Arrow - Oak River

Integrated Watershed Management Plan

MINISTER OF WATER STEWARDSHIP

Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

Mr. Ron Kostesky
Chair
Upper Assiniboine River Conservation District
Box 223, 111 Sarah Ave.
Miniota MB R0M 1M0

JUN 0 7 2011

Mr. Ken Cook
Chair
Little Saskatchewan River Conservation District
Box 209, 55 North Railway St.
Oak River MB R0K 1T0

RE: Arrow-Oak River Integrated Watershed Management Plan

Dear Mr. Kostesky and Mr. Cook:

In accordance with Section 19(2) of *The Water Protection Act* and on the advice of the Manitoba Water Council, I approve the Arrow-Oak River Integrated Watershed Management Plan dated November 2010.

I would like to congratulate the Project Management Team, staff and Boards of both the Little Saskatchewan River and Upper Assiniboine River Conservation Districts for working together to cooperatively develop the Arrow-Oak 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 this diverse 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,

Christine Melnick

Upper Assiniboine River Conservation District

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As the Project Management Team Chairman, I am pleased to present the first Arrow Oak Integrated Watershed Management Plan (IWMP). Our natural environment is the basis for economic social wellbeing in our communities and our climate is changing. To prepare for this we must ensure that we have a robust and resilient environment. To buffer against droughts and extreme floods, a balanced approach to water management will help protect against extremes in weather and other forces that come with extreme environmental conditions, which is what this plan represents.

The Arrow Oak IWMP offers insight into the actions needed across five broad goals, nine objectives, and 38 specific action items to address the current concerns within the watershed. To sustainably manage our natural environment, protect soil, water and biodiversity in the face of future environmental pressures, the Project Management Team has laid out an aggressive agenda. I trust that this report will help watershed stakeholders on the journey towards a more sustainable and balanced approach to resource management. Inside these pages you will discover that collaboration by all stakeholders will be critical in the successful implementation of this plan.

This report would not have been possible without the support of people who provide invaluable local knowledge, technical expertise, photographs and financial assistance which is captured in more detail on pg 6. I invite you to read through the plan and ask yourself, "how can I become part of the solution towards more health and safe environment."

Robert Alexander
Chair, Arrow Oak Project Management Team

EXECUTIVE SUMMARY

In 2006, the Little Saskatchewan River and Upper Assiniboine River conservation Districts were jointly designated the Water Planning Authority for the Arrow-Oak River Watershed as part of a larger initiative to complete Integrated Watershed Management Plans (IWMPs) on the upper reaches of the Assiniboine River.

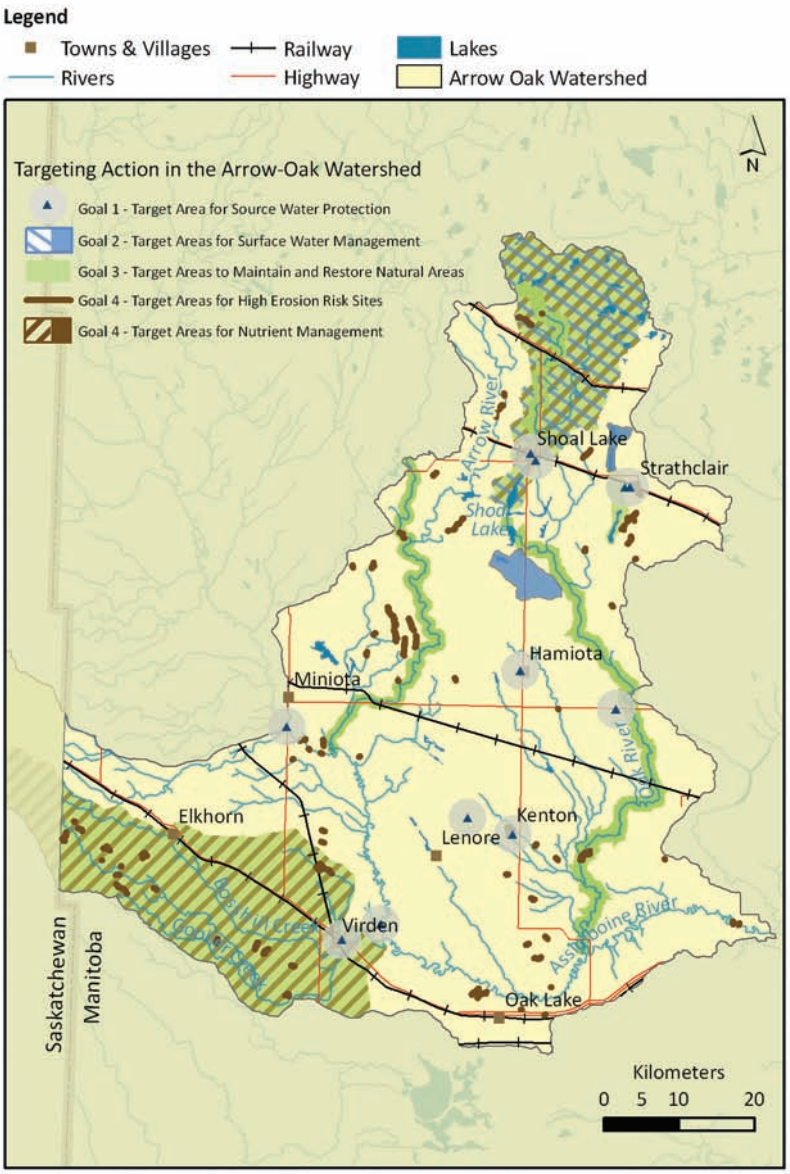
Through the input of technical experts, local stakeholders, and watershed residents the Water Planning Authority developed five broad goals which serve as the foundation for this IWMP. In addition to these goals, a number of specific, measurable objectives were developed, each of which break the watershed goals into specific, manageable components.

Watershed Goals & Objectives

1	**To enhance, maintain & protect safe drinking water sources:** **Objective 1A:** Prevent bacterial or pollutant contamination of public water sources **Objective 1B:** Prevent bacterial and pollutant contamination of identified semi-public and private water sources
2	**To manage water from the top to the bottom of the watershed to minimized damage to natural ecosystems and human activities** **Objective 2A:** Prevent flood damage on North Salt Lake, Six Mile Slough and Shoal Lake **Objective 2B:** Develop a surface water management plan for the watershed by 2012
3	**To maintain and restore natural areas in the watershed** **Objective 3A:** No-net loss of wetlands and no-loss of unbroken native prairie in the watershed **Objective 3B:** Identify threats to aquatic ecosystem in water bodies with important aquatic habitat
4	**To reduce nutrient and bacteria inputs into lakes and streams in the watershed** **Objective 4A:** Reduce the annual average total Phosphorus levels on Shoal Lake, South Salt Lake & Gopher Creek by 10% over the next 10 years **Objective 4B:** Ensure that recreational water bodies remain safe to swim in (<200 fecal coliforms or e.coli /100ml)
5	**To sustainably use groundwater supplies and expand knowledge of local aquifers** **Objective 5A:** Improve public and technical understanding of groundwater re sources in the watershed

The first section of the IWMP provides background on the planning process and general watershed management principles, the second section outlines the goals developed by the planning team and how we intend to reach these goals, the third section suggests general policies to implement across the watershed, and the fourth section provides a detailed breakdown of the recommended actions. For each action a lead agency, measure of success, partner agencies, timeframe to complete the action, target area and desired outcome are recommended. For a map summary of goals and potential actions see page 5.

This plan will serve as a roadmap for the Conservation Districts, Government, and other agencies in order to **maintain** and **improve the health of our watershed**.



GOAL 1

To enhance, maintain & protect safe drinking water sources.

To reach this goal our actions included programs like:

- Focusing abandoned well sealing dollars in target areas around municipal systems.
- Communicating best practices for maintaining private wells
- Working with the Office of Drinking Water to ensure subsidized testing for land owners into the future.

GOAL 2

To manage water from the top to the bottom of the watershed and minimize damage to natural ecosystem and human activities.

To reach this goal our actions included programs like:

- Encourage small water retention/storage projects in the target catchments.
- Conduct a culvert inventory of the watershed.
- And many more...

GOAL 3

To maintain and restore natural areas in the watershed.

To reach this goal our actions included programs like:

- Promoting a wetland bank/market to offset wetland loss throughout the watershed.
- Restore vegetated riparian buffers on watercourses and lakes.
- Protect remaining native prairie through easement or purchase.
- And many more...

GOAL 4

To reduce nutrient and bacteria input into lakes and streams in the watershed.

To reach this goal our actions included programs like:

- Offer incentives for alternative watering & reparian fencing on watercourses and lakes.
- Educate residents about household and grassroots measures to improve water quality.
- Restore wetlands in target catchments.
- And many more...

GOAL 5

To sustainably use groundwater supplies and expand knowledge of local aquifers.

To reach this goal our actions included programs like:

- Conservation Districts adopting a formal no-net loss policy for wetlands in the watershed.
- Source water protection should be given the highest priority.

Actions targeted towards the ENTIRE WATERSHED include:

- Conservation Districts adopting a formal no-net loss policy for wetlands in the watershed
- Source water protection should be given the highest priority

ACKNOWLEDGEMENTS

The Arrow-Oak Watershed Planning Authority would like to gratefully acknowledge and thank the Upper Assiniboine River & Little Saskatchewan River Conservation Districts, the watershed planning advisory team members, member municipalities, and all watershed residents and stakeholders for their Support, input and participation in developing the Arrow-Oak Watershed Management Plan.

Special thanks go to the members of the Project Management Team which included Robert Alexander, Dallas Miller, and manager Ryan Canart from Upper Assiniboine River CD; Ron Budiwski, Ralph Sprenger, Rod Veitch and manager Colleen Cuvelier from Little Saskatchewan River CD; and Jason Senyk from Manitoba Water Stewardship.

Additional thanks go to the members of the four-watershed project management team which shepherded the planning process from the start, Dave Dobson from Ducks Unlimited, and Manitoba Water Stewardship planners, Phil Weiss & Sheldon Kowalchuck, Project Management Team Members: John Whitaker, Robbie Craig, Robert Alexander, Geordie Danyliuk, Ron Turetsky, Ed MacKay, and Dennis Pedersen, all of whom were instrumental in the initial stages of the planning process.

Figure 1: Small drains, such as this one running through a pasture, are easy to forget but looking after the many small drains and water-courses is an important part of maintaining the overall health of our watershed.

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Map of Arrow-Oak Watershed

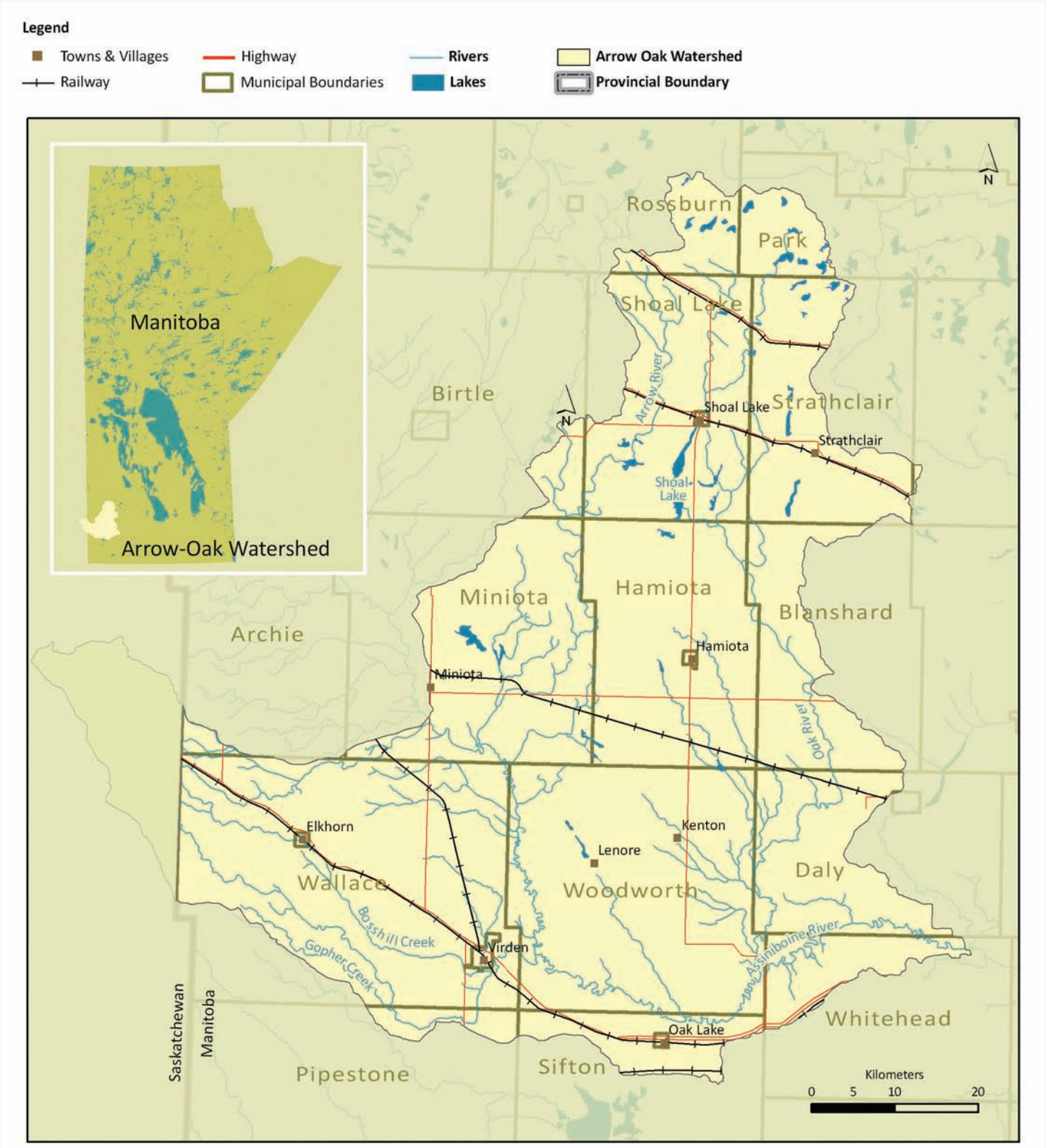

Figure 3: A map of the Arrow-Oak watershed. A small portion of the watershed, extends west into Saskatchewan and is outside of the mandate of this integrated watershed management plan.

