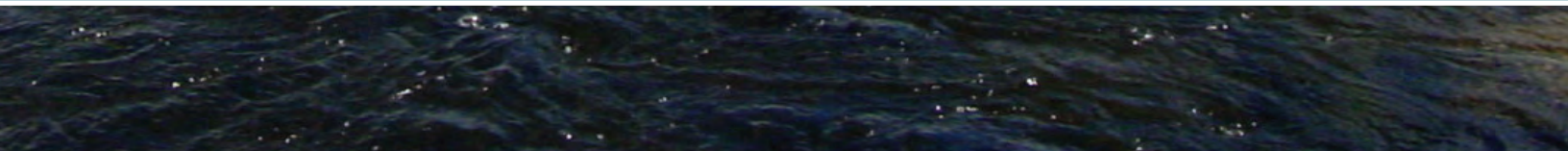
SEINE RIVER

INTEGRATED WATERSHED MANAGEMENT PLAN



La Broquerie, MB
October, 2009

As chairman of the Seine-Rat River Conservation District and member of the Project Management Team, I am pleased to present the Integrated Watershed Management Plan document for the Seine River Watershed to you.

The process started in the spring of 2006, and many hours have been spent by various people in developing this plan. The focus of this document centers around surface water, ground water and land use planning. To improve these resources, a cooperative effort between many different groups and jurisdictions will be required. The success of the plan depends on the commitment from the watershed community to protect and improve the health and sustainability of the Seine River Watershed.

On behalf of the Seine-Rat River Conservation District Board and the Watershed Planning Advisory Team, we are prepared to implement this plan to the best of our ability.

Cornie Goertzen

Cornie Goertzen

SRRCD Chair

Minister of Water Stewardship
Legislative Building
Winnipeg, Manitoba, Canada
R3C 0V8

Mr. Cornie Goertzen, Chairperson
Seine-Rat River Conservation District
Box 339, La Broquerie, MB R0A 0W0

Dear Mr. Goertzen,

In accordance with Section 19(2) of *The Water Protection Act* and on the advice of the Manitoba Water Council, I approve the Seine River Integrated Watershed Management Plan dated October 2009.

I would like to congratulate the staff, Project Management Team, and Board of the Seine-Rat River Conservation District for developing the Seine River Integrated Watershed Management Plan. This plan reflects considerable hard work over the past several years as you developed solutions to many difficult issues facing the Seine River watershed.

The Government of Manitoba is committed to watershed planning as an effective means to address risks to water and aquatic ecosystems.

Thank you for your ongoing efforts in watershed management. I offer the continued support of our department as you work towards implementation of the goals in your plan.

Yours sincerely,

C. Melnick

Christine Melnick

Contents

Acknowledgements

The efforts of the Project Management Team in its role as a steering committee for the planning process is much appreciated. Members of the Project Management Team include Cornie Goertzen, Laurie Evans, Maurice Leclaire, Kristy-Layne Carr and Patrick Watson. Lloyd (Buzz) Crooks, Barry Oswald and Alan Skrepnek also provided valuable contributions to developing the plan.

1.0 Introduction

Flooding, soil erosion, loss of wildlife habitat, streambank erosion, wetland drainage and increasing water demand are common issues for many watersheds in southern Manitoba. But in particular, the steady decline in water quality in the Lake Winnipeg drainage basin over recent decades, and more specifically in Lake Winnipeg itself, is a major concern. In 2003, the Province announced the establishment of the Lake Winnipeg Action Plan. One of the central goals of the plan is to reduce nitrogen and phosphorus levels in Lake Winnipeg to pre-1970 levels. To accomplish this goal, all watersheds contributing to Lake Winnipeg, including the Seine River Watershed will need to reduce nutrient loading for their own benefit as well as for the greater good.

1.1 What is a Watershed?

A watershed is an area of land that drains to a common downstream point. The land and water within a watershed are connected by a network of waterways and drainage systems. This connectivity extends beyond the connection between a stream and a river; it also extends to the plants and animals that depend upon these systems for life.

A watershed is also a community where people, business, agriculture, governments and institutions are interconnected by the common water resource. The actions of the community influence the health of the watershed, just as the watershed has an influence on the community. All watershed activities that affect water quality, quantity, or rate of movement at one location, have impacts downstream.

The watershed plan is a roadmap for the community to manage its resources.

1.2 What is an Integrated Watershed Management Plan?

An integrated watershed management plan is a strategy prepared by the community that describes the actions needed over time to achieve a sustainable, healthy watershed. The integrated watershed management plan is a roadmap for the community to manage its resources for the future. It helps set local priorities between what needs to be done and things that would be nice to do, and presents a strategic plan to address these priorities. The plan also sets a way to measure future progress on meeting resource goals and objectives. Quantifying improvements in the health of the watershed over time is important to watershed residents and all Manitobans.

An integrated watershed management plan helps local groups such as conservation districts set programming agendas and direct funds to watershed priorities. Information and recommendations in the plan should be used by local municipalities and planning districts in developing responsible and sustainable development plans.

2.0 Players and Process

In January 2005, the Province of Manitoba introduced *The Water Protection Act* [1]. The purpose of the *Act* is *"to provide for the protection and stewardship of Manitoba's water resources and aquatic ecosystems…"* The *Act* sets out specific guidelines to follow when developing watershed management plans, and defines their content. Each plan is unique and based largely on the issues and concerns of the watershed community. Partnerships, cooperation, local input and funding are all important components in developing and implementing a successful watershed management plan.

2.1 Players

Seine-Rat River Conservation District

The Seine-Rat River Conservation District was designated the Water Planning Authority for the Seine River Watershed.

Established in 2002, the Seine-Rat River Conservation District is a municipal-based organization comprised of local people in partnership with the provincial government, private industry, and non-government organizations with a cooperative mandate to promote the sustainable use and management of the land, water and related resources within the Seine River and Rat River watersheds. The Seine-Rat River Conservation District is one of 18 conservation districts in Manitoba. Manitoba's conservation districts cover over 85 per cent of municipal Manitoba.

In March 2006, through a Memorandum of Understanding signed with Manitoba Water Stewardship, and authorized within *The Water Protection Act*, the Seine-Rat River Conservation District was designated the Water Planning Authority for the Seine River Watershed.

Water Planning Authority

The mandate of the Water Planning Authority was to develop an integrated watershed management plan for the Seine River Watershed using available scientific information while maximizing the input of all local and interested stakeholders.

The Water Planning Authority was given the responsibility of ensuring all provisions for preparing the plan, contents of the plan, consultation and public meetings, and plan review, revision and approval process were completed in accordance with *The Water Protection Act*. In preparing the plan, the group also considered Provincial land and water policy and legislation.

Watershed Planning Advisory Team

In order to maximize local input and to facilitate the gathering of pertinent technical and scientific information, a Watershed Planning Advisory Team of stakeholders from numerous organizations and agencies was established. This group included representatives of cities, towns, villages, municipalities, producer groups and environmental and recreation organizations. The members of the Watershed Planning Advisory Team are indicated in Appendix A: List of Organizations/ Agencies Invited to Participate.

The Watershed Planning Advisory Team also included members of the provincial and federal public service that had key science-based watershed information. These individuals, collectively referred to as the Technical Advisory Sub-group, provided comment on all available watershed technical information related to their respective fields. Report submissions focused on identifying areas or criteria of concern within the watershed, extent of current impacts, historical review of impacts, potential for future impacts based on available data and options to address issues to maintain and improve the health and sustainability of the watershed.

[1] A copy of The Water Protection Act can be found on-line at: http://web2.gov.mb.ca/laws/statutes/2005/c02605e.php

Project Management Team

The Project Management Team was a group of five individuals appointed by the Water Planning Authority to act as a steering committee throughout the planning process. They were also responsible for reporting regularly to the Water Planning Authority, organizing and compiling all data submissions, and coordinating the public consultation and advisory team meetings.

Watershed Residents

Residents of the Seine River Watershed participated in the development of the plan through four public consultation meetings. Their input on watershed issues and concerns, and their contribution of ideas towards addressing and resolving the issues, are critical to the long-term success of the plan. Many of the issues identified were rural-based. But since nearly half of the population in the watershed lives in urban or built-up areas, their participation and awareness of watershed issues is also a very important key to success.

Manitoba Water Council

The Manitoba Water Council is a group of nine individuals appointed by the Minister of Water Stewardship with general responsibilities identified within *The Water Protection Act.* Prior to final plan approval, the Minister of Water Stewardship forwards all watershed management plans to the Water Council for additional review and advice.

2.2 Process

State of the Watershed Report

The intent of the State of the Watershed report was to provide an overview of the current health of the watershed, identify the watershed issues and priority areas, and provide recommendations and options to address the issues. The Project Management Team compiled the technical and scientific data submissions from the Technical Advisory Sub-group of the Watershed Planning Advisory Team into the "Seine River Watershed - State of the Watershed Report"[2]. The sub-group members provided assessments, evaluations, interpretations and suggestions related to their specific areas of expertise. In addition, several earlier studies and reports were referenced that together provided a comprehensive documentation of the natural resources and related issues and concerns in the Seine River Watershed.

The State of the Watershed Report was an important tool in the development of the plan.

[2] The entire "State of the Watershed" report is available on-line at www.srrcd.ca.

The Process

March 2006
Seine-Rat River Conservation District designated the Water Planning Authority

Fall 2006 - Winter 2007
Technical Input and State of the Watershed Report Prepared

Spring 2007
Public Consultations

Spring 2007 - Winter 2008
Draft Plan Prepared

March 2008
Technical Review of the Draft Plan

April 2008
Public Review of the Draft Plan

September 2008
Final Plan Prepared

September 2008
Plan Forwarded for Provincial Approval

2008-2018
Implementation

Public Consultations

The Water Protection Act requires the Water Planning Authority to provide residents of the watershed the opportunity to provide input into the development of the plan. There were two rounds of public consultations. In the spring of 2007, two public consultation meetings were held to provide the public with opportunities to identify watershed issues and concerns. The input was documented and used to develop the draft plan.

In April 2008, two more public consultation meetings were held to obtain feedback and comments specifically on the action items identified in the second version of the draft plan. This input was further discussed by the Watershed Planning Advisory Team and incorporated into the final version of the plan.

Plan Preparation

Starting in March 2006, the Project Management Team met regularly to assist in the writing of the plan. The Team also reported progress to the Water Planning Authority on a regular basis.

