



RAT-MARSH RIVER

INTEGRATED WATERSHED MANAGEMENT PLAN

ACKNOWLEDGEMENTS

The Seine-Rat River Conservation District, as the Water Planning Authority for the Rat-Marsh River Watershed, would like to acknowledge and thank the watershed residents and partners for participating and providing input to the development of the Rat-Marsh River Integrated Watershed Management Plan.

Thank you to members of the Watershed Team that represented the following organizations:

- **Seine-Rat River Conservation District**
- **RM of De Salaberry**
- **RM of Stuartburn**
- **RM of Hanover**
- **RM of La Broquerie**
- **RM of Franklin**
- **RM of Piney**
- **RM of Morris**
- **RM of Montcalm**
- **RM of Ritchot**
- **Village of St. Pierre-Jolys**
- **Maple Leaf Agri-Farms**
- **HyLife Ltd**
- **The Puratone Corporation**
- **Agra-Gold Consulting Ltd**
- **Dairy Farmers of Manitoba**
- **Red River Basin Commission**
- **Manitoba Habitat Heritage Corporation**
- **Nature Conservancy of Canada**
- **Ducks Unlimited Canada**
- **St. Malo Lake Stewardship Committee**
- **Agriculture and Agri-food Canada – Agri-Environmental Services Branch**
- **Manitoba Agriculture, Food and Rural Development**
- **Manitoba Conservation and Water Stewardship**
- **Manitoba Municipal Government**
- **Manitoba Infrastructure and Transportation**

Thank you to the members of the Project Management Team - Gerry Maynard, Jim Swidersky, Cornie Goertzen, Patrick Watson, Kristy-Layne Carr and Jodi Goerzen whom displayed devotion, integrity and diligence throughout the development of the plan.

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EXECUTIVE SUMMARY

The Rat-Marsh River Integrated Watershed Management Plan was developed in partnership with the Seine-Rat River Conservation District, the Province of Manitoba, stakeholder organizations, and watershed residents. The purpose of the plan is to positively influence the stewardship of land, water, and aquatic ecosystems in the watershed over the next 10 years.

The plan represents a watershed area, beyond municipal and community boundaries, connected by shared land and water. This watershed connection is most obvious when activities and developments in the upstream area of the watershed cause negative impacts downstream such as flooding, riverbank erosion, and water quality degradation.

In the early stages of the planning process, five public consultation meetings were held in communities throughout the watershed. The purpose of the meetings was to openly discuss and document watershed issues and concerns. This formed the starting point for the plan and led to the establishment of four watershed goals.

WATERSHED GOALS

- 1 SOURCE WATER PROTECTION**
Protect and conserve the quality and quantity of groundwater
- 2 SURFACE WATER MANAGEMENT**
Adopt an integrated, watershed-based approach to surface water management
- 3 WATER QUALITY PROTECTION**
Protect and improve surface water quality in waterways
- 4 RIPARIAN AND AQUATIC ECOSYSTEM MANAGEMENT**
Protect and restore riparian areas and aquatic ecosystems

Implementation plans including actions to meet the watershed goals were developed for each of the stakeholder organizations. The implementation of these actions through on-going partnerships, communication and cooperation over the next 10 years is crucial to protecting and enhancing the long-term health and sustainability of the Rat-Marsh River Watershed.

Watershed health and sustainability requires long-term planning, commitment, and cooperation – everyone has a role to play.

INTRODUCTION

A watershed is a topographically defined area of land, akin to a bathtub, where all the precipitation that lands within the area either soaks into the ground or flows through a network of waterways and ends up at a common downstream point such as a lake or large river. The water that soaks into the ground becomes groundwater and may eventually resurface at a location elsewhere in the watershed.

The most ecologically and administratively appropriate planning unit for water management is a watershed. Planning at a watershed level gives local people an opportunity to gain a better understanding of land and water interactions that occur and strengthens the importance of their role in protecting and improving the long-term health and sustainability of the place they call home.

Watersheds are comprised of a uniquely diverse and interrelated complex of natural and man-made landscapes. When these landscapes are disturbed or altered by human or natural causes, there is usually an impact or consequence downstream in the watershed. The most common impact is higher stream flows which can cause flooding, erosion, sedimentation and water quality issues.

A healthy watershed is the result of good land use and development planning and an ethic of land and water stewardship. Healthy watersheds maintain prosperous local communities and provide a quality source of drinking water, agricultural opportunities, wildlife, and places for recreational enjoyment. The plan outlines many simple daily changes that people can make to minimize their environmental footprint and maintain and improve watershed health.

PURPOSE

The purpose of the Rat-Marsh River Integrated Watershed Management Plan is to positively influence the stewardship of land, water, and aquatic ecosystems in the watershed.



INTEGRATED WATERSHED MANAGEMENT PLANNING

Integrated watershed management planning is a cooperative and community-based planning effort undertaken to discuss and develop actions to resolve issues affecting water, aquatic ecosystems, and drinking water sources. In Manitoba, integrated watershed management plans (IWMPs) are developed cooperatively between the local conservation district, the Province of Manitoba, stakeholders and residents. Plans should be supportive of the existing community framework for economic development and land use planning. In this plan, an effort was made to build linkages with the existing development plans and to work in harmony with other planning processes and regional strategies.

LAND USE PLANNING

Land use planning in Manitoba is legislated by *The Planning Act* and guided by the Provincial Land Use Policies (PLUPs). *The Planning Act* requires that all municipalities, either individually or through a Planning District, must adopt a Development Plan By-law and a Zoning By-law. The by-laws are established to ensure orderly and organized development of land within a municipality. Throughout the development of the by-laws, a planning district board or municipal council must consider the PLUPs and the application of integrated watershed management plans. The Zoning By-Law is intended to: prescribe specific development standards for each land use; outline the conditional use process used to deal with potentially sensitive uses; and regulate or prohibit the use of land, establishment of buildings and structures, and the cutting and removal of trees and vegetation in an effort to protect sensitive lands.

CROWN LAND PLANNING

The planning and classification of Crown land in agro-Manitoba is the responsibility of the Crown Lands Assistant Deputy Ministers Committee (CLADMC). The interdepartmental committee includes representation from Manitoba Agriculture, Food and Rural Development, Conservation and Water Stewardship, Aboriginal and Northern Affairs, Municipal Government, and Mineral Resources. The purpose of the committee is to oversee Crown land use planning and resolution of land and resource use conflicts among government departments.

Regional Block Planning Committees, comprised of specialists from each of the departments represented on the Crown Lands Assistant Deputy Ministers Committee, provide on-the-ground, integrated planning and resource management expertise on issues related to Crown land. Their recommendations, intended to improve long-term land and resource use and reduce land-use conflicts, are forwarded to the CLADMC for final approval.

Crown land suitable for agricultural use may be leased for grazing, haying or annual cropping, depending on the capability of the land. Through a careful planning process, provincial land use and watershed specialists determine how parcels of Crown land may be used, the intensity of use and how different parcels may be developed.

LINKAGES WITH REGIONAL PLANS

Throughout the planning process the Project Management Team compiled and reviewed existing regional plans and identified recommendations and policies where there may be opportunities to support or coordinate efforts for plan implementation. Although this plan is the only plan based on the watershed boundaries, many common issues and recommendations were found. The intention of the IWMP was never to replace existing plans but rather to enhance or support them.

Many planning initiatives require consideration and integration of other regional strategies or plans. As an example, Section 62.1 'Consideration of *Water Protection Act*' in *The Planning Act* states that, "When preparing a development plan or amending or re-enacting a development plan by-law, a board or council must consider the application of the following insofar as they relate to land within the planning district or municipality: (a) any regulation made under section 5 of *The Water Protection Act* governing, regulating or prohibiting use, activity or thing in a water quality management zone designated under that Act; (b) any watershed management plan approved under *The Water Protection Act*."

NON-GOVERNMENT ORGANIZATIONS – PLANNING AND LAND MANAGEMENT

The three most notable non-government organizations in the watershed are the Seine-Rat River Conservation District, Nature Conservancy of Canada and Manitoba Habitat Heritage Corporation. Each has led land and water management planning initiatives and offer beneficial management practice (BMP) programs in the Rat-Marsh River Watershed. Although each organization has somewhat different mandates, they all share a common vision to protect and enhance watershed health for present and future generations.



RAT-MARSH RIVER WATERSHED

The Rat-Marsh River Watershed is located in southeastern Manitoba. The two main rivers in the watershed are the Rat River and Marsh River. The Rat River begins in the Sandilands Provincial Forest near the town of Carrick and flows west and northwest to the downstream confluence with the Red River about three kilometres north of Ste Agathe. The two main tributaries of the Rat River are Joubert Creek and Sand River. The Marsh River begins approximately fifteen kilometres southeast of Morris and flows north through the Red River Valley joining the Rat River near Ste Agathe.

The Rat-Marsh River Watershed has a drainage area of approximately 2,180 square kilometres (1,080 square miles) with over 850 kilometres (528 miles) of waterways. The watershed includes land in the municipalities of De Salaberry, Stuartburn, Franklin, Morris, Montcalm, Ritchot, Hanover, La Broquerie, and Piney and has a population of approximately 10,000 people. As illustrated in Figure 1, the Rat-Marsh River Watershed is comprised of three sub-watersheds: Upper Rat River sub-watershed, Lower Rat River sub-watershed, and Marsh River sub-watershed.

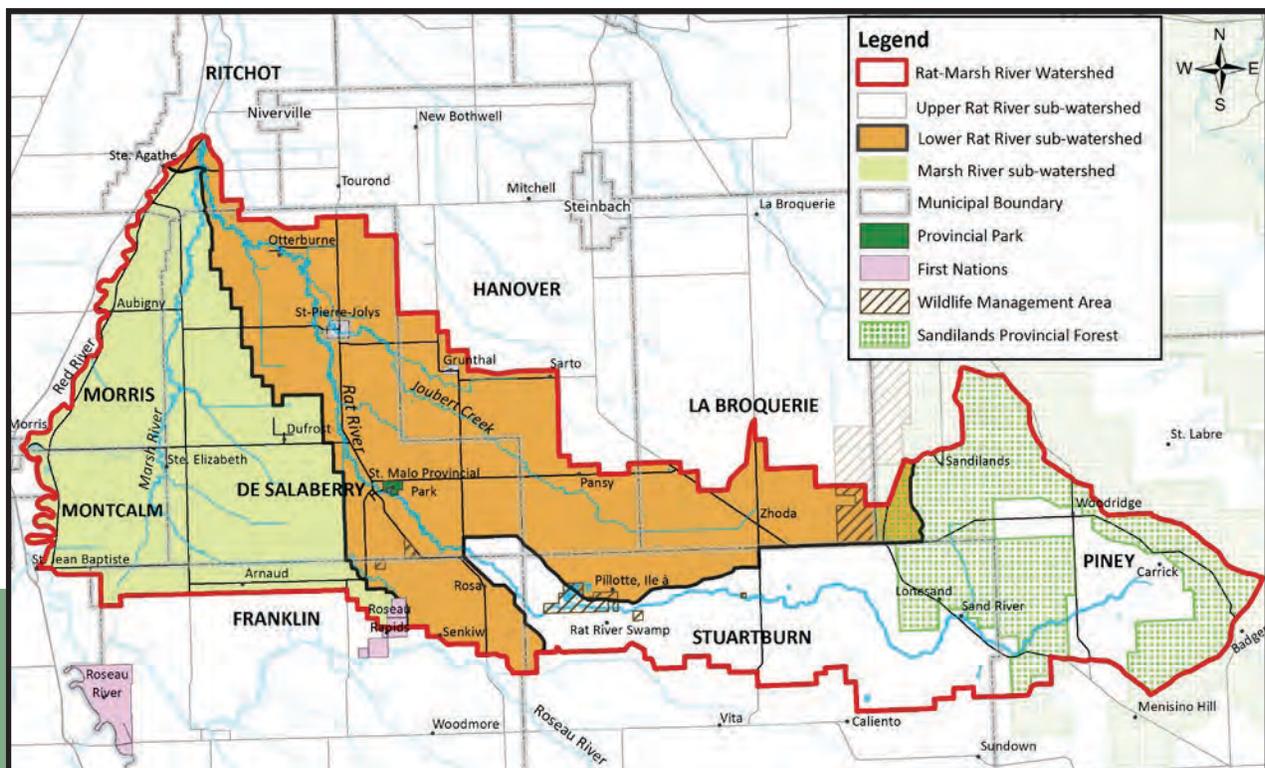


Figure 1: Sub-watersheds in the Rat-Marsh River Watershed

The Marsh River sub-watershed is characterized by a topographically flat, river valley, flood-prone landscape with agriculturally productive soils used primarily for crop production. The western half of the Lower Rat River sub-watershed is characterized very similar to the Marsh River sub-watershed while the eastern half is characterized by forest, marshland, cropland, hay land and pasture. Livestock production is concentrated in the Lower Rat River sub-watershed; characterized by numerous small cattle operations, as well as intensive hog and poultry operations. The western half of the Upper Rat River sub-watershed is characterized by a topographically flat, marshland, hay land, and cropland landscape while the eastern half is primarily forested Crown land, marshland, with some hay land, pasture and cropland.