INTRODUCTION

Welcome to the Integrated Watershed Management Plan (IWMP) for the Arrow-Oak Watershed. This plan is the result of over three years of work from a variety of organizations including the Little Saskatchewan River & Upper Assiniboine River Conservation Districts, watershed residents and technical experts. This plan is intended for the Arrow-Oak watershed and the community that lives, works and plays in the watershed. Therefore, it will only succeed if you, and the rest of the watershed community embrace this plan and become involved in the IWMP's implementation.

What is a Watershed?

A watershed is defined as an area of land where all water within it drains to a common point such as a river or lake. Within a watershed surface and groundwater is generally connected and either flows across the landscape through waterways or vertically through various layers of soil and substrate. This movement of water across and through the landscape connects an area hydrologically. This connectivity extends beyond soil and water to include the plants and animals that depend upon these systems for life. A watershed is a natural spatial unit defined by the movement of water, and as such, it is also the area best suited to manage and make decisions about water. Since a watershed is a naturally defined area of land it intersects with and cuts across existing man-made political boundaries such as municipalities, this poses a challenge to our existing models of governance and decision making.

What is an Integrated Watershed Management Plan?

An integrated watershed management plan is intended to be used as a roadmap to assist the watershed community in reaching its vision: to live in and manage a watershed that provides a healthy balance and a sustainable future for all members of the ecosystem and economy. To this end, the IWMP outlines five general goals and nine specific objectives which serve to put our watershed vision into more concrete terms. The implementation section contains the specific recommended actions which will help us to achieve our objectives and thus fulfill our watershed vision.

An integrated watershed management plan is unique in that it is focused on natural resources and the environment. Whereas development plans and other planning initiatives typically contain sections dealing with general environmental concerns and or specific resources, these areas are often dealt with as constraints to development rather than specific objectives in their own right. Thus, there is opportunity for the two planning processes to compliment each other and provide tools for the community to address both environmental and development goals. The IWMP is intended to operate in concert with existing development plans, and the implementation section contains a number of land use recommendations for planning districts, towns, and rural municipalities to implement in order to help reach the watershed goals.

Purpose - Why Create an Integrated Watershed Management Plan?

The purpose of this IWMP is to clearly state the goals for the protection, conservation, or restoration of land and water, aquatic ecosystems and drinking water sources in the watershed. The IWMP also outlines the specific actions that are necessary in order achieve these goals. In other words, it defines what our watershed community wants to achieve and how will we accomplish this.

Legislative and Regulatory Background

Integrated watershed management plans are a key component of Manitoba's Water Protection Act, proclaimed in January of 2006. The Act includes general instructions for the planning process, requirements for what should be included in integrated watershed management plans, and outlines how watershed plans are to be approved.

Key Players in the Planning Process

- Watershed Residents

Watershed residents are an important group in the creation and implementation of this IWMP. This IWMP is intended to be a reflection of the collective values of watershed residents in relation to the environment and natural resources. In the process of drafting this plan, 44 watershed residents participated in open-house meetings. Through their participation they helped prioritize the issues facing the watershed and shared their vision of what they would like the Arrow-Oak watershed to look like for future generations.

- Water Planning Authority (WPA)

The Water Planning Authority (WPA) is the agency that is designated under the authority of the Water Protection Act with the responsibility to conduct the preparation of the watershed management plan. The Little Saskatchewan River and Upper Assiniboine River Conservation Districts share the responsibility as a joint WPA for the Arrow-Oak watershed.

- Watershed Planning Advisory Team (WPAT)

The Watershed Planning Advisory Team (WPAT) is a large group of people who represent key stakeholder organizations and technical support staff. The role of the WPAT is to collect and interpret local and technical information about the watershed and provide input on the formation of the watershed plan. The WPAT met 10 times during the planning process between late 2006 and the end of 2007 and received presentations from a wide variety of technical experts from government and other agencies.

- Project Management Team (PMT)

The Project Management Team (PMT) is a small group of people and includes staff and board representation from the Little Saskatchewan and Upper Assiniboine River Conservation Districts, and a provincial planner. The role of the PMT is to make key decisions throughout the planning process which are intended to reflect the issues and concerns of the broader WPAT. The PMT was responsible for designing communication materials, planning open houses to engage public participation; combining the local and technical input to generate the goals, objectives, and actions for the watershed; and finalizing the content of the IWMP. The PMT for the Arrow-Oak watershed was formed in the summer of 2008. Prior this point a single PMT oversaw the conduct and development of four Assiniboine IWMPs together.

Figure 5: Riparian areas are critical as the interface between land and the water. Healthy riparian buffers serve to improve aquatic and terrestrial habitat, reduce nutrient enrichment of waterways, reduce shoreline erosion, and stabilize channels.

Watershed Management Principles

The following watershed management principles provided a foundation to the Watershed Planning Advisory Team and the Project Management Team throughout the planning process. These principles help to illustrate the connections and inter-relationships within a watershed, and assist with the development of management strategies and specific actions for the watershed.

- Nothing happens in isolation – everything is connected by the land and water in a watershed
- Upstream is connected to downstream
- Water management planning should be based on watersheds
- What happens on the land is reflected in the water
- Clean water is critical to the sustainability of our local communities and environment
- The watershed planning process needs to be community-based and inclusive of all stakeholders
- Management strategies need to be adaptive to changing conditions and situations
- Decisions need to be made considering the best available science, local knowledge and experience
- Monitoring and research is an essential part of water management
- Nothing happens overnight - large-scale landscape improvements require long-term commitment and participation
- Building momentum through implementation successes is critical to reaching watershed goals and long-term success
- Opportunities for learning and participating must be easily accessible

Watershed Background

The State of the Watershed Report for the Arrow-Oak Watershed contains background information and a summary of the available data on the people, environment and resources of the watershed. If you are interested in learning more about the watershed or if you would like some detailed background information on watershed issues please see the Arrow-Oak State of the Watershed Report (2008) available from your local CD office or online at www.uarcd.com/IWMP.htm.

Planning Process and Timeline

In early 2006, the Arrow-Oak watershed and three neighbouring watersheds, the Little Saskatchewan River, Assiniboine-Birdtail, and Shell River were joined together into a single planning process intended to simplify and streamline the development of all four integrated watershed management plans. As plan development progressed team members broke out into separate project management teams for each watershed which worked to tailor plans to local needs and enhance local involvement.

A Terms of Reference detailing the timelines, budget, roles and responsibilities for the parties involved in the planning process was signed in June of 2006. The planning process, however, has had to be adaptive in order to meet changing circumstances. For example, the planning process was originally scheduled to take two years but due to staff turnover and delays in the collection and submission of technical data the process took just over 3 years to complete.

In June of 2008 the State of the Watershed Report was released for the Arrow-Oak Watershed. This report contained a summary of the existing scientific data and the issues facing the watershed from the perspective of resource experts. In late July 2008, a series of nine public open houses were held in order to garner feedback and capture the resource and environmental concerns of watershed residents. In fall of 2008, the Project Management Team for the Arrow-Oak Watershed began the task of combining the issues brought forward by both the experts and local people – the goals, objectives and recommended actions contained herein are the result of their work.

Figure 4: A timeline of the watershed planning process utilized in the preparation of the Arrow-Oak Integrated Watershed Management Plan.

WATERSHED GOALS AND OBJECTIVES

The following pages provide details on each of the goals and objectives in our watershed plan, and also explains some of the rationale and causes behind the issues. The table below summarizes how the watershed plan is structured and organized. First, the vision for the watershed acts as the singular, long term guiding statement, calling for a sustainable ecosystem and economy for all members of our watershed community. In the next layer are our five goals, which although broad and general, serve as guiding statements for issues that were identified. The next layer of organization constitutes the nine objectives for our watershed. Whereas the goals are intended to be more general, our objectives are specific, measurable, and achievable outcomes that we desire to reach, often connected to a specific geographic target area. At the next stage of organization are the actions which have been identified as the concrete steps necessary to achieve our goals, objectives and ultimately the vision for our watershed.

Vision

To live in and manage a watershed that provides a healthy balance between ecosystem and economy and a sustainable future.

Watershed Goals and Objectives

1	**To enhance, maintain & protect safe drinking water sources:** **Objective 1A:** Prevent bacterial or pollutant contamination of public water sources **Objective 1B:** Prevent bacterial and pollutant contamination of identified semi-public and private water sources
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3	**To maintain and restore natural areas in the watershed** **Objective 3A:** No-net loss of wetlands and no-loss of unbroken native prairie in the watershed **Objective 3B:** Identify threats to aquatic ecosystem in water bodies with important aquatic habitat
4	**To reduce nutrient and bacteria inputs into lakes and streams in the watershed** **Objective 4A:** Reduce the annual average total Phosphorus levels on Shoal Lake, South Salt Lake & Gopher Creek by 10% over the next 10 years **Objective 4B:** Ensure that recreational water bodies remain safe to swim in (<200 fecal coliforms or e.coli /100ml)
5	**To sustainably use groundwater supplies and expand knowledge of local aquifers** **Objective 5A:** Improve public and technical understanding of groundwater re sources in the watershed

1 Our Goal: To Enhance, Maintain & Protect Safe Drinking Water Sources

There are seven public drinking water systems in the Arrow-Oak Watershed, many more semi-public systems (i.e.schools, hospitals) and a large number of private wells. All public systems in our watershed withdraw their water from groundwater sources, as do all known semi-public and privatewater sources. This makes protecting our groundwater aquifers extremely important.