In March 2008, the draft plan was presented to the Watershed Planning Advisory Team for review and comment. These comments were incorporated into the final plan.

Approval by the Minister of Water Stewardship.

As required by *The Water Protection Act*, the Seine River Integrated Watershed Management Plan was submitted to the Minister of Water Stewardship for approval.

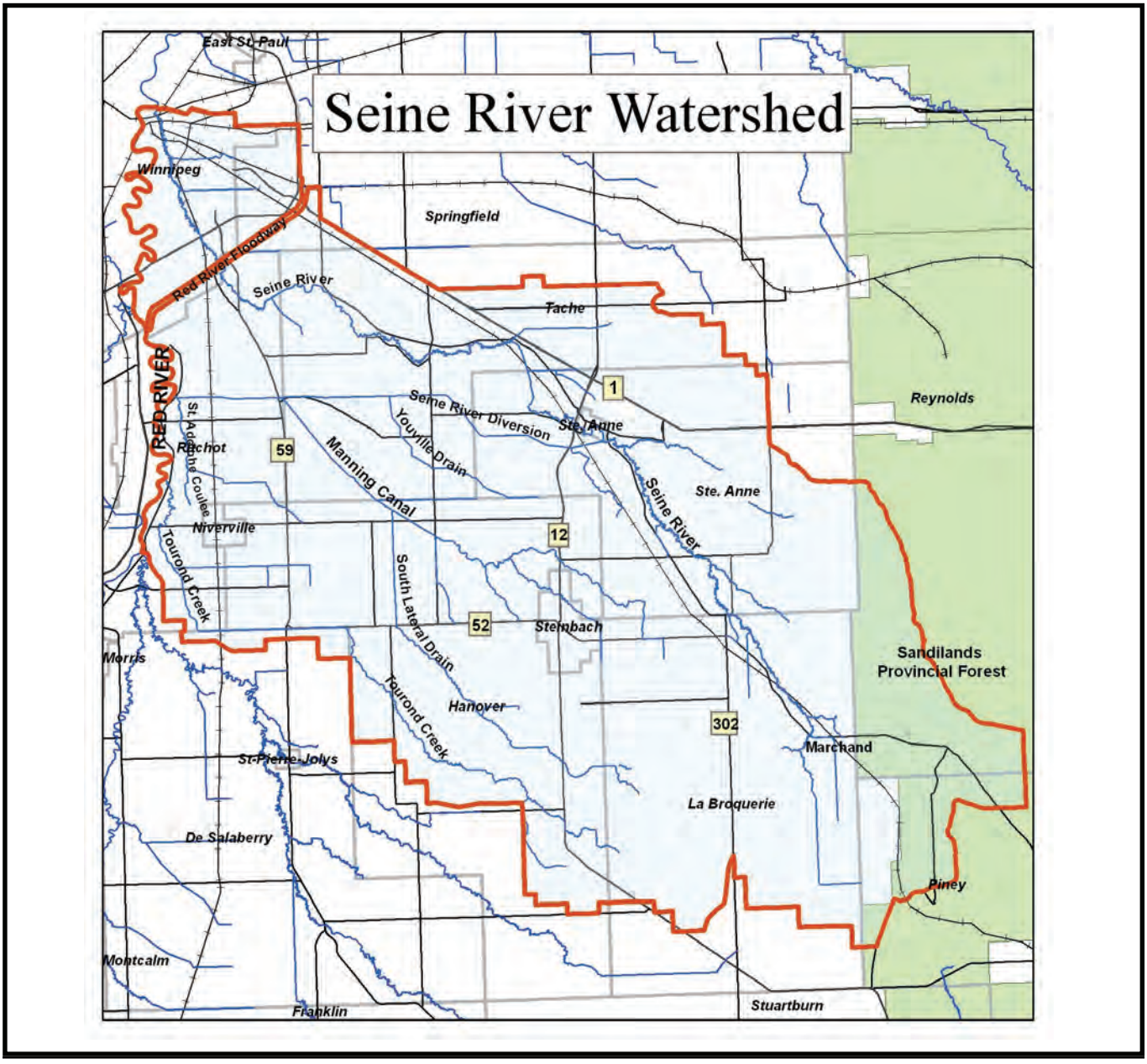
Public input was an important component of developing the plan.

3.0 Seine River Watershed

3.1 Location and Size

Located in southeastern Manitoba, the Seine River Watershed (Figure 1) is approximately 2,509 square kilometres in size. The Seine River has its headwaters in the Sandilands Provincial Forest, near the village of Marchand. The river meanders northwest to the town of Ste. Anne where the Seine River Diversion channels a portion of the flow west to the Red River. Between Ste. Anne and the Red River, the Diversion is joined by a number of tributaries, including Youville Drain, Manning Canal and St. Adolphe Coulee. From Ste. Anne, the Seine River continues northwest, passing under the Red River Floodway through the Seine River Siphon and joins the Red River in Winnipeg.

Figure 1 – Seine River Watershed



3.2 Communities and Population

There are nine rural municipalities located, either in whole or in part, in the Seine River Watershed. These include the rural municipalities (listed from most area to least) of Hanover, La Broquerie, Ste. Anne, Tache, Ritchot, Reynolds, Piney, Springfield, and De Salaberry. Also included in the watershed are the City of Steinbach, a portion of the City of Winnipeg, the towns of Ste. Anne and Niverville and several smaller communities.

More than one-third of the population lives in urban centers.

The population of the watershed is estimated at slightly more than 44,000, not including that portion of the watershed which lies within Winnipeg, and continues to grow, largely due to rural residential development. More than one-third of the population lives in urban centers, the largest being the city of Steinbach at about 11,000 residents[3].

3.3 Land Use

Agriculture and related agri-business is the main industry within the western and central areas of the watershed. According to the 2001 Census, there were 498 farms covering about 82,000 hectares of the watershed[4] . Almost 40 per cent of the farmland was used for cereal crops. The watershed has the most intensively developed hog industry of all watersheds throughout Manitoba[5] . The gross farm receipts in 2001 for all farms in the watershed totaled $192 million[6].

With the abundant sand and gravel deposits, peat moss areas, provincial forest and backcountry on the eastern side of the watershed, associated land use activities include quarry operations, peat moss harvesting, commercial forestry and recreation areas.

A more detailed description of the physical characteristics, communities and land use activities can be found within the Seine River Watershed – State of the Watershed Report.

Agriculture is the main industry in the watershed.

[3] Census of Canada, 2006
[4] Agriculture and Agri-Food Canada – Prairie Farm Rehabilitation Administration, Winnipeg, Manitoba. Seine River Watershed Study Area, Land Use and agricultural Activities. PFRA's Input to the SRRCD State of the Watershed Report. June 2007
[5] Agriculture and Agri-Food Canada – Prairie Farm Rehabilitation Administration, Winnipeg, Manitoba. Summary of Resources and Land Use Issues Related to Riparian Areas in the Seine River Watershed Study Area. 2005.
[6] Derived from Census of Canada data.

4.0 Watershed Issues and Concerns

Through various meetings and discussions over the two-year planning process, watershed residents, local organizations and resource professionals have identified more than 30 issues and concerns within the Seine River Watershed.

While recognizing all of the issues identified are important, the Water Planning Authority and the Watershed Planning Advisory Team have chosen to focus their activities on those most in need of immediate attention. Since the conservation district and partner organizations are somewhat restricted by available time and resources, the number of issues to work at over the next ten years has been limited to six categories.

4.1 Surface Water Management

The Seine River floods frequently during spring run-off and after major spring or summer rains. This appears to be occurring much more rapidly and with greater severity than in the past. Most recently, excessive spring and summer rainfall and associated flooding in 1999, 2000, 2002, and 2004 resulted in significant crop losses and property damage.

Flows on the Seine River and the Seine River Diversion vary widely from year to year, and even within the space of a single year. For example, mean monthly flows of zero have been recorded on the Seine River both at Ste. Anne and at Prairie Grove on a number of occasions. Also, flows on the Seine River Diversion have reached nearly zero in several instances.

Flooding appears to be occurring much more rapidly and with greater severity than in the past.

On the opposite end of the spectrum, the highest daily flow recorded on the Seine River at Ste. Anne was 98.3 m3/sec (3471 cfs), recorded on April 22nd 1967. On the Seine River Diversion at Ile Des Chenes, the highest daily flow recorded was on April 21, 1997 at 230 m^3/sec (8122 cfs). Flow volumes on the Seine River Diversion are often higher than the flows in the Seine River at Prairie Grove.

The intensity of flooding in the Seine River Watershed is aggravated by land clearing, particularly in the upper reaches of the watershed, and by drainage of wetlands and other land for agricultural production. Residential and other development along waterways and in other sensitive areas also contributes to the problem.

There are about 600 kilometres of Provincial drains in the watershed. Some of these drains provide flood protection, such as the Seine River Diversion, in addition to agricultural land drainage. The responsibility for the Provincial drains and ditches paralleling Provincial Trunk Highways and Provincial Roads lies with Manitoba Infrastructure and Transportation.

The Provincial drainage system is supplemented by a network of municipal drains. Rural municipalities are responsible for the construction and maintenance of municipal drainage infrastructure. This typically includes smaller natural waterways as well as municipal road ditches. All municipal drainage works are subject to regulation under *The Water Rights Act*, which is administered by Manitoba Water Stewardship.

The question of whether the existing drainage system is properly designed, efficient and adequate, and whether it is contributing to flooding in some areas, needs to be addressed. In some cases, drainage ditches appear to be the by-product of municipal road construction. The size of the resulting drains is determined by the amount of material needed to create a roadbed, and not on the amount of water the channel should handle. Unlicensed drains, often constructed without proper surveying and lacking in control structures, are a problem throughout the watershed.

Drainage standards for Provincial drains are based on the agricultural capability of the land, with drainage sizing affected by characteristics such as topography and soil properties. Many Provincial drains are not currently sized to the appropriate standard, or if they are properly sized, they are often not regularly maintained[7]. This often leads to significant crop losses following heavy summer rains.

Many Provincial drains are not currently sized to the appropriate standard, or if they are properly sized, they are often not regularly maintained.

A preliminary assessment of the land drainage system has indicated drainage of some marginal land including wildlife reserves, peat extraction areas and pastureland of limited agricultural productivity cannot be economically justified. Reducing the rate of outflow through culvert reduction, partial blockage and other methods to manage flow is being evaluated in portions of the watershed. Any benefits or negative aspects of eliminating some drains, or reducing flow rates, would be identified. It may be expedient to delay any additional new drainage until the issues of water retention and drainage rationalization are addressed. The conservation district and local municipalities should be given the opportunity to review and comment on drainage licensing applications and proposed water management projects in the watershed.

