , be provided at no cost to watershed groups and landowners and a program be developed for assistance in planting them in buffer zones.
18. The existing 10 metre buffer zones, not be cultivated, and not be harvested.
19. All Island roads be assessed to determine where siltation or other degradation of watersheds is occurring and appropriate measures be taken to deal with these problems. A buffer zone (no cultivation or spray) in addition to the ditch will be required in sensitive areas.
20. The Department of Transportation and Public Works use rip-rap or filter fabric as opposed to hay or straw bales in the ditches to control erosion. All exposed soil shall be immediately stabilized.
21. All provincial government projects have an Environmental Impact Assessment done, and be a model of environmentally sound practices.
22. Government protect and restore biodiversity through the purchase of riparian zones, diverse forest ecosystems, natural wetlands, and other ecologically sensitive lands, when such lands become available.

## ***Education/Awareness***

23. Government educate and raise awareness about regulations affecting our watersheds, and on practices to meet the requirements of these regulations.
24. Government develop a public awareness campaign, to inform and educate Islanders about the role of watersheds and our individual and collective responsibilities for watershed problems and solutions. The campaign should be designed to make environmental awareness a way of life. It is important to be aware of our footprint on the environment with every step we take.
25. This campaign to include, but not be limited to the following:
  - a. A watershed component incorporated into courses as a required element in Island high schools, and this report be included in that component.
  - b. Government and watershed groups provide and staff exhibits on watersheds at public events.
  - c. An annual set of watershed and environmental prizes be offered with criteria developed by the Watershed Management Committee (see recommendation 2).

## ***Research and Technical Support***

26. Government appoint an economist to immediately conduct a full cost analysis that accounts for the environmental, social and cultural losses resulting from inaction in addressing the key environmental issues in watersheds. The analysis to be conducted concurrently with the implementation of other recommendations from this report.
27. The number of watershed co-ordinators be increased to a minimum of eight.
28. Up-to-date data on water sampling results be provided for each watershed through a province wide, government supported program of testing surface and groundwater, and these results be publically available.

29. A website be developed providing ready access to the full range of available research and local information about watersheds as a means of supporting the work of watershed groups and as an educational resource for the general public and watershed groups. The contents of this website would include, but not be limited to:
- a. maps of land use and farming activities within watersheds;
  - b. maps showing the Island watersheds and the watershed groups located therein;
  - c. water testing results;
  - d. listings and activities of all watershed groups;
  - e. relevant research done by government, university, and watershed groups;
  - f. sources of information about more general issues in watershed and environmental health; and
  - g. a link to similar national websites when available
30. Watershed groups be provided the opportunity to have input into government and university research.

### ***Organization and Structure***

31. An annual conference be organized for watershed groups, with government support, to raise awareness of watersheds, and to celebrate successes and reflect on issues in watershed groups in the previous year. This conference is intended for all stakeholders.
32. Government take an active role in facilitating the creation and development of watershed groups in all areas where they do not already exist, or where they require assistance so that all watersheds on PEI are represented.
33. Efforts be made to consolidate watershed groups by encouraging smaller groups in a watershed, or in closely related watersheds, to join together with the aim of maintaining 25-35 watershed groups to cover all of PEI.

## *Funding*

34. The provincial government provide significant short term and long term funding for watershed management through watershed groups. We recommend that the current budget must be immediately increased to \$500,000 for spring/summer 2007, and \$500,000 for developing watershed management plans throughout the fall and winter. Funding in 2008 be increased to a minimum of \$2 million until a full cost analysis is completed (see Recommendation 26).
35. Adequate funding be provided for any watershed group wishing to develop a Watershed Management Plan.
36. Ongoing core funding be provided for all watershed groups with a Watershed Management Plan.
37. Long term and short term funding be provided for specific projects of watershed groups, whether or not the watershed group has a Watershed Management Plan.
  - a. Long term (up to five years) funding be available for multi-year projects.
  - b. Short term (one year) funding be available for yearly projects.
38. Each and every provincial government department must contribute a fixed portion of its budget to support watershed management.
39. Federal and municipal governments must contribute to the costs of watershed management through agreements made with the provincial government.
40. A single application and a single reporting form needs to be developed for provincial and federal funding.
41. Government to provide assistance with seeking funding from other sources and streamlining the application and reporting process.

42. For groups receiving core or multi-year project funding, year end progress reports be required rather than yearly applications for funding.
43. Earlier and extended funding be provided for watershed groups and no portion of their funds be withheld.
- Earlier: Funding for summer projects be in place no later than April 1.
- Extended: Four months of funding be provided for staff for watershed projects.