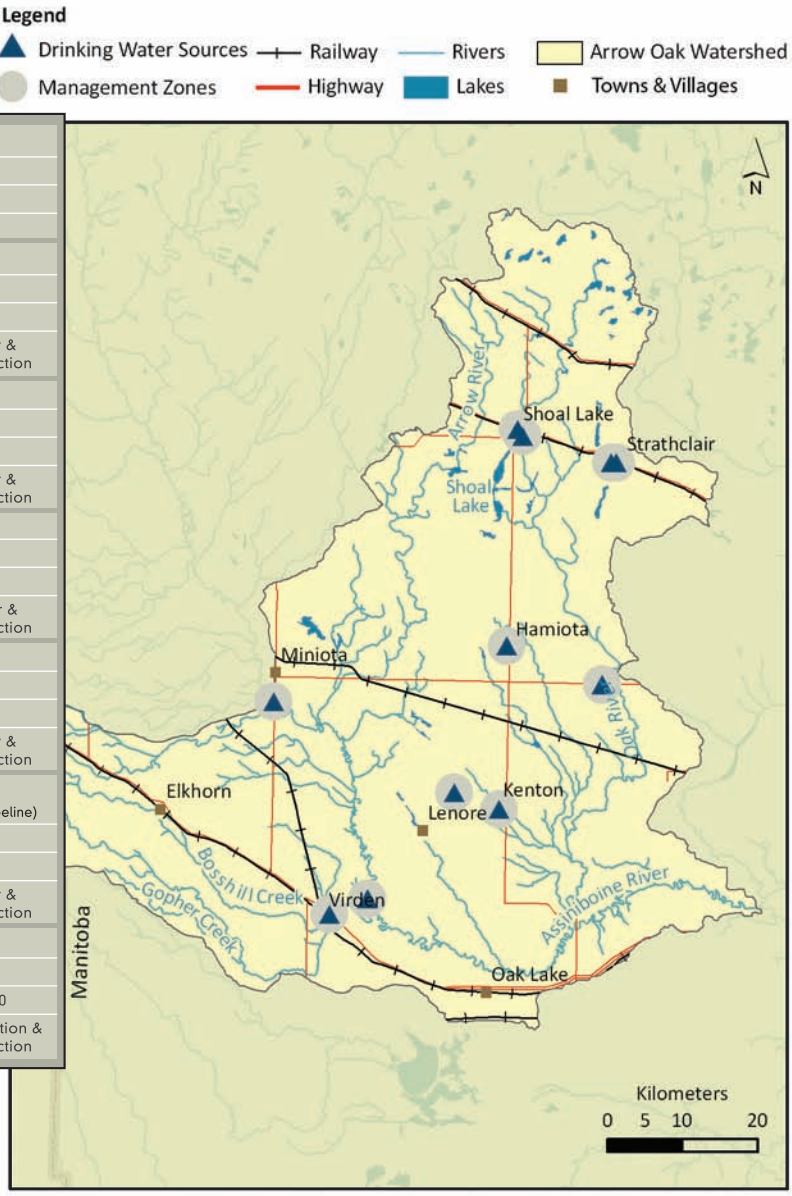
In this watershed, groundwater is extracted from either the Odanah Shale bedrock or from sand and gravel aquifers which can be located more closely to the surface. The Odanah Shale is deep and generally well protected from land use activities, however, the sand and gravel aquifers may be more sensitive to activities we conduct at the surface.

Land use activities such as:

- livestock operations
- waste disposal grounds
- septic tanks or improperly functioning septic fields
- herbicides, pesticides, and fungicides
- sewage lagoons

may impact the quality of our valued groundwater by leaching pollutants into the ground. It makes sense to reduce the risk of groundwater contamination by ensuring that good land management practices are conducted throughout the watershed, and especially in close proximity to a public drinking water source.

Shoal Lake	
Wells: 2	
Population: 800	
Chlorination	
Strathclair	
Wells: 2	
Population: 300	
Membrane Filter & Chlorine Disinfection	
Hamiota	
Wells: 1	
Population: 850	
Membrane Filter & Chlorine Disinfection	
Kenton	
Wells: 1	
Population: 300	
Greensand Filter & Chlorine Disinfection	
Oak River	
Wells: 2	
Population: 200	
Membrane Filter & Chlorine Disinfection	
Minota (RM of Wallace Pipeline)	
Wells: 1	
Population: 450	
Membrane Filter & Chlorine Disinfection	
Virden	
Wells: 2	
Population: 3,100	
Ozonation, Filtration & Chlorine Disinfection	



From Source To Tap

We can get more 'bang for our buck' if we focus our programming to areas of which will protect the greatest amount of people. The "managment zones' on the map indicate these the focus around public drinking wells.

Abandoned or improperly sealed wells can act as a conduit for pollutants to directly enter the groundwater and flood events can carry nutrients and contaminants into aquifers via poorly located or maintained active wells. In addition to quality concerns, some watershed residents were concerned with groundwater availability due to drought, reduced recharge, or overuse.

Finally, there are naturally occurring risks that we need to be aware of, but we may not necessarily be able to take action to correct. For example, Virden's water exceeds the health-based guideline of 0.01mg/L for arsenic not because of human activity but due to naturally high arsenic levels in the surrounding soils.

We developed actions aimed at solving the concerns mentioned above and we'll know we've met our goal if we've prevented bacterial or pollutant contamination of public, semi-public and private drinking water sources throughout the watershed.

How We Plan To Reach Our Goal

Objective 1A: Prevent Bacterial and Pollutant Contamination of Public Drinking Water Sources

To protect public drinking water sources we will:

a. Seal abandoned wells in the defined management zone of each public water source
b. Conduct a source water assessment survey of all public water sources
c. Form a source water protection committee to include a representative from the local municipality, the CDs, provincial representatives from:
   - surface water quality,
   - Office of Drinking Water,
   - and the groundwater management section, to develop an action plan for priority threats identified through the source water assessment
d. Erect Signage to delineate wellhead protection areas
e. Refine source water protection zones for public wells based on local geology
f. Control development that may contribute harmful levels of pathogens, bacteria, pollutants, or nutrients, in source water management zones and known groundwater recharge areas

In many instances, people are unaware that their activities on the surface may impact a groundwater source. Signage posted around the wellhead of public water sources will increase awareness of the location of the well and should make people more careful of their activities. (Photo courtesy of South Dakota Department of Environment and Natural Resources)

Objective 1B: Prevent Bacterial and Pollutant Contamination of Identified Semi-Public and Private Water Sources

To protect semi-public and private drinking water sources we will:

a. Coordinate an education effort on wellhead protection
b. Rejuvenate poorly constructed or degraded wells
c. Provide free grass seed for well head protection areas
d. Seal abandoned wells near semi-public and private wells
e. Offer annual water tests for private and semi-public water sources

Who is Responsible for carrying out these actions?
Turn to page 25 to find out...

2 Our Goal: To Manage Water from the top to the bottom of the Watershed to minimize damage to natural ecosystems and human activities

When people talk about drainage in Manitoba, emotions always run high, and the public response for this watershed was no different. Public feedback was generally divided between those that wanted to improve the drainage network and get water off the land as quickly as possible and those that saw problems with flooding and erosion and wanted to see retention of water on the landscape.

Water management decisions in our watershed are often made at small scales, often looking at individual fields or culverts, with little consideration of upstream activities or downstream impacts. Further, when decisions are made about water the focus is typically on managing the quantity of water and little or no emphasis is placed on the other effects of water such as impairment of water quality, aquatic ecosystems, or soils. For example, when water is removed from the landscape very quickly there is more water in the streams and drains over a short time (higher peak flow). This can result in:

- Infrastructure damage
- Higher erosion rates
- Less water storage on the landscape resulting in greater potential for water shortages

There were a number of specific areas targeted for special attention in the watershed including:

- Flooding of farmland and ditches in the area around Six Mile slough
- High water levels on Shoal Lake causing shoreline erosion and flooding
- Localized flooding and infrastructure damage due to beavers

Water, Water Everywhere

The three coloured zones on this map are catchments (small sub-watersheds) which contribute water to the target areas where there are flooding problems. The target areas were identified during public consultations and by technical experts.

Objective 2A: Prevent Flood Damage on North Salt Lake, Six Mile Slough and Shoal Lake

To reduce the levels of flooding and minimize flood damage we recommend:

a. Conduct flood frequency analysis to determine probable runoff volumes
b. Investigate the opportunity to construct a fixed height outlet for each closed basin
c. Provide incentives to convert flood prone land from annual crop production to permanent cover
d. Prohibit additional drainage of wetlands in the affected catchments
e. Restore wetlands in the affected catchments
f. Maintain a 30m natural riparian buffer zone for development on watercourses & lakes in the target areas
g. Ensure all drainage works in the target catchments are licensed
h. Encourage small water retention/storage projects in the target catchments

Figure 6: Aerial view of high water levels in Six Mile Slough, April 2009.

Objective 2B: Develop a Surface Water Management Plan for the Watershed by 2012

To provide a holistic surface water management strategy we recommend:

a. Delineate water management zones based on physical characteristics and land use
b. Establish policies and guidelines for surface water in each management zone
c. Establish objective criteria to evaluate drainage applications
d. Ensure all drainage works in the catchment are licensed
e. Conduct an inventory of culverts and drains in the watershed

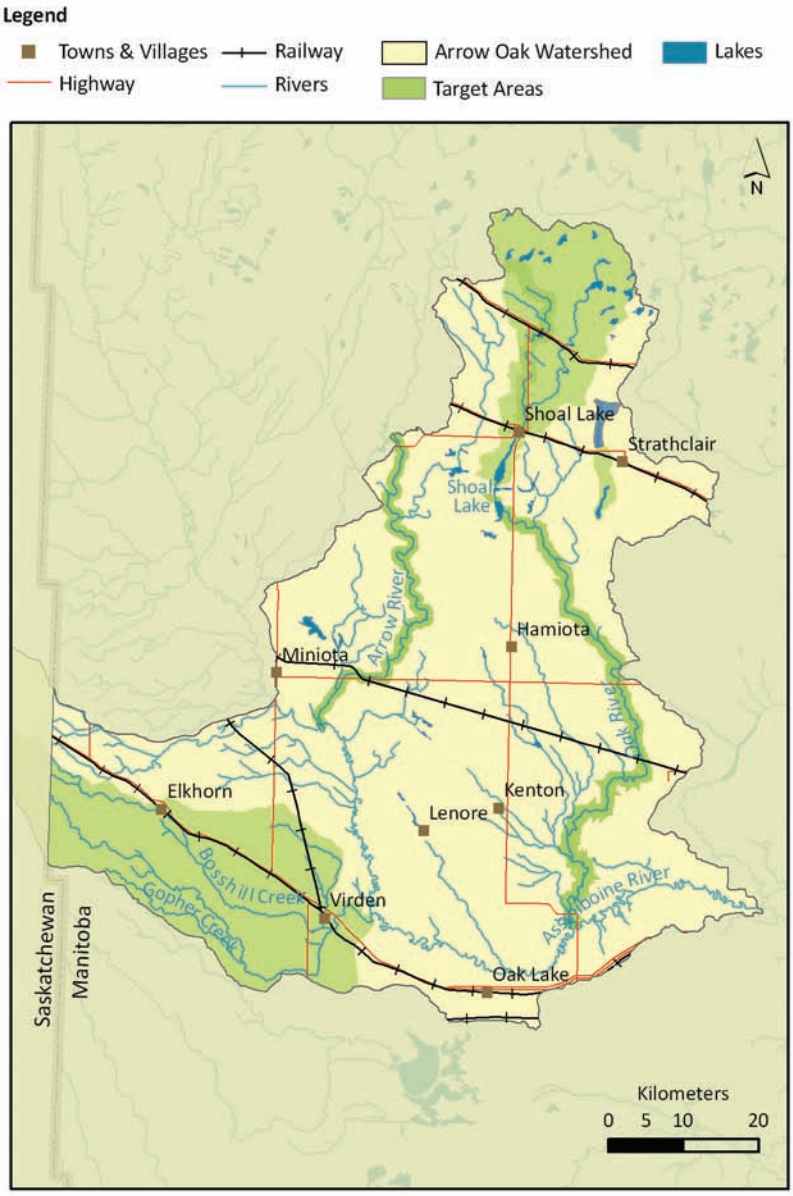
3 Our Goal: To Maintain and Restore Natural Areas in the Watershed

Ensuring sufficient habitat in the Arrow-Oak watershed is critical to supporting healthy aquatic and terrestrial ecosystems. Despite ongoing conservation efforts the indication is that habitat, particularly wetlands and riparian areas, are being lost and at an increasingly rapid rate. Preserving connections between natural areas is also important as it allows for travel between different areas and different habitat types.

Protecting habitat for wildlife is an important goal in itself but we also recognize that natural areas provide valuable ecological services such as mediating water quality and water quantity. The loss of natural areas, therefore, also has an impact on water quality, flooding and other issues which may seem unrelated. Wetlands and riparian areas were identified as particularly important and vulnerable natural areas in our watershed.

Wetlands and riparian areas both act as the interface between land and water, and as a result, their loss will mean that human activities will have a greater impact on water quality, water quantity, and aquatic ecosystem health.

Unfortunately, there is very little scientific data available on the health of aquatic ecosystems in our watershed. Fish are a valued part of our aquatic ecosystem and the presence of large-bodied species like walleye, pike and catfish are one indication of a healthy ecosystem. Fisheries experts identified the Arrow and Oak Rivers are the two priority streams in the watershed for protection and habitat improvement.



Keeping Nature Natural

Objective 3A targets specific types of natural areas (wetlands and native prairie) across the watershed; Oak River and Arrow River are also identified as important aquatic habitat to protect.