It is important to keep the water where it falls, not only to reduce runoff and flooding, but also to help recharge aquifers and surface water resources. While action is already being taken in this regard by the Seine-Rat River Conservation District, more needs to be done to store runoff waters in any and all suitable areas.

A natural water retention site.

Currently, a number of potential small-scale water retention areas are being assessed to determine the economic feasibility and to identify landowners who may wish to cooperate in water retention projects. In addition, the conservation district has asked municipalities in the upstream areas to identify and designate recharge and retention areas in their jurisdictions so that their development plans will prevent non-compatible land use from occurring.

Much of the eastern parts of the rural municipalities of Ste Anne, Reynolds and La Broquerie provide very limited opportunities for agricultural development. Within this area many swamps and lowlands have been identified as potential water retention sites, but are not clearly defined in terms of exact location, size or water-holding capacity. These include the Giroux Bog and Devil's Swamp. These significant water areas are currently being used for peat extraction but seem to be logical areas to examine for water retention.

[7] Seine River, State of the Watershed Report. Drainage Infrastructure and Water Rights Licensing report. Manitoba Water Stewardship, 2007.

4.2 Surface Water Quality

In recent years, water quality has become an increasing concern for Manitobans. This is evidenced in the widespread media coverage of such issues as the phosphorus loading in Lake Winnipeg. Manitobans contribute about 47 per cent of the phosphorus and 44 per cent of the nitrogen to Lake Winnipeg[8] . About 15 per cent of the phosphorus and six per cent of the nitrogen is contributed by agricultural activities within Manitoba. About nine per cent of the phosphorus and six per cent of the nitrogen entering Lake Winnipeg from Manitoba comes from wastewater treatment facilities such as lagoons and sewage treatment plants.

The Water Quality Index in the Seine River is described as 'Fair' to 'Good'.

As part of the Lake Winnipeg Action Plan, the Province of Manitoba is committed to reducing nutrient loading to Lake Winnipeg to levels that existed prior to the 1970s. To make these improvements, significant effort, resources and partnerships need to be developed and implemented, focusing within the many basins and watersheds that drain into the lake. As a result of the much larger goal of improving the quality of Lake Winnipeg, other jurisdictions who implement water quality management activities and initiatives will realize local improvements in water quality and the protection of their source drinking water and aquatic ecosystems.

Water Quality Management Section of Manitoba Water Stewardship has one permanent water quality sampling station on the Seine River. This is located near Winnipeg at the South Perimeter Highway. Based on data gathered at that station, water quality in the Seine River fell within the categories of 'Fair' to 'Good' as described by the Canadian Water Quality Index (Figure 2)[9]. The Canadian Council of Ministers of the Environment (CCME) Water Quality Index is used to summarize large amounts of water quality data (25 variables) into simple terms for reporting in a consistent manner. While nutrients such as nitrogen were within the guidelines for the entire testing period, total phosphorus consistently exceeded the guidelines. During the period of record, there was a consistent pattern of low dissolved oxygen in the river during ice-covered months. The pesticides Simizine and MCPA exceeded their water quality guideline once during the period of record. No other pesticides were detected.

Water Quality Index

Excellent (95-100):
Water quality never or very rarely exceeds guidelines
Good (80-94):
Water quality rarely exceeds water quality guidelines
Fair (60-79):
Water quality sometimes exceeds guidelines and possibly by a large margin
Marginal (45-59):
Water quality often exceeds guidelines and/or by a considerable margin
Poor (0-44):
Water quality usually exceeds guidelines and/or by a large margin

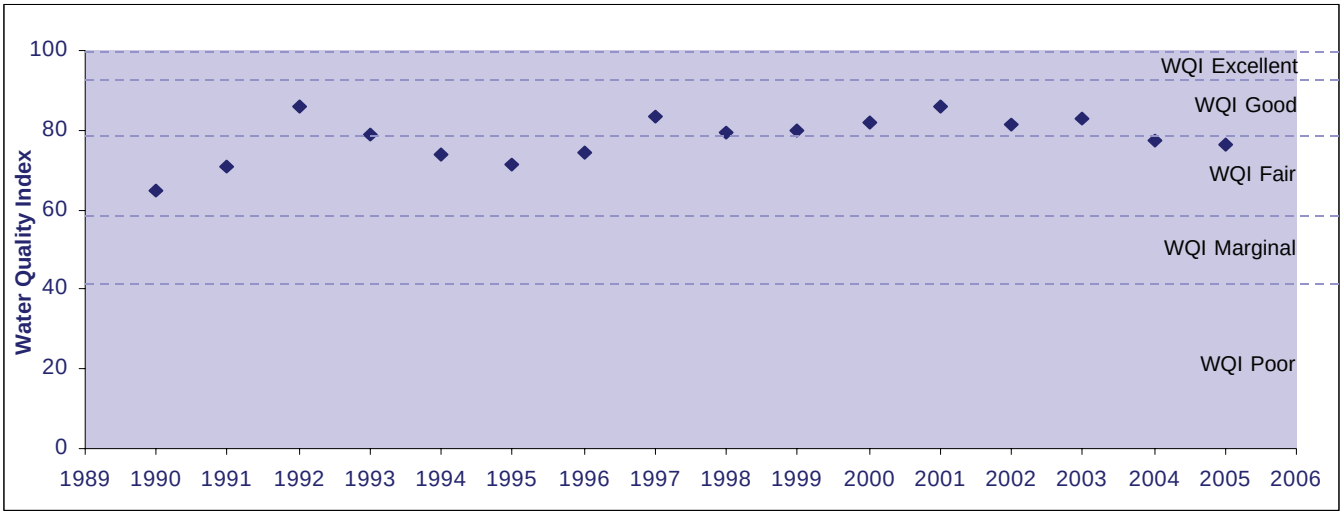


Figure 2 - Water Quality Index from 1990 to 2005 for the Seine River at the South Perimeter Highway.

[8] Bourne, A., N. Armstrong, G. Jones. 2002. A preliminary estimate of total nitrogen and total phosphorus loading to streams in Manitoba, Canada. Manitoba Conservation Report No. 2002-04, updated in 2006

[9] Seine River Watershed - State of the Watershed Report: Water Quality Component - Wendy Ralley, Manitoba Water Stewardship.

Lagoon discharge.

According to the Water Quality Management Section of Manitoba Water Stewardship, studies have shown that phosphorus loading has increased 10 per cent to Lake Winnipeg and nitrogen loading has increased by about 13 per cent since the early 1970's. In the Seine River, specifically at the South Perimeter Highway of Winnipeg, the total nitrogen increased by about 75 per cent from 1973 to 1999, and total phosphorus increased by about 188 per cent[10]. This not only impacts water quality within the Seine River Watershed, but ultimately in the Red River and Lake Winnipeg. This increase can be attributed to sources such as agricultural activity, wastewater facilities, and municipal lagoon discharges.

From 1994 to 1996, the Water Quality Management Section of Manitoba Water Stewardship collected water quality samples from 15 locations along the Seine River. In general, they found that downstream sites were statistically higher in concentrations of nutrients, general chemistry, and dissolved salts and minerals when compared to the upstream sites. However, that study was short-lived and the sampling was discontinued.

Wastewater teratment facilities need to be assessed and upgraded.

While the increase in nutrients in the Seine River itself is well documented, little information is available regarding the levels of nitrogen, phosphorus or other contaminants in the outflows from major drains, and especially the Seine River Diversion. The Water Planning Authority feels that more effort needs to be directed at finding the sources of nutrients entering these waterways. This data would be particularly useful at times when the various lagoons are being discharged.

The approval to discharge a lagoon is largely based on bacterial levels in the effluent, with no measurement taken of nitrogen, phosphorus or other contaminants. Most of the municipal lagoons in the watershed are operating on environmental licenses that were issued over thirty years ago when the only requirements were to test for Biological Oxygen Demand (BOD) and E. coli bacteria. Testing municipal waste as it enters the Seine River Diversion, and other waterways, would provide better information on the sources of nutrients entering the watershed.

Wastewater treatment facilities need to be assessed and upgraded to meet current standards and the requirements of growing communities within the watershed. Discussions should begin regarding long-term funding to upgrade and build new wastewater treatment facilities. In addition, consideration should be given to significantly reducing nitrogen and phosphorus from wastewater lagoon discharges.

[10] Jones, G. and N. Armstrong. 2001. Long-term trends in total nitrogen and total phosphorus concentrations in Manitoba streams. Water Quality Management Section, Water Branch, Manitoba Conservation, Winnipeg, MB.

The SRRCD has been offering a riparian management program for livestock producers to establish riparian fencing, grassed or treed buffers and off-site watering systems. Since livestock still have unrestricted access to waterways in some areas, the conservation district will continue to promote these practices, partner with other organizations and provide technical and financial incentives to district landowners. In addition, there are other incentive programs available through Agriculture and Agri-Food Canada.

Agricultural fertilizers are sources for phosphorus and nitrogen entering the watershed. In some cases, there are excessive amounts of fertilizer, either as livestock manure or commercial fertilizers, applied to land which results in excess nutrients leaving agricultural fields and entering waterways during spring thaw and rainfall events. Producers should be encouraged to soil test regularly to avoid over-application of fertilizers.

Some drain inlets into the river have no rip-rap or material to prevent serious gully erosion. This is creating areas of bank instability and introducing sediment into the river. Sedimentation reduces water quality, can cause blockages in the stream and has a negative impact on aquatic habitat. Action is required to prevent further damage.

Off-site livestock watering system demonstration.

4.3 Groundwater

Groundwater is the major source of water supply for private domestic use as well as for municipal, industrial, commercial and agricultural purposes within the Seine River Watershed.

Sources of groundwater in the watershed include aquifers in the bedrock formations of the Red River Formation carbonate and underlying Winnipeg Formation sandstone, and localized sand and gravel aquifers. Within the Seine River Watershed, excluding observation wells located within the city of Winnipeg, a network of 43 observation wells is currently maintained by the Province. Most of these wells have been drilled since 1990. Records of water levels and water quality data are maintained by the Province and are available upon request[11]. Overall, groundwater quality in the watershed is considered to be good to excellent.

The development of source water protection plans is required to manage demands and potential threats to the quality of the groundwater resource.