## Conclusion

*“... Unless we gain greater control over the economic forces that are shaping our Island, we risk destroying the very foundation of our economy. Soil and wildlife habitat are being lost, our waterways are deteriorating and the softwood growing stock in our forests is in a state of serious decline. People are concerned about the disappearance of hedgerows, the quality and quantity of their drinking water and the unknown threats posed by pesticides and their derivatives. We must resolve to protect and improve our environment. This is a task that requires a commitment from all residents, urban and rural, since we all have a stake in the outcome.”*

The words quoted above are a fitting conclusion to our report. They provide an apt description of the concerns of Islanders, of an impending crisis in the quality of our environment, and the need for collective commitment to significant change. We could have written these words. But we did not. They were written 10 years ago in the conclusion of *Cultivating Island Solutions* by the members of the Roundtable on Resource Land Use and Stewardship.

Our experiences during these consultations has underscored the urgent need to address the critical environmental issues we face in our watersheds and on PEI. It was suggested to us that we have perhaps 10 years to implement significant change before the environmental health of this Island is irretrievably damaged. Throughout these consultations we heard from Islanders representing agriculture, fishing, the Native Council, watershed groups and private landowners. The consensus is that we must act now. Seldom have so many groups been in overall agreement.

Members of our committee were left with the feeling that much of what we have heard from Islanders and attempted to express in our report has been heard before and has already been expressed in a number of reports. Because our consultations had a particular focus on watersheds and watershed planning, we feel that we offer some valuable specific recommendations that may not have been presented previously.

Like many of the participants, we found ourselves frustrated by the very limited time frame provided for us in conducting these consultations and reporting on such important issues. When the EAC was given the task of these consultations, the goals of the process were defined more specifically in terms of



watersheds and watershed management planning. We were hopeful that we could maintain this focus in these consultations without being diverted too much into general issues of water quality. But it became apparent to us that this was not possible. There simply is no way to discuss watersheds and developing a planning process for healthy watersheds without talking about water quality, and all the sources that impact upon it. One cannot meaningfully talk about watersheds and water quality without talking about virtually every important environmental issue that we face.

The environmental problems we experience on PEI and in our watersheds and the task before us is clear, and have been for some time. We are all “upstream” and we are all “downstream.” We need to become aware of our ecological footprint with every step we take, and take active responsibility for reducing our impact on our watersheds and on the environment. We are all part of the problem, and part of the solution. The time has long passed for accepting actions that are harmful to our watersheds and to the environment.

We urge government, in the strongest possible terms to take this opportunity to act to protect and restore our watersheds and to develop and enact a vision that could truly make PEI an example of sustainability and environmental health for the rest of the world.

While some of the recommendations will not be easy to implement or popular with government or landowners, they are nonetheless necessary, and cannot be delayed. It will take some time to implement some of the recommendations and it must be done properly.

We hope that all individuals representing government will stand behind the recommendations as our watersheds should not be a political issue. It is an Island issue and is the responsibility of all Islanders. It is hoped that industry, all levels of government, municipalities, private interest groups, corporations, the agricultural sector, watershed groups, and the general public will work together to address and find solutions to the problems that are presently occurring.

We would like to thank Premier Pat Binns and Minister Jamie Ballem for bringing this forward to the Environmental Advisory Council, and for the opportunity to conduct the hearings and prepare this report.

Ten years have passed since government received the Roundtable on Resource Land Use and Stewardship report. If government waits another 10 years, no amount of funding will fix the problem; it will be too late.

# Appendix A

## *List of Presentations at the Public Consultations*

(\*A written submission was also provided.)

### **Charlottetown:**

- \*New Glasgow Community Corporation, Jim Newson
- \*Wright's Creek Watershed Environmental Committee, John Andrew
- \*Winter River Environmental Committee, Gary Fournier
- \*Hillsborough River Association, Wayne Cameron
- \*Wheatley River Group, Ann Wheatley
- Council of Canadians, Leo Broderick
- \*Erik Klassen
- Jacques Gaudreau

### **Kinkora:**

- \*Tryon River Watershed Committee, Barb Clement
- \*Seaview Watershed Association, Jeremy Stiles
- \*Hunter Clyde Watershed Group, Andrew Lush
- \*DeSable River Enhancement and Activity Management, Joe Matters
- \*Hal Mills
- John Phillips
- \*Leaming Murphy
- Barry Murray
- Fred McCardle
- Morley Wood