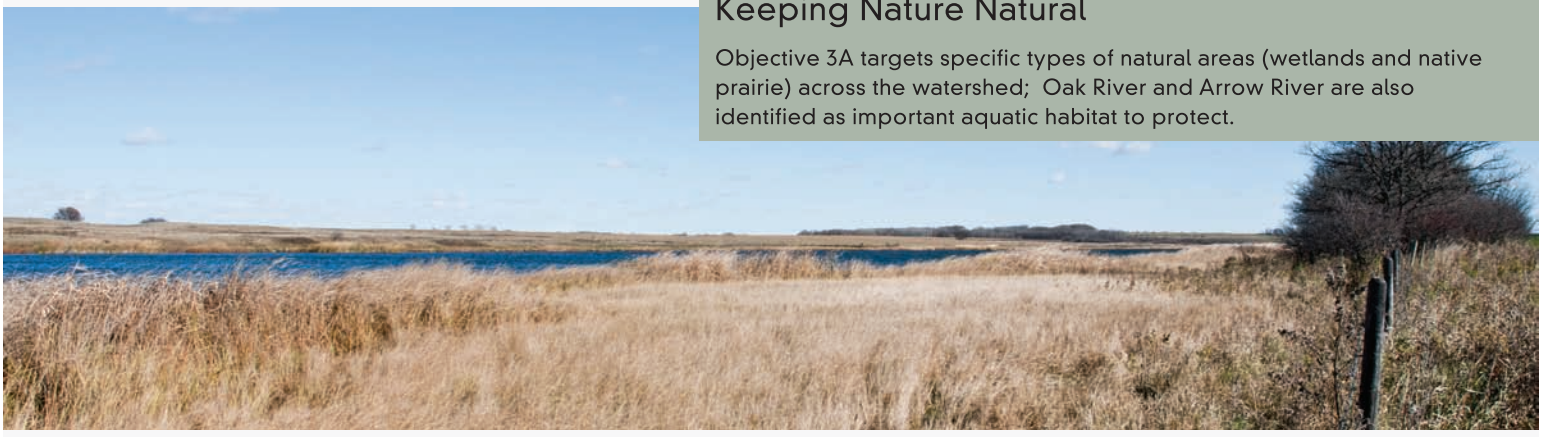


Figure 7: Wetlands, such as this one, can act to capture sediment and nutrients that otherwise runoff into our lakes and rivers.

How We Plan To Reach Our Goal

Objective 3A: No-net loss of wetlands and noloss of unbroken native prairie in the watershed

To preserve vulnerable wetlands and native prairie we will:

a. Inventory grasslands, woodlands, and wetlands in the watershed
b. Protect, by easement or purchase, the remaining native prairie
c. Adopt a watershed wide ecological goods and services program
d. Foster a wetland bank/market
e. Prohibit drainage of wetlands in identified target catchments
f. Restore drained wetlands in the affected catchments

Objective 3B: Identify threats to aquatic ecosystem health in waterbodies with important aquatic habitat

To preserve healthy aquatic ecosystems we will:

a. Conduct aquatic ecosystem assessments on important aquatic habitat
b. Implement habitat improvement/mitigation projects on identified problem sites
c. Maintain a 30m natural riparian buffer zone for development on watercourses & lakes in the target areas
d. Restore vegetated riparian buffers on identified high erosion risk sites

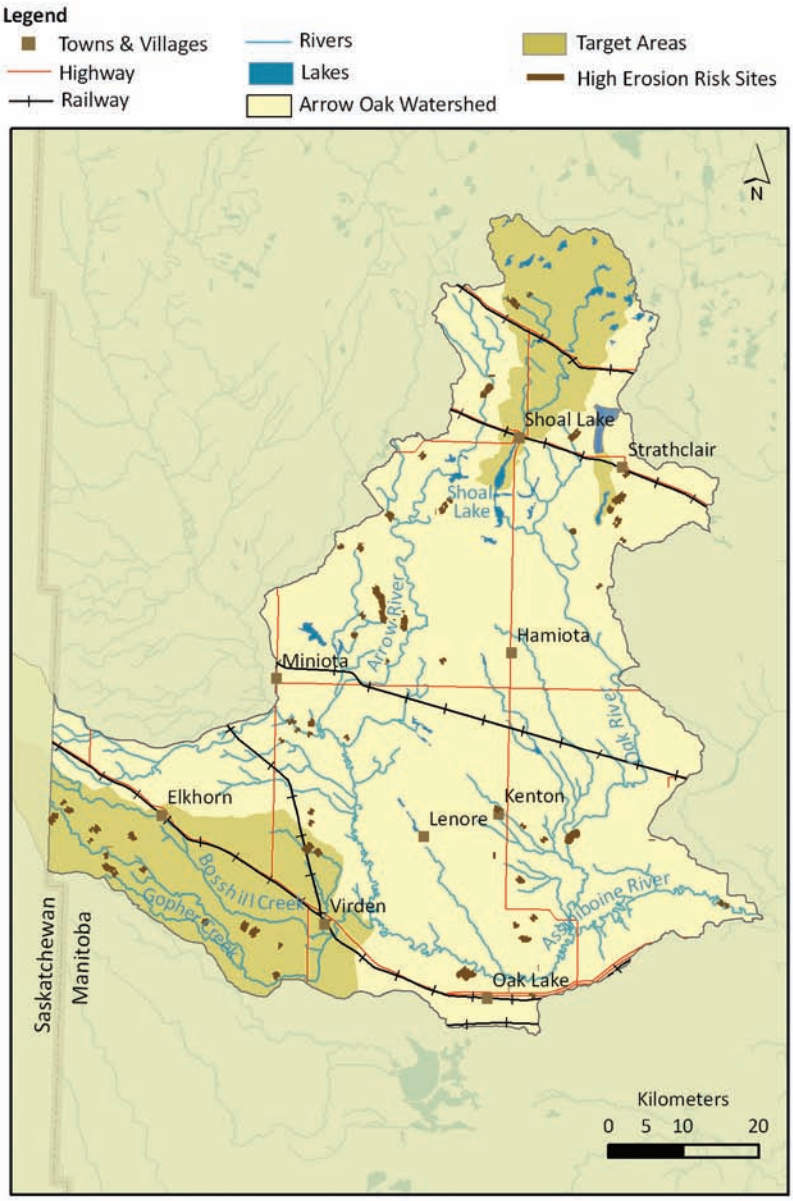
Figure 8: Riparian areas, like the one shown here on Eternal Springs provide habitat, protect water quality, and also help connect habitat in different areas.

4 Our Goal: To Reduce Nutrient and Bacteria Input into Lakes and Streams in the Watershed

Water quality describes the chemical, biological and physical characteristics of water. Nutrient enrichment is one of the chief water quality concerns in our watershed. Although nutrient enrichment is often talked about in connection with Lake Winnipeg there are effects seen closer to home. Tests on the Arrow and Oak Rivers from 1999 to 2003 showed that both rivers regularly have high levels of Phosphorus, sometimes as much as 20 time above the objective level. Shoal Lake has been identified as a hypereutrophic (extremely nutrient enriched) lake and studies have shown that three quarters of the nutrients in the lake originate from sources on the landscape (e.g. livestock, fertilizers, sewage).

Elevated levels of the nutrients nitrogen and phosphorus in our waterways can fuel excessive production of algae in local water bodies and downstream in Lake Winnipeg. Algae is a natural part of aquatic ecosystems but too much algae can degrade water quality and cause problems for drinking water, recreation, ecosystem health—and in some cases can create toxicity problems for humans and animals. Some of the sources of nutrient sources that were identified by local residents and technical advisors included: sewage (wastewater lagoons and private septic fields), Livestock wastes, Drainage of land, Application of fertilizers to land.

Residents also made it clear that it was important for recreational water bodies, such as Salt Lake and Shoal Lake, to remain safe for swimming and other recreational uses. Fortunately, many of the actions that will help us reduce nutrient enrichment will also help us lower the levels of fecal coliform present in water bodies.



Clean and Clear?

Phosphorus levels were found to be high in most of the streams in our watershed. The three target areas for nutrient reduction were chosen based on recommendations from watershed residents.

How We Plan To Reach Our Goal

Objective 4A:
Reduce the annual average total phosphorus levels on Shoal Lake, South Salt Lake & Gopher Creek by 10% over the next 10 years

Objective 4B:
Encourage measures that reduce the incidence of bacteria in Shoal Lake & South Salt Lake (<200 fecal coliforms or e.coli /100ml)

To reduce nutrient and bacteria levels in our water we will:

a. Offer incentives for offsite watering and riparian fencing on watercourses and lakes
b. Prohibit drainage of wetlands in identified target catchments
c. Maintain a 30m natural riparian buffer zone for development on watercourses & lakes in the target areas
d. Restore vegetated riparian buffers on identified high erosion risk sites
e. Encourage landowners to divert farmyard runoff (point source) into retention ponds
f. Restore drained wetlands in the target catchments
g. Explore local treatment and diversion options to reduce nutrient output from municipal sewage lagoons
h. Adopt a watershed wide ecological goods and services program
i. Educate residents about household and grassroots measures to protect and improve water quality

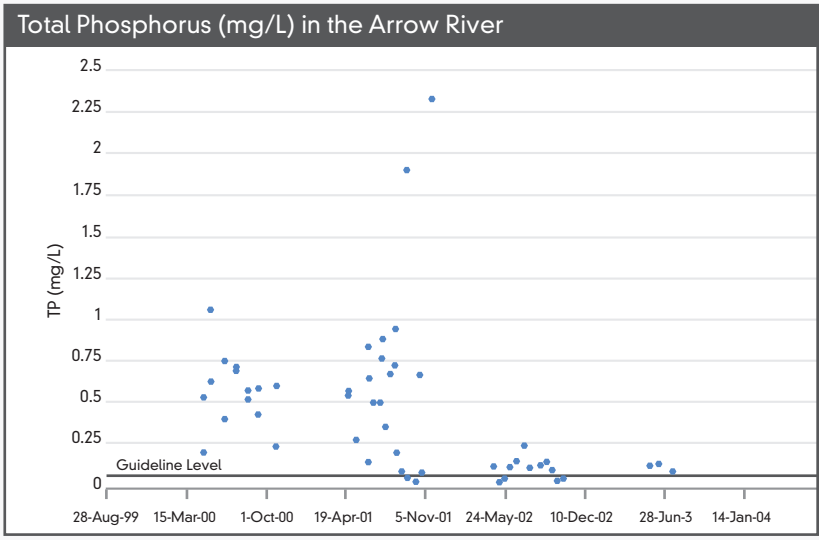


Figure 10: A graph of phosphorus levels on the Arrow River from 2000-2003. The objective level of 0.05 mg/l is shown as a solid line at the bottom of the graph.

Figure 11: Algae on Kenton Reservoir, Summer 2008

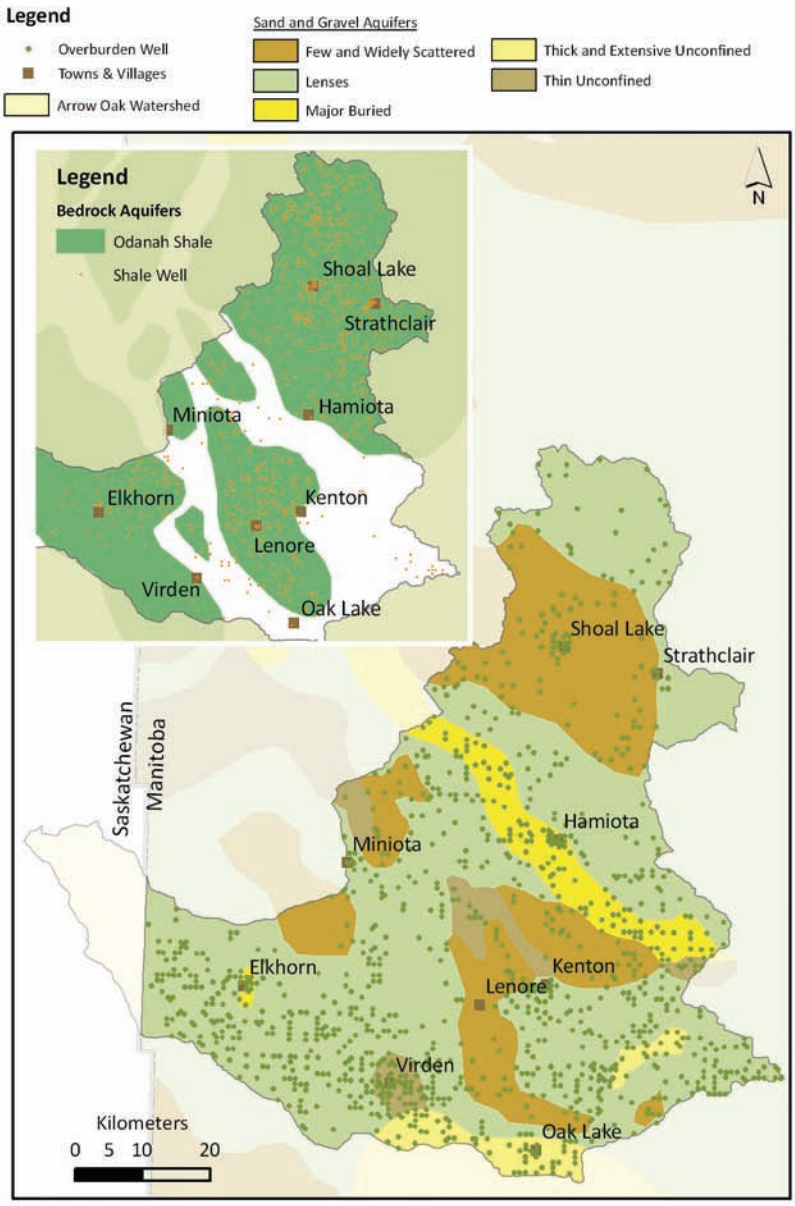
5 Our Goal: To Sustainably use Groundwater Supplies and Expand Knowledge of Local Aquifers

Groundwater is the source of drinking water for all of the towns and private residences in our watershed. The groundwater used for these purposes varies between shallow, sand or gravel aquifers and confined, deep bedrock aquifers.