Figure 2 illustrates the land cover in the Rat-Marsh River Watershed. The percentages of total land cover are: annual cropland (34%), trees (33%), grassland/pasture (18%), wetlands (9%), urban/cultural (3%), forage (2%), and water (1%).¹

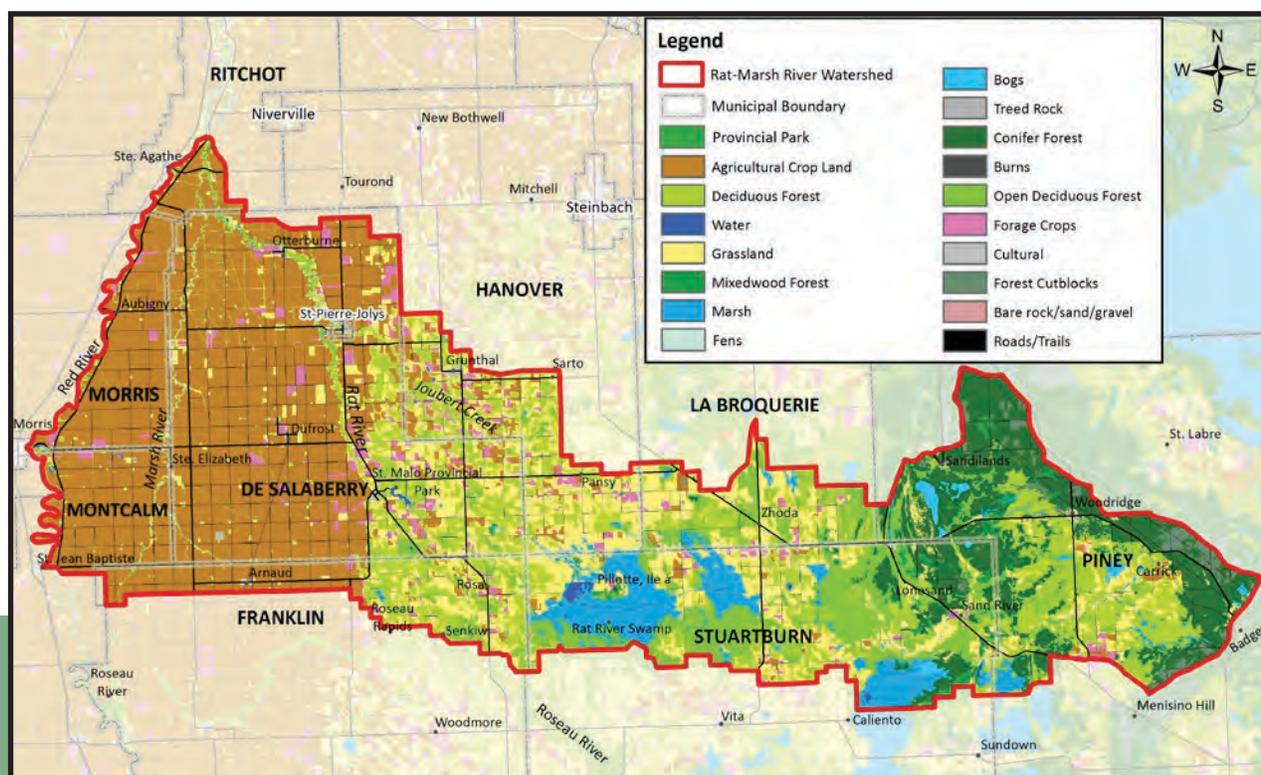


Figure 2: Land Cover in the Rat-Marsh River Watershed

Provincial Crown land covers approximately 24% (52,200 ha) of the watershed. The vast majority (82%, 42,600 ha) of this Crown land is non-agricultural in nature, consisting of mostly provincial forest and wildlife management areas in the eastern part of the watershed. Agricultural Crown land is located primarily in the central area of the watershed and includes leased land (4,900 ha), community pasture (3,000 ha), and annually permitted land (1,600 ha). The vast majority of the Crown land in the watershed is located within the RM of Piney (56%, 29,279 ha) and RM of Stuartburn (36%, 18,547 ha). Much smaller areas of Crown land are located within the RM of Hanover (3%, 1,809 ha), RM of La Broquerie (3%, 1,631 ha), RM of De Salaberry (1%, 545 ha), and RM of Franklin (<1%, 259 ha).¹

The large amount of public and private conservation land in the Rat River Swamp is notable. Crown lands within the Rat River Swamp combined with the Pansy Community Pasture, Nature Conservancy of Canada land, Manitoba Habitat Heritage Corporation land, St. Malo Game and Fish land, the Rat River Wildlife Management Area, and the north block of the Manitoba Tall Grass Prairie Preserve create a nearly-contiguous block of virtually uninhabited and largely natural land in excess of 12,000 ha (>29,600 ac).

Over the past 15 years, there has been a small reduction in the acres of annual cropland as cultivated acres have been converted to forages, especially in the central watershed area. As well, a small increase in the area of wetlands has occurred in the eastern portion of the watershed.

Agricultural capability is a seven class rating of mineral soils based on the severity of limitations to dry farming. The rating does not indicate soil productivity, but rather the capability to sustain agricultural crops based on limitations to soil properties, landscape features and climate. Figure 3 illustrates the agricultural capability in the Rat-Marsh River Watershed. Approximately 56% or 121,200 ha of the land in the Rat-Marsh River Watershed are classified as highly productive (Class 1, 2 and 3) land in terms of agricultural capability. The vast majority of this land is located in the Red River Valley. Approximately 36% or 77,870 ha of the land in the watershed is considered marginal (Class 4, 5 and 6) in terms of agricultural capability, and is mostly located in the eastern portion of the watershed, west of St. Malo. Marginal land has soil limitations that are not well suited for annual crop production. Approximately 9% or 18,700 ha of land in the watershed are classified as organic. Organic soils are primarily found in the wetlands associated with the Rat River and Sand River in municipalities of Stuartburn and Piney.

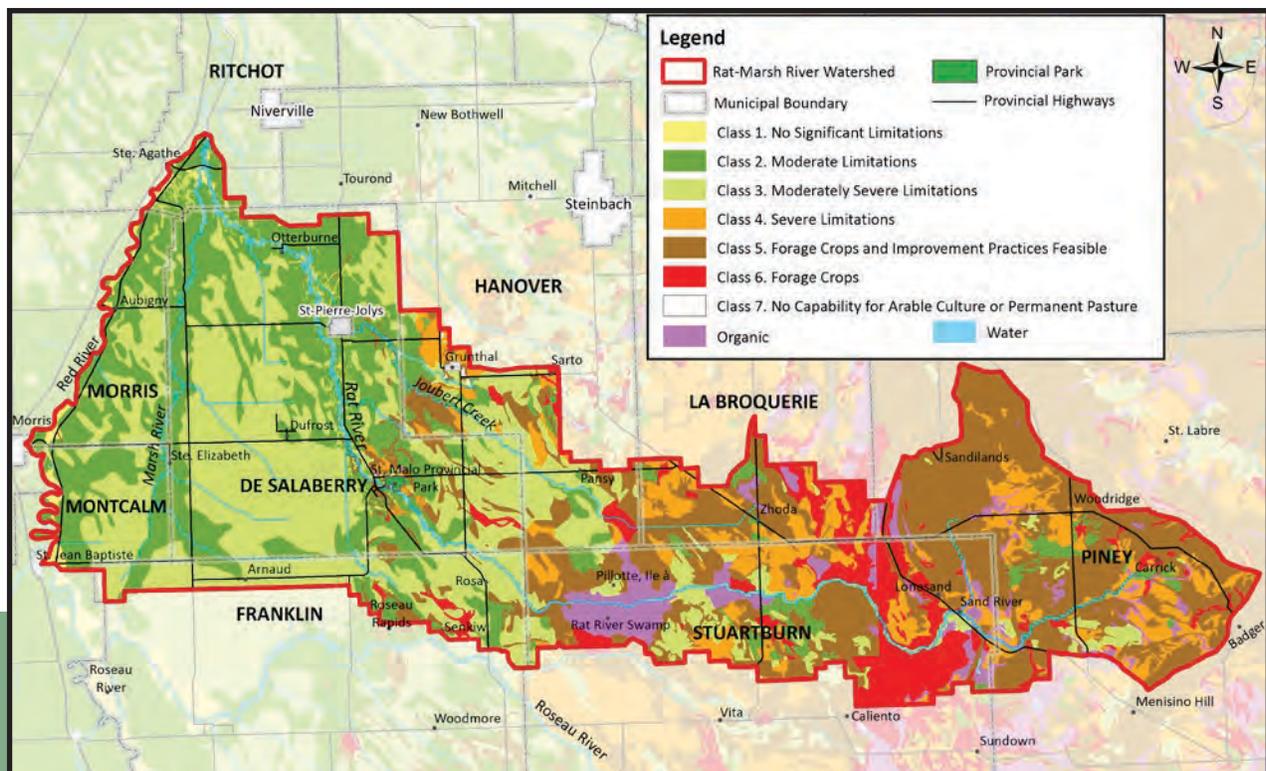


Figure 3: Agricultural Capability in the Rat-Marsh River Watershed

Soil drainage classification reflects the actual moisture content in excess of field capacity and the length of the saturation period within the plant root zone. Excess water content in the soil limits the free movement of oxygen and decreases the efficiency of nutrient uptake. Drainage improvements to decrease the duration of standing water and amount of soil moisture provide greater flexibility to crop management. Figure 4 illustrates the soil drainage classes in the Rat-Marsh River Watershed. Approximately 71% or 155,600 ha in the watershed are classified as imperfectly or poorly drained. There are pockets of very poorly drained organic soils in the central and eastern portions of the watershed, located in the wetlands of Stuartburn and Piney and along the Sand River. The furthest east area of the watershed is located on sandy soils and is primarily classified as well or rapidly drained.

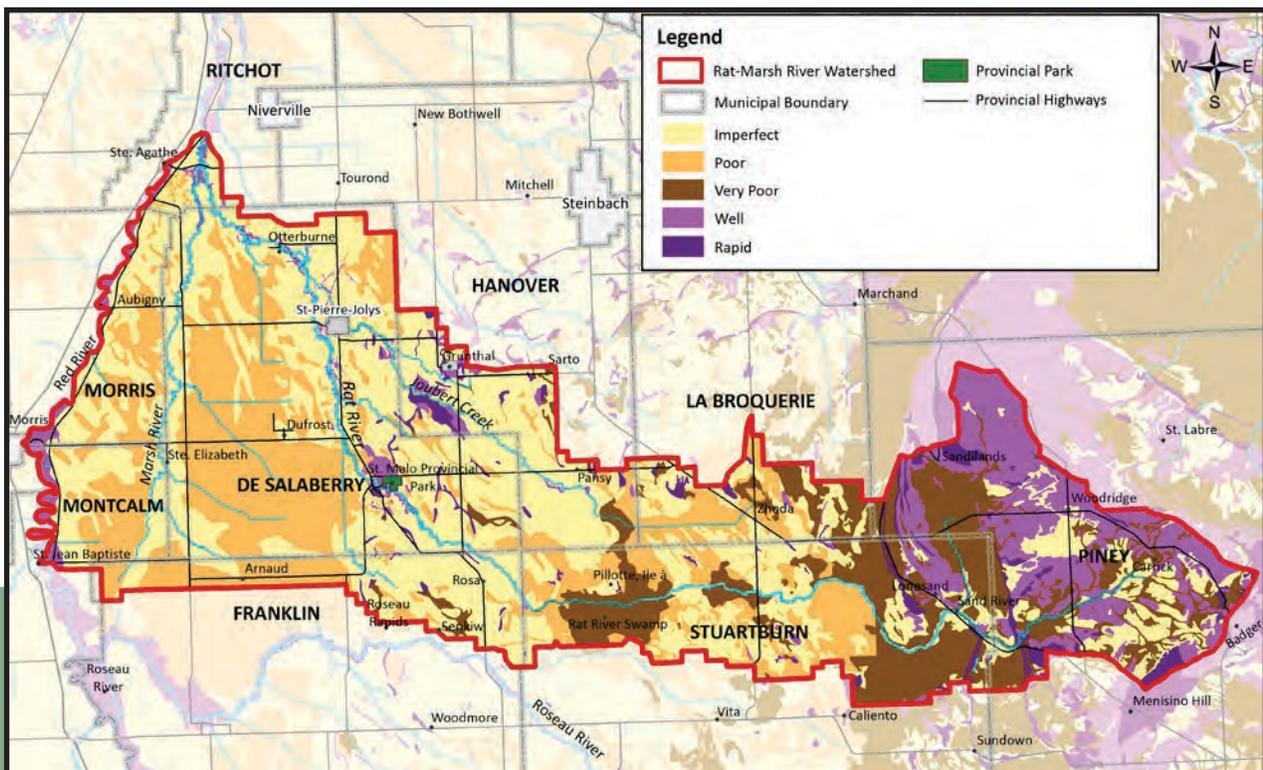


Figure 4: Soil Drainage Classes in the Rat-Marsh River Watershed

The Red River Valley Designated Flood Area is illustrated in Figure 5. This provincially designated flood area is defined in the Designated Flood Area Regulation of *The Water Resources Administration Act*. The Regulation describes the requirements necessary for activities and development within the area. All permanent structures constructed within the Red River Valley Designated Flood Area must be protected from flooding by flood protection works. Flood protection for structures within the area must be provided to the corresponding 1997 water surface elevation plus 0.6 metres (2 feet). Designated Flood Area Permits must be obtained from Manitoba Infrastructure and Transportation prior to building permits being issued by local municipalities. The Designated Flood Area Permit will specify the elevation, referenced to Geodetic Survey of Canada Datum, to which flood protection works must be constructed. There is no charge for a permit.

The Red River Valley Special Management Area is defined in the Livestock Manure and Mortalities Management Regulation of *The Environment Act*. The intent of the regulation is to ensure that livestock manure and mortalities are managed in an environmentally sound manner. As Figure 5 illustrates, the Special Management Area includes the vast majority of the Red River Valley within the Rat-Marsh River Watershed. The Red River Valley Special Management Area is a regularly flooded area where special manure management practices are required. As of November 2006, manure applied to tilled land in the fall (between September 10th and November 10th) must be injected or incorporated within 48 hours of application. This is not required for manure applied to perennial forage or no-till systems.