Over time, greater demand for drinking water will be placed on groundwater resources in the watershed through increased urban and rural residential development, and a general increase in population. In addition, outside interests have already been considering the feasibility of accessing the groundwater resources within the Seine River Watershed.

The development of source water protection plans is required to manage these demands and potential threats to the quality of the groundwater resource. Further information on the amounts of groundwater available, recharge areas and rates of recharge, and water quality in recharge areas is required. Currently, the Groundwater Management Section of Manitoba Water

[11] Seine River Watershed – State of the Watershed Report: Groundwater Resource Information. Manitoba Water Stewardship, Groundwater Management Section. January 2007.

Abandoned wells can act as direct conduits for contaminants from the surface into aquifers.

Stewardship is updating regional groundwater maps on a watershed basis, including the Seine River Watershed. The Section is also involved in developing the Southeast Regional Groundwater Management Plan intended to identify groundwater management issues, actions and strategies for wise use and sustainable development. All of the additional data obtained through these initiatives will be helpful in developing source water protection plans.

Abandoned wells can act as direct conduits for contaminants from the surface into aquifers below, and for the transfer of water between aquifers, potentially threatening the quality of the water supply. The Seine-Rat River Conservation District has sealed more than 40 abandoned wells in the district. While many abandoned wells are located in rural areas, attention needs to be paid to communities within the watershed as they develop water supply projects. Wells that are no longer required in these communities should be properly decommissioned.

There is little monitoring of the condition and efficiency of domestic septic systems.

Several major flowing well areas have been identified within the watershed[12] . The main concern regarding flowing wells is the potential for the uncontrolled discharge of water resulting in the loss of valuable groundwater. This uncontrolled discharge could also contribute to local drainage and foundation problems. Most municipal development plans already identify that proper well construction methods should be used in flowing well areas so that any discharge is controlled.

A comprehensive inventory of water wells in the watershed is needed. This information could be used to locate problem wells, identify abandoned wells to seal and improve the groundwater database.

Installation of a septic field.

The interest in rural residential and hobby farm development continues to grow, especially in areas near the city of Winnipeg. As the number of properties increases, so does the issue of proper sewage disposal, and the potential threat to water quality. Currently, there is little monitoring of the condition and efficiency of domestic septic systems. Before this can take place, however, an inventory of the locations and types of septic systems must be conducted. While records of recently installed systems may exist, there is no common knowledge of the locations and condition of most of the older septic systems. As a starting point, a voluntary inspection service – similar to a fire inspection – could be initiated whereby homeowners would request an inspection of their septic systems. The emphasis of such an undertaking would be education and not enforcement of regulations. Over the long term, it would go a long way to eventually developing an inventory of septic systems for the watershed.

[12] Seine River Watershed – State of the Watershed Report: Groundwater Resource Information. Manitoba Water Stewardship, Groundwater Management Section. January 2007.

4.4 Management of the Seine River

The Seine River Diversion was constructed in 1960 to provide flood protection to the town of Ste. Anne and other downstream communities. The Diversion operates year-round, and in doing so, it has reduced the amount of water flowing down the original channel. This reduced flow in the natural river section has greatly reduced the quality of aquatic habitat for fish species, as well as had a negative impact on recreational use of the river downstream of the Diversion.

A study conducted in 2005[13] revealed that about 40 per cent of the riparian buffer zones within the Seine River Watershed have either been highly (6.5%) or moderately (33.6%) impacted by human activity. While the primary causes of the riparian impacts appear to be from agricultural practices, other activities such as residential developments have also negatively impacted riparian habitats. The study also documented 49 sites along the Seine River that would benefit from rehabilitation efforts.

Healthy riparian zones play an important role in improving water quality by filtering nutrient and sediment loading into the river, controlling erosion and enhancing habitat for aquatic life. Riparian zones also help to dissipate energy during flood events while providing cover, food, and travel corridors for animals and birds. There is an opportunity for local organizations, in cooperation with the conservation district and others, to become involved in pilot projects demonstrating methods of returning these riparian zones to a healthy state.

Currently, the Seine River is showing the negative impacts of human activity.

The Seine River offers recreational opportunities such as canoeing and fishing in the summer, and cross-country skiing and snowmobiling in the winter. Currently it is showing the negative impacts of human activity. In areas where livestock are allowed access to the river, they have caused erosion and loss of natural vegetation. The river has also served as a repository for junk (old cars, farm equipment, wire, barrels, etc.). Increased land drainage over the years has created fluctuations in water levels, which have only added to the problem.

Many dead trees, some as a result of Dutch elm disease, others as a result of human activities, are causing blockages along the Seine River, resulting in channel diversion and erosion, and destroying its aesthetic appeal. In some cases landowners have attempted to modify or maintain water levels by placing stones, concrete or other obstacles in the river to restrict flow. These blockages can disturb fish habitat, block fish passage, catch additional flotsam and cause unnatural localized flooding. Removing some of the obstructions, whether natural or man-made, may increase the recreational value of the river, and improve flow and aquatic habitat. However, the conservation district has no intention of removing all of the obstructions and debris from the river because it is important to leave a certain amount of woody debris as critical aquatic habitat.

[13] Seine River Survey and Restoration Planning Project, Final Report. November 2005. Dillon Consulting Limited.

4.5 Land Use Planning

There are many diverse interests and activities using the land base within the Seine River Watershed (Figure 3), including forestry, agriculture, mining, recreation, tourism and urban development, just to name a few. With all of these interests occupying land near each other, and with many continuing to expand, the demand for development must be balanced with protecting and preserving valuable resources and the environment.

There is a need for synchronization between land use plans (or development plans) within the watershed and the integrated watershed management plan. It is important for water planning authorities to work closely with rural municipalities, towns and planning districts to create and achieve a vision of healthy, prosperous and sustainable communities. Land use planning and strict adherence to land use policies in local development plans is very important to long-term sustainability and watershed health.

The demand for development must be balanced with protecting and preserving valuable resources and the environment.

The livestock industry, particularly hog production, is an important economic driver in the Seine River Watershed. The hog industry in the watershed accounts for 21 per cent of the hogs produced in Manitoba[14] . The Lower Seine River sub-watershed and the Manning Canal sub-watershed have the highest livestock density in the province at 0.98 animal units per hectare. Most of this is hogs. However, care must be taken to protect the environment when choosing locations for new intensive livestock facilities. Not only must the actual location of the facility be carefully selected, enough suitable land must be available for disposal of the livestock waste. The conservation district should be involved in municipal decisions regarding the establishment or expansion of intensive livestock operations with input into technical review reports.

The steady increase in rural residential and hobby farm development throughout the watershed, except for the southeastern-most quarter of the watershed, is expected to continue. Special attention should be paid to the proper management of rural residential and subdivision development on sensitive lands. Lands subject to significant flooding, erosion or bank instability, or in potential water retention areas, should be left in a natural state or developed only for low intensity uses such as open space recreation, grazing, cropping, forestry and wildlife habitat.

Hog production is an important economic driver in the watershed.

More intensive development should be considered only if the risk can be eliminated, satisfactorily reduced or if the use would be compatible with the risk. If structures or other higher intensity uses are necessary, such as in urban centers, they should be carefully planned and constructed so that they are protected against significant flooding, erosion or bank instability, are made compatible with any residual risk and do not contribute to risks on other land.

Although on-site wastewater management systems are regulated through *The Environment Act*, there are locations throughout the watershed where more stringent standards, such as larger lot sizes to support septic fields, cluster development and fully serviced lots, should be implemented. In some areas, there are issues with water contamination and on-site wastewater management systems that are ineffective over the long-term. Municipalities play a huge role in approving land use changes and protecting groundwater and surface water resources.

[14] Summary of Resources and Land Use Issues Related to Riparian Areas in the Seine River Watershed. Agriculture and AgriFood Canada-Prairie Farm Rehabilitation Administration, 2005.

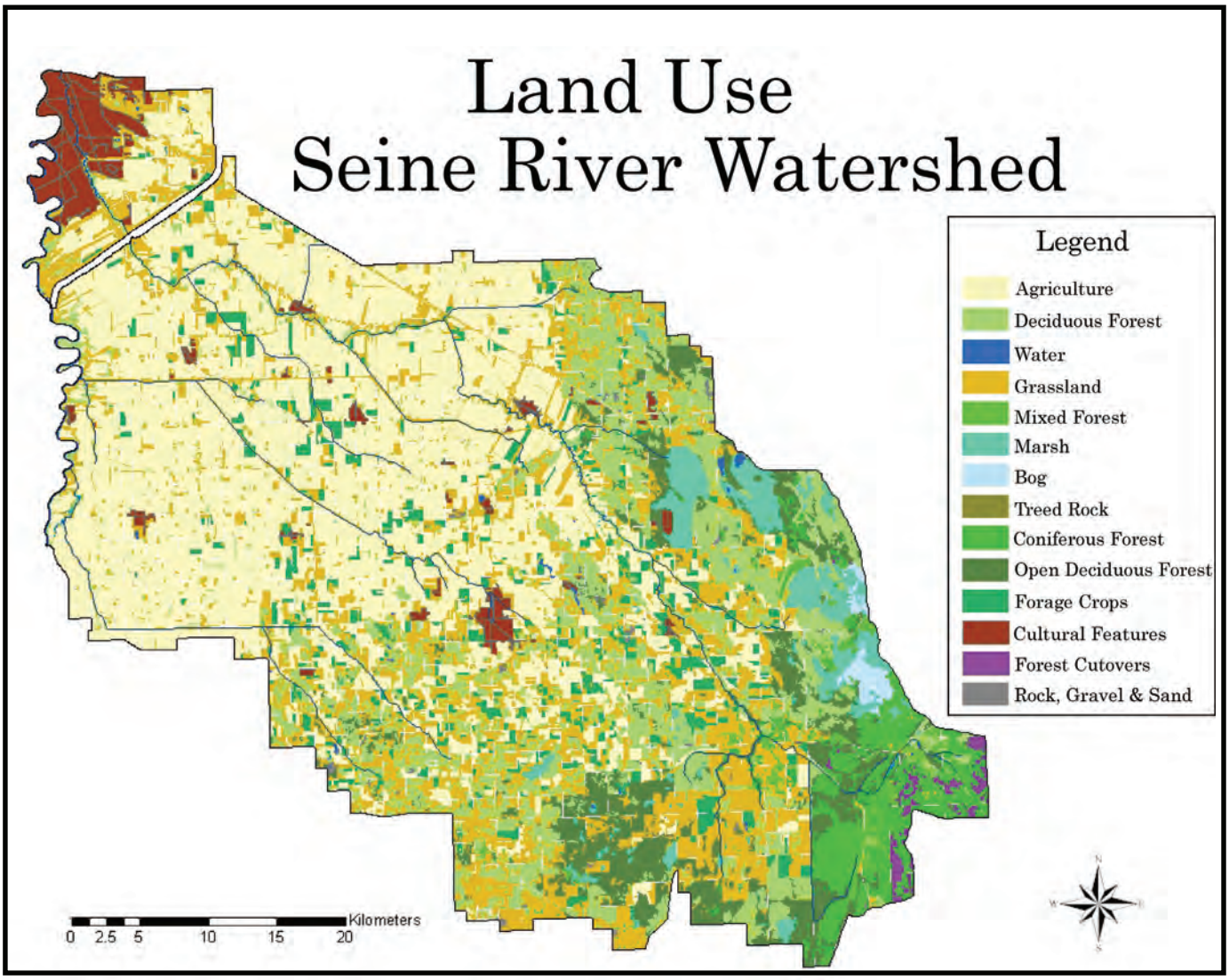


Figure 3: Land Use in the Seine River Watershed

4.6 Watershed Awareness

An educated, well-informed public is essential to the success of the watershed management plan. It will be actions of the residents of the watershed that will ultimately determine whether the plan will succeed or not.