Depending on the soils, topography, and underlying geology, human activities at the surface can potentially impact groundwater quality and quantity. Some of the activities which may impact groundwater quality and quantity are:

- Application of fertilizers
- Operation of municipal or private sewage systems
- Application of Herbicides, pesticides, and fungicides
- Contamination from livestock wastes
- Loss of wetlands (possible reduction in recharge)

One of the central concerns relating to groundwater in our watershed is that there is insufficient knowledge about the number, location, and construction of active and abandoned wells in the watershed. Abandoned or improperly sealed wells form a particular hazard as they pose a contamination hazard for the aquifers which may affect other wells that utilize the same groundwater. Manitoba Water Stewardship maintains a database of wells in the province, however, many wells, especially older ones, are not recorded. A well inventory to locate wells and assess their condition is an important step in protecting groundwater resources.



Water Below

Unconfined aquifers as displayed in the map are generally more susceptible to contamination from activities at the surface. The wells which utilize shallower groundwater in these areas represent spots where particular attention should be paid to groundwater protection.

Another key area of concern identified by watershed residents was a lack of information about the total quantity of water available from key aquifers, the volume of recharge versus withdrawal, and the critical areas which serve to recharge local aquifers. More information and education for watershed residents and industries will assist in protecting groundwater from contamination and in ensuring that water is available for future generations.

Objective 5A: Improve public and technical understanding of groundwater resources in the watershed

To improve public and technical understanding of groundwater resources in the watershed we will:

a. Conduct a well inventory in the watershed
b. Prepare new groundwater maps at the watershed scale and share with the watershed community
c. Evaluate the groundwater monitoring well network so that key aquifers within the watershed are monitored
d. Deliver education targeted to students and landowners on groundwater protection
e. Consider changes to The Groundwater and Water Well Act to require all new well locations to be logged and all test holes to be sealed once finished

Figure 12: An old, disused well that is about to be sealed. Abandoned or disused wells can act as direct conduits for pollutants at the surface to reach aquifers.

WATERSHED WIDE POLICIES

There are a number of policies and actions which the Watershed Planning Authority recommends adopting in order to improve watershed health.

1. Conservation Districts to adopt a formal no-net loss policy for wetlands in the watershed

According to recent research, up to 70% of the wetlands originally on the landscape have already been lost (Ducks Unlimited Canada, 2008). Wetland loss has huge impacts on water quality, water quantity, wildlife habitat, and carbon storage. The consensus recommendation among the government and nongovernment scientists and experts who contributed to this watershed plan is that we cannot afford to lose any more wetlands.

A no-net loss policy for wetlands does not necessarily mean that no further drainage could be done on private lands. It would mean that if a landowner wants to drain a wetland the Conservation District will encourage them to restore a wetland, of equivalent volume, within the same sub-watershed . A wetland bank which connected landowners who wanted to drain land with landowners who were willing to restore wetlands would allow for a free market exchange to take place.

2. Source water protection programming and activities should be given the highest priority in designated source water protection areas

Water is a fundamental need to support human life and as such it is critical that we take the steps necessary to ensure that the water we drink remains safe. Goal 1 establishes the objectives and focus areas in order to protect public drinking water sources, these actions are recognized as the highest priority of the Water Planning Authority.

A multi-barrier approach which includes source water protection is generally accepted as the most effective method of ensuring safe drinking water. In addition, the increasing use of rural water pipelines within our watershed mean that more people will be drinking water from the same source—making it even more important to ensure that source water is adequately protected.

3. For projects in partnership with private landowners, Conservation Districts should cover a minimum of 75% of costs associated with recommended actions in focus areas

This watershed plan identifies objectives for the watershed and recommends actions to help us achieve those objectives. This represents a change in the way in which most CDs have operated, from a walk-in clinic approach where interested landowners could apply for programming to an outcome-focused approach in which CDs will initiate contact with landowners in focus areas. Landowners in focus areas may not be aware of the need, or be willing to change management practices on their land. Thus, a larger incentive is required in order to entice the landowner to participate and to achieve the desired conservation outcome.

By covering a greater proportion of the costs associated with projects and programs and initiating contact with landowners in focus areas, CDs will shift the delivery of their programs from a demandbased model to an outcome based model. A consequence of this shift is that the incentives that are offered to landowners will have to be increased, this will make the project/program more attractive and encourage landowner participation.

IMPLEMENTATION PLAN

In the introduction, the IWMP was compared to a roadmap for the watershed, laying out where we want to go (our objectives) and how we plan to get there (the actions). In this section, the focus is on the actions that need to be completed in order to meet our objectives. The implementation plan also includes a measure of success for each action, partner agencies that will assist in implementation, a target timeframe to complete the action, specific target areas for the action, and a reference to the specific objective(s) that each action will accomplish.

Each action is colour coded to indicate which goal it works towards. Goal colours are as follows, but can be combined if the action works towards achieving more than one goal:

GOAL 1 Drinking Water Protection	GOAL 2 Surface Water Management	GOAL 3 Natural Areas	GOAL 4 Water Quality	GOAL 5 Groundwater Protection

	Action	Measure of Success	Partner Agencies	Timeframe	Target Area(s)	Desired Outcome
1.	Form a source water protection committee (including municipal CD, and provincial representation) to develop an action plan for priority threats identified through the source water assessment	Recommendations for each public water source	• MB Water Stewardship • Environmental Services Branch • Environmental Operations Branch, MB • Water Services Board • RMs • Planning District	2010	Management zone around all seven public drinking sources	Obj 1A
2.	Seal abandoned wells in the capture zone of each public water source and in close proximity to semi-public water sources	All identified abandoned/disused wells in the capture zone of public wells – 30 wells/year	None identified	Ongoing	1.5km radius of public and semi-public, water sources	Obj 1A & 1B
3.	Erect signage to delineate wellhead protection areas	Increased public awareness of well location	RM's to assist	2010	Within sight of all public wells	Obj 1A
4.	Coordinate education effort on groundwater and wellhead protection targeting students and landowners	students participate annually; landowners participate biannually	Local schools to participate	Annually (at schools); biannually (with landowners)	Watershed wide	Obj 1B & 5A
5.	Rejuvenate poorly constructed or degraded wells	30 wells / year	None identified	Ongoing	Wellhead of private wells	Obj 1B
6.	Provide grass seed for wellhead protection areas	3 wells / year	None identified	Ongoing	Wellhead of private wells	Obj 1B

GOAL 1 Drinking Water Protection	GOAL 2 Surface Water Management	GOAL 3 Natural Areas	GOAL 4 Water Quality	GOAL 5 Groundwater Protection

	Action	Measure of Success	Partner Agencies	Timeframe	Target Area(s)	Desired Outcome
7.	Assist with annual water tests for private and semi-public water sources	All semi-public wells and 25% of known private wells	MB Water Stewardship to help fund bacteria testing	Annualy	Watershed wide	Obj 1B
8.	Conduct a source water assessment survey of all public water sources	Identify and eliminate potential hazards due to the well site/situation	MB Water Stewardship	2010 - 2010	Zone around all 7 public drinking sources	Obj 1A
9.	Provide incentives to convert flood prone land from annual crop production to permanent cover	Establish natural reserve through purchase/easement on land prone to flooding	MHHC, DUC, NCC	2015 - 2019	North Salt Lake and Six Mile Slough catchments	Obj 2A
10.	Delineate water management zones in the watershed	Water management zones based on physical characteristics and land use	RMs Landowners	2010 - 2012	Watershed wide	Obj 2B
11.	Establish policies and guidelines for surface water in each manage-ment zone	Policies and guidelines for water management in each zone	RMs Landowners	2010 - 2012	Watershed wide	Obj 2B
12.	Establish objective criteria to evaluate drainage applications in each zone	Criteria for drainage	RMs Landowners	2010 - 2012	Watershed wide	Obj 2B
13.	Encourage small water retention/storage projects in the target catchments	None identified	Landowners	2012 - 2016	North Salt Lake and Six Mile Slough catchments	Obj 2A
14.	Inventory grasslands, woodlands, and wetlands on private & public land	Map of protected and unprotected natural areas	MHHC, DUC, NCC, MB Conservation, MB Water Stewardship, MAFRI	2011	Watershed wide	Obj 3A
15.	Foster a wetland bank/market	Offsetting habitat loss	None identified	2014 onwards	Watershed wide	Obj 3B

GOAL 1 Drinking Water Protection	GOAL 2 Surface Water Management	GOAL 3 Natural Areas	GOAL 4 Water Quality	GOAL 5 Groundwater Protection

	Action	Measure of Success	Partner Agencies	Timeframe	Target Area(s)	Desired Outcome
16.	Implement habitat improvement/ mitigation projects on identified sites	Mitigate/eliminate identified habitat threat	MB Water Stewardship, DFO, MAFRI	Ongoing	Shoal Lake catchment, Arrow River, and Oak River	Obj 3B
17.	Conduct aquatic ecosystem assessments on important recreational water systems	Inventory existing aquatic and riparian habitat; ID sites which require remediation	RM's, MB Water Stewardship	All 3 target areas by 2017	Shoal Lake catchment, Arrow River, and Oak River	Obj 3B
18.	Offer incentives for alternative watering & riparian fencing on watercourses and lakes	2 sites/year	Landowners	2009 - 2015	South Salt Lake, Shoal Lake, and Gopher Creek catchments	Obj 4A & 4B
19.	Restore vegetated riparian buffers on watercourses and lakes	Healthy riparian zones on identified erosion risk sites	Landowners, RMs, DFO	2009 - 2015	Riparian areas at risk of erosion	Obj 3B, 4A & 4B
20.	Encourage landowners to divert farmyard runoff (point source) into retention ponds meeting requirements of the Livestock Manure and Mortalities Management Regulation	2 sites/year	Growing Forward, Environmental Services Branch, Environmental Operations Branch.	2009 - 2015	South Salt Lake, Shoal Lake, and Gopher Creek catchments	Obj 4A & 4B
21.	Educate residents about household and grassroots measures to protect and improve water quality	None identified	None identified	Ongoing	Watershed wide	Obj 4A & 4B
22.	Conduct a well inventory in the watershed	Up-to-date well inventory	MB Water Stewardship	2009 - 2012	Watershed wide	Obj 5A

GOAL 1 Drinking Water Protection	GOAL 2 Surface Water Management	GOAL 3 Natural Areas	GOAL 4 Water Quality	GOAL 5 Groundwater Protection

Conservation Agencies

	Action	Measure of Success	Partner Agencies	Timeframe	Target Area(s)	Desired Outcome
23.	Restore wetlands in the target catchments	30 acres/catchment	MB Water Stewardship, DUC, MHHC, CDs	2009 - 2012	Salt Lakes, Shoal Lake, Gopher Creek, and Six Mile Slough catchments	Obj 2A, 3A, 4A & 4B
24.	Protect remaining native prairie through easement or purchase	All identified native prairie is protected	MHHC, DUC, NCC, CDs	2011 - 2015	Identified native prairie	Obj 3A

Manitoba Water Stewardship

25.	Refine source water protection zones for public wells based on local geology	Accurate management zones for public water sources	CDs	2010 - 2012	Management zone around all 7 public drinking sources	Obj 1A
26.	Ensure all existing drainage works in the catchment are licensed	All identified drainage is licensed	RMs, Landowners	2015	Watershed wide	Obj 2A & 2B
27.	Conduct Precipitation/ Flood frequency analysis	Model of discharge/ lake level based on precipitation events	None identified	2010	North Salt Lake, Six Mile Slough, and Shoal Lake catchments	Obj 2A
28.	Prohibit additional drainage of wetlands in the catchments of closed basins	No loss of class 1-5 wetlands (based on Stewart & Kantrud's classification system)	None identified	Ongoing	North Salt Lakes and Six Mile Slough catchments	Obj 2A, 3A, 4A & 4B
29.	Produce new digital groundwater maps at the watershed scale	New groundwater maps	None identified	None identified	Regional	Obj 5A
30.	Evaluate and if necessary redesign groundwater monitoring well network	Validated groundwater monitoring well network	None identified	None identified	Regional	Obj 5A
31.	Consider changes to The Groundwater and Water Well Act to require all new well locations to be logged and all test holes to be sealed once finished	More data on well locations and test wells are sealed	None identified	None identified	Not applicable	Obj 5A