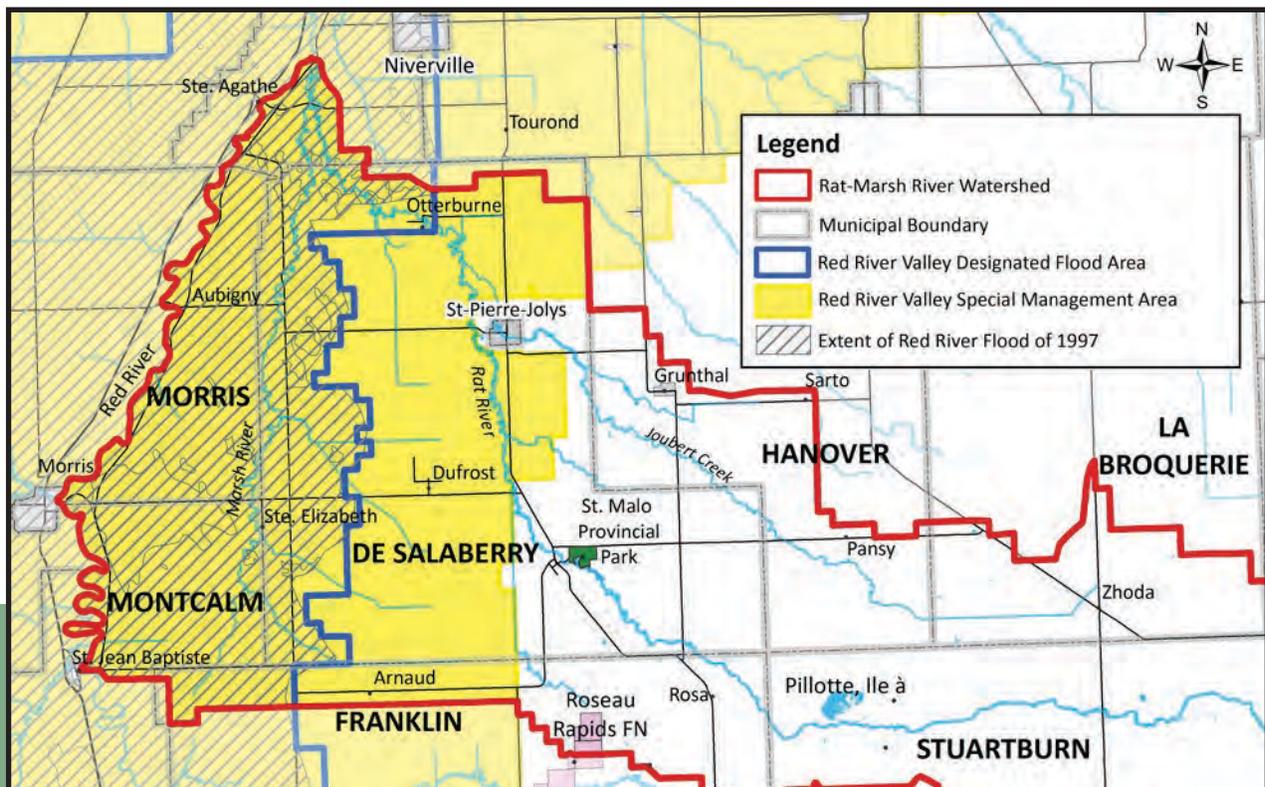


Figure 5: Red River Valley Designated Flood Area and Special Management Area in the Rat-Marsh River Watershed

The geological framework of the watershed is somewhat complex. It consists of overburden deposits of silt, clay, till and sand and gravel which are underlain by bedrock deposits. The thickness of the overburden is typically a minimum of about 30 metres (100 feet) in the western lowland portion of the watershed (Red River plain) and increases to greater than 120 metres (400 feet) in the eastern upland portion (Sandilands) of the watershed.² In general, overburden materials in the lowland portion of the watershed are primarily lacustrine clay overlying glacial till but also include lenses of sand and gravel as inter till deposits; and overburden materials in the upland portion of the watershed include lacustrine clay (which thins and terminates eastwardly), glacial till and fairly extensive (and in some areas complex) glacial deposits of surficial, near-surface, lenses of, and major buried sand and gravel.

Groundwater exists in a long-term balance between recharge and discharge of water within the aquifer system. The fundamental mechanisms contributing to groundwater recharge and discharge are generally well understood; however, details regarding recharge and discharge process and rates, surface water and groundwater interactions, and aquifer and aquitard dynamics are often not well developed. Numerical modeling completed as part of a groundwater resource evaluation within the south-eastern region of Manitoba by the Groundwater Management Section of Manitoba Conservation and Water Stewardship has improved the understanding of recharge processes and rates in the Rat-Marsh River Watershed and suggests that recharge rates vary with time and area. For modeling purposes, the rate of recharge has been estimated for three zones within the region: 1) clay covered lowlands within the Red River Plain; 2) glacial till covered uplands – the area east of the Red River to approximately the eastern boundary of the municipality of La Broquerie; and 3) the forest covered area to the east of the glacial till covered uplands. The average estimates of recharge are 10 mm/yr for the clay covered lowlands, 20 mm/yr for the glacial till covered uplands, and 220 mm/yr for the forest covered area.

The availability of groundwater varies across the watershed. In the downstream part of the watershed, groundwater is brackish to saline (TDS greater than 1,000 mg/L) and usually not a suitable source of potable water. Groundwater elsewhere throughout the watershed is generally available in quantities sufficient for private, domestic use.

As illustrated in Figure 6, the principal aquifers in the watershed are:

- overburden deposits of sand and gravel
- carbonate (limestone/dolomite) rocks of the Ordovician Red River Formation
- sandstone of the Ordovician Winnipeg Formation

As also illustrated in Figure 6, a fresh water-salt water boundary exists within the sandstone aquifer. The location and potential migration of the naturally occurring boundary is an on-going concern for the RM of De Salaberry. Water quality monitoring related to the location of the boundary is ongoing.

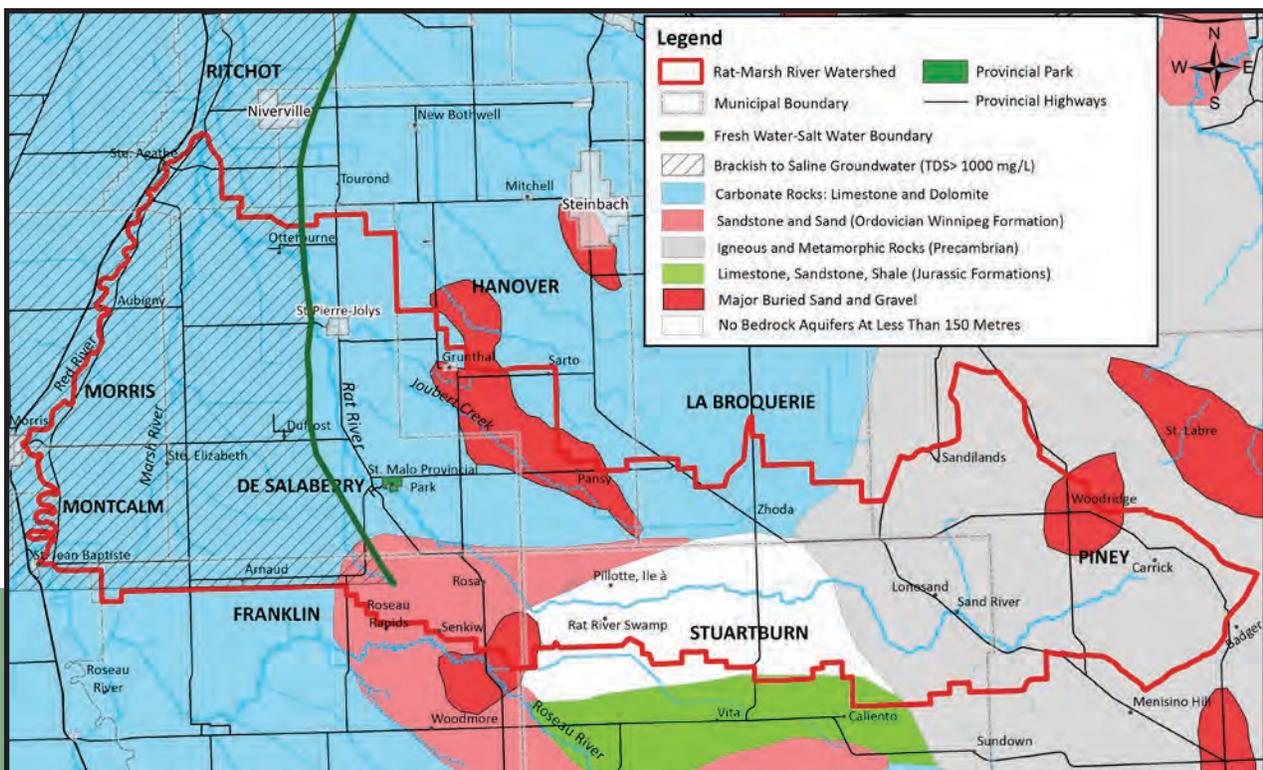


Figure 6: Groundwater in the Rat-Marsh River Watershed

WATERSHED GOALS

The Project Management Team, a group of local people who coordinated the development of the plan, hosted public meetings to collect input on land and water related issues in the watershed. The input was recorded in a 'Summary of Public Input to the Rat-Marsh River IWMP' document.³ Upon consideration of all of the input collected from the public meetings and from the technical information submissions received from numerous experts from various disciplines, the Project Management Team developed four watershed goals.

WATERSHED GOALS

1

SOURCE WATER PROTECTION

Protect and conserve the quality and quantity of groundwater

2

SURFACE WATER MANAGEMENT

Adopt an integrated, watershed-based approach to surface water management

3

WATER QUALITY PROTECTION

Protect and improve surface water quality in waterways

4

RIPARIAN AND AQUATIC ECOSYSTEM MANAGEMENT

Protect and restore riparian areas and aquatic ecosystems



PROTECT AND CONSERVE THE QUALITY AND QUANTITY OF GROUNDWATER

Groundwater is the primary water supply for domestic, municipal, commercial and agricultural purposes in the watershed. It also provides important base flow and ecological function to rivers and wetlands through discharge as springs and seepages. Protecting and conserving the quality and quantity of groundwater is vitally important for watershed residents and the ecological health of the watershed.

THE DRINKING WATER SAFETY ACT

Manitoba Conservation and Water Stewardship's Office of Drinking Water administers and enforces *The Drinking Water Safety Act* and associated Regulations. Regional Drinking Water Officers work closely with the operator of public water systems to ensure that they meet requirements of the provincial regulations.

PUBLIC AND SEMI-PUBLIC WATER SYSTEMS

In Manitoba, a public water system is defined as a drinking water supply system that has 15 or more service connections or has been designated as a public water system under *The Drinking Water Safety Act*. A semi-public water system is defined as a drinking water supply system with 2 to 14 service connections or an individual water supply for a facility that serves the public such as a school, restaurant or hospital. All of the systems draw water from groundwater aquifers in the watershed. Of the approximately 10,000 people living in the watershed, about 25% use treated water from one of the nine public water systems and 75% from either a semi-public water system or private well.



DID YOU KNOW?

SOURCE WATER ASSESSMENTS

Source water assessments were completed for each of the nine public water systems in the watershed. The purpose of the assessments was to identify issues within a 1.5 kilometre radius buffer around each public water system well that pose a high risk to the quality of the drinking water source, and to develop actions to address the issues. Figure 7 illustrates the name of each public water system, locations of the water system well(s), and the source water protection zones.

The source water assessment report describing the process, information about each water system, and maps showing the source water protection zones around the public water system wells is available from the Seine Rat River Conservation District. It is important to note that the assessment process is a relatively informal and qualitative approach to assessing threats to public drinking water sources and that source water protection needs to be an on-going effort.

During the source water assessments, there were very few potential sources of contamination that were identified and none were ranked as having a high risk of impacting the quality of the public drinking water sources. The general recommendations established for all of the public water systems are as follows:

- Municipalities should adopt policies that restrict future intensive and high-pollution risk developments in source water protection zones. These developments include activities, land uses and structures that have a high risk of causing pollution and include, but are not limited to chemical and fertilizer storage facilities, septic systems, petroleum storage, waste disposal grounds, and wastewater lagoons.
- Seal unused, abandoned, and poorly constructed or hazardous wells located within a source water protection zone.
- Distribute publications that educate landowners on:
 - i. Public drinking water sources in their watershed;
 - ii. Groundwater protection and conservation;
 - iii. Impacts of land use activities on groundwater and aquatic ecosystems;
 - iv. Well assessment and maintenance;
 - v. Septic system monitoring and maintenance.
- Ensure campgrounds and trailer parks with 15 or more water connections are reporting to the Office of Drinking Water as a public water system and operating in compliance with regulatory requirements.

- There are several thousand kinds of bacteria found in nature – far too many to test for individually. A positive test result for E.coli or total coliforms in drinking water signals bacterial contamination. Although many types of bacteria are not harmful to humans or livestock, their presence indicates the potential presence of more harmful bacteria or pathogenic organisms in the water.