Many watershed residents are not fully aware of their watershed, the concept of watershed management planning, and the Seine-Rat River Conservation District and its role in managing the resources within the watershed. Better awareness of the interrelationships between people and the environment, and an improved sense of what each individual can do to work toward a healthier watershed is required.

4.7 Other Issues

Through the public consultation process, many watershed issues and concerns were identified by residents of the watershed in addition to the six priority issues, and related items, described on the previous pages. Many of these suggestions were general in nature such as tree planting, manure management and the promotion of wildlife management. Others were more site-specific, calling for an improved Seine River Siphon, or redirecting Fish Creek into Center Line Drain to reduce flooding on the Seine River, as examples. Several participants expressed the need for better enforcement of Acts and Regulations related to water rights, drainage and environmental issues.

Wildlife management is an important issue for many watershed residents.

While all issues are important to the residents of the watershed, several are outside of, or marginal to, the conservation district's mandate, and require action by other entities. Those that are within the mandate of the conservation district, and the watershed management plan, will be given consideration at some future time when sufficient progress has been realized in dealing with the major issues outlined in this plan.

Appendix B includes a summarized list of other watershed issues and concerns raised during the first round of public consultations.

5. Goals, Objectives and Recommended Actions

While many issues were identified during the planning process, the Water Planning Authority and the Watershed Planning Advisory Team, through necessity, have chosen to focus on six issues categories in this watershed plan. These issues, along with the asscociated goals and objectives are summarized in Table 1 below.

Table 1: A Summary of Issues, Goals and Objectives

Watershed Issues and Goals	Objectives
SURFACE WATER MANAGEMENT **Goal:** Manage the land drainage network to provide benefits to the residential and agricultural community while minimizing impacts to downstream landowners.	- Implement water management strategies throughout the watershed to minimize downstream flood damage to residential areas and infrastructure. - Ensure that waterways maintenance proceeds in an effective and environmentally responsible manner.
SURFACE WATER QUALITY **Goal:** Improve and maintain the surface water quality in the Seine River Watershed.	- Obtain a better understanding of the current water quality and nutrient source inputs in the Seine River Watershed. - Reduce nitrogen and phosporus loading by 10%.
GROUNDWATER **Goal:** Ensure the protection and sustainability of all drinking water sources.	- Protect drinking water sources from contamination. - Expand the groundwater database to gain a better understanding of the groundwater resources in the watershed.
MANAGEMENT OF THE SEINE RIVER **Goal:** Improve the riparian health and aesthetics of the Seine River so that it becomes an attraction and valuable asset to the local community.	- Implement river management projects to improve flow, biodiversity and aesthetics. - Remove all garbage and excess debris from the Seine River.
LAND USE PLANNING **Goal:** Ensure that all development is environmentally responsible and sustainable.	- Continue to improve the way development and land use occurs by involving relevant stakeholders, enforcing and reviewing existing legislation, and implementing new policy and technologies.
WATERSHED AWARENESS **Goal:** To make all watershed residents aware of the importance of protecting their watershed and working together to enhance it for future generations.	- Provide the public with opportunities to become aware of the importance of healthy watersheds.

Each recommended action described on the following pages is defined with a proposed timeframe, and list of organizations that could potentially assist in implementation.

Action timeframes:

- Short-term indicates that the action is planned to begin and end within the next 3 years.
- Long-term indicates that the action is planned to begin as soon as possible and to continue over the next 10 years.
- On-going indicates actions that are already underway and will continue over the next 10 years.

The 10-year time-line is a reflection of the effective life of this plan, in that is to be reviewed and redeveloped in 10 years. Actions considered in this plan as long-term or on-going may well be continued into the next edition of the plan.

In addition to the actions to be taken by the SRRCD and its partners, individuals also have a role to play in improving the health of the watershed. See Appendix C for a list of actions you, as an individual, can take to become involved.

5.1 Surface Water Management

Goal: Manage the land drainage network to provide benefits to the residential and agricultural community while minimizing impacts to downstream landowners.

Objective: Implement water management strategies throughout the watershed to minimize downstream flood damage to residential areas and infrastructure.

	Recommended Action	Timeframe	Organizations that could assist with implementation
A	Develop water storage/retention projects.	On-going	- SRRCD - Manitoba Water Stewardship - Water Control Systems Management - Landowners - Manitoba Conservation

The SRRCD has developed a map of potential water storage/retention areas (Figure 4) which will be updated and improved as more information is obtained. In addition, the SRRCD will partner with Manitoba Water Stewardship – Water Control Systems Management to conduct feasibility studies of water storage/retention areas based on criteria including flow volumes, topography, capacity, impacts and cost-benefit.

	Recommended Action	Timeframe	Organizations that could assist with implemenation
B	Rationalize the land drainage network.	On-going	- SRRCD - Municipalities - Manitoba Water Stewardship - Landowners

The SRRCD will continue to evaluate the purpose and need of man-made drains throughout the watershed and will work with municipalities, landowners and Manitoba Water Stewardship to develop creative water management projects.

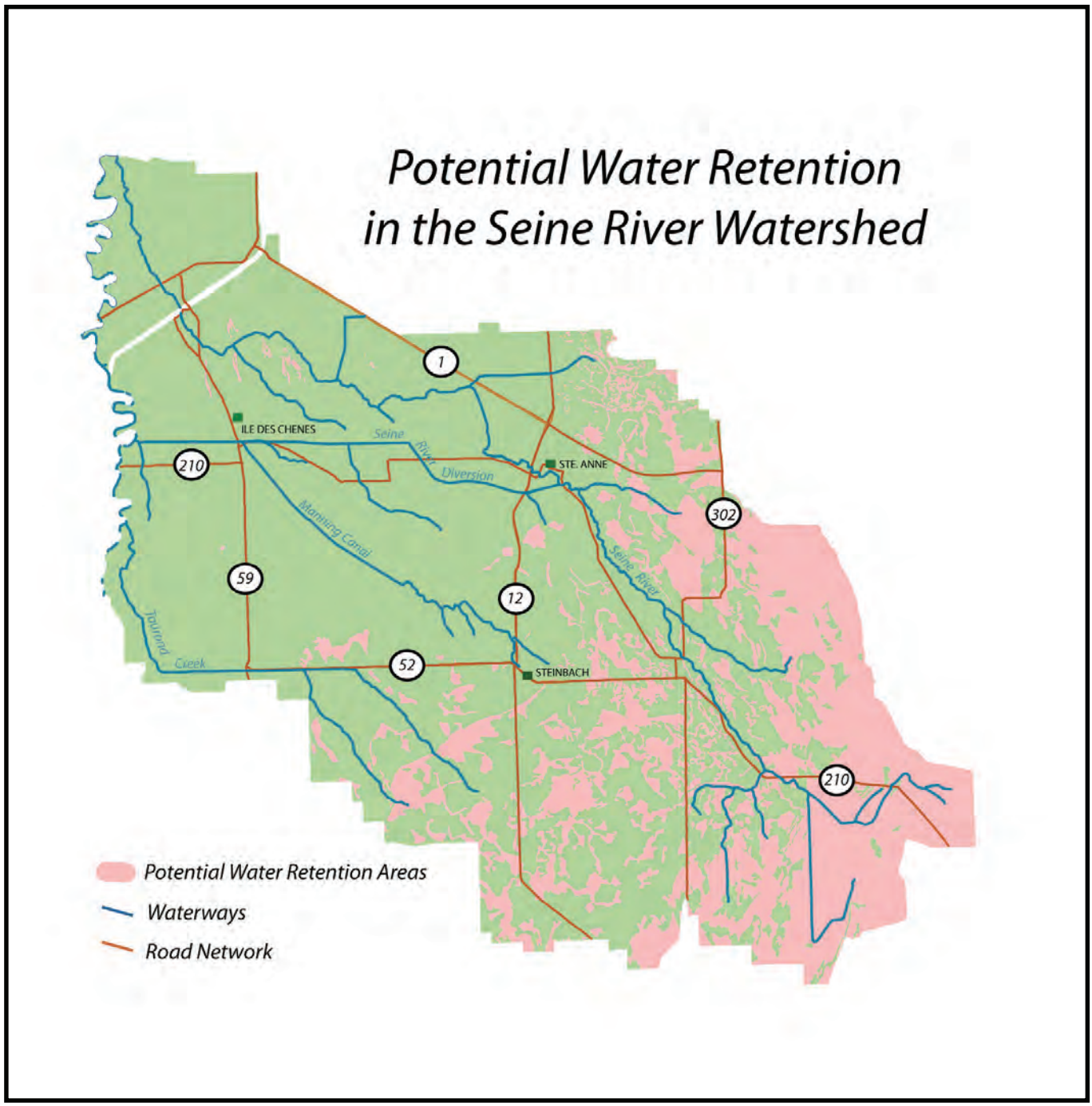


Figure 4: Potential Water Retention in the Seine River Watershed.