### **Poole's Corner:**

- \*Central Queens Wildlife Federation – West River Watershed, Regina Wells
- \*Souris & Area Branch PEI Wildlife Federation and Souris River Water Management Committee, Fred Cheverie
- \*Trout River Environmental Committee, Rob Sharkie
- \*PEI Trappers Association, Clarence Ryan
- \*Central Northumberland Strait Fisherman's Association, Charles McGeoghegan
- \*Keystone Agricultural Producers, Ian Wishart
- Southeast Environmental Association, Andrew Trivett
- \*Rob MacLean
- Boughton River Watershed Committee, Martin MacLeod

## **Miscouche:**

- \*Richmond/Grand River Watershed Committee, Leonard MacDonald
- \*Gordon's Pond Enhancement Group, John Sentner
- \*Prince County Fly Fishers, Trent Williams
- \*Mannie Gallant
- Margaret MacKay

## **Elmsdale:**

- \*IXTHUS Christian Life Community, Bill Costain
- \*Native Council of Prince Edward Island, Tim Haines
- \*PEI Federation of Agriculture, Eddie Dykerman
- \*PEI Federation of Municipalities, John Dewey
- \*PEI Shellfish Association, Clifford Bernard
- \*Ronnie MacWilliams
- \*Environmental Farm Plan, Ray Arsenault

## ***Other Written Submissions***

Helen Doiron  
John & Jean Baird  
Anvil Mechanical Contractors, Scott Newson & Leanne Newson  
Andrew Morrow  
Anna & Gary MacKay  
Kent MacDonald  
Robert Boehner  
PEI Soil & Crop Improvement Association  
Lloyd Lewis  
Dr. Kevin Teather, Todd Dupuis, Prof. Daryl Guignon, Dr. Mike van den Heuvel  
Black Pond Watershed Group, David Aylward  
Leard's Pond (Coleman) Environment Project, Allan MacPhee  
Lawson Drake  
Southwest River Enhancement Association, Don MacEachern  
PEI Aquaculture Alliance  
Arsenault's Pond Improvement Committee  
David Boyce  
Ducks Unlimited Canada  
Indian River Watershed Association, Bruce Gillespie  
Brenda Hancock  
Atlantic Salmon Federation, Mark Lanigan  
National Farmer's Union, Danny Hendricken  
Bedeque Bay Environmental Management Association

UPEI Wildlife Biology Class – Katherine Dewar, Angela Douglas, Garry Gregory, Devin Harper, Alex MacDonald, Mark MacDonald, Megan Miller, Krystal Pyke, Laura Rogasky, Lauren Smith David Hooley  
Miminegash Roseville River Enhancement Committee

### ***Supplementary Materials and References Submitted***

Souris River Watershed Management Committee/Souris & Area Branch PEI Wildlife Federation. (2006) Souris River Watershed Management Plan.

Hillsborough River Association (1996). Charting a course: A management plan for the Hillsborough River

Bedeque Bay Environmental Management Association (2007). Sustainable Community Development Project, Status Report.

PEI Federation of Agriculture (2007). Standing Policy.

Michael, H.J., Boyle, K. J. & R. Bouchard (1996). Water quality affects property prices: A case study of selected Maine lakes. Maine Agricultural and Forest Experiment Station.

Environment Canada. (2005). Existing Substances Evaluation. Assessment Report – Nonylphenol and its ethoxylates

Valiela, I., Tomasky, J., Kauxwell, F., Cole, M.L., Cerebria, J. & Kroeger.(2000). Operationalizing sustainability management and risk assessment of land derived nitrogen loads to estuaries. *Ecological Applications*, 10(4), 1006-1023.

Serveiss, V.B. (2002). Applying ecological risk principles to watershed assessment and management. *Environmental Management*, 29(2), 145-154.

Cormier, S.M., Smith, M., Norton, S. & T. Neiheisel (2000). Assessing ecological risk in watersheds: A case study of problem formulation in the Big Darby Creek Watershed, Ohio, USA. *Environmental Toxicology & Chemistry*, 4(2), 1082-1096.

Gabor, T.S., North, A.K., Ross, L.S.M., Murkin, H.R., Anderson, J.S. & Raven, R. Natural values: The importance of wetlands and upland conservation practices in watershed management: Function and values for water quality and quantity. Ducks Unlimited Canada, 2004.

Manitoba Water Stewardship Public Consultation Draft. Nutrient Management Regulations.