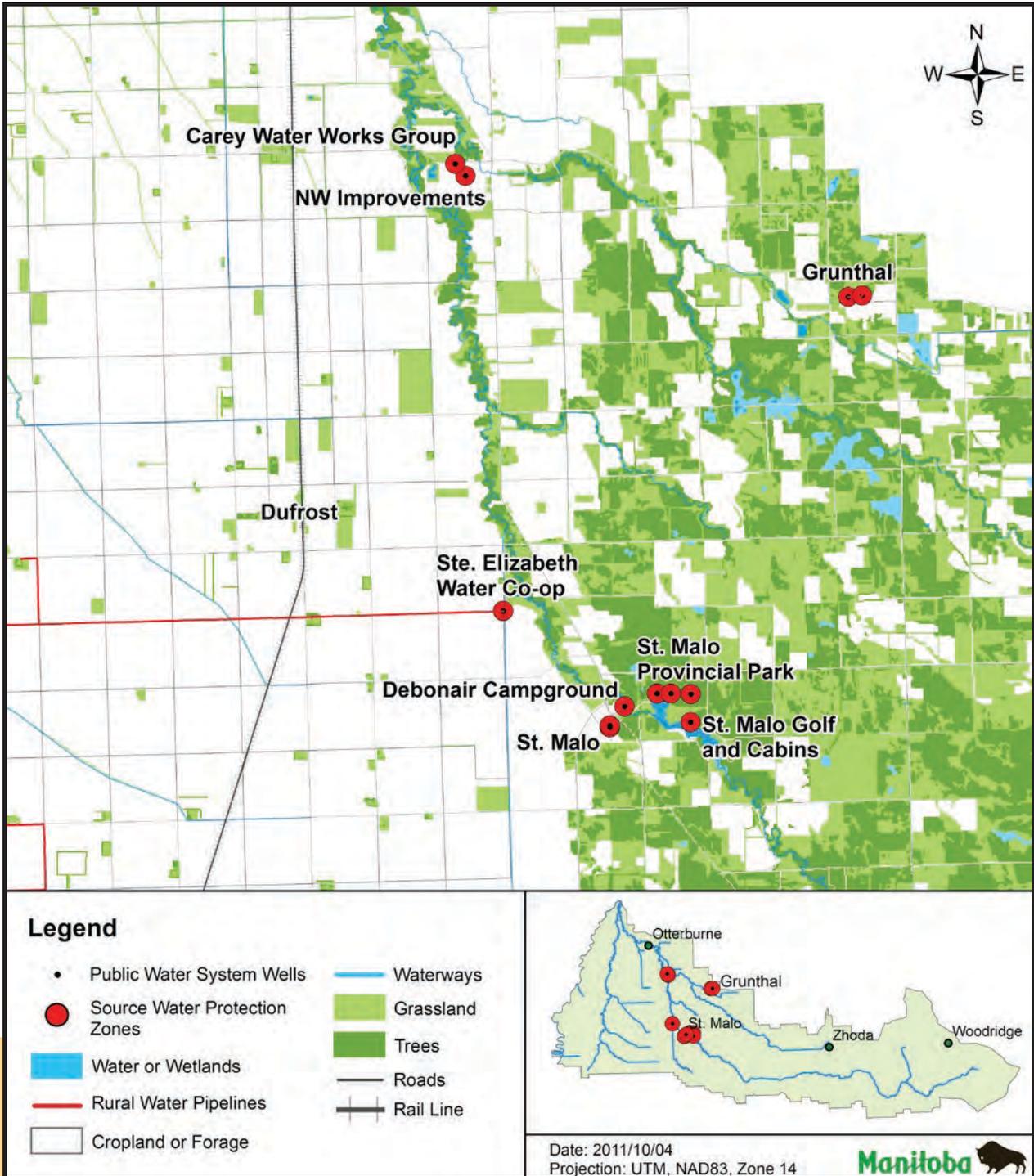


Figure 7: Public Water System Wells and Source Water Protection Zones in the Rat-Marsh River Watershed

BOIL WATER ADVISORIES

As of December 2012, four of the nine public water systems in the watershed were under boil water advisory for failing to meet the regulatory requirements as defined in *The Drinking Water Protection Act*. The other five systems have never been under boil water advisory. Owners of the public drinking water systems, with support from Manitoba Conservation and Water Stewardship's Office of Drinking Water, are responsible for the removal of boil water advisories and ensuring compliance with provincial regulations.

EMERGENCY RESPONSE PLANS

Emergency preparedness is important for addressing spills, accidents or other emergencies that may affect water, aquatic ecosystems or drinking water sources. Owners and operators of public water systems are responsible for the development of Emergency Response Plans under MR 77/2003 - Section 29 of the Water and Wastewater Facility Operators Regulation. This regulation falls under *The Environment Act* and is administered by Manitoba Conservation and Water Stewardship. The Office of Drinking Water has also included the requirement for an Emergency Response Plan in each Water Plant Operating Licence. Deadlines for the development of an Emergency Response Plan are specified within each operating licence.

ABANDONED WELL SEALING PROGRAM

The Seine-Rat River Conservation District realizes the importance of protecting groundwater and offers an abandoned well sealing program. The program generally covers 100% of the cost of well sealing for residents within the district, although there are some eligibility criteria which must be met. Between 2001 and 2013, the conservation district sealed over 200 abandoned wells.

ACTIONS

SOURCE WATER PROTECTION

To achieve the goal of protecting and conserving the quality and quantity of groundwater:

- **Manitoba Conservation and Water Stewardship will develop a strategy to review existing information, assess the current location of the fresh water – salt water boundary, and determine the need for an on-going monitoring program (including short- and long-term objectives) to monitor movement of the boundary.**
- **Seine-Rat River Conservation District will deliver groundwater protection and awareness initiatives with support from the Groundwater Management Section of Manitoba Conservation and Water Stewardship.**
- **Seine-Rat River Conservation District will promote and offer an abandoned well sealing program.**
- **Seine-Rat River Conservation District will work with watershed residents to protect groundwater and enhance groundwater recharge through the maintenance of wetlands and development of water retention areas.**
- **Watershed residents will help reduce the risk of well water contamination by:**
 - o Retaining an experienced and provincially licensed well drilling contractor for the drilling of a water well;
 - o Locating a new water well at a safe distance from potential sources of contamination and in an area away from surface runoff pathways;
 - o Ensuring an experienced and licensed contractor completes the hook-up of the water well to the water distribution system using pitless well construction;
 - o Disinfecting a new well, pump and water distribution system to kill any bacteria that may be present prior to putting it into operation;
 - o Ensuring that wells located in a designated flood prone area have adequate well head protection to ensure flood water does not directly enter the well, and;
 - o Sealing abandoned wells properly in accordance with the guidelines recommended in Manitoba's Guide for Sealing Abandoned Water Wells⁴

WELL INVENTORY AND GROUNDWATER ASSESSMENT PROJECT

In 2010, the Seine-Rat River Conservation District started a multi-year well inventory and assessment project in partnership with the Groundwater Management section of Manitoba Conservation and Water Stewardship. The results of the water testing indicated that approximately 18% of the wells sampled failed to meet the Tier II Manitoba water quality objectives for drinking water due to the presence of bacteria or higher than acceptable levels of nitrates. All well owners received a copy of their water sample test results, and where a test failed, the landowner was able to contact the Seine-Rat River Conservation District for recommendations for corrective action and instructions on getting a re-test. The Tier II Manitoba water quality objectives for drinking water from a surface or groundwater source area are as follows: Fecal coliform bacteria or E.coli = 0 (zero) colony forming units per 100 ml, and Nitrate – Nitrite – Nitrogen = less than 10 mg/L as N.

SOUTHEAST REGIONAL GROUNDWATER MANAGEMENT PLAN

The Southeast Regional Groundwater Management Plan was developed through a stakeholder-led planning process with a primary purpose of identifying regional groundwater-related issues, reviewing current groundwater management activities, and developing recommendations to guide sustainable groundwater management over the next decade. The roughly 16,700 square kilometre study area extended from the Red River east to the western edge of the Whiteshell Provincial Park and from the international border north to Lake Winnipeg and the Winnipeg River. The planning process, which ran from 2008 through to 2010, led to the expansion of the provincial groundwater monitoring network and the development of a three-dimensional groundwater model which will be used to support better, more informed decision-making into the future. A final draft was approved by the planning group in 2011 and is posted on the SRGMP website.

THE GROUNDWATER AND WATER WELL ACT

As a key component in the Province's strategy to protect aquifers, groundwater, and those who rely on well water, Manitoba Conservation and Water Stewardship recently introduced a new *Groundwater and Water Well Act*. The new Act includes measures to manage and protect groundwater, as well as strengthens legislation governing the drilling, construction, maintenance, and sealing of wells. New and improved licensing and standards to protect groundwater and regulations for certification requirements for well drillers and sealers are being developed. In addition to water supply wells, the new Act also applies to geothermal, geotechnical, and monitoring wells. The new Act will formalize the process for establishing aquifer management plans for the management, protection, and sustainable use of aquifers, and will enable the development of supporting regulations. The current Act will remain in place until new regulations are developed.



DID YOU KNOW?



ACTIONS

CONTINUED

- **Watershed residents will use water more wisely by:**
 - o Installing low-flow water fixtures (i.e. toilets, showerheads, etc.);
 - o Replacing worn out appliances and fixtures with Energy Star and WaterSense products;
 - o Landscaping with native and drought-resistant plants that do not require excessive watering;
 - o Constructing a rain garden to accept sump pit water and local runoff;
 - o Using a rain barrel collection system for local watering;
 - o Repairing water leaks at faucets and pipes around the house, and;
 - o Taking regular water meter readings to check for water loss from leaks (take reading at night when everyone has used the bathroom and gone to bed and a new reading first thing in the morning before anyone uses any water).
- **Municipalities will adopt policies that restrict future intensive and high-pollution risk developments in source water protection zones. These developments include activities, land uses and structures that have a high risk of causing pollution and include, but are not limited to chemical and fertilizer storage facilities, septic systems, petroleum storage, waste disposal grounds, and wastewater lagoons.**
- **Municipalities will continue to promote and improve public accessibility to drop-off sites for hazardous waste and chemicals.**
- **Municipalities will adopt technologies that improve water use efficiency.**

- High nitrogen levels in water are an indicator of contamination by human or livestock waste, excessive fertilization of lawns and agricultural land, and/or seepage from onsite wastewater systems or dump sites. High nitrate levels in drinking water can cause health problems, particularly for infants and during pregnancy. When ingested, nitrates are converted to nitrites, which reduce the ability of blood to carry oxygen.
- Boiling drinking water will kill bacteria but will not eliminate nitrates.

ADOPT AN INTEGRATED, WATERSHED-BASED APPROACH TO SURFACE WATER MANAGEMENT

BACKGROUND

The drainage system serving Manitoba has evolved significantly over the past 60 years. The natural landscape and drainage system consisted of swamps, natural streams and rivers. As immigration occurred and population into rural areas increased, so did the area of land developed and used for agriculture. This increase in agricultural activity across the landscape, and the importance of it to the growth and development of the local economy, dictated that in order to maximize the potential of agricultural production, a comprehensive drainage network strategy had to be developed. In the late 1950s, the provincial government took on a new role in surface water management and began to develop comprehensive drainage networks for certain areas in Manitoba.

In developing these provincial drainage networks, surveyors and engineers had to traverse the landscape to physically note all natural and man-made waterways and drains. This information was used to establish watershed boundaries, document drainage networks, and develop maps.

The Province then developed a drain design formula to ensure that the size and type of drains constructed would reflect the type and value of the land the drain was servicing. Four drainage design standards were established. The land deemed to have the greatest potential for high value agricultural development was provided with the highest standard of drainage.



JURISDICTION OVER DRAINAGE

All drainage works in Manitoba are subject to the jurisdiction of *The Water Rights Act*. All property and rights to the use, diversion or control of all water in the Province is vested in the Crown in right of Manitoba.

In 1965, in an attempt to resolve on-going inter-municipal drainage issues, Manitoba established and took on responsibility for some of the major drains in each watershed, and named them Provincial Waterways. The tributary drains that contributed to the Provincial Waterways, in general, remained the responsibility of the municipalities. In some areas of Manitoba, Conservation Districts have assumed authority over waterways in their district. In the Rat-Marsh River Watershed, Manitoba retained responsibility for all of the Provincial Waterways. The Seine-Rat River Conservation District is not involved in drain maintenance or reconstruction.

CURRENT OPERATION OF DRAINAGE SYSTEM

The drainage infrastructure on the landscape was designed and constructed to service an agricultural land base and practices established in the late 1960s and early 1970s. As technology and agricultural research has advanced, so has the capability of the agricultural land base to handle increasingly specialized crops. In some areas, land that was previously classified as marginal and within the pioneer or forage crop drainage standard is now considered much more agriculturally viable and profitable. Much of this land has now been cleared and drained which has substantially increased the effective drainage area of the watershed. Therefore, the originally designed drainage standards that the provincial drainage networks were constructed to are no longer applicable and accurate.

RECONSTRUCTION OF EXISTING INFRASTRUCTURE

Due to the increase in land value, changing land use practices, improved on-farm infrastructure, size of agriculture equipment, landowner's mechanized ability to alter runoff, and urban development into agricultural areas, the modern-day drainage system needs and capacity has increased substantially. The network of provincial and municipal drains needs to be re-assessed and re-engineered throughout most of Manitoba. This assessment and determination of specific drainage system requirements in a watershed would require a significant investment of time and money and is beyond the scope of this plan.

The Province currently develops five-year capital and minor infrastructure work plans in order to prioritize the long list of required work and address areas of highest concern. Unfortunately, over the past two decades, the demand for drainage infrastructure improvements has far outweighed the annual budgets and marginal progress has occurred.