	Recommended Action	Timeframe	Organizations that could assist with implementation
C	Enforce illegal and unplanned drainage.	Long-term	- Manitoba Water Stewardship - Water Control Works and Drainage Licensing - SRRCD - Municipalities

Within *The Water Rights Act*, there is a requirement for all landowners to apply for a Water Rights license whenever water flow is diverted, altered, controlled or changed in any way. Manitoba Water Stewardship – Water Control Works and Drainage Licensing section is responsible for responding to all drainage complaints and enforcing *The Water Rights Act.*

The SRRCD and Watershed Planning Advisory Team clearly understand that drainage is a high priority issue but that it must be considered within an overall drainage strategy which considers upstream and downstream impacts. In addition, the Watershed Planning Advisory Team believes that the SRRCD and local municipalities should participate in the review and comment on all drainage licensing applications.

	Recommended Action	Timeframe	Organizations that could assist with implementation
D	Offer an on-site water management program for urban areas.	On-going	- SRRCD - Property owners - City of Steinbach - Manitoba Water Stewardship

The SRRCD will offer a rain garden program, targeted primarily at urban residential areas. The program is designed to provide a way of slowing stormwater runoff, using sump pit water, and having more local water infiltration. The program will be improved annually as opportunities arise.

Objective: Ensure that waterways maintenance proceeds in an effective and environmentally responsible manner.

	Recommended Action	Timeframe	Organizations that could assist with implementation
E	Establish and implement a maintenance and works schedule for Provincial waterways in the Seine River Watershed.	Long-term	- Manitoba Infrastructure and Transportation - Manitoba Water Stewardship - Water Control System Management - SRRCD - Municipalities

Manitoba Infrastructure and Transportation will establish and implement an annual maintenance schedule for the Provincial waterways in the Seine River Watershed. SRRCD sub-district members and member municipal representatives will meet Manitoba Infrastructure and Transportation staff throughout the winter months in order to discuss issues and needs in the development of the annual maintenance and works program.

	Action	Timeframe	Lead (*Partners*)
F	All drain maintenance activities should be in accordance with the Manitoba Drain Maintenance Guidelines.	Long-term	- Manitoba Infrastructure and Transportation - Municipalities

Drain maintenance guidelines are currently being developed by Manitoba Water Stewardship, Conservation, Infrastructure and Transportation, and Fisheries and Oceans Canada to allow drain maintenance to proceed in a timely manner and meet the requirements of *The Federal Fisheries Act.* Once completed, practices identified in the guidelines should be implemented throughout the watershed.

5.2 Surface Water Quality

Goal: Improve and maintain the surface water quality in the Seine River Watershed.

Objective: Obtain a better understanding of the current water quality and nutrient source inputs in the Seine River Watershed.

	Recommended Action	Timeframe	Organizations that could assist with implementation
A	Install additional long-term surface water quality monitoring stations throughout the Seine River Watershed.	Long-term	- Manitoba Water Stewardship - Water Science and Management - SRRCD

One long-term surface water quality monitoring station exists at the downstream end of the Seine River. Manitoba Water Stewardship will install an additional station on the downstream end of the Seine River Diversion. The station will provide additional data to assist with long-term water quality analysis in the watershed.

The SRRCD will also investigate the feasibility of collecting additional water quality samples throughout the watershed, and will work closely with Manitoba Water Stewardship to select proper sites, determine frequency and parameters to measure.

Objective: Reduce nitrogen and phosphorus loading by 10%.

	Recommended Action	Timeframe	Organizations that could assist with implementation
B	Provide effective options for riparian area management and rehabilitation.	On-going	- SRRCD - Manitoba Agriculture, Food and Rural Initiatives - Manitoba Conservation - Manitoba Water Stewardship - Agriculture and Agri-Food Canada

The main objective of the future Environmental Goods and Services (EG&S) policy in Manitoba is to achieve cost-effective, multiple environmental benefits in cooperation with landowners, such as (i) improved water quality; (ii) climate change adaptation and greenhouse gas mitigation through increased carbon sequestration or reduced nitrous oxide and methane emissions; (iii) reduced water and wind erosion; (iv) and the conservation of biodiversity and natural habitat. Therefore MAFRI, in partnership with the SRRCD and local landowners, will be able to provide technical and financial support to improve the health of the Seine River Watershed.

	Recommended Action	Timeframe	Organizations that could assist with implementation
C	Reduce silt and sediment from erosion on drains from entering the Seine River.	Long-term	- Municipalities - SRRCD - Manitoba Infrastructure and Transportation

There are sites along the river where erosion has become a very serious concern and has damaged, or is currently threatening the safety of municipal infrastructure. A lot of drains into the river have no erosion control materials in place resulting in significant continual degradation and material loss following any rainfall event. The local rural municipalities will work with the SRRCD and Manitoba Infrastructure and Transportation to develop erosion control projects at specific problem sites.

	Recommended Action	Timeframe	Organizations that could assist with implementation
D	Consider alternatives to conventional fertilizers and application routine.	Long-term	- Municipalities - Golf courses - SRRCD - Towns and cities

In some situations, more effective application and small changes in an annual routine of fertilizer application can result in less nutrients ending up in our waterways. Under the Nutrient Management Regulation, golf courses are required to prepare Nutrient Management Plans documenting their nutrient management practices. Manitoba Water Stewardship - Water Quality Management reviews the plans and provides feedback/suggestions for better management practices. Towns and cities are no longer allowed to apply fertilizers containing more than 1 per cent phosphorus to land and are required to change their fertilizer practices in buffer zones along waterways.

	Recommended Action	Timeframe	Organizations that could assist with implementation
E	Address wastewater and manure management issues.	Long-term	- Manitoba Conservation - Municipalities - Manitoba Water Stewardship - Manitoba Agriculture, Food and Rural Initiatives - SRRCD

There are many wastewater and manure management issues and challenges that exist throughout the watershed. Manitoba Conservation is responsible for administering *The Environment Act* and works with a number of partners to obtain information and address issues as efficiently as possible.

5.3 Groundwater

Goal: Ensure the protection and sustainability of all drinking water sources.

Objective: Protect drinking water sources from contamination.

	Recommended Action	Timeframe	Organizations that could assist with implementation
A	Seal all abandoned wells.	On-going	- SRRCD - Manitoba Water Stewardship

The SRRCD will continue to offer the abandoned well sealing program to all residents of the Seine River Watershed at no cost to the landowner. Because a vast majority of rural residents in the watershed get their drinking water from groundwater, the SRRCD has identified the entire watershed as a priority area to seal all abandoned wells. With further work planned to locate all wells and clearly identify specific threats in the source water management zones, the SRRCD will be directing its drinking water source protection activities accordingly.

	Recommended Action	Timeframe	Organizations that could assist with implementation
B	Establish and maintain a Source Water Protection Committee.	Long-term	- SRRCD - Municipalities - Manitoba Water Stewardship

The SRRCD will establish a Source Water Protection Committee of key stakeholders to undertake a source water assessment and develop a source water protection plan for each of the public water distribution systems in the watershed.

Figure 5, on the following page, shows public water distribution systems in the Seine River Watershed.

	Recommended Action	Timeframe	Organizations that could assist with implementation
C	Provide on-going outreach and educational opportunities to all watershed residents on how to minimize or eliminate risks of contamination to groundwater.	On-going	- SRRCD - Manitoba Water Stewardship

The SRRCD will assist Manitoba Water Stewardship with the distribution of literature on reducing and eliminating potential threats to groundwater.

The current process of relaying boil water advisories to all watershed residents should be improved. Drinking Water Officers from the Manitoba Water Stewardship – Office of Drinking Water should work more closely with public utilities, municipalities and local media to ensure that boil water advisories are well advertised and every effort is made to inform potentially impacted residents.

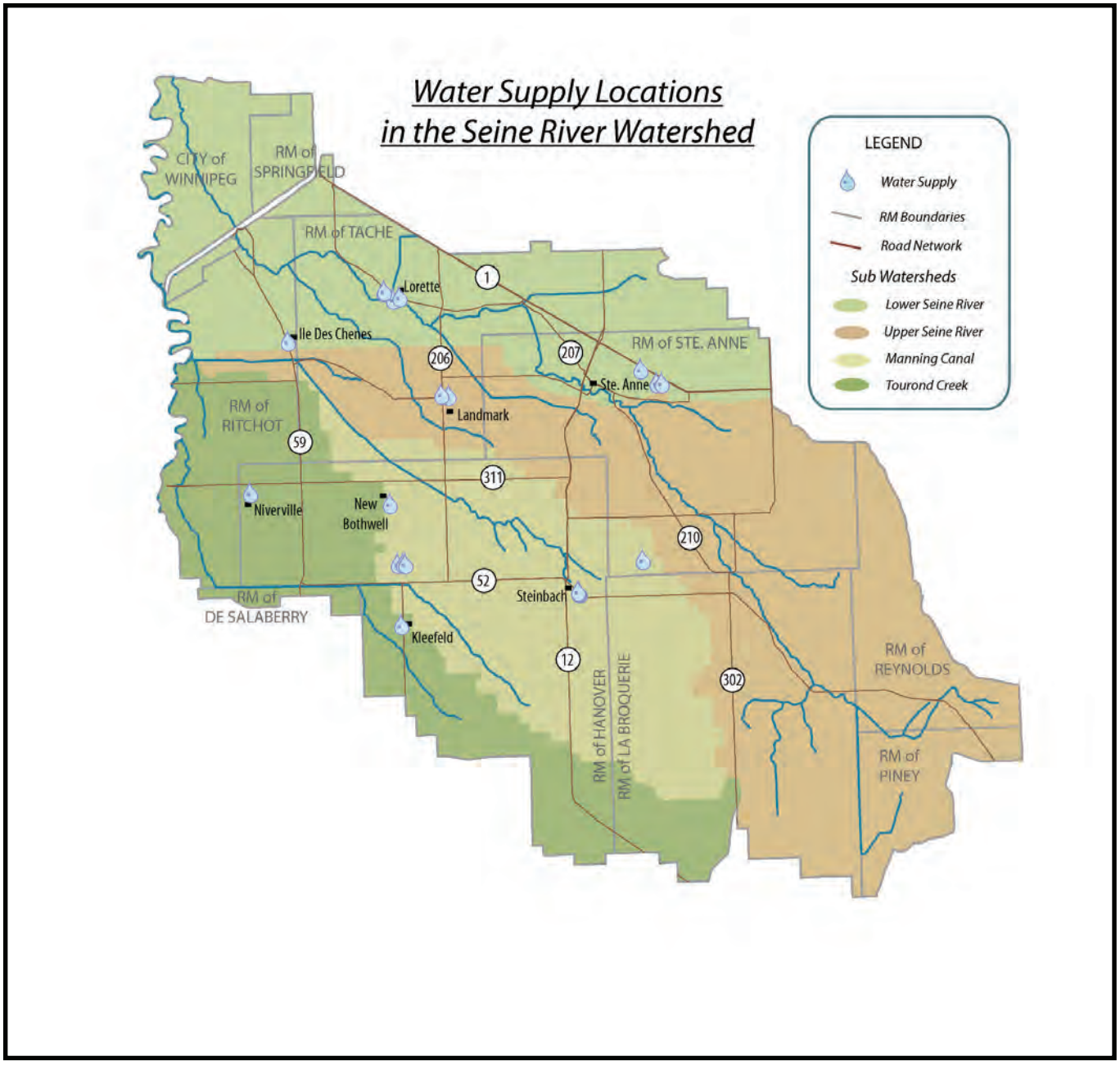


Figure 5: Public Water Supply Systems and Source Water Management Zones.