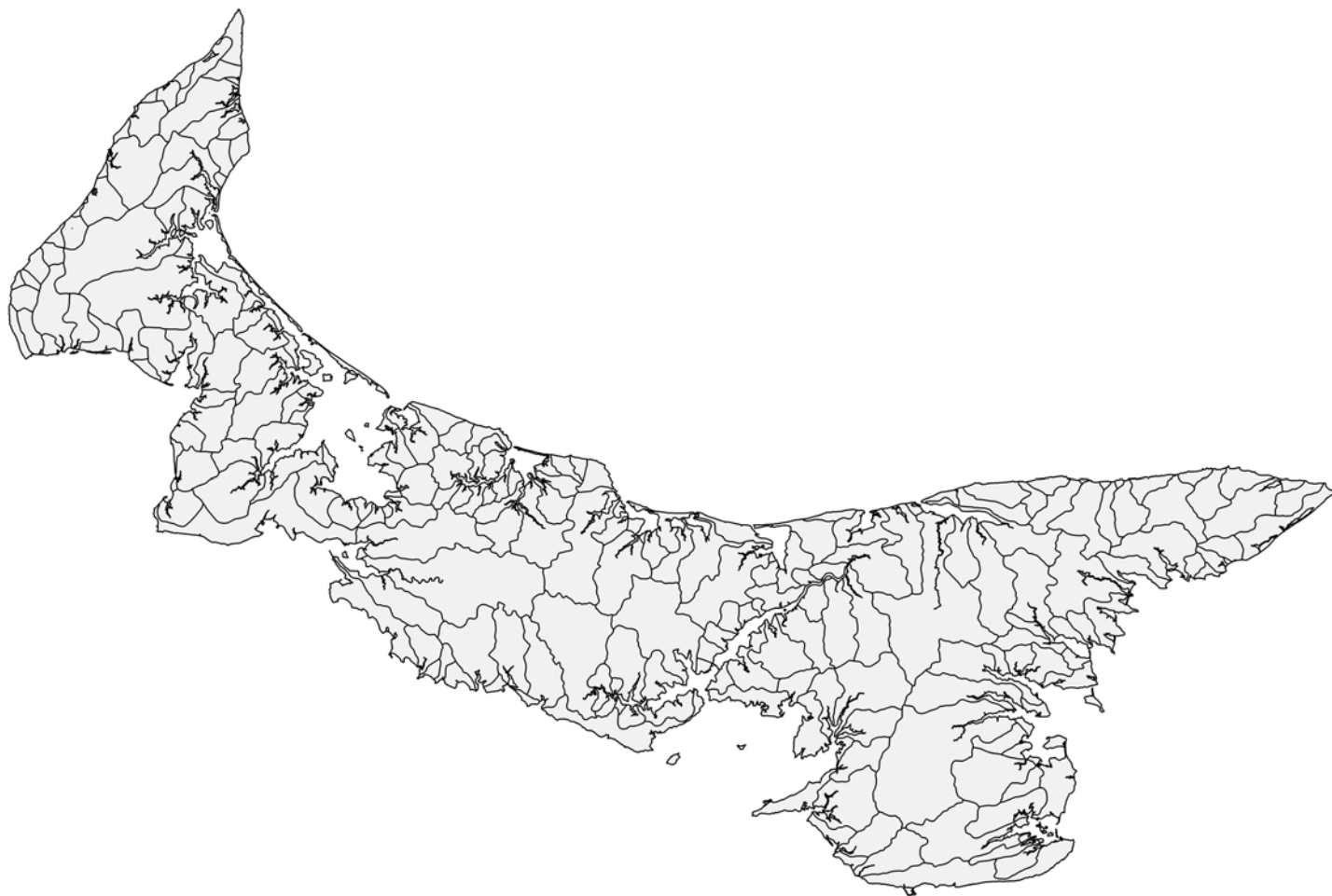
US Environmental Protection Agency (2002). Waquoit Bay Watershed ecological risk assessment: The effects of land derived nutrient loads on estuarine eutrophication.

US Environmental Protection Agency (1999). Workshop report on characterizing ecological risk on a watershed scale.

National Watershed Forum. Final report. June 27-July 1, 2001. Arlington, Va.

# Appendix B

## Map of PEI Watersheds



## **Appendix C**

### ***Environmental Advisory Council Membership List 2007***

**Ms. Sherra Profit**  
Chair

**Mr. Elmer MacDonald**  
Vice-Chair

**Ms. Leslie Cudmore**

**Dr. James Kemp**

**Mr. Don Matheson**

**Mr. Murray Cook**

**Mr. Emmerson McMillan**

**Mr. Bruce McNeill**

**Mr. Allan Hicken**

**Ms. Joanne LeBlanc-Arsenault**

**Mr. Patrick Birtwistle**

**Ms. Gwen Wyand**