DRAINAGE LICENSING AND ENFORCEMENT OF THE WATER RIGHTS ACT

Manitoba Conservation and Water Stewardship is responsible for administering and enforcing *The Water Rights Act*. The *Act* is used to govern drainage and water diversion or control activities on the landscape. The role of the Province is to ensure that proposed projects do not have negative impacts on upstream or downstream water users.

Individuals interested in undertaking a drainage project must submit an application for licence to construct water control works to Manitoba Conservation and Water Stewardship. The application is assessed based on the type and size of the drainage project and with respect to the provincial surface water management policies.

Historically, enforcement under *The Water Rights Act* was sporadic and largely ineffective. Enforcement under the *Act* has been raised repeatedly as a top issue of concern by the Association of Manitoba Municipalities, Keystone Agricultural Producers and the Manitoba Conservation Districts Association. In 2006, *The Water Rights Amendment Act* was passed and provided Water Resource Officers with more enforcement powers to deal with illegal drainage offenses as they occur.

RM OF DE SALABERRY DRAINAGE POLICIES

The RM of De Salaberry has developed drainage policies and procedures to handle requests for drainage works within the municipality. Landowners complete and submit a drainage request form at the municipal office which is then reviewed by the drainage committee. The committee generally meets up to four times per year, including a spring tour to look at proposed drainage projects. If the committee approves of a drainage request, they include the project in their submission of projects to the local Water Resources Officer for additional review and potential licensing.



SURFACE WATER MANAGEMENT AREA 1 **LOWER WATERSHED**

CHARACTERISTICS

- Flat landscape, prime agricultural land - agricultural capability classes 1, 2 and 3
- Imperfect and poor soil drainage, heavy clay soils
- Extensive man-made drainage network
- Extremely slow rate of groundwater recharge
- Western half of this area is in the Red River Valley Designated Flood Area

ISSUES

- Provincial and municipal drainage infrastructure should be better maintained. Although drainage is critical in supporting agriculture, it is also recognized that drainage works can have environmental impacts on riparian areas, aquatic ecosystems and water quality.
- Severe flooding events in the Red River Valley have relocated huge volumes of topsoil into the Marsh River. The river is now clogged with sediment plugs and aquatic vegetation like bullrushes and cattails.
- Agricultural development has resulted in significant loss of natural areas.
- Cultivation and annual cropping is occurring in riparian areas in most locations along the Rat River and Marsh River.
- Low-level crossings in Marsh River restrict river flow.

GOAL

Manage surface water to maximize economic benefit from crop production, minimize the hardships from flooding through the establishment and maintenance of the drainage network and flood protection works while conserving and enhancing natural areas, wetlands and critical riparian habitat areas along the Rat River, Marsh River and Red River.

SURFACE WATER MANAGEMENT AREA 2 **CENTRAL WATERSHED**

CHARACTERISTICS

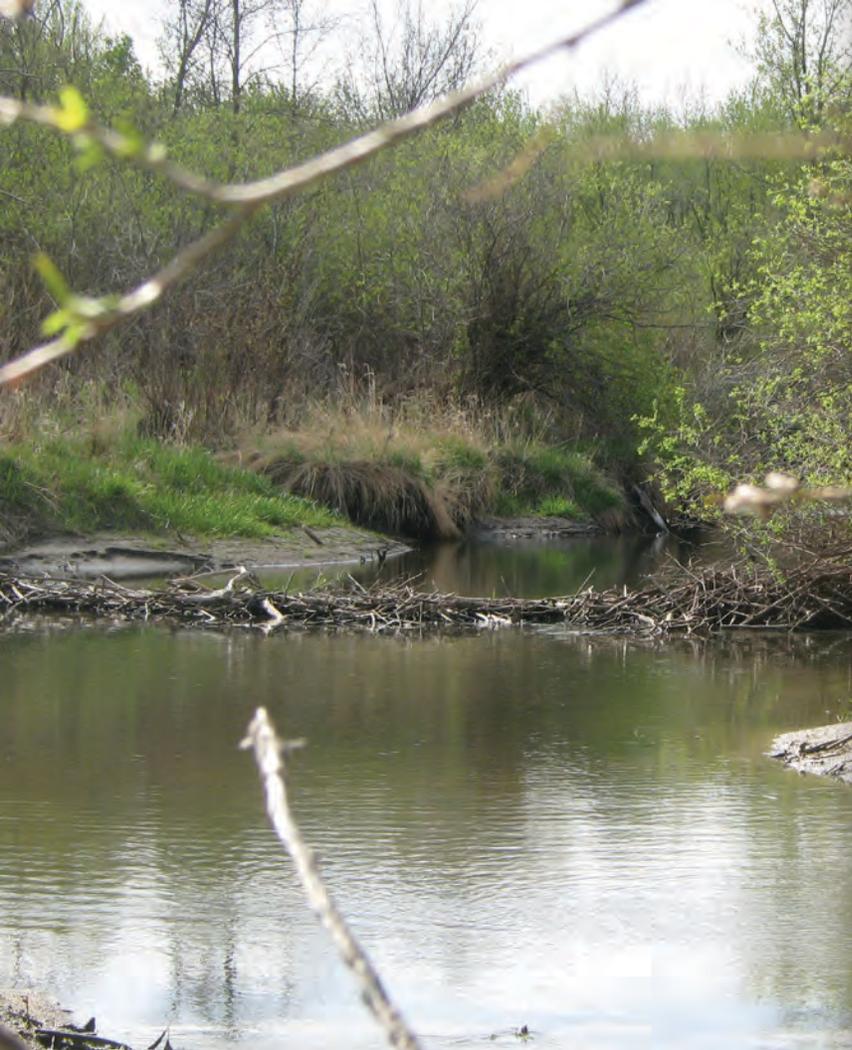
- Relatively flat landscape covered by deciduous forest, pasture, native grassland, large wetlands, and some gravel pits
- Imperfect, poor and very poor soil drainage
- Sandy and coarse textured soils
- Moderate rate of groundwater recharge

ISSUES

- Beaver activity and dams causing erosion along riverbanks
- Residential development in flood prone and high water table areas may result in long-term issues and costs related to flood protection, compensation, and human health and safety.
- Land acquisition by conservation organizations has impacted rural communities by inflating land sale prices and reducing the availability of land for agriculture.
- Restrictions of flow at low-level crossings
- Drainage of wetlands and marginal land is resulting in loss of wildlife habitat, erosion and water quality degradation.
- Illegal drainage and water diversions
- Overland flooding from breaks in the riverbanks along the Rat River in the RM of Stuartburn

GOAL

Manage surface water to support agricultural production while conserving and enhancing native grasslands, riparian areas and wetlands.



ACTIONS

SURFACE WATER MANAGEMENT

- Manitoba Infrastructure and Transportation (MIT) and municipalities will implement beneficial management practices (BMPs) to prevent soil erosion and side-slope degradation, “naturalize” drains to reduce erosion and allow contact points where nutrients can settle out, and control the growth of vegetation, all in the best interest of maximizing effective drain function and longevity.
- Municipalities will place specific development conditions and/or restrictions on land vulnerable to overland flooding, riverbank or shoreline erosion, and/or with a high water table.
- Seine-Rat River Conservation District, municipalities and watershed residents will work in cooperation with Manitoba Conservation and Water Stewardship’s Water Resource Officers to ensure all drainage and water diversion related activities are in compliance with *The Water Rights Act*.
- Manitoba Conservation and Water Stewardship – Biodiversity, Habitat and Endangered Species Section will establish a working group to review current management practices and develop recommendations respecting the long term management of beaver in Manitoba. The working group will include representatives from the Association of Manitoba Municipalities and other departments of government who also deal with problem beavers.
- Seine-Rat River Conservation District, Manitoba Conservation and Water Stewardship and municipalities will work together to review and assess the feasibility of the water control and flood protection projects identified in the Rat River Basin Hydraulic Study, 2011.
- Seine-Rat River Conservation District will work with their municipal partners to investigate and develop water retention projects for flood management, drought mitigation, water quality protection, and wildlife habitat enhancement.
- Municipalities and the Seine-Rat River Conservation District will work together to assess the low-level crossings in the Marsh River and develop projects to restore river flow and reduce localized flooding.

SURFACE WATER MANAGEMENT AREA 3 UPPER WATERSHED

CHARACTERISTICS

- Headwaters of the watershed and mostly Provincial Forest and Crown land
- Diverse topography of hilly terrain and steep slopes covered by mixed-wood forest, marshland, and grassland
- Predominantly sandy, coarse textured and lighter soils
- Natural drainage system with very few man-made drains
- Highest rate of groundwater recharge in the watershed

ISSUES

- Beaver activity is causing flooding and increasing the potential for road washouts when dams burst
- During heavy rains, water runs off the landscape quickly and backs up against Highway 12 at Lonesand which poses a significant risk for road washouts

GOAL

Manage surface water to minimize risks to roads and crossing infrastructure while protecting natural water retention areas.

SURFACE WATER MANAGEMENT AREA 4 ST. MALO LAKE

CHARACTERISTICS

- Relatively flat landscape covered by deciduous forest, pasture, native grassland, and wetlands
- Sandy and coarse textured soils with imperfect and poor soil drainage
- Community surrounding St. Malo Lake includes some permanent residences, seasonal cottagers, private campgrounds, and the St. Malo Provincial Park
- St. Malo Provincial Park is a very important provincial and municipal asset and has tremendous social and economic value
- St. Malo Lake is classified as a designated reservoir area under The Water Resources Administration Act – Designated Reservoir Areas Regulation. Provincial authorization and permits are required for any building or structure within designated reservoir areas.

ISSUES

- Areas of excessive aquatic plant growth in some areas of the lake
- Shoreline erosion, slumping, and degradation
- Sediment accumulation and growth of wild rice at the inlet of the lake
- Bush clearing and drainage works in upstream areas have increased inflows to the lake.
- Development occurring within the St. Malo Reservoir Area without proper authorization and permits

GOAL

Manage surface water to ensure the long-term sustainability of St. Malo Lake by conserving and restoring riparian areas, providing water stewardship extension to local property owners, restricting additional upstream drainage activities, and managing future developments that could negatively impact the lake.

ACTIONS

CONTINUED

- Seine-Rat River Conservation District will investigate the feasibility of a large water retention project upstream of Lonesand.
- Manitoba Conservation and Water Stewardship – Biodiversity, Habitat and Endangered Species Section, Ducks Unlimited, Manitoba Habitat Heritage Corporation, and the Seine-Rat River Conservation District will continue to work together to maintain the wetland project east of Rosa.
- Manitoba Infrastructure and Transportation – Water Management and Structures Division will continue to maintain and improve public safety at the St Malo Dam.



PROTECT AND IMPROVE SURFACE WATER QUALITY IN WATERWAYS

WATER QUALITY INDEX

Based on data collected at the one long-term water quality monitoring station in the Rat River at PR 303 at Otterburne and as illustrated graphically in Figure 9, the Water Quality Index for the Rat River Watershed is typically rated as 'Fair' to 'Good'. This indicates water quality occasionally exceeds the water quality guidelines for some of the twenty-five variables used in calculating the Water Quality Index. Total phosphorus is typically responsible for lowering the Water Quality Index.

Figure 10 illustrates total phosphorus concentrations in the Rat River at PR 303 at Otterburne. The phosphorus concentrations were often well above the Manitoba Water Quality Guideline for rivers of 0.05 mg/L.

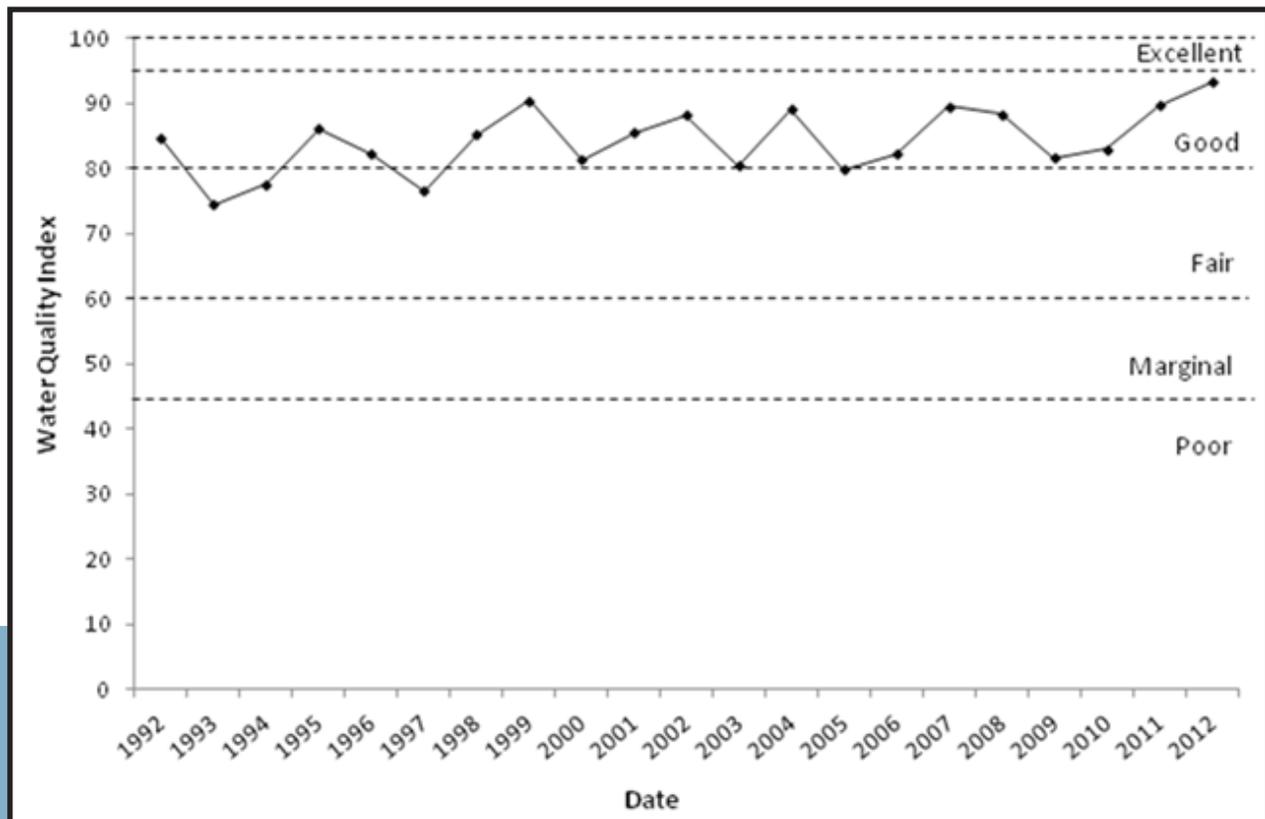


Figure 9: Water Quality Index calculated from 1992 to 2012 for the Rat River at PR 303 at Otterburne