GOAL 1 Drinking Water Protection	GOAL 2 Surface Water Management	GOAL 3 Natural Areas	GOAL 4 Water Quality	GOAL 5 Groundwater Protection

Municipalities

	Action	Measure of Success	Partner Agencies	Timeframe	Target Area(s)	Desired Outcome
32.	Construct a fixed height outlet on closed basins (if feasible)	Work completed	Federal Infrastructure Funding	2015	North Salt Lake and Six Mile Slough catchments	Obj 2A
33.	Conduct a culvert inventory of the watershed	Identify size & location of culverts	CD to assist with mapping	2010 - 2012	Watershed wide	Obj 2B

Planning Districts

34.	Control development that may contribute harmful levels of pathogens, bacteria, pollutants, or nutrients, in source water management zones and known groundwater recharge areas	Restrictions on high risk developments in the capture zone	RMs	2010	Capture zone around all 7 public drinking sources	Obj 1A
35.	Maintain natural riparian buffer zones of 30 m for developments on watercourses & lakes	No existing riparian areas lost in target areas	RMs, DFO	Ongoing	Salt Lakes, Six Mile Slough, Shoal Lake, and Gopher Creek catchments	Obj 2A, 3A, 4A & 4B

Multi-Agency

36.	Explore local treatment and diversion options to reduce nutrient output from municipal sewage lagoons	None identified	RMs & Towns, MBWSB, MB Water Stewardship, CDs	2018	Sewage lagoons in the South Salt Lake, Shoal Lake, and Gopher Creek catchments	Obj 4A & 4B
37.	Adopt a watershed wide ecological goods and services program	Incentive payment for wetlands and riparian areas	Government (all levels), ENGOs and conservation agencies	None identified	Class 1-3 wetlands and riparian areas	Obj 3A
38.	Investigate the potential of constructing a fixed height outlet for each closed basin	Identify flood damage; costbenefit assessment of outlet; ID land-owner willingness	RMs, landowners	2010	North Salt Lake and Six Mile Slough catchments	Obj 2A

EVALUATION AND REPORTING

An IWMP is not meant to be complete once the plan is printed. This integrated watershed management plan is meant to guide conservation and resource management initiatives in the watershed over the next 10 years. During this time, socioeconomic and environmental circumstances will certainly change and the needs and priorities of watershed residents and stakeholders will change as well. As such, this IWMP is meant to be adaptive, which means that it is not written in stone and the Water Planning Authority, with the advice of the WPAT, has the ability to change objectives as needed, along with the actions and policies recommended to meet these objectives.

Our success in implementation will be evaluated primarily by the progress made towards meeting our stated Objectives. The secondary means of evaluating progress will be meeting the measure of success listed for each individual action. In this manner, if the actions we take do not allow us to reach our objectives we may need to revise actions or add new ones, or alter our objectives to be more realistic.

Reports on plan implementation will be produced every two years in order to update stakeholders and watershed residents on the progress towards reaching our objectives from the IWMP. In addition to biannual updates this watershed management plan will undergo full, comprehensive review in 2014, halfway through its intended lifespan.

GLOSSARY & ACRONYMS

Management Zones
The management zone represents the crucial land use and management area where activities or interventions have the greatest opportunity to affect the raw water quality of a source water.

Natural Areas
Land which remains undeveloped and supports a healthy ecosystem that provides ecological goods and services, including wildlife habitat.

Riparian area
The transition zone which acts as the interface between upland ecosystems and water courses.

Semi-Public Water Source
A surface or groundwater source that is not public or private, consists of less than 15 service connections, or a single connection that supplies a public facility such as a school or hospital.

Sensitive Developments
Any development that will or, under specific circumstances (spill, accident, etc), could reasonably be expected to impact a source water by contributing pathogenic organisms, deleterious chemicals, nutrients, or increase the turbidity of the source water.

Source Water
The raw, untreated water which is used to supply a public water source. Source waters may be surface water, such as a lake, reservoir or river, or groundwater.

Private Water Source
A surface or groundwater source that provides water to a single connection, usually a home or farm.

Public Water Source
A surface or groundwater source that provides water to a system with 15 or more service connections.

Acronyms

CD - Conservation District
DFO - Fisheries and Oceans Canada (formally known as the Department of Fisheries and Oceans)
DUC - Ducks Unlimited Canada
IWMP - Integrated Watershed Management Plan
MAFRI - Manitoba Agriculture, Food and Rural Initiatives
MHHC - Manitoba Habitat Heritage Council
MBWSB - Manitoba Water Services Board
NCC - Nature Conservancy Canada
PD - Planning District
PMT - Project Management Team
RM - Rural Municipality
WPA - Water Planning Authority
WPAT - Watershed Planning Advisory Team

APENDIX A: Watershed Planning Advisory Team - Invite List

Agriculture and Agri-Food Canada/ Agri-Environment Services Branch
Archie Miniota Economic Development
Assessippi Parkland Tourism
Assessippi Ski Area and Winter Park
Assiniboine Agricultural Producers
Assiniboine Community College
Assiniboine Development Corridor
Assiniboine Hills Conservation District
Assiniboine Valley Producers Association
Assiniboine-Birdtail Soil Association
Beautiful Plains School Division
Birdtail Sioux First Nation
Birtle & District Community Development Corp.
Birtle Ag Society
Birtle and District Chamber of Commerce
Birtle and District Community Development Corp.
Blanshard & District CDC
Bluestem Wildlife
Boggy Creek Metis Association
Boundary Colony
Boundary Lane School
Brandon & Area Environmental Council
Brandon Naturalist Society
Brandon Soil Management Association
Brandon University
Brandon Wildlife Association
Bunge Canada
Canola Council of Canada
Carlton Trail Planning
Central Agricultural Conservation Area
Citizens for the Responsible Application of Phosphorus
Clear Lake Cabin Owners Association
Clear Lake Cottage Owners Association
Climate Change Connection
CN
Cool Spring Colony
CP
Dairy Farmers of Manitoba
Decker Colony
Deerboine Colony
Delta Waterfowl
Ditch Lake - Beatty Sub-division
Ducks Unlimited Canada
Ducks Unlimited Canada
Duke Energy
Eagle Guide Service
Elkhorn Ag Society
Emergency Measures Organization - Western Region
Enbridge
Enerplus
Environment Canada / CWS
Erickson & District Wildlife Association
Erickson Clanwilliam CDC
Fisheries and Oceans Canada / DFO
Flax Council of Canada
FLIPPR
Fort la Bosse School Division
Friends of Riding Mountain National Park
Friends of Rivers Lake
Gambler First Nation
GreenWing Energy Management Ltd.
Hamiota Economic Development Corp.
Harding Ag Society
Harrison CDC
Husky Energy Inc.
Inglis and Area Business Group
Intermountain Conservation District
International Erosion Control Association - Northern Plains Chapter
Keeseekoowenin First Nation
Kelvin Nerbas
Keystone Agricultural Producers
Keystone Vegetable Producers Association
Kilman's Cottage Association
Lake Audy / Riding Mountain Landowners Association
Lake Enterprises Ltd
Lake of The Prairies Conservation District
Lakeside Resort (Ditch Lake)
Little River Game & Fish Association
Little Saskatchewan Game & Fish
Little Saskatchewan River Conservation District
Long Range Game & Fish
Lost Meadows
Louisiana Pacific
MacDonald Soil and Water Conservation
Manitoba Aboriginal and Northern Affairs
Manitoba Ag Woodlot Program
Manitoba Agriculture, Food and Rural Initiatives
Manitoba Canola Growers Association
Manitoba Cattle Producers Association
Manitoba Chicken Producers
Manitoba Conservation/Conservation Data Center
Manitoba Conservation/Environment Officer
Manitoba Conservation / Forestry
Manitoba Conservation / Land and Water Use
Manitoba Conservation / Remote Sensing
Manitoba Conservation / Wildlife
Manitoba Eco-Network, Water Caucus
Manitoba Forage Seed Association
Manitoba Forestry Association
Manitoba Habitat Heritage Corporation
Manitoba Hydro
Manitoba Industry, Economic Development & Mines
Manitoba Intergovernmental Affairs / Trade
Manitoba Intergovernmental Affairs / Planning Districts
Manitoba Naturalists' Society
Manitoba Pork Council
Manitoba Pulse Growers Association
Manitoba Transportation and Government Services
Manitoba Trappers Association
Manitoba Water Services Board
Manitoba Water Stewardship / Environment Office
Manitoba Water Stewardship / Fisheries
Manitoba Water Stewardship / Groundwater
Manitoba Water Stewardship / Hydrology
Manitoba Water Stewardship / Licencing
Manitoba Water Stewardship / Licencing
Manitoba Water Stewardship / Licensing
Manitoba Water Stewardship/Water Quality
Manitoba Zero Tillage Research Association
Manitoba - Petroleum Branch
Mid West Recreation
Mid West Weed District
Mid-West Planning District
Minnedosa Ag Group
Minnedosa Ag Society

Minnedosa Chamber of Commerce
Minnedosa Fish Enhancement
Minnedosa Soil Management Association
Minnedosa Wildlife Association
Mixedwood Forest Society
Mountain View School Division
MTS (Manitoba Telephone)
National Farmers Union
Nature Conservancy of Canada
Neepawa & Area Planning District
Oak River Ag Society
Oak River Colony
Oakburn Game and Fish
Onanole Fish & Wildlife
Organic Producers Association
Otter Lake Cottage Owners Association
Park West School Division
Parks Canada-Riding Mountain National Park
Parks Canada-Riding Mountain National Park
Pelly Trail CDC
Plainview Colony
Plainview Colony School
Prairie Fruit Growers Association
Prairie Lake Lodge
Prairie West Recreation
Pyott's Campground
Rapid City & District Wildlife Association
Rapid City Ag Society
Rapid City Cattle Producers
Red River Community College
Ricker's Campground
Riding Mountain Biosphere Reserve
Riding Mountain Landowners Association
Riding Mountain Liaison Committee
Rivers Ag Society
Rivers Game & Fish
Rivers West
Rivers-Daly CDC
RM o f Archie
RM of Birtle
RM of Blanshard
RM of Clanwilliam
RM of Daly
RM of Ellice
RM of Grandview
RM of Hamiota
RM of Harrison
RM of Hills burg
RM of Miniota
RM of Minto
RM of Odanah
RM of Park
RM of Park (North)
RM of Pipestone
RM of Rosedale
RM of Rossburn
RM of Russell
RM of Saskatchewan
RM of Shell River
RM of Shoal Lake
RM of Sifton
RM of Silver Creek
RM of Strathclair
RM of Swan River
RM of Wallace
RM of Whitehead
RM of Woodworth
Roblin & District CDC
Roblin Ag Society
Roblin Chamber of Commerce
Roblin Planning District
Rolling River First Nation
Rolling River School Division
Rossburn & District CDC
Rossburn Community Development Corp.
Rossburn Planning
Rossburn Recreation Commission
Rossman Game and Fish
Russell Ag Society
Russell Chamber of Commerce
Russell Game and Fish
San Clara Metis Association
Sandy Lake Cottage Owners Association
Sandy Lake Game & Fish
Sandy Lake Recreation Association
Saskatchewan Watershed Authority
SAVED
Shellmouth Community
Shoal Lake Ag Society
Shoal Lake Chamber of Commerce
Shoal Lake Economic Development
Shoal Lake Enhancement Corp
Shoal Lake Planning
Silver Beach Cottage Owner's Association
Sioux Valley Dakota Nation
Snake Creek Wildlife Association
South Ditch Lake Recreational Co-op Limited
South Riding Mountain Planning District
South Riding Mountain Wildlife Association
Southwest Regional Development Corp
Starbuck Marketing Club
Strathclair Ag Society
Strathclair CDC
Tanner's Crossing Planning District
Town of Birtle
Town of Erickson
Town of Hamiota
Town of Minnedosa
Town of Rapid City
Town of Rivers
Town of Roblin
Town of Rossburn
Town of Russell
Town of Shoal Lake
Trans Canada Pipeline
TransCanada West
Tri-Roads Planning District
University of Manitoba (NRI)
University of Winnipeg Environmental Science
Upper Assiniboine River Conservation District
Valley Inc/Minnedosa & Area CDC
Valley Recreation District
Vegetable Growers Association of Manitoba
Village of Binscarth
Village of Elkhorn
Village of St. Lazare
Virden Ag Society
Virden Area Wildlife Association
Virden Economic Development
Wasagaming Chamber of Commerce
Wasagaming Tenants' Association
Water Ski Manitoba
Water Wisdom
Waywayseecappo First Nation
West Souris River Conservation District
Wolf Creek Conservation
Woodlot Association of Manitoba
Woodworth CDC
Woodworth Conservation Group
Woodworth Ducks Unlimited
Woodworth Game & Fishing Association
Woodworth Soil Association

APENDIX B: Summary of Public Input

Arrow-Oak Watershed (05MG) - Public Concerns

In January 2006 the Little Saskatchewan River Conservation District (LSRCD) & Upper Assiniboine River Conservation District (UARCD) were jointly designated as the Water Planning Authority (WPA) for watershed 05MG. by the Province of Manitoba. This watershed plan was initiated as part of a larger planning initiative for the Assiniboine River which also included the Shell River-05MD, Assiniboine-Birdtail-05ME, and Little Saskatchewan River-05MF. Following the collection of data and the compilation of a State of the Watershed (SOW) Report, a Project Management Team (PMT) was created specifically for each of the four watersheds in order to provide more local input and guidance on planning for each of the individual watersheds.