	Recommended Action	Timeframe	Organizations that could assist with implementation
D	Develop contingency plans for drought and water supply contamination.	Long-term	- City of Steinbach - Rural Municipality of Ritchot - Manitoba Water Stewardship - Manitoba Health - Manitoba Emergency Measures Organization

In partnership with Manitoba Water Stewardship, Manitoba Health and Manitoba Emergency Measures Organization, the City of Steinbach and the Rural Municipality of Ritchot are each responsible for developing emergency preparedness plans in the case of drought or water supply contamination.

Objective: Expand the groundwater database to gain a better understanding of the groundwater resources in the watershed.

	Recommended Action	Timeframe	Organizations that could assist with implementation
E	Initiate a Well Inventory and Groundwater Sampling project.	Long-term	- SRRCD - Manitoba Water Stewardship - Groundwater Management

The SRRCD, in partnership with Manitoba Water Stewardship – Groundwater Management, will initiate a Well Inventory and Groundwater Sampling project. The project will identify the status and location of private wells within the watershed. The well locations will be collected with a global positioning system (GPS) and will be entered into a geographic information system (GIS) database.

The Groundwater Management section of Manitoba Water Stewardship is committed to constantly improving their knowledge and data on the groundwater resources in the Seine River Watershed. They have suggested the following future project work:

- Monitor groundwater levels and water quality in aquifers throughout the watershed.
- Design and implement a monitoring program with indicators to benchmark groundwater quality and identify trends.
- Produce groundwater maps of interconnected aquifers and flowing wells.
- Develop a comprehensive water use monitoring system.

	Recommended Action	Timeframe	Organizations that could assist with implementation
F	Participate in Southeast Regional Groundwater Management Plan.	Short-term	- Manitoba Water Stewardship - SRRCD - Municipalities - Other stakeholder groups

The Southeast Regional Groundwater Management Plan is being developed to address the issues of groundwater use and development in the region. Participation in this initiative will help ensure watershed needs and concerns are being considered.

5.4 Management of the Seine River

Goal: Improve the riparian health and aesthetics of the Seine River so that it becomes an attraction and valuable asset to the local community.

Objective: Implement river management projects to improve flow, biodiversity and aesthetics.

	Recommended Action	Timeframe	Organizations that could assist with implementation
A	Develop an operational plan for the Seine River Diversion water control structure that considers the in-stream flow needs of the Seine River.	Long-term	- Manitoba Infrastructure and Transportation - Manitoba Water Stewardship - Water Control System Management; Fisheries - Fisheries and Oceans Canada - Town of Ste. Anne - Rural Municipality of Ste. Anne - SRRCD

A plan must be devised to permit the Seine River Diversion gate to be managed so as to maintain minimum in-stream flows through the Seine River. In-stream flows are critical to protecting and improving fish habitat and the overall health of the Seine River aquatic ecosystem. In addition to flood control and in-stream flow considerations, the timing of municipal lagoon discharges should be considered.

	Recommended Action	Timeframe	Organizations that could assist with implementation
B	Undertake projects at the rehabilitation sites identified in the Seine River study.	On-going	- SRRCD - Landowners - Manitoba Water Stewardship - Fisheries - Manitoba Agriculture, Food and Rural Initiatives

The SRRCD will continue to establish partnerships and develop projects at all of the rehabilitation sites identified in their river assessment and restoration planning studies.

	Recommended Action	Timeframe	Organizations that could assist with implementation
C	Undertake riverbank rehabilitation and reclamation demonstration projects.	Short-term	- Municipalities - SRRCD - Manitoba Water Stewardship - Water Control Systems Management - Manitoba Water Stewardship - Fisheries - Fisheries and Oceans Canada

The purpose of this action would be to demonstrate to landowners, municipalities and others some examples of effective measures to deal with riverbank erosion and slumping. Effective partnerships will be the key to achieving success.

Objective: Remove all garbage and excess debris from the Seine River.

	Recommended Action	Timeframe	Organizations that could assist with implementation
D	Conduct river clean-up projects in partnership with the local community and the federal and provincial governments.	On-going	- SRRCD - Save Our Seine - Municipalities - Landowners - Youth groups - Manitoba Water Stewardship - Fisheries and Oceans Canada

The SRRCD will strive to complete as many river clean-up projects as possible each year.

As part of this action, the SRRCD will also:

1) capture "before and after" pictures at all project sites,
2) create and maintain a map of all completed project sites, and
3) identify and reward landowners involved in self-initiated stewardship and rehabilitation projects along the Seine River with appreciation events and good news stories in local newspapers.

5.5 Land Use Planning

Goal: Ensure that all development is environmentally responsible and sustainable.

Objective: Continue to improve the way development and land use occurs by involving relevant stakeholders, enforcing and reviewing existing legislation, and implementing new policy and technologies.

	Recommended Action	Timeframe	Organizations that could assist with implementation
A	Provide assessment, review and comments on applications for new or expanding livestock facilities, rural residential and subdivision development and Crown land management.	Long-term	- Provincial Technical Review Committee - Manitoba Intergovernmental Affairs - Manitoba Conservation - Manitoba Agriculture, Food and Rural Initiatives - Municipalities - SRRCD

The SRRCD should be involved in the evaluation, comment and review process for new or expanding livestock facilities, rural residential and subdivision development applications, and Crown land sales, lease renewals and new lease agreements.

	Recommended Action	Timeframe	Organizations that could assist with implementation
B	Ensure rural residential and subdivision development adheres to the appropriate land use planning guidelines.	Long-term	- Manitoba Intergovernmental Affairs - Municipalities - Manitoba Conservation - SRRCD

Land subject to significant flooding, erosion or bank instability should be left in its natural state or developed only for low intensity uses such as open space recreation, grazing, cropping, forestry and wildlife habitat. More intensive development may be considered if the risk can be eliminated, satisfactorily reduced or if the use would be compatible with the risk. If structures or other higher intensity uses are necessary, such as in urban centers, they should be carefully planned and constructed so that they are protected against significant flooding, erosion or bank instability, are made compatible with any residual risk and do not contribute to risks on other land. If there is significant risk, the following criteria should be applied:

a) Development shall not adversely alter, obstruct or increase water flow, flow velocities or flood levels. Development should be allowed only if the cumulative effect of all foreseeable development in the flood prone area is within water flow, flow velocity, or flood level limits that may be specified in regulations or by-laws for the area;
b) Activities such as dumping, excavation and clearing, which accelerate or promote damage due to causes such as erosion or bank instability, shall be prohibited; and
c) Natural tree and vegetative cover shall be preserved to reduce erosion and assist in maintaining bank stability.

	Recommended Action	Timeframe	Organizations that could assist with implementation
C	Create a map showing "hazard areas unsuitable for development".	Long-term	- Manitoba Intergovernmental Affairs - Community Planning - Municipalities - Manitoba Water Stewardship - SRRCD

Developing a digital map that illustrates “hazard areas unsuitable for development” would be useful for many organizations and would be a positive step towards ensuring more responsible land use planning.

5.6 Watershed Awareness

Goal:To make all watershed residents aware of the importance of protecting their watershed and working together to enhance it for future generations.

Objective: Provide the public with opportunities to become aware of the importance of healthy watersheds.

	Recommended Action	Timeframe	Organizations that could assist with implementation
A	Provide a variety of watershed awareness and education opportunities.	On-going	- SRRCD - Local schools - Manitoba Water Stewardship - Manitoba Agriculture, Food and Rural Initiatives - Municipalities

- Develop educational opportunities for youth. These opportunities may include classroom presentations, field trips, river clean-ups, tree planting or water quality sampling.
- Develop placemats for distribution to local restaurants and coffee shops.
- Submit watershed management articles to local newspapers.
- Host workshops, field tours and demonstration days on a variety of topics including the promotion of beneficial management practices.
- Encourage participation in the Agriculture in the Classroom program.

	Recommended Action	Timeframe	Organizations that could assist with implementation
B	Maintain open and positive relationships among local municipal partners.	On-going	- SRRCD - Municipalities

There are many benefits of having local municipalities working together through a central water management organization like the SRRCD. Rather than thinking of the municipal or ward boundary, members of the conservation district are asked to "set aside" their municipal hats and change their thinking to a watershed boundary.

The SRRCD will strive to:

- Keep local municipal councils informed of the programs and activities of the district.
- Make staff or board members available for special meetings.
- Provide municipal partners with Board and sub-district meeting minutes and an annual report.

6.0 Implementation

There is little value in developing any plan in isolation and with no clear implementation strategy or "business plan". An effective watershed management plan needs to include a realistic, manageable and effective implementation plan. With consideration for all the time, effort and money devoted to the planning process, the implementation plan is ultimately the most important part of the overall watershed management plan. The implementation plan must state well-defined objectives and prioritized remedial and protective actions, specifying how these actions can be carried out by various organizations, through partnerships, and within municipal development plans. Without a solid implementation plan for a watershed, a plan is simply a plan.

Without a solid implementation plan for a watershed, a plan is simply a plan.

The most significant hurdle with implementing a watershed management plan is the fact that landowners are not going to do things that don't suit their economic needs. Another major hurdle is that watershed residents are not going to change their activity if they personally don't believe that there is any harm in what they are doing, or there is any benefit to changing what they're doing. Projects and incentive programs designed by local (sub-district) representatives of the Seine-Rat River Conservation District are generally very easy for landowners to participate in, causing minimal disruption in their daily routines and established land and water uses. Efforts are being made to inform local residents of the benefits to themselves and the watershed as a whole, of participating in these programs.