NUTRIENT LOADING

High concentrations of phosphorus and nitrogen can be partly attributed to natural watershed characteristics, but many man-made activities also contribute significantly. Some of the activities that have contributed to increased nutrient loading include:

- **organic and inorganic nutrient run-off from agricultural activities and urban areas**
- **overland flooding**
- **irresponsible onsite wastewater management such as damaged, leaking septic tanks, and insufficiently maintained septic fields**
- **wastewater discharges**
- **inappropriate application of fertilizer**
- **irresponsible manure spreading**
- **livestock having open access to water bodies**
- **poor farmyard runoff and livestock management**
- **land development and drainage**

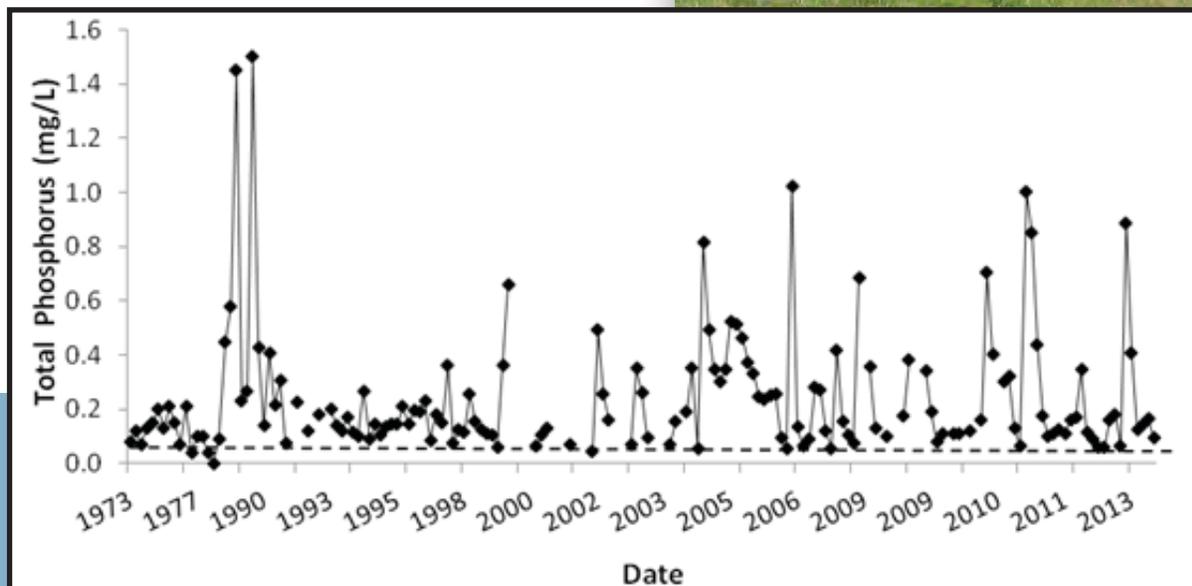
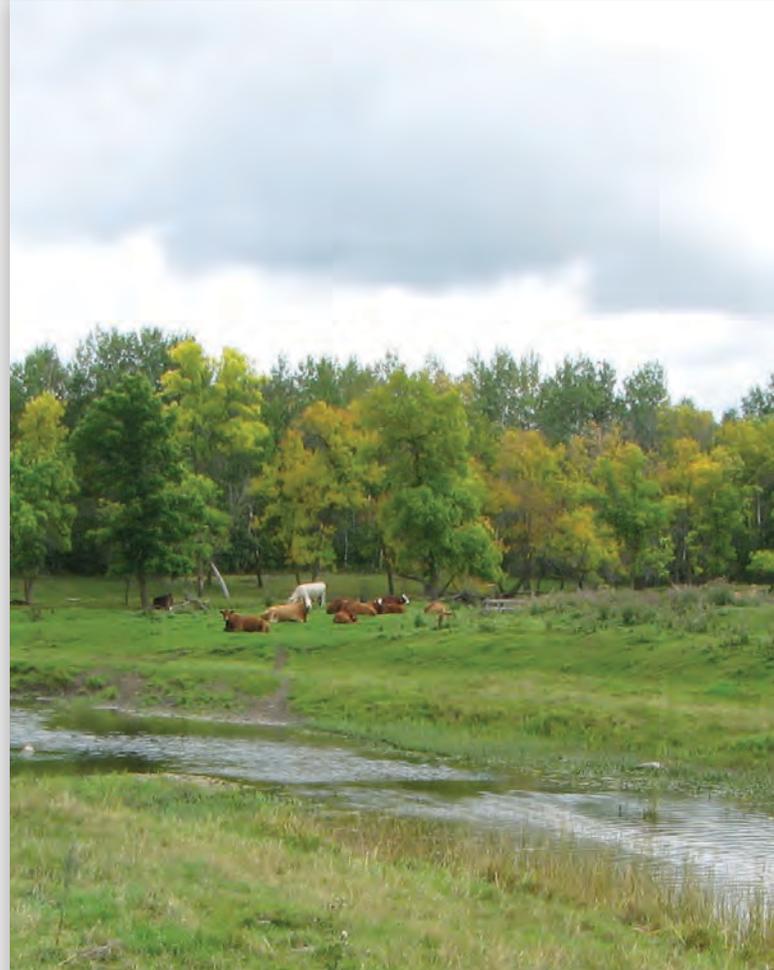


Figure 10: Total Phosphorus concentrations in the Rat River at PR 303 at Otterburne from 1973 to January 2014

ADDITIONAL WATER QUALITY MONITORING

In the late 1990s, the Southeast Soil Conservation Organization (SESCO) established a water quality monitoring program because of the observed intensity of agricultural development, the desire to know what the status of water quality was, and to target BMP incentive programming most appropriately. When SESCO disbanded in 2002, the Seine-Rat River Conservation District took over the program and inherited all data collected to date. The SRRCD now collects water samples at seven sites along the Rat River and Joubert Creek. While the results from the Rat River sampling indicated no significant increase in phosphorus, the results from the Joubert Creek sampling did indicate a significant increase in phosphorus.

MUNICIPAL WASTEWATER TREATMENT

There are seven provincially licensed wastewater treatment facilities in the watershed. Municipal wastewater effluent typically contains human and other organic waste, nutrients, pathogens, microorganisms, suspended solids and household and industrial chemicals that may pose risks to human health and the environment. To prevent or minimize these risks, management of effluent quality, proper levels of treatment, monitoring before discharge, and reporting are important. As a requirement of their operating licence, each facility must take measurements of specific parameter concentrations prior to the release of any effluent to the environment. *Environment Act* licences provide consideration to the Manitoba Water Quality Standards, Objectives, and Guidelines⁶. The dates of the year when effluent is allowed to be released to the environment is also prescribed in each operating licence. Manitoba Conservation and Water Stewardship is responsible for licensing and monitoring compliance under *The Environment Act*.

INTENSIVE LIVESTOCK OPERATIONS

In response to the concerns expressed related to the intensity and locations of livestock operations being developed throughout the Province, and the risks that these operations could pose to water quality, the Province developed the Livestock Manure and Mortalities Regulation under *The Environment Act*. The Regulation is administered and enforced by Manitoba Conservation and Water Stewardship and intended to ensure that livestock manure and mortalities are managed in an environmentally sound manner.



DID YOU KNOW?

LOCAL CONCERNS RELATED TO MANAGEMENT OF HOG INDUSTRY

During the development of the plan, many local people expressed concerns for the management and regulation of the hog industry in the watershed. They have observed the dramatic landscape changes that have occurred since the rapid expansion of the hog industry began, and numerous violations of the provincial regulations. Some of the concerns expressed include:

- **insufficient land available as suitable spread acres and the fact that some operators include forested and marshland as spread acres;**
- **field overlap and double applications of hog manure, and no framework in place to determine whether multiple applications are occurring;**
- **minimal soil testing for phosphorus and a lack of confidence in any change of practice as a result of soil test information;**
- **locations where operators are disposing of manure;**
- **timing when operators choose to dispose of manure; and**
- **lack of enforcement of the existing regulations.**

CLEAN ENVIRONMENT COMMISSION REPORT

The Clean Environment Commission (CEC) conducted a thorough, year long, in-depth investigation into the environmental sustainability of hog production in Manitoba and, in December 2007, submitted their findings in a report to the government. The report, *Environmental Sustainability and Hog Production in Manitoba*,⁷ includes a long list of recommendations that the CEC recommended should be implemented immediately. The last paragraph of the Executive Summary states, *“Environmental sustainability is achievable, but it cannot be put off into the future. The challenge for the government will be to develop an implementation strategy that works with producers and other members of society to ensure the industry’s social and economic sustainability. In those areas where nutrient production is currently out of balance with the environment’s ability to remove those nutrients, the province and producers must move quickly and cooperatively to bring production into balance within the next five years.”*

ACTIONS

WATER QUALITY PROTECTION

To achieve the goal of protecting and improving surface water quality in waterways:

- **Manitoba Conservation and Water Stewardship staff will respond as appropriate upon receipt of a public complaint regarding on-site wastewater systems around St. Malo Lake.**
- **Watershed residents will maintain onsite wastewater systems for effective operations and adhere to provincial legislation during any construction or reconstruction.**
- **Watershed residents and agricultural producers will manage manure responsibly to minimize the risk of negatively impacting water quality.**
- **Manitoba Conservation and Water Stewardship will continue to work cooperatively with municipalities to implement technologies to reduce nutrient loads from municipal wastewater treatment facilities.**
- **Seine-Rat River Conservation District, municipalities, and watershed residents will conserve and restore wetlands.**
- **All stakeholders are encouraged to minimize the application of phosphorus-based fertilizers, select low phosphorus or phosphorus-free cleaning products, and implement recommendations listed in the Lake Winnipeg Stewardship Board 2006 report “Reducing Nutrient Loading to Lake Winnipeg and its Watershed: Our Collective Responsibility and Commitment to Action”.⁸**

- Surface water runoff from fields can contain excess levels of nutrients, bacteria, pesticides, and organic matter which can have negative impacts on downstream water quality.
- Phosphorus can cause accelerated aging (eutrophication) of water bodies – a process that occurs when algae and other aquatic plants experience rapid growth due to high amounts of phosphorus and other nutrients. As plants die, oxygen in the water is depleted, and fish and other aquatic animals die.

PROTECT AND RESTORE RIPARIAN AREAS AND AQUATIC ECOSYSTEMS

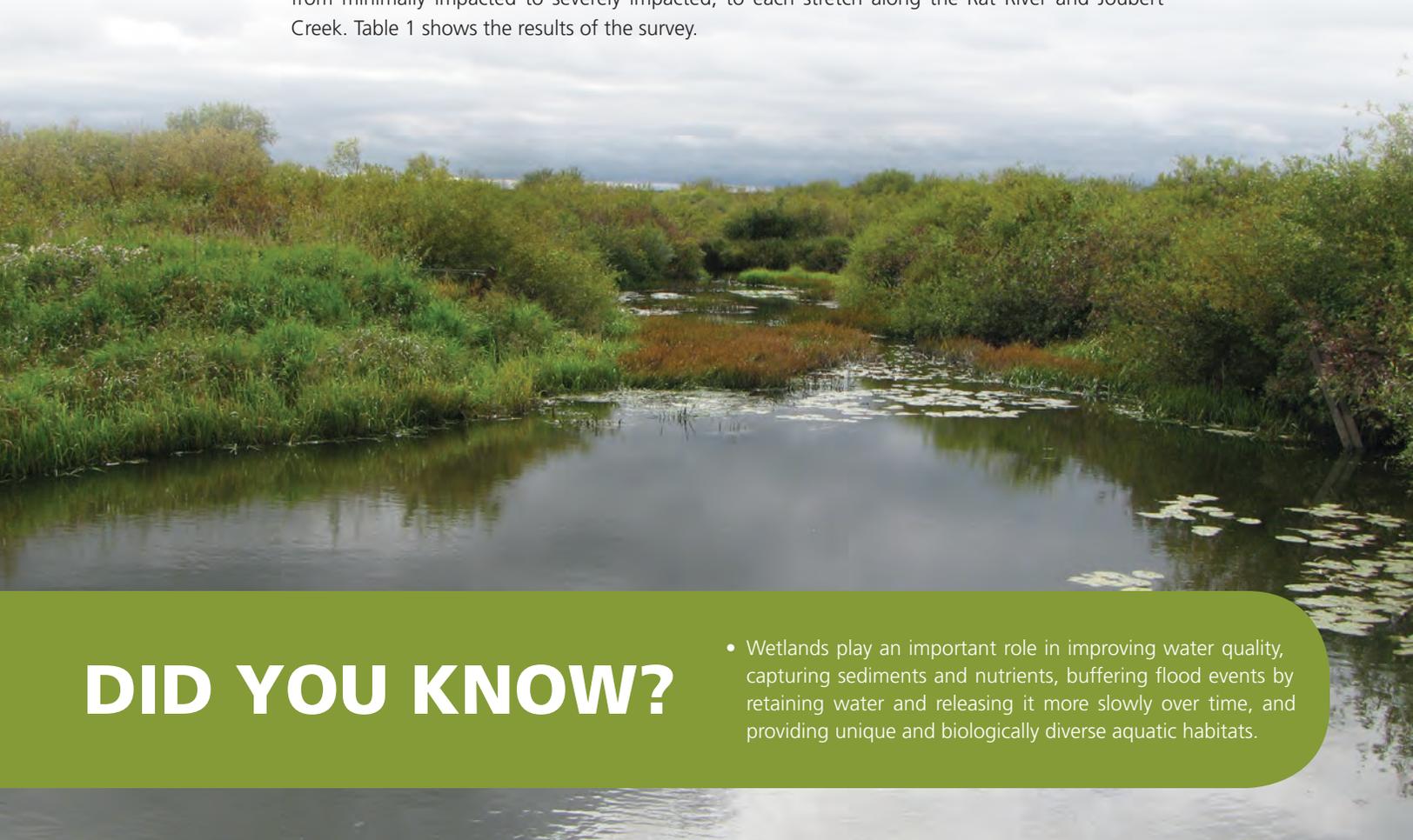
Riparian areas are the transitional zones or vegetated buffers along streams, rivers, lakes, and wetlands. They are distinct and unique ecosystems generally comprised of aquatic and terrestrial plant communities. They provide shoreline stability with their root systems, serve as wildlife habitat, maintain areas of high biological diversity, slow down and store water, provide necessary shade to moderate water temperature, recharge and discharge groundwater, filter field run-off, and catch sediment.