The next step in the development of the IWMP was to hold public forums to explore the water concerns of local residents and other stakeholders within the watershed. The issues identified at these public forums will provide direction to the Arrow-Oak PMT on the direction and focus of the Integrated Watershed Management Plan. Nine meetings were held across the watershed with the goal of engaging residents and soliciting a range of public issues. The meetings were held in July 2008 at: Oakburn, Strathclair, and Shoal Lake (July 28); Oak Lake, Kenton, and Hamiota (July 29); and Miniota, Elkhorn, and Virden (July 30).

At each of the public meetings the attendees were asked to provide their top three concerns related to water within the Arrow-Oak watershed. Attendees were also asked to contribute ideas on how their issues could be resolved and, if the issue was successfully resolved what that success would look like in 25 years. Participants at each of these public open houses were also asked to form groups, discuss the issues in the watershed and form a collective list of issues and solutions for the watershed. This was done to allow for discussions on issues and to obtain more general concerns within the watershed as opposed to very site specific issues garnered through individual responses. All of the individual and group responses were collected and compiled in a digital format, word for word, by members of the PMT. The complete list of public and group concerns is available on the Assiniboine IWMP website at www.uarcd.com/IWMP.htm.

In order to analyze the individual and group responses, the public responses were categorized into a primary issue category (e.g. surface water quality), a sub-category if enough information was provided (e.g. Nutrients), and a target location if provided (e.g. Shoal Lake). This methodology required some subjectivity in the categorization process but concerted efforts were made to capture the essence of the issues. In the event that several concerns were addressed in one issue statement, the first issue mentioned was taken as the category, or the issue for which solutions were provided was taken as the dominant concern.

The following is a summary of what 44 watershed residents told us.

Main Categorization of Issues

Top priority issues – Individual responses (n=44):

19 people, representing 43% of respondents, cited surface water management (i.e. drainage) as their number one concern
10 people, representing 23% of respondents, cited surface water quality as their number one concern
7 people, representing 16% of respondents, cited ground water quality as their number one concern
5 people, representing 11% of respondents, cited natural areas (i.e. wetlands, riparian zones and wildlife) as their number one concern
3 people, representing about 7% of respondents, cited groundwater quantity as their number one concern

Top priority issues – Group responses (n=9):

4 groups, representing 44% of responses, cited surface water management as their number one concern
2 groups, representing 22% of responses, cited surface water quality as their number one concern
2 groups, representing 22% of responses, cited groundwater quality as their number one concern
1 groups, representing 11% of responses, cited natural areas as their number one concern

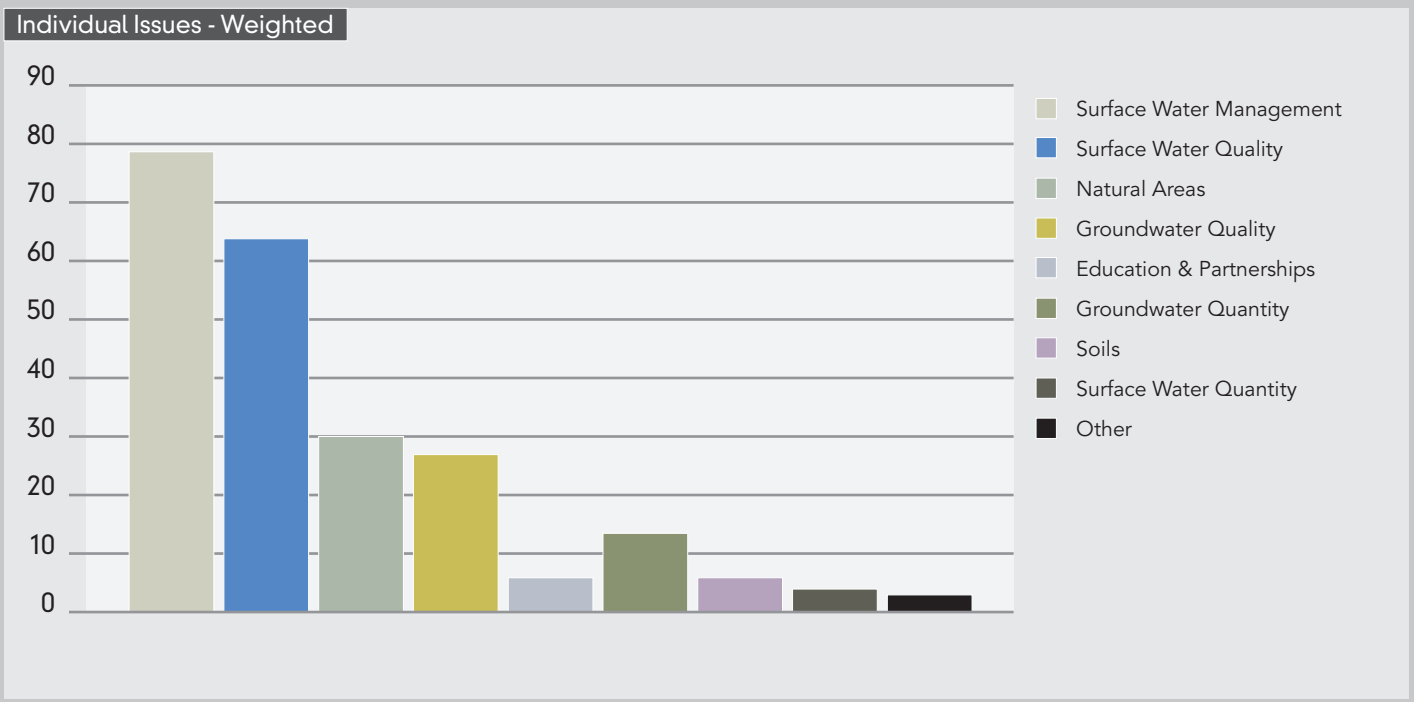


Figure i: Weighted ranking of individual issues based on priority level

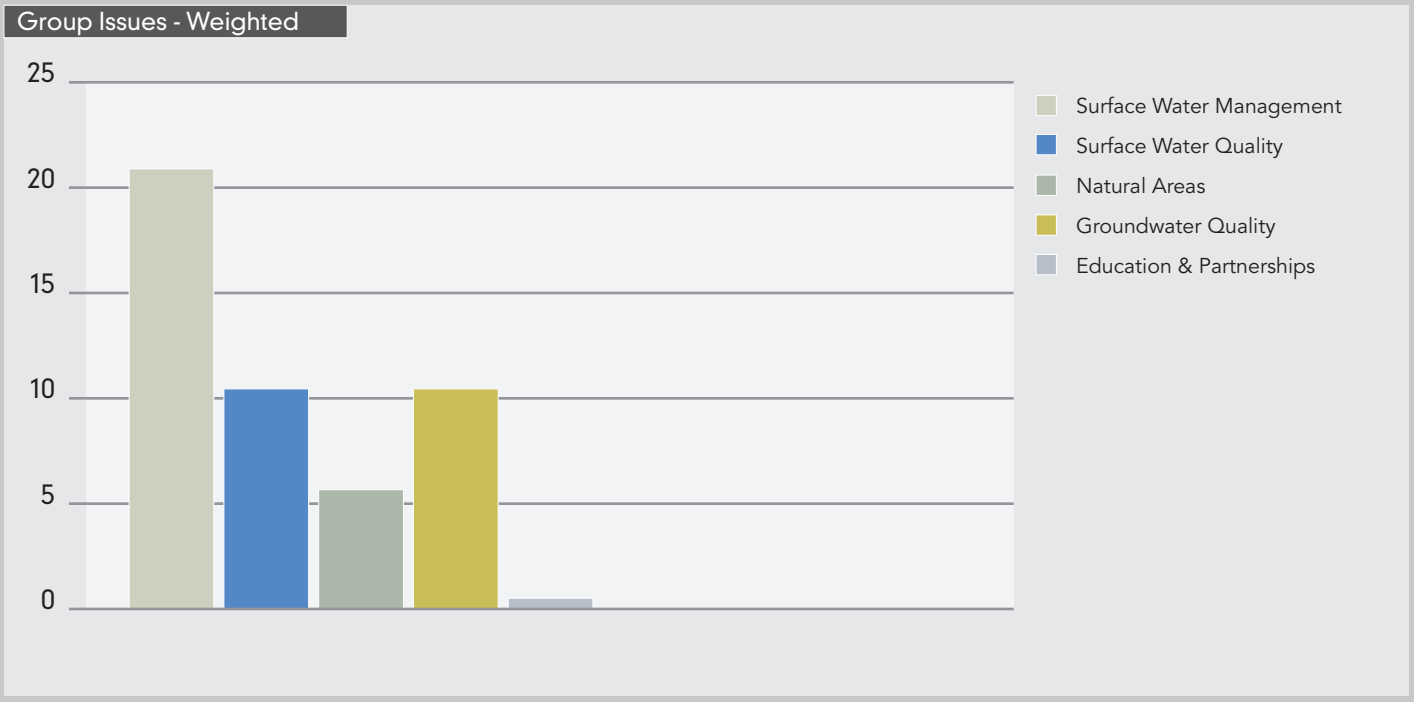


Figure ii: Weighted ranking of group issues based on priority level

In order to better incorporate all of the public input and priorities, a weighting system was used which provides more relative importance (weight) to first and second priority issues (i.e. 1st priority = 3 points, 2nd priority = 2 points, 3rd priority = 1 points). Figure i shows the results from the individual input based on this weighting system and Figure ii shows the results from the group input based on the same weighting system.

The results from the individual and group results are similar, clearly placing Surface Water Management as the most important issue to local residents. The top four local priorities were surface water management, surface water quality, groundwater quality, and natural areas; these four issues received 86% of the weighted support from individuals and 98% of the weighted support from groups.

Public Priorities

Surface Water Management
Surface Water Quality
Groundwater Quality
Natural Areas

Sub-Categorization of Issues

In order to provide more specific direction for the integrated watershed management plan the four highest priority areas of concern were further broken down into sub-categories. These sub-categories are outlined here in order to allow for a better understanding of the nature of the concerns and will, therefore, assist in the design of better and more relevant solutions. A glossary, explaining each of the sub-categories can be found at the end of this document.