Support for implementation must involve all stakeholder groups, watershed residents and provincial and federal governments. The support must be sustainable, physical, technical and financial. When stakeholders decide to become involved in the planning process, they generally know what watershed issues and concerns are affecting them already, and want to have a say in how these issues may be addressed and resolved. They also need to see some results from their planning efforts through the implementation of their plan.

Manitoba Water Stewardship, through the Conservation Districts Program, provides an annual grant to the Seine-Rat River Conservation District (2009-10: $340K). The funds are provided to deliver land and water management incentive programs and to implement the actions identified within the watershed management plan. In addition, the conservation district receives financial support of over $115K from its municipal partners, and because of its non-profit charitable status, is able to apply to a number of additional funding programs.

7.0 Measuring Success

7.1 Current Success

Not all of the success experienced throughout the integrated watershed management planning process is measurable. Throughout the process and with the completion of the watershed management plan, watershed residents have gained, or are now more able to gain a better understanding of the current health of the Seine River Watershed and the impacts that all people have within their watershed. Local people have been involved in identifying watershed issues and proposing solutions to address those issues. They have also become more aware of which provincial departments and staff are involved in maintaining infrastructure, approving and licensing projects, and protecting and managing natural resources.

7.2 Performance Measures

The Water Planning Authority is responsible for providing an annual measure of success related to the objectives listed within Section 5.0. As stated previously, the success of the plan lies largely with the collaborative efforts of stakeholder groups, watershed residents and the provincial and federal governments, and will also require their annual input on progress made in relation to the stated objectives and actions. Table 2: Performance Measures, on the following page, illustrates how perfromance will be measured.

7.3 Measuring Watershed Health – Report Card

It is the intention of Manitoba Water Stewardship to develop a Watershed Report Card for all watersheds in Manitoba. The report card would include a standardized set of indicators determined and measured by the scientific community. This reporting method would allow fair comparisons of watershed health to other watersheds and within an individual watershed over time. Once the reporting method and format is approved, Manitoba Water Stewardship will work with each Water Planning Authority to develop a report card. Considering the cost, involvement of technical experts, necessity related to measurable change, and urgency, the interval at which a Watershed Report Card will be provided to the general public requires further discussion.

A Watershed Report Card would allow fair comparisons of watershed health to other watersheds and within an individual watershed over time.

7.4 Plan Review

As described in the Terms of Reference for the development of the Seine River Integrated Watershed Management Plan, the Water Planning Authority is responsible for a full review and re-development of the plan starting in March 2018. Although the composition of the Seine-Rat River Conservation District Board of Directors will change over the next ten years, the Water Planning Authority designation along with specific roles and responsibilities will remain in place.

Table 2: Performance Measures

Objective	Performance Measure	Reporting Authority
Implement water management strategies throughout the watershed to minimize downstream flood damage to residential areas and infrastructure.	1) Number of Crop Insurance claims 2) Number of EMO claims 3) Number of claims and repair projects by municipalities	1) Manitoba Crop Insurance 2) Manitoba Emergency Measures Organization (EMO) 3) Local municipalities
Ensure that the provincial waterways network is maintained effectively.	1) Kilometres of provincial waterways maintained/reconstructed 2) Number of crossings maintained/replaced	Manitoba Infrastructure and Transportation
Obtain a better understanding of the current water quality and nutrient source inputs in the Seine River Watershed.	1) Number of water quality samples obtained from throughout the watershed	SRRCD
Reduce nitrogen and phosporus loading by 10%.	1) Water quality parameters (total Nitrogen and total Phosphorus)	Manitoba Water Stewardship
Protect drinking water sources from contamination.	1) Number of abandoned wells sealed 2) Establishment of Source Water Protection Committee 3) Number of Source Water Protection projects completed 4) Number of well water samples that obtained a "Pass" result.	SRRCD; Manitoba Water Stewardship - Groundwater Management
Expand the groundwater database to gain a better understanding of the groundwater resources in the watershed.	1) Number of groundwater samples collected	Manitoba Water Stewardship - Groundwater Management
Implement river management projects to improve flow, biodiversity and aesthetics.	1) Number of river management projects completed	SRRCD
Remove all garbage and excess debris from the Seine River.	1) Length (Metres) of river cleaned up 2) Completion of river clean-up inventory project	SRRCD
Continue to improve the way development and land use occurs by involving relevant stakeholders, enforcing and reviewing existing legislation, and implementing new policy and technologies.	1) Number of municipalities incorporating the watershed management plan recommendations into their municipal development plans 2) Number of environmental farm plans completed in the watershed	1) Manitoba Intergovernmental Affairs - Community Planning Services 2) Agriculture and Agri-Food Canada
Provide the public with opportunities to become aware of the importance of healthy watersheds.	1) Number of school-aged children involved in workshops and watershed education presentations 2) Number of watershed education documents produced and distributed to public	SRRCD

Appendix A: List of Organizations/Agencies Invited to Participate

1. Agriculture and Agri-Food Canada-Prairie Farm Rehabilitation Administration*
2. Canadian Wildlife Service*
3. City of Steinbach*
4. City of Winnipeg*
5. Cooks Creek Conservation District*
6. Dairy Farmers of Manitoba*
7. Environment Canada*
8. Fisheries and Oceans Canada*
9. Hanover School Division
10. Louis Riel School Division
11. Macdonald-Ritchot Planning District
12. Manitoba Cattle Producers Association*
13. Manitoba Egg Producers
14. Manitoba Habitat Heritage Corporation*
15. Manitoba Lodge and Outfitters Assoc.
16. Manitoba Water Services Board
17. Manitoba Wildlife Federation*
18. Manitoba Agriculture, Food and Rural Initiatives*
19. Manitoba Conservation*
20. Manitoba Industry, Economic Development and Mines*
21. Manitoba Infrastructure and Transportation*
22. Manitoba Intergovernmental Affairs & Trade*
23. Manitoba Water Stewardship*
24. Nature Conservancy of Canada*
25. Pinewood Pure Springs
26. Premier Horticulture Ltd.
27. Red River Valley School Division
28. Rural Municipality of De Salaberry*
29. Rural Municipality of Hanover*
30. Rural Municipality of La Broquerie
31. Rural Municipality of Piney
32. Rural Municipality of Reynolds*
33. Rural Municipality of Ritchot*
34. Rural Municipality of Springfield*
35. Rural Municipality of Ste. Anne*
36. Rural Municipality of Taché
37. Save Our Seine River Environment Inc.*
38. Seine River School Division
39. Seine River Wildlife Association*
40. Seine-Rat River Conservation District*
41. Seven Oaks Game and Fish Club*
42. Snow Raiders Snowmobile Club
43. South East Soil Conservation Organization*
44. Steinbach Game and Fish Club
45. The Manitoba Sheep Association*
46. Town of Niverville
47. Town of Ste. Anne*
48. University of Manitoba, Clayton H. Riddell Faculty of Environment, Earth and Resources
49. University of Winnipeg*
50. Village of St. Pierre-Jolys*

*** Indicates member of the Watershed Planning Advisory Team**

Appendix B: Other Issues Raised by the Public

In addition to concerns expressed by watershed residents regarding the six major issues discussed in this plan, several other issues were raised.

- Provide compensation for landowners participating in water retention projects.
- Control drainage discharges from peat moss operations.
- Promote wildlife management.
- Water conservation.
- Increase appropriate beaver control.
- Crop input plans should address water quality.
- Need more efficient nutrient management of raw sewage and manure.
- Increase enforcement of *The Environment Act* related to manure.
- Better management of fuel tanks, especially in aggregate operations.
- Increase soil conservation and more grassed waterways.
- Need to regulate the clearing of marginal land for agriculture.
- Treat the Seine River and Seine River Diversion as separate waterways.
- Reseed the banks of the Seine River Diversion to reduce erosion and runoff.
- Improve Seine River for recreation.
- Improve the Seine River siphon to allow for better fish passage.
- Redirect Fish Creek into Center Line Drain (Floodway) to reduce flooding on Seine River.
- Investigate Prairie Grove Drain Plan.
- Increase the cooperation of industries in water protection.
- Reduce flood effects on septic fields and wells.
- Reduce number and duration of boil water advisories.
- Develop Emergency Flood plan.

Appendix C: You Can Improve the Health of the Seine River Watershed

Watershed health is a shared responsibility! All watershed residents can participate towards protecting, enhancing and improving the Seine River Watershed. It is truly impossible to complete a comprehensive watershed management plan because of the overwhelming complexity of known and unknown interactions and associations within a watershed, but the vision of the Water Planning Authority is that all watershed residents will do their part in securing the sustainability of the natural resources and environment that they depend on and enjoy.

Here are some suggestions on how you can do your part:

Surface Water Management

- Assist the Conservation District in identifying suitable water retention sites.
- Control drainage from your property to reduce potentially negative impacts to downstream neighbours.
- Maintain permanent cover (forage, grass, stubble) and establish shelterbelts as a way of catching snow and slowing the snow-melt in the spring.
- Value wetlands and marshland! They play a vital role in storing and purifying water and providing a diversity of habitat for fish and wildlife.
- Maintain vegetated and healthy buffers along waterways. Rivers and riverbanks are not static systems and require maintenance and rehabilitation.

Surface Water Quality

- Ensure that your septic system operates properly and is serviced regularly.
- Use phosphate-free detergents, soaps and household cleaners.
- Fence livestock from waterways and establish off-site watering systems.
- Maintain vegetated and healthy riparian buffers along waterways.
- Don't use fertilizers (chemical or natural) close to waterways.
- Conduct annual soil testing to guide your decisions regarding the level of nutrients that are applied to the land.

Groundwater

- Call the Seine-Rat River Conservation District if you have an abandoned well that needs to be sealed/decommissioned.
- If you have your own well, get the well water tested annually.
- Inspect your well annually to eliminate any chances of contaminated water entering your well casing.

Management of the Seine River

- Remove unnecessary man-made obstructions and debris from the Seine River.
- Don't throw your lawn clippings or any garbage into the river or on the river bank.
- Initiate a local river clean-up group with your neighbors or hold an annual river clean-up day each fall.
- Maintain a natural vegetation buffer of trees and shrubs along the river.

Land Use Planning

- Contact your municipal office to find out more about your municipal development plan.
- Make your local municipal councilors aware of concerns with land use development plans.

Watershed Awareness

- Volunteer or participate in group activities with the Seine-Rat River Conservation District.
- Encourage your children to respect the environment and understand the importance of protecting our valuable water resources.