AQUATIC HABITAT AND RIPARIAN AREA ASSESSMENT

In 2005, the Seine-Rat River Conservation District hired North / South Consultants Inc. – Aquatic Environment Specialists to do the Rat River–Joubert Creek Aquatic Habitat and Riparian Assessment Survey.⁹ The survey collected information on the status of riparian areas and aquatic ecosystems throughout the watershed and identified potential rehabilitation project sites. The survey also involved assessing and rating the condition of the existing aquatic habitat where riverbank stability, channel morphology, barriers to fish passage, and the intactness of the riparian zone were qualitatively classified and considered collectively in order to assign aquatic habitat quality ratings, ranging from minimally impacted to severely impacted, to each stretch along the Rat River and Joubert Creek. Table 1 shows the results of the survey.

DID YOU KNOW?

- Wetlands play an important role in improving water quality, capturing sediments and nutrients, buffering flood events by retaining water and releasing it more slowly over time, and providing unique and biologically diverse aquatic habitats.



Class	Rat River, 183 km	Joubert Creek, 79 km
A – minimally impacted	55 %	42 %
B – moderately impacted	11 %	16 %
C – highly impacted	26 %	34 %
D – severely impacted	8 %	8 %

Table 1: Aquatic Habitat Quality Rating along the Rat River and Joubert Creek from the Rat River – Joubert Creek Aquatic Habitat and Riparian Assessment Survey (2005)

The Rat River–Joubert Creek Aquatic Habitat and Riparian Assessment Survey specifically noted that the aquatic habitat quality rating is intended to provide a general overview of the condition of the stream reaches and should be used primarily to focus rehabilitation efforts.

JOUBERT CREEK – RIPARIAN HEALTH PREDICTIVE MODEL

In 2009, a number of government and non-government organizations, including Agriculture and Agri-Food Canada and Manitoba Agriculture, Food and Rural Development partnered to develop and validate a new, cost-effective way of classifying riparian zones and to evaluating riparian health in agricultural watersheds. On-the-ground health assessments were conducted and utilized to validate a Riparian Health Predictive Model which is capable of estimating riparian condition using remote sensing.

As part of the project’s field validation requirement, riparian condition along Joubert Creek was evaluated in 2010 and 2011. Joubert Creek is a perennial watercourse in the northern portion of the Rat-Marsh River Watershed and flows west into the Rat River. It is located just outside of the Red River Valley and cuts through a relatively flat landscape utilized primarily for pasture and cropland. This particular creek was chosen as a study site for a number of reasons, but primarily because it was identified by the SRRCD as a priority waterway and there was active participation from local landowners.

Field assessments along Joubert Creek revealed that the functionality and health of the system varied by location, but overall was good. After applying this information to the predictive model, it was estimated that approximately 75% of the creek was in proper functional condition (meaning that all riparian functions are being performed and the reach exhibits a high level of riparian condition), 14% was functional at risk (meaning healthy with problems, some clear signs of stress to riparian functions evident), and 11% was non-functional (meaning that most of the riparian functions are severely impaired or have been lost).

JOUBERT CREEK – RIPARIAN HEALTH PREDICTIVE MODEL CONTINUED...

Results obtained from the Joubert Creek study are isolated and independent from other watercourses. That being said, assumptions can be made as to the functionality of other watercourses in the watershed. The Rat River and Joubert Creek are very similar systems. Both watercourses are similarly sized and are located on land with very similar characteristics in terms of soils characteristics and topology. Farming practices and management are also very comparable along the two watercourses; composed mainly of pasture and forage cropland, as well as some pockets of annual cropland. Based on the common characteristics of Joubert Creek and the Rat River, it would be expected that the condition of the two systems is quite similar.

On the other hand, the Marsh River differs from Joubert Creek and the Rat River in numerous aspects. It is located within the Red River Valley which has significantly different landscape characteristics than the eastern portion of the watershed. Additionally, farming along the Marsh River is characterized almost exclusively as annual cropping, which is vastly different than farming practices along Joubert Creek and the Rat River. As such, riparian health of the Marsh River cannot be inferred from results obtained from the Riparian Health Model for Joubert Creek.

No two watercourses are completely identical, so inferring the health of one from another can only provide an estimate as to the functionality of the system. To properly grade riparian health in the watershed and determine areas which may be non-functional, more work is required on targeted watercourses in the area. This includes an independent, and more detailed investigation of functionality along the Rat River, as well as an examination of health along the Marsh River and at St. Malo Lake.

Further investigation of riparian areas within the watershed may be conducted through various means. Local knowledge can be used to determine those areas which are at high risk of impairment and warrant on-the-ground health assessments. Alternatively, newer methodologies, such as the Riparian Health Predictive Model developed on Joubert Creek, could be used to develop a more comprehensive record of riparian health throughout the entire watershed.



FISH PRESENCE

There are up to 31 species of fish present in the Rat-Marsh River Watershed.¹⁰ The majority of the species are non-recreational species such as minnows, catfish and suckers. The notable recreational and sport fishing species include perch, rock bass, northern pike and walleye. There are two SARA/COSEWIC species, Silver Chub and Chestnut Lamprey, found in the watershed. SARA/COSEWIC is the acronym for *Species at Risk Act/Committee on the Status of Endangered Wildlife in Canada*. The purpose of *The Species at Risk Act* is to protect wildlife species at risk in Canada. COSEWIC is the independent body of experts responsible for identifying and assessing wildlife species considered to be at risk.

FISH STOCKING

From 1956 to 1989, the Rat River was stocked 11 times with trout. From 1961 to 2010, St. Malo Lake was stocked 28 times, mostly with walleye, some rainbow and brook trout, and once with largemouth bass. In and after 1983, the majority of the fish stocking was with wall-eye fry at St. Malo Lake. Recently, the St. Malo Lake Stewardship Committee has requested that Manitoba Conservation and Water Stewardship's Fisheries Branch assess the option of stocking black crappie in the lake, as there are similar lakes in Manitoba where that species has thrived and provided an additional sport fishing opportunity.



ACTIONS

RIPARIAN AND AQUATIC ECOSYSTEM MANAGEMENT

To achieve the goal of protecting and restoring riparian areas and aquatic ecosystems:

- **Seine-Rat River Conservation District will offer riparian management and riverbank stabilization incentive programming like willow planting, tree planting, riparian fencing and alternative watering systems to minimize shoreline and riverbank erosion, encourage the maintenance of a naturally vegetated riparian area, and filter sediments and nutrients from run-off water through the growth of healthy riparian areas.**
- **Seine-Rat River Conservation District will lead and facilitate the completion of projects identified in the 2005 Rat River–Joubert Creek Aquatic Habitat and Riparian Assessment Survey.**
- **Manitoba Habitat Heritage Corporation (MHHC) and Nature Conservancy of Canada (NCC) will continue to work with landowners to protect and manage critical riparian areas, wetlands and endangered natural habitats through conservation agreements and other conservation programs.**
- **Municipalities will adopt development restrictions that require the retention and management of existing vegetation along waterways and undeveloped right-of-ways.**
- **Seine-Rat River Conservation District and Manitoba Agriculture, Food and Rural Development will work cooperatively to coordinate educational opportunities that encourage beneficial management practices and demonstrate the value of healthy riparian areas.**
- **Municipality of De Salaberry, St. Malo Wildlife Association and the Seine-Rat River Conservation District will work together to investigate opportunities to improve fish habitat and populations in the Rat River and St. Malo Lake.**
- **Seine-Rat River Conservation District will work cooperatively with the St. Malo Lake Stewardship Committee in providing an annual watershed education and stewardship program.**

PLAN IMPLEMENTATION, MONITORING AND EVALUATION

IMPLEMENTATION

Successful plan implementation requires participation and long-term commitment from all watershed residents, municipalities, agricultural producers, non-governmental organizations, and the provincial and federal governments. Each organization needs to assess the actions in the plan alongside their existing management responsibilities, to establish the necessary plans and partnerships, and to arrange their financial, technical, and human resources accordingly.

MONITORING, EVALUATION AND REPORTING

As a locally-led, grass-roots organization comprised of watershed residents from each of the municipalities in the watershed, and with the mandate to support and promote the sustainable management of the land, water and related resources in the Seine River and Rat River watersheds, the Seine-Rat River Conservation District is the ideal organization to oversee plan implementation, monitoring and evaluation. They will continue to host an annual meeting to provide their membership with a list of recent accomplishments and plans for the future, as well as field tours to proposed and completed project sites throughout the year.

In partnership with Manitoba Conservation and Water Stewardship, the Seine-Rat River Conservation District will produce and distribute a progress report on plan implementation every three years. This report will include descriptions of completed actions and success stories from each of the watershed stakeholder organizations.

PLAN SEINE-RAT RIVER CONSERVATION DISTRICT

Actions to achieve the goal of protecting and conserving the quality and quantity of groundwater	FOCUS AREA
1. Deliver groundwater protection and awareness initiatives with support from Manitoba Conservation and Water Stewardship – Groundwater Management Section.	Watershed
2. Promote and offer an abandoned well sealing program	Watershed
3. Work with watershed residents to protect groundwater and enhance groundwater recharge through the maintenance of wetlands and development of water retention areas.	East of Highway 59

Actions to achieve the goal of adopting an integrated, watershed-based approach to surface water management	FOCUS AREA
4. Work with municipalities, watershed residents and Manitoba Conservation and Water Stewardship's Water Resource Officers to ensure all drainage and water diversion related activities are in compliance with <i>The Water Rights Act</i> .	Watershed
5. Work with Manitoba Conservation and Water Stewardship and partner municipalities to review and assess the feasibility of the water control and flood protection projects identified in the Rat River Basin Hydraulic Study, 2001.	Surface water management areas 2, 3 and 4
6. Work with municipal partners to investigate and develop water retention projects for flood management, drought mitigation, water quality protection, and wildlife habitat enhancement.	Watershed
7. Partner with the municipalities to assess the low-level crossings in the Marsh River and develop projects to restore river flow and reduce localized flooding.	Marsh River
8. Investigate the feasibility of a large water retention project upstream of Lonesand.	Lonesand area
9. Partner with Manitoba Conservation and Water Stewardship – Biodiversity, Habitat and Endangered Species Section, Ducks Unlimited, and Manitoba Habitat Heritage Corporation to maintain the wetland project east of Rosa.	Ducks Unlimited wetland project east of Rosa
Actions to achieve the goal of protecting and improving surface water quality in waterways	FOCUS AREA
10. Partner with municipalities and watershed residents to conserve and restore wetlands.	Watershed
11. Implement recommendations listed in the Lake Winnipeg Stewardship Board 2006 report "Reducing Nutrient Loading to Lake Winnipeg and its Watershed: Our Collective Responsibility and Commitment to Action".	Watershed
Actions to achieve the goal of protecting and restoring riparian areas and aquatic ecosystems	FOCUS AREA
12. Offer riparian management and riverbank stabilization incentive programming like willow planting, tree planting, riparian fencing and alternative watering systems to minimize shoreline and riverbank erosion, encourage the maintenance of a naturally vegetated riparian area, and filter sediments and nutrients from run-off water through the growth of healthy riparian areas.	Watershed
13. Lead and facilitate the completion of projects identified in the 2005 Rat River – Joubert Creek Aquatic Habitat and Riparian Assessment Survey.	Along Rat River downstream of St. Pierre-Jolys and at the areas assigned habitat quality ratings of class C and D.
14. Work with Manitoba Agriculture, Food and Rural Development to coordinate educational opportunities that encourage beneficial management practices and demonstrate the value of healthy riparian areas.	Watershed
15. Partner with municipality of De Salaberry and St. Malo Wildlife Association to investigate opportunities to improve fish habitat and populations in the Rat River and St. Malo Lake.	St. Malo Lake
16. Work cooperatively with the St. Malo Lake Stewardship Committee in providing an annual watershed education and stewardship program.	St. Malo Lake