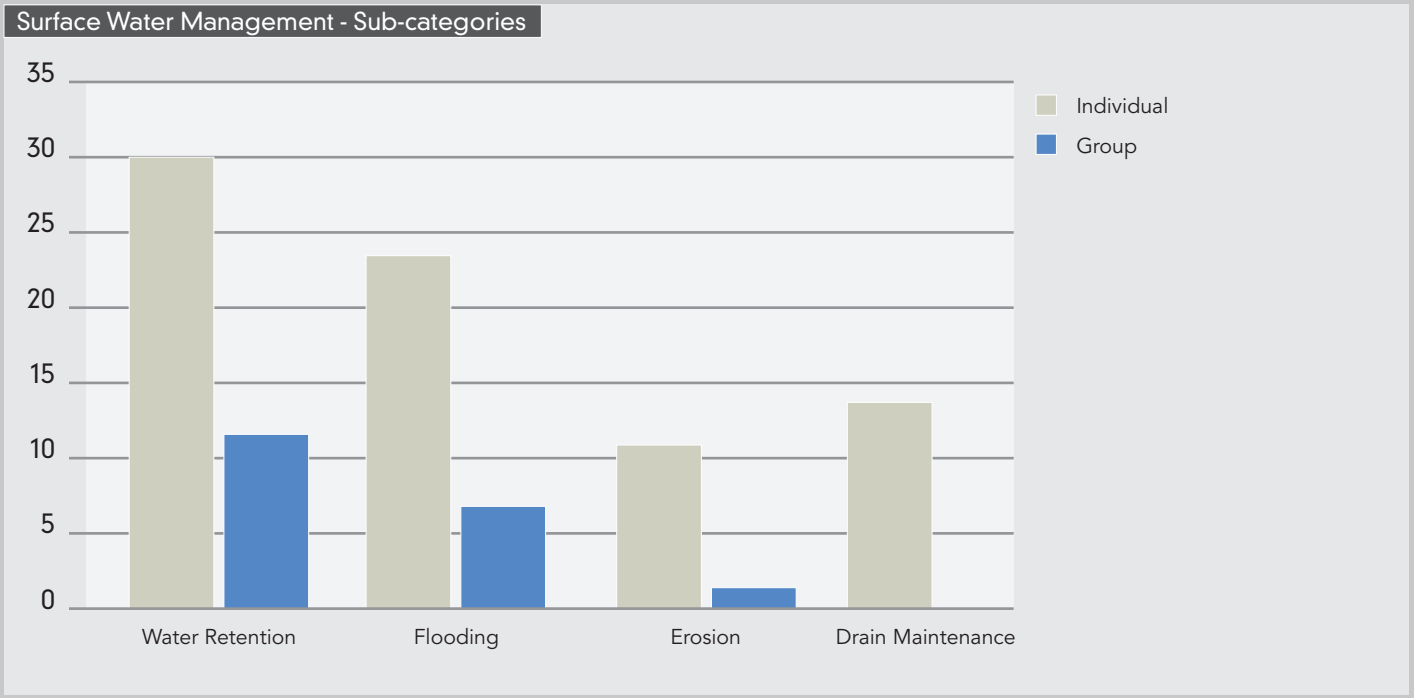


Figure iii: Sub-category issues related to surface water management (i.e. drainage)

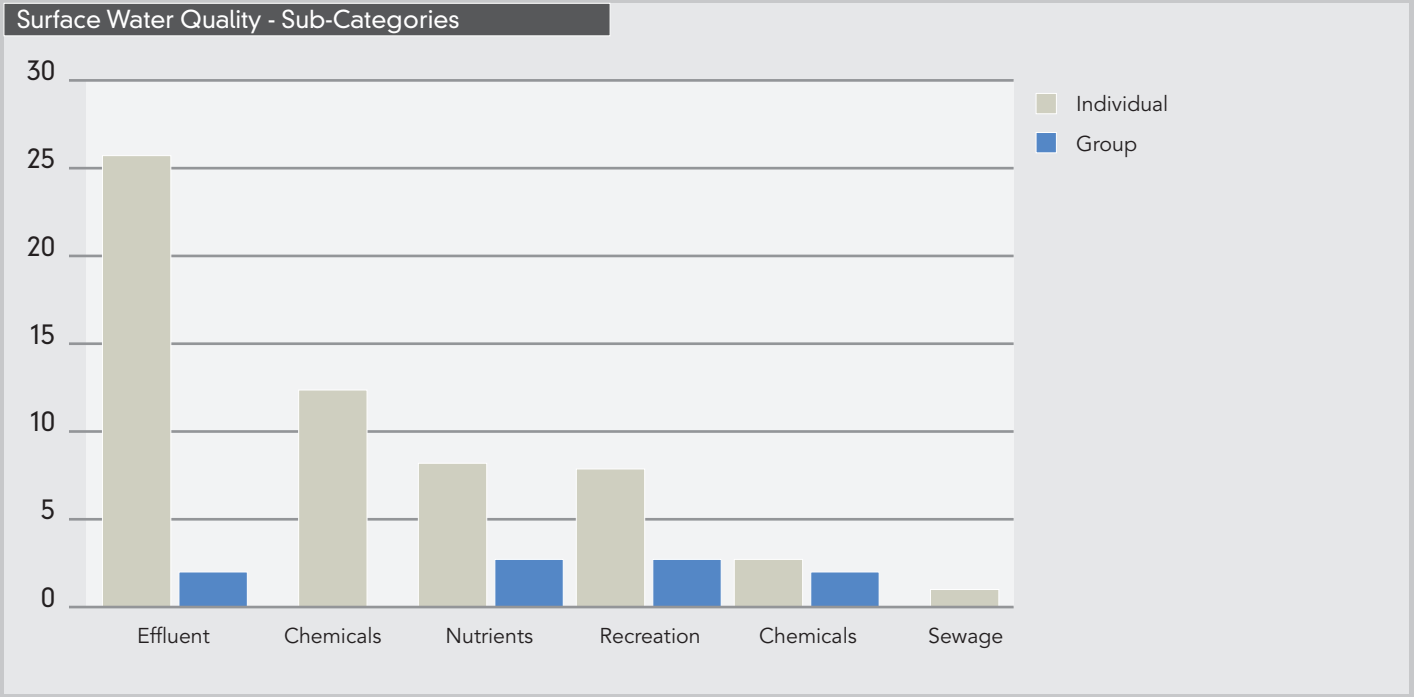


Figure iv: Sub-category issues related to surface water quality

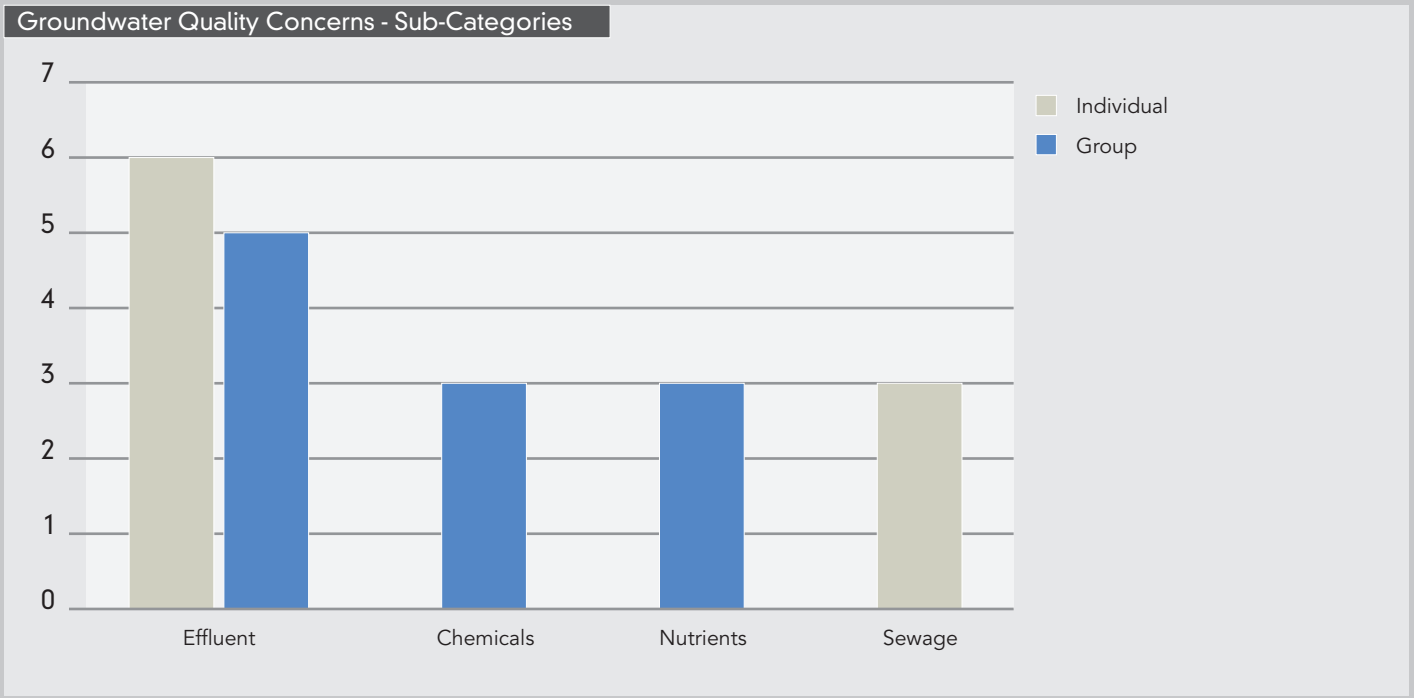


Figure v: Sub-category issues related to groundwater quality

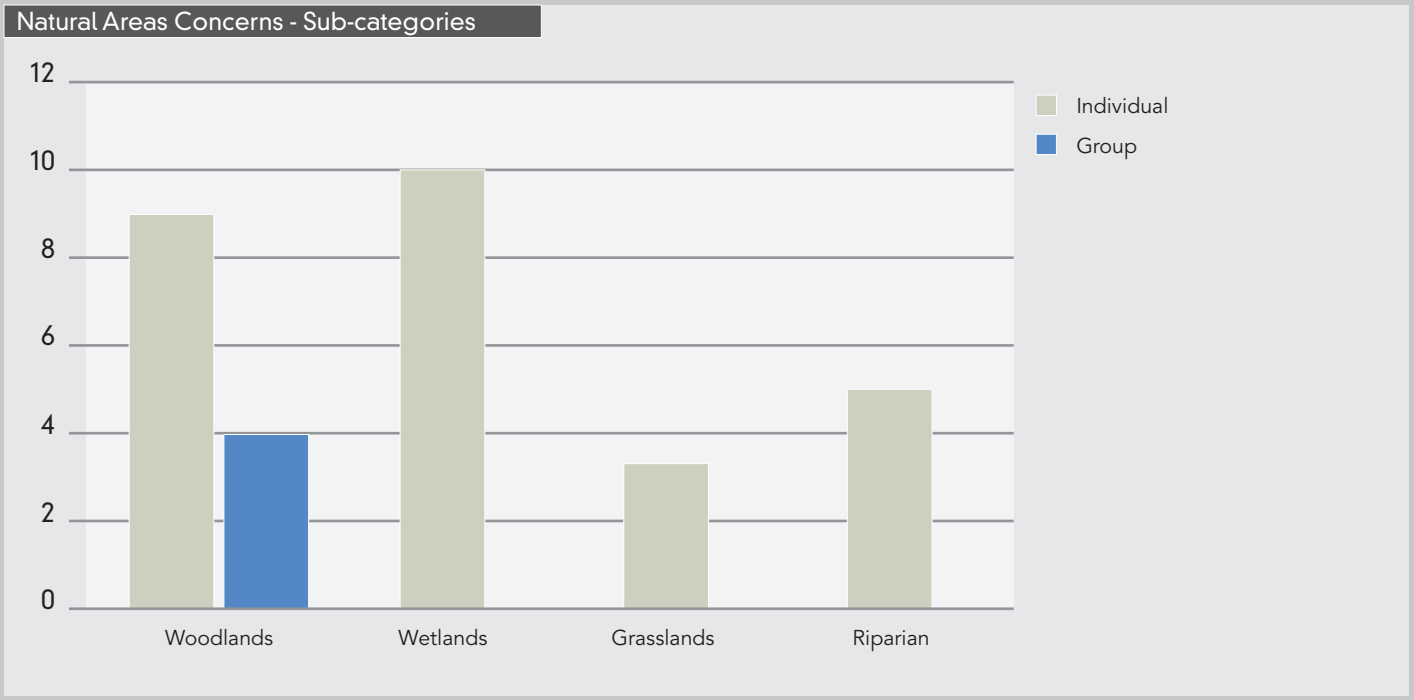


Figure vi: Sub-category issues related to natural areas

Target Locations

Surface Water Management
There were a number of key areas identified for surface water management concerns. These included: flooding and water retention on the Six Mile Slough (N of Hamiota), Erosion on the Assiniboine River, Flooding on portions of the Arrow River, Flooding and erosion on Shoal Lake, and flooding in the NW area of the watershed.

Surface Water Quality
Key areas identified for surface water quality concerns included: Effluent on Shoal Lake, the recreational importance of Salt Lakes and concerns over effluent inputs, and concern over nutrients in source water zones.

Natural Areas
Road allowances were identified as an important natural area. Numerous respondents called for the preservation of natural habitat on undeveloped road allowances, and the restoration of road allowances which have been developed or cleared by neighbouring landowners back into natural habitat states.

Groundwater Quality
The key target area for groundwater quality identified by respondents was source water zones as mapped in the drinking water section of the State of the Watershed report.

Summary
This document was prepared for the benefit of the PMT, all watershed stakeholders, and the public at large in order to provide an overview of the concerns voiced by residents of the Arrow-Oak watershed. The four key issues in the Arrow-Oak watershed, as identified by the public, are: surface water management, surface water quality, natural areas, and groundwater quality. The breakdown and analysis of the public input will be used by the PMT, in conjunction with the technical and scientific input, in the preparation of the Arrow-Oak IWMP.

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