PLAN PROVINCE OF MANITOBA

Actions to achieve the goal of protecting and conserving the quality and quantity of groundwater	FOCUS AREA
1. Manitoba Conservation and Water Stewardship – Groundwater Management Section will develop a strategy to review existing information, assess the current location of the fresh water – salt water boundary, and determine the need for an on-going monitoring program (including short- and long-term objectives) to monitor movement of the boundary.	At fresh water – salt water boundary near highway 59
2. Manitoba Conservation and Water Stewardship – Groundwater Management Section will continue to support the Seine-Rat River Conservation District in delivering groundwater protection and awareness initiatives.	Watershed
Actions to achieve the goal of adopting an integrated, watershed-based approach to surface water management	FOCUS AREA
3. Manitoba Infrastructure and Transportation (MIT) will implement beneficial management practices to prevent soil erosion and side-slope degradation, “naturalize” drains to reduce erosion and allow contact points where nutrients can settle out, and control the growth of vegetation, all in the best interest of maximizing effective drain function and longevity.	Watershed
4. Manitoba Conservation and Water Stewardship’s Water Resource Officers will work with municipalities, watershed residents and the Seine-Rat River Conservation District to ensure all drainage and water diversion related activities are in compliance with <i>The Water Rights Act</i> .	Watershed
5. Manitoba Conservation and Water Stewardship - Biodiversity, Habitat and Endangered Species Section will establish a working group to review current management practices and develop recommendations respecting the long term management of beaver in Manitoba. The working group will include representatives from the Association of Manitoba Municipalities and other departments of government who also deal with problem beavers.	Surface water management areas 2, 3 and 4
6. Manitoba Conservation and Water Stewardship will continue to support the Seine-Rat River Conservation District in reviewing and assessing the feasibility of the water control and flood protection projects identified in the Rat River Basin Hydraulic Study, 2011.	Surface water management areas 2, 3 and 4
7. Manitoba Conservation and Water Stewardship - Biodiversity, Habitat and Endangered Species Section, Ducks Unlimited, Manitoba Habitat Heritage Corporation, and the Seine-Rat River Conservation District will continue to work cooperatively to maintain the wetland project east of Rosa.	Surface water management area 2
8. Manitoba Infrastructure and Transportation – Water Management and Structures Division will continue to maintain and improve public safety at the St Malo Dam.	St. Malo Lake

Actions to achieve the goal of protecting and improving surface water quality in waterways	FOCUS AREA
9. Manitoba Conservation and Water Stewardship staff will respond as appropriate upon receipt of a public complaint regarding on-site wastewater systems around St. Malo Lake.	St. Malo Lake
10. Manitoba Conservation and Water Stewardship will continue to work cooperatively with municipalities to implement technologies to reduce nutrient loads from municipal wastewater treatment facilities.	Watershed
Actions to achieve the goal of protecting and restoring riparian areas and aquatic ecosystems	FOCUS AREA
11. Manitoba Agriculture, Food and Rural Development will work cooperatively with the Seine-Rat River Conservation District to coordinate educational opportunities that encourage beneficial management practices and demonstrate the value of healthy riparian areas.	Watershed

PLAN MUNICIPALITIES

Actions to achieve the goal of protecting and conserving the quality and quantity of groundwater	FOCUS AREA
1. Work cooperatively with the Seine-Rat River Conservation District to focus water retention for groundwater recharge in the area east of Highway 59.	East of Highway 59
2. Adopt policies that restrict future intensive and high-pollution risk developments in source water protection zones. These developments include activities, land uses and structures that have a high risk of causing pollution and include, but are not limited to chemical and fertilizer storage facilities, septic systems, petroleum storage, waste disposal grounds, and wastewater lagoons.	Source water protection zones around all public drinking water systems
3. Continue to promote and improve the public accessibility to drop-off sites for hazardous waste and chemicals.	Watershed communities
4. Adopt technologies that improve water use efficiency.	Watershed communities
Actions to achieve the goal of adopting an integrated, watershed-based approach to surface water management	FOCUS AREA
5. Implement beneficial management practices to prevent soil erosion and side-slope degradation, "naturalize" drains to reduce erosion and allow contact points where nutrients can settle out, and control the growth of vegetation, all in the best interest of maximizing effective drain function and longevity.	Watershed
6. Work with Manitoba Conservation and Water Stewardship's Water Resource Officers, watershed residents and the Seine-Rat River Conservation District to ensure all drainage and water diversion related activities are in compliance with <i>The Water Rights Act</i> .	Watershed
7. Place specific development conditions on land vulnerable to overland flooding, riverbank or shoreline erosion, and/or with a high water table.	Watershed
8. Work with the Seine-Rat River Conservation District and Manitoba Conservation and Water Stewardship to review and assess the feasibility of the water control and flood protection projects identified in the Rat River Basin Hydraulic Study, 2011.	Surface water management areas 2, 3 and 4
9. Work cooperatively with the Seine-Rat River Conservation District to investigate and develop water retention projects for flood management, drought mitigation, water quality protection, and wildlife habitat enhancement.	Watershed
10. Partner with the Seine-Rat River Conservation District to assess the low-level crossings in the Marsh River and develop projects to restore river flow and reduce localized flooding.	Marsh River

Actions to achieve the goal of protecting and improving surface water quality in waterways	FOCUS AREA
11. Work cooperatively with Manitoba Conservation and Water Stewardship with regards to technical support and evaluation of technologies to reduce nutrient loads from municipal wastewater treatment facilities.	Watershed communities
12. Partner with the Seine-Rat River Conservation District and watershed residents to conserve and restore wetlands.	Watershed
13. Implement recommendations in the Lake Winnipeg Stewardship Board 2006 report "Reducing Nutrient Loading to Lake Winnipeg and its Watershed: Our Collective Responsibility and Commitment to Action".	Watershed
Actions to achieve the goal of protecting and restoring riparian areas and aquatic ecosystems	FOCUS AREA
14. Adopt development restrictions that require the retention and management of existing vegetation along waterways and undeveloped right-of-ways.	Watershed
15. RM of De Salaberry will partner with the St. Malo Wildlife Association and the Seine-Rat River Conservation District to investigate opportunities to improve fish habitat and populations in the Rat River and St. Malo Lake.	St. Malo Lake



PLAN WATERSHED RESIDENTS / AGRICULTURAL PRODUCERS

ACTIONS:

SOURCE WATER PROTECTION:

Reduce and eliminate the risk of well water contamination by:

- Retaining an experienced and provincially licensed well drilling contractor for the drilling and construction of a water well
- Locating a new water well at a safe distance from potential sources of contamination and in an area away from surface runoff from potential sources
- Ensuring an experienced and licensed contractor completes the hook-up of the water well to the water distribution system using pitless well construction
- Disinfecting a new well, pump and water distribution system to kill any bacteria that may be present prior to putting it into operation
- Ensuring that wells located in a designated flood prone area have adequate well head protection to ensure flood water does not directly enter the well
- Sealing abandoned wells properly in accordance with the guidelines recommended in Manitoba's Guide for Sealing Abandoned Water Wells

Use water wisely by:

- Installing low-flow water fixtures (i.e. toilets, showerheads, etc.)
- Replacing worn out appliances and fixtures with Energy Star and WaterSense products
- Landscaping with native and drought-resistant plants that don't require excessive watering
- Constructing a rain garden to accept sump pit water and local runoff
- Using a rain barrel collection system for local watering
- Repairing water leaks at faucets and pipes around the house
- Taking regular water meter readings to check for water loss from leaks (take reading at night when everyone has used the bathroom and gone to bed and a new reading first thing in the morning before anyone uses any water)

SURFACE WATER MANAGEMENT:

- Work with Manitoba Conservation and Water Stewardship's Water Resource Officers, municipalities and the Seine-Rat River Conservation District to ensure all drainage and water diversion related activities are in compliance with *The Water Rights Act*.

WATER QUALITY PROTECTION:

- Maintain onsite wastewater systems for effective operations and adhere to provincial legislation during any construction or reconstruction.
- Manage manure responsibly to minimize the risk of negatively impacting water quality.
- Conserve and restore wetlands.

- Implement recommendations listed in the Lake Winnipeg Stewardship Board 2006 report “Reducing Nutrient Loading to Lake Winnipeg and its Watershed: Our Collective Responsibility and Commitment to Action”.

RIPARIAN AND AQUATIC ECOSYSTEM MANAGEMENT:

- Participate in the land and water management programs offered by the Seine-Rat River Conservation District (www.srrcd.ca), Manitoba Habitat Heritage Corporation (www.mhhc.mb.ca), and Nature Conservancy (www.natureconservancy.ca/en/where-we-work/manitoba/). Programs include riparian area management, riverbank stabilization, riparian area fencing, alternate/offsite watering systems, water retention, watershed education, land purchase/optional lease-back, conservation agreements, etc.
- Cooperate with the Seine-Rat River Conservation District in order to complete riparian area rehabilitation projects identified in the 2005 Rat River – Joubert Creek Aquatic Habitat and Riparian Assessment Survey (<http://srrcd.ca/special-projects/rat-river-studies/>).
- Participate in community activities to clean-up and maintain local waterways.

PLAN NATURE CONSERVANCY OF CANADA

Nature Conservancy of Canada is very active in conservation programming in the central portion of the Rat-Marsh River Watershed and has acquired a significant amount of land in the Rat River Swamp. Their activities are guided by their long-term plans to secure biologically diverse and endangered habitat. The organization meets with landowners to discuss options which include purchase, donations, conservation agreements, a lease-back program, and property management plans that can include grazing, haying and prescribed burns.

Nature Conservancy of Canada will continue to implement their conservation plans and work in cooperation with local landowners, municipalities, Seine-Rat River Conservation District and Manitoba Habitat Heritage Corporation.

PLAN MANITOBA HABITAT HERITAGE CORPORATION

The Manitoba Habitat Heritage Corporation (MHHC) is a non-profit Crown corporation that works in partnership with public and private organizations and individual landowners to conserve, restore, and enhance fish and wildlife habitat in Manitoba. MHHC programming in southeastern Manitoba focuses on riparian areas and includes conservation agreements and management extension / training.

MHHC will continue to offer conservation programming and work in cooperation with landowners, agricultural producers, local municipalities, Seine-Rat River Conservation District, Nature Conservancy of Canada, and other organizations.

PROVINCIAL LEGISLATION

The Province of Manitoba has established the following legislation related to environmental management and water protection:

- ***The Water Protection Act and Regulations:***
 - o Manitoba Water Quality Standards, Objectives and Guidelines Regulation
 - o Nutrient Management Regulation
 - o Phosphorus Reduction Regulation
- ***The Ground Water and Water Well Act and Well Drilling Regulation***
- ***The Water Rights Act and Water Rights Regulation***
- ***The Water Resources Administration Act and Regulations:***
 - o Designated Flood Area Regulation
 - o Designated Reservoir Areas Regulation
 - o Establishment of Designated Dyking Systems Regulation
- ***The Water Resources Conservation Act***
- ***The Drinking Water Safety Act and Regulations:***
 - o Drinking Water Safety Regulation
 - o Drinking Water Quality Standards Regulation
- ***The Environment Act and Regulations:***
 - o Livestock Manure and Mortalities Management Regulation
 - o Onsite Wastewater Management Systems Regulation
 - o Pesticides Regulation
 - o Waste Disposal Grounds Regulation
 - o Water and Wastewater Facility Operators Regulation
 - o Classes of Development Regulation
- ***The Dangerous Goods Handling and Transportation Act and Storage and Handling of Petroleum Products and Allied Products Regulation***
- ***The Mines and Minerals Act and Quarry Minerals Regulation***
- ***The Planning Act and the Provincial Planning Regulation***
- ***The Public Health Act and Protection of Water Sources Regulation***



REFERENCES

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2. Manitoba Conservation and Water Stewardship – Water Science and Management Branch, Groundwater Management, January 2012. Rat Marsh River Watershed Groundwater Resource Information
3. Seine-Rat River Conservation District: Summary of Public Input to the Rat-Marsh River IWMP. http://srrcd.ca/documents/summary_public_ratmarsh.pdf
4. Manitoba Conservation and Water Stewardship – Groundwater Management Branch http://www.gov.mb.ca/waterstewardship/water_info/misc/abandoned_wells.pdf
5. Manitoba Conservation and Water Stewardship – Water Science and Management Branch, Water Quality Management, March 2011. Rat-Marsh River Watershed Integrated Watershed Management Plan – Water Quality Report
6. Manitoba Water Stewardship – Water Science and Management Branch, November 28, 2011. Report 2011-01. Manitoba Water Quality Standards, Objectives, and Guidelines.
7. Manitoba Clean Environment Commission, December 2007. Environmental Sustainability and Hog Production in Manitoba http://www.gov.mb.ca/conservation/envprograms/livestock/pdf/hogproductionreport_2008_1.pdf
8. Lake Winnipeg Stewardship Board http://www.gov.mb.ca/waterstewardship/water_quality/lake_winnipeg/interim_rpt.html
9. North / South Consultants Inc., 2005, Rat River – Joubert Creek Aquatic Habitat and Riparian Assessment Survey, <http://srrcd.ca/special-projects/rat-river-studies/>
10. Manitoba Conservation and Water Stewardship – Fisheries Branch, 2012, Fisheries Information submitted to Rat-Marsh River Watershed Team

BACKGROUND INFORMATION

Additional background information on the Rat-Marsh River IWMP is available by calling the Seine-Rat River Conservation District office at 204-424-5845 or from their website at: <http://srrcd.ca/special-projects/rat-river-integrated-watershed-management-plan-iwmp